

FORMATION AND DEVELOPMENT OF AN ECONOMIC MECHANISM FOR MANAGING LAND RESOURCES IN THE CONTEXT OF DIGITALIZATION OF AGRICULTURE

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Abstract

The purpose of paper consists in developing the economic mechanism for increase in effective management of land resources in agriculture. Theoretical provisions of institutionalism, management, system approach, the general scientific and special methods were used in the course of the research. Considering influence of negative externalities on the market of the agricultural land and a deviation of the prices from equilibrium level, it is expedient to influence a market turnover of agricultural grounds by means of the priority directions of development: reductions of transactional costs for execution of transactions and registration of the property rights to the land plots, updating of cadastral cost of the land plots, accelerations of differentiation of the lands which are in federal, regional, regional property, etc. As a result of a research authors constructed the regional economic mechanism of management of land resources in agriculture on the basis of use of digital technologies. Thus, the mechanism includes the executive power, scientific centers, higher educational institutions, software products providing accumulation, updating, structuring, storage of cartographic and thematic information for adoption of optimal management decisions. The offered economic mechanism is recommended to be used when developing state programs.

Key words: economic mechanism, land resources, agriculture, digital technologies, science

INTRODUCTION

Development of the organizational and economic mechanism of management of land resources is based on institutional, neoinstitutional theories, theories of public administration, management, systems.

From the philosophical point of view management is an art of correlation purposes with funds from a position of its efficiency [22], deliberate orientation of action [33], ability of systems to keep the qualitative definiteness, to maintain dynamic balance with environment, to be improved [5], to direct and adjust various manifestations of their internal and external activity by means of accumulation, transformations and information transfers [1].

The humanitarian portal contains interpretations of management as actions – "impact (the subject of management) on the

operated system (object of management) for the purpose of ensuring the behavior demanded it or change of its characteristics" and as functions, "which provides: maintaining certain structure of a system and its system characteristics; maintenance of the set mode of activity of a system and its optimization; realization ... the set program of activity of a system (achievement of the goal)" [4].

The modern institutional economic theory defines management as concentration of external efforts in a certain direction [16]; the influence directed to change of a condition of an object on some interval of time [34].

In the theory of public administration this term is considered as the conscious organizing and regulating impact of the state on public (public) activity of people for its streamlining, preservation or transformation [3], the purposeful, organizing and regulating

influence of people (and the institutes created by them) on own, public, collective and group activity in definite purposes and interests [29]. From a position of the theory of administrative management, management is the universal process consisting of functions of forecasting, planning, the organization, motivation, coordination and control, directed to a formulation and achievement of the goal of the organization [32].

On the basis of synthesis of the accumulated theoretical experience, results of the previous researches [38] management of land resources can be interpreted as the system consisting of set of the interconnected and interacting elements, allowing to create objective prerequisites for adoption of the correct decisions on development of the land relations in agriculture.

This term is used by the United Nations for designation of the processes including definition of property rights and other attributes of the earth (cost and use), shooting and the graphic description, detailed documenting and granting the relevant information for support of the land markets [25].

For the last decades in scientific literature a definition "mechanism" and its specifications are widely used: economical, organizational, organizational and economic, mechanism of management, etc.

In modern economic science use as the equivalent or complementary definition "the economic mechanism" entered into a terms framework of mainstream economic by Nobel Prize laureates on economy of 2007 Hurwicz, Maskin, Myerson. In vision of Hurwicz and his adherents working within the theory of economic mechanisms, the mechanism is the interaction between subjects and the center consisting of three stages: each subject in a private order sends to the center the message of m_i ; the center, having received all messages, calculates estimated result: $Y = f(m_1, \dots, m_n)$; the center announces result of Y and as necessary realizes it [15]; it is "game" which participants communicate with each other or with "the center of messages" [2].

There are different views of the maintenance of a concept of the mechanism of economy:

[8] considers it expedient to understand as him set of resources of economic process and ways of their connection, [13] – characteristics of process: ways, methods, norms, means, forms of functioning something or impact on something, but not set of resources or conditions of an object.

