The influence of the agroindustrial complex on the region spatial development (under the conditions of the new technological way)

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Abstract. The spatial heterogeneity of Russian territories has among other differences (like the climatic, resource) also an association with interregional and intraregional differentiation. The development of the agro-industrial complex (AIC) along with other industries will contribute to smoothing these differences and improving inter-level interaction. They can become catalysts for spatial development by introducing new technological processes in the agro-industrial complex, improving regional and municipal infrastructure, and digitalizing the regional economy. Due to the introduction of informative-communicative technology the production of regional economic entities is developing, a bigger increase in the gross regional product is provided. The thesis formulates that the digitalization of the regional agro-industrial complex contributes to the solution of the transformation issues in industrial and social relations that affect the further development of the agro-industrial complexes due to the implementation of new methodological and practical approaches in regional management of different territories. Monitoring tools, resource forecasting analysis allow bringing regional agribusiness and related industries to a new progressive level of development, which regional financial interests, systematized into homogeneous groups, allow solving many issues of the spatial development of regions.

1. Introduction

The concepts of the development of the agro-industrial complex (AIC) are multifaceted and are based essentially on the formation of food security and import substitution, which predetermines not only the deepening and increase of agricultural production but also the progressive development of complementary and related industries.

A significant role in the effectiveness and solution of these problems assigns to the Food Security Doctrine of the Russian Federation, approved by the Presidential Decree on January 21, 2020. It defines the level of self-sufficiency, calculated as the specific weight-volume of domestic production to the volume of domestic consumption, which also takes into account imported products [1].

It means that the agro-industrial complex receives new impulses for intensive development associated with innovative processes, digital transformation, which influence the expansion of material factors of production. Such positive changes make it possible to give a comprehensive assessment territorial development level of the region where the awareness should be directed to the estimation of inter-territorial differentiation that mitigates territorial differences. However, this issue is hard to solve due to regional and intraregional imbalances exacerbate the interregional differentiation level and hurt the economic, regional, and state development [15]. In this regard, it can be considered that the
successes of the agro-industrial complex are not always associated with natural results of activity and are temporary and accidental. Although in comparison with other industries, positive trends in the agro-industrial complex, food, processing industries