Opinions of scientists which define the economic mechanism as the tool (a set of economic methods, ways, forms, tools, influence levers) are known. So, for example, by [30], the economic mechanism is meant as set of methods and levers on economic processes, their regulations; [37] – "... set of the economic levers of the subject on the operated object determined by the conditions of market economy following from interrelation of subjects of a market system", [35] – the certain objective tool existing in a social system, consisting of the organizational relations and economic levers, allowing to transform an economic system and also to change its technical and economic indicators during time.

Some authors speak about the economic mechanism as about the system of economic regulators (their interconnected, interdependent combination). In understanding [18] the economic mechanism is "... specific set of the elements, states and processes located in this sequence, which are in certain communications, the relations and determining an order of any type of activity", [7] – set of ways of management and interaction of subjects which criterion function is rational managing and formation of steady regularities in development of economy, [27] – the uniform system of the complex economic relations, actions, tools and receptions focused on realization of any economic purposes or the solution of the tasks causing interdependence of economic events.

The description of a phenomenon of the economic mechanism of [19] is of scientific interest. The scientist treats it as "the system of interrelations of economic events which arise in certain conditions under the influence of an initial impulse", notes that it is possible to talk about the economic mechanism "... in case a certain initial economic event involves some other, and their emergence does not

require an additional impulse. They follow one another in a certain sequence and lead to certain obvious results. Thus, the economic mechanism is defined by either the nature of the initial phenomenon, or the end result of a series of the phenomena. But as the making mechanism elements always both the initial phenomenon, and the finishing phenomenon, and all process which happens in an interval between them" at the same time act. The similarity of views of [14] is traced: "economic mechanisms are not certain manifestations of these or those lines of economic activity autonomous, not dependent from each other. Working at the same time, causing and mutually supplementing each other, all set of economic mechanisms represents a big system with all regularities

inherent in it. Such mutually interlacing of the economic mechanisms functioning within the country and in interaction with a world economic system makes intrinsic (substantionalny) fundamentals of national economy".

Among the points of view of scientists on concepts of the mechanism is management and the organizational and economic mechanism of management it is possible to allocate the following directions (Table 1).

Thus, it is logical to consider the mechanism as unity of structural and process components, a form of the system interaction of various subjects and objects having entrance parcels (impulses) and the resulting reaction. Depending on overweight of accents this or that mechanism will have the name.

Table 1. Scientific ideas of the content of categories "mechanism of management", "organizational and economic mechanism of management"

| Approach | Author | Example of the formulated position |
|------------------------------------|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Set of administrative tools | Lafta | The mechanism of management is the set of the levers used in management or more precisely, a complex of the levers used in management |
| | Tretyakov | The mechanism of management is the set of the interacting elements (states, processes, social and economic norms and rules) united by a definite purpose and which are the tools transferring an object from one state to another by influence of the making elements on it |
| | Buleev | The organizational and economic mechanism of management is the set of forms, methods and instruments of management |
| | Malyshev | The organizational and economic mechanism of management is the operating in the institutional environment of society, organized to adequately legal form, target, interconnected effectively functioning device, set of states, processes, social and precepts of law and rules of which there is a management as the social phenomenon |
| System of administrative influence | Goncharov & Oleynikova | The mechanism of management is an implementer of management decisions, actuating of some links of the operated system for the purpose of stimulation of other links of a system on the necessary movement aimed at obtaining positive result |
| | Kournikova | The mechanism of management is the set of various methods of management used by the subject of management and making impact on the relations, communications between system elements (object of management) for the solution of the put, relevant tasks |
| | Mishenina & Kovalenko | The organizational and economic mechanism of management isa complex of organizational, economic, motivational, legal and other ways of interaction of subjects of managing and impact on their activity which provides coordinating of the interacting objects and subjects of management |
| | Litvinov & Kaptalan | The organizational and economic mechanism of management is the set of the administrative actions directed to the organization of interaction between system elements for the purpose of achievement of their economic interests taking into account features of external and internal environment |

Source: Made by authors by [20, 36, 6, 24, 12, 17, 26, 23].

In our opinion, the economic mechanism of management of land resources in agriculture is a form of system interaction of subjects and

objects for impact on a market turnover of agricultural grounds by means of the priority directions of development taking into account

influence of negative externalities on the market of the agricultural land and a deviation of the prices from equilibrium level.

In this context, the purpose of the paper – to offer the economic mechanism of management of land resources in agriculture.

MATERIALS AND METHODS

The theoretical and methodological basis of the study was the works of Russian and foreign scientists and specialists of theories of economic policy, public administration, management, institutional management, organizational mechanisms, economic mechanisms.

The consolidation of information resources for land management was made, the data of the Ministry of Agriculture of Russian Federation, official government publications (federal laws, departmental project, land code, resolution) were used in the preparation of the paper.

The research on development of the economic mechanism of management of land resources in agriculture is conducted on the basis of system, functional, information approaches with application of various methods of scientific knowledge: abstraction, scientific idealization, axiomatic, induction, deduction, analysis, synthesis, structurization, systematization, interpretation, modeling, etc.

RESULTS AND DISCUSSIONS

Management of the market of the agricultural land difficult according to the contents as includes obligatory elements of public administration by land resources and market mechanisms of impact on this process (Figure 1).

In the developed economic mechanism of management of land resources in agriculture externalities (outer effects) of a regulation of operations with the land plots from structure of agricultural grounds are allocated, corrective actions on a market turnover of lands are proposed. Subjects of the mechanism are the Government of the Russian Federation, owners of lands, the

market of the agricultural land; objects are the land plots.

The main regulating documents are the Land Code of the Russian Federation [21], the Federal Law "About land turnover of agricultural purpose" [11], the State program of effective involvement in land turnover of agricultural purpose and development of ameliorative complex of the Russian Federation [31]. Administrative influence can lead to negative externalities, overestimate of the prices of the land plots that will be reflected in a market turnover of the agricultural land.

Increase in efficiency of functioning of the land market has to be promoted by a control system with application of methods of impact on a market turnover of the agricultural land. Streamlining of the procedure, elimination of additional need of providing documents, visits of specialized institutions, implementation of payments, use of the information portal allow to reduce transactional costs for execution of transactions and registration of the property rights to the land plots [41].

Market price of the land plots from structure of the agricultural land does not form the objective basis for determination of their mortgage cost. The corresponding point that the mortgage cost of the land plot of a such type can be determined by the agreement of the depositor with the pawnbroker proceeding from its cadastral cost without evaluating its market value is introduced in the Federal Law "About a Mortgage (Pledge of the Real Estate)" [10]. Similar assessment is subjective, it is confirmed in practice by insignificant transactions between interested parties and demands development of land mortgage lending. Methods of comparison of sales and capitalization of a land rent are most perspective for high-quality improvement of reliability of assessment of cadastral cost of the agricultural land. As the cadastral cost of the agricultural land assumes mass market assessment, one of the called methods conforming at the moment to methodical requirements and conditions of active sales or rent of lands in areas is chosen.

Their registration by the declarative principle became the reason of low level of registration

of the rights for the land plots: the big areas of agricultural grounds are legally not involved in a market turnover, and the state receives less the essential sums of land payments in the budget. Besides, account of lands by Federal State Statistics Service (Rosstat) is kept only on one sign – agricultural grounds, without indication of their structure (the arable lands, haymakings, pastures, deposits, lands occupied with long-term plantings). In practice such approach led to division of agricultural grounds into land shares only on arable land, without the areas of meadows and pastures; to receiving by owners of lands a

possibility of the unauthorized and free translation of meadows and pastures in an arable land that can have further negative impact on development of livestock production.

Some of the main directions of increase in effective management of land resources should consider process of acceleration of differentiation of the agricultural land which is in the state, regional (republican) and municipal landed property. The lack of accurately established borders between various forms of the landed property develops the shadow sector of economy.

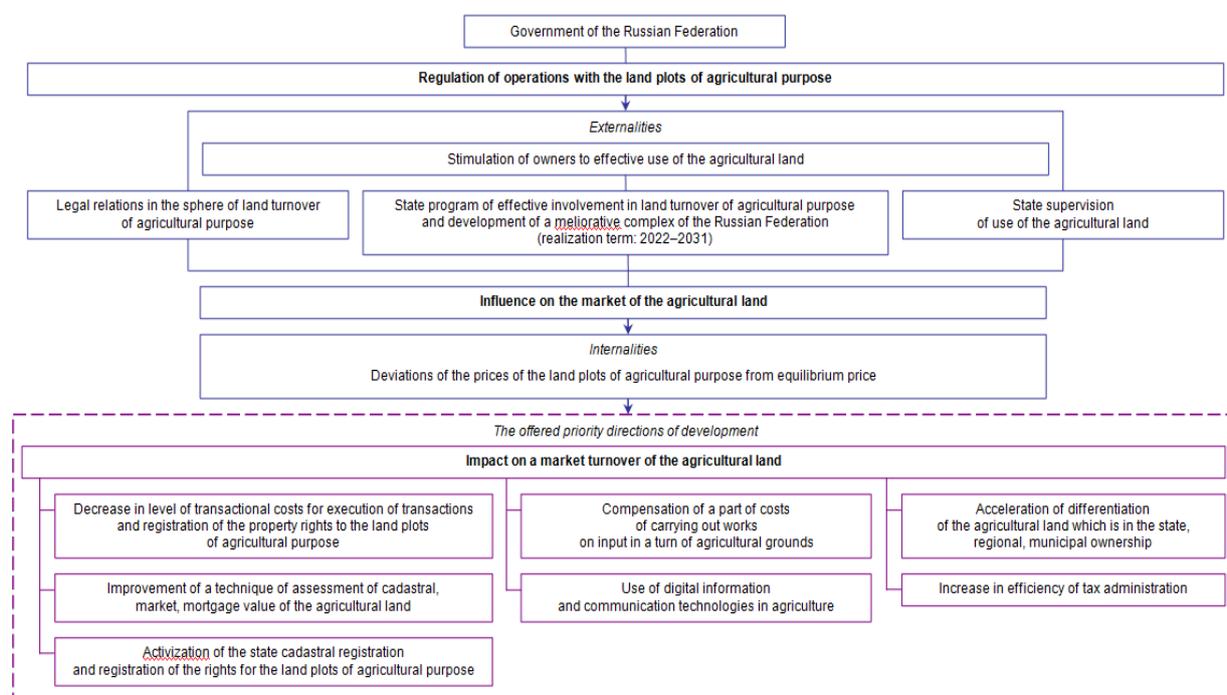


Fig. 1. The developed economic mechanism of management of land resources in agriculture

Note: The dotted violet line selected authors' offers.

Source: Author's own elaboration.

The institutional form of government the economic relations assumes improvement of administration of land tax due to granting tax benefits when involving of not used agricultural land in economic circulation, applications of the raising coefficient at calculation of the amount of tax concerning not used lands.

Due to the annual increase in the areas of intensive overgrowing of an arable land, haymakings, pastures the bush and low wood for agricultural producers set tasks of

involvement of lands in economic circulation, carrying out a complex of actions for improvement of natural fodder grounds and to development of new lands for the subsequent their use in agriculture. Space overgrown with the small wood works demand essential investments therefore it is necessary to provide allocation of subsidies for compensation of a part of expenses from federal and regional budgets.

The high importance of use of information and communication technologies in

agriculture caused need of development of model of a common information space for formation and development of the economic

mechanism of management of land resources (Figure 2).

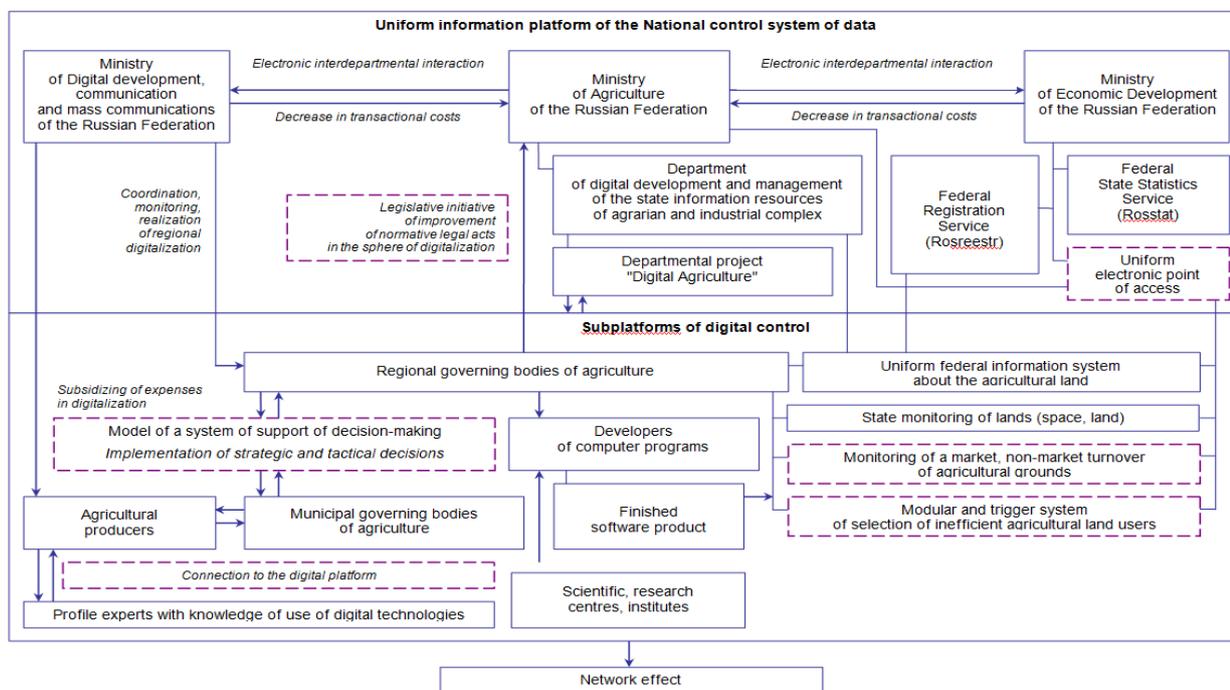


Fig. 2. Model of a common information space of the economic mechanism of management of land resources in agriculture

Note: The dotted violet line selected authors' offers.

Source: Author's own elaboration.

At the federal level implementation of exchange of information between the Ministry of Agriculture of the Russian Federation, the Ministry of Digital development, communication and mass communications of the Russian Federation and the Ministry of Economic Development of the Russian Federation for the purpose of effective management of land resources in agriculture through the Federal state information system "Uniform Information Platform of the National Control System of Data" (FGIS "EMP NSUD") is supposed.

The Ministry of Agriculture of the Russian Federation developed the departmental project "Digital Agriculture" [9]. The national platform of digital public administration has to be integrated by agriculture vertically with digital subplatforms at the regional and municipal levels for digitalization of agriculture by means of development and deployment of digital technologies and platform decisions for ensuring development

of the industries of agro-industrial complex. Especially for these purposes the Department of digital development and management of the state information resources of agrarian and industrial complex having two divisions in the structure is created: department of project management by the state information systems, the department of information and analytical providing and information security [28], interacting with the similar structures of regional governing bodies of agriculture which are responsible for introduction of digitalization at regional and municipal levels. At the regional level application of incremental approach during the developing and improvement of the software on model of the management of land resources in agriculture consisting in the gradual approbation increasing quality of the software product is required. Executive authorities and agricultural producers have to select the service suitable them in the set parameters, giving the chance of carrying out analytical

interpretation, adoption of effective management decisions. The similar campaign allows to consider completeness of the obtained information, to reveal mistakes, to change algorithms in process of management of land resources. For assessment of efficiency of use of agricultural grounds producers of the Saratov region recommend developed by scientists of the Povolzhskiy Scientific Research Institute of Economic and Organization of Agroindustrial Complex (PSRIEOAIC) the modular and trigger system of selection of inefficient agricultural land users [40].

The Ministry of Agriculture of the Saratov region carries out monitoring of agricultural grounds, drawing up analytical information on the happened changes of quality indicators of soils with the software product of LLC CentrProgrammSistem. Timely reaction provides reproduction of soil fertility agricultural producers whose majority has no funds for a covering of the corresponding expenses. Therefore it is offered to develop the new software product on monitoring of market and non-market land turnover of agricultural purpose. Creation of digital service, development, service of the program will demand the corresponding financial security. Subsidizing of expenses - allocation of budgetary funds for development of network infrastructure and transmission media of data can become one of sources of financing of digitalization.

Now implementation of digital technologies in production and administrative activity of agricultural producers generally has fragmentary character. First of all, it belongs to carrying out remote sensing, use of methods of predictive modeling of indicators of field agroecosystems. It is necessary to use the model of a system of support of decision-making including conceptual, information, component, methodical support which is considered effective, including at the solution of semistructured problems. (Service providers and users) at use of digital technologies the positive network effect which is formed on condition of stimulation of demand for services and increases in

number of consumers has to become result of interaction of interested parties.

For this purpose existence of mechanisms of the system involvement of agricultural producers into this process is necessary.

Formation of a system of public administration during digital transformation of the industry is based on legal regulation and its development and also creation of safe information infrastructure. Regional governing bodies of agriculture can bring the relevant legislative initiatives in higher bodies (in this case – in the Ministry of Agriculture of the Russian Federation).

Are the characteristic reasons of complexity of the regional economic mechanism of management of land resources in the conditions of digitalization of agriculture (Figure 3):

– weak legislative and a regulatory framework concerning informatization and digitalization in agriculture from a position of creation of the corresponding infrastructure and subsidizing of this process;

– absence of uniform governing body of land resources and dispersal of administrative functions in the Ministry of Agriculture of the Saratov region, the Ministry of Economic Development of the Saratov region, Committee on management of property of the Saratov region;

– discrepancy of the available software products to requirements for ensuring rational management of land resources;

– need of involvement of private business structures for a computerization, digitalizations in agriculture.

Management of agriculture and land resources at the regional level by means of the digital platform "Digital Agriculture" has to be carried out in interaction of executive authorities by means of combination of functionality of digital platforms (subplatforms) on a seamless basis with application of feedback mechanisms for obtaining internal office information and performance of tasks on implementation of state programs.

The important stage of digitalization of management of land resources in agriculture consists in design and introduction of

programs, applications, services. It assumes holding competitions on the basis of open data between developers. According to us, it is

expedient to involve scientists of profile research institutes, higher education institutions, experts of GIS technologies to it.

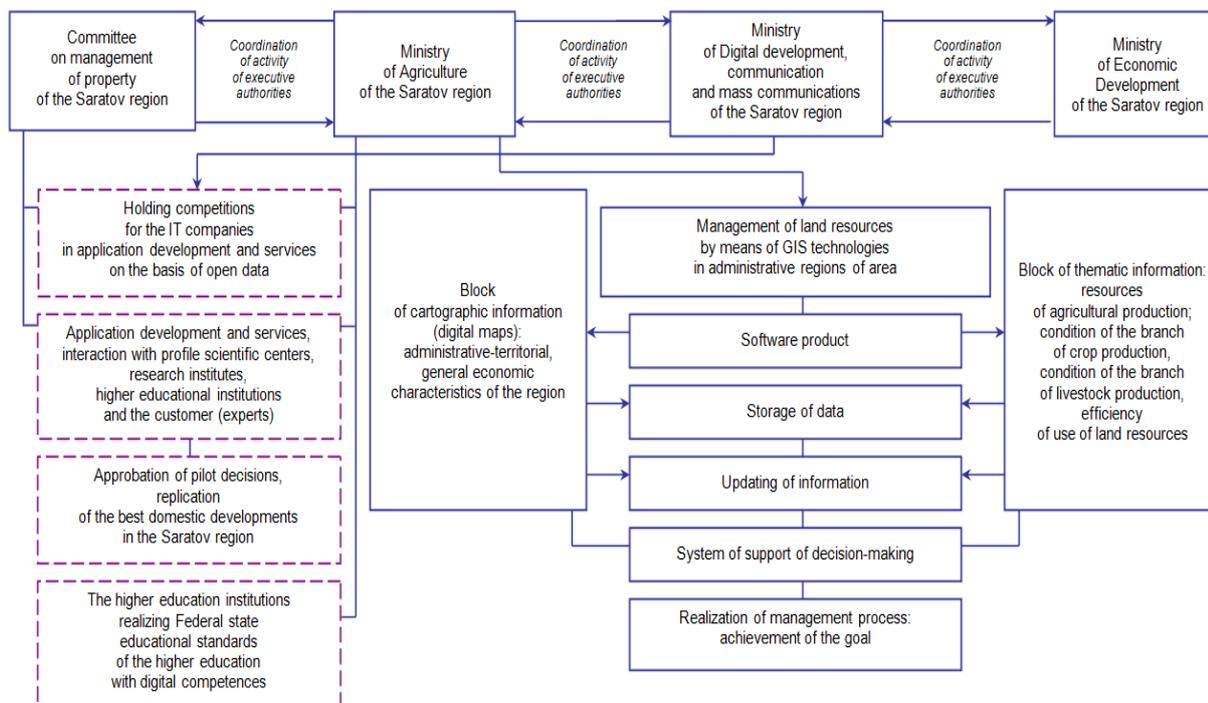


Fig. 3. The regional economic mechanism of management of land resources in agriculture on the basis of use of digital technologies

Note: The dotted violet line selected authors' offers.

Source: Author's own elaboration.

The software product on management of land resources has to undergo the corresponding approbation regarding quality and efficiency of the decisions made on its basis in agriculture, the subsequent replication to users. It contains two blocks of information. The block of cartographic information is administrative-territorial maps and general economic characteristics of regions. Visual images are used: administrative-territorial division (number of rural districts, number of settlements), area of the territory (sq. km, share in the general indicator), area of agricultural lands (hectare, specific weight of an arable land), cadastral cost of agricultural grounds (million rubles, share in the total cadastral cost), etc. Digital maps give the chance to automatically observe significant deviations of the corresponding indicators a certain period, to establish the reasons of such changes and to make the relevant

management decisions. Addition of new data on land resources provides formation of the following layer of visual space on condition of their usefulness.

The block of thematic information is one of the most important elements of process of management of land resources, includes use of the agricultural land (structure, dynamics of the areas, distribution on forms of ownership, the area not used, involved in a turn), a condition of the agricultural land on categories (level of natural and artificial fertility, monitoring of negative processes, the structure of sown areas and productivity of crops, use of the reclaimed lands, existence of especially valuable productive agricultural grounds), etc.

The information massif is going to storage of data, the algorithm of calculation of indicators is modelled, there is their continuous updating that allows authorities to make timely,

effective decisions on management of land resources in agriculture. PSRIOAIC's scientists in Federal Service for Intellectual Property (Rospatent) registered the databases "Quantitative assessment of economic value of the agricultural land", "Tools for assessment of efficiency of use of lands from structure of agricultural lands in the Saratov region", "Analytical information on the market of the agricultural land in the Saratov region" [39, 43, 42].

At the final stage for performance of the specified functions the system of support of decision-making which on the basis of processing, structuring the obtained information provides acceleration of adoption of rational management decisions has to be created. Realization of process of management of land resources consists in achievement of the goal (purposes), is carried out by competent specialists in all vertical of administrative hierarchy.

CONCLUSIONS

Essential factor of increase in effective management of land resources in agriculture is use of the developed economic mechanism. Considering influence of negative externalities on the market of the agricultural land and a deviation of the prices from equilibrium level, it is expedient to influence a market turnover of agricultural grounds by means of the priority directions of development: reductions of transactional costs for execution of transactions and registration of the property rights to the land plots, updating of cadastral cost of the land plots, accelerations of differentiation of the lands which are in federal, regional, regional property, etc.

The constructed model of a common information space of the economic mechanism of management of land resources in agriculture assumes the organization of digital interaction of the ministries, departments by means of use of specialized information, the corresponding portals, implementation of space, land monitoring of lands, monitoring of a market, non-market turnover of agricultural grounds, selection of

inefficient agricultural land users through modular and trigger assessment, development of the system of support of decision-making on regional and municipal subplatforms of digital control, ensuring the network effect which is expressed in increase in value of information and communication technologies with increase in number of users among participants of the land relations.

The evidence-based regional economic mechanism of management of land resources in agriculture designed on the basis of use of digital technologies involves executive authorities, scientific centers, higher educational institutions when developing the software products providing accumulation, updating, structuring, storage of cartographic and thematic information for efficiency of adoption of management decisions.

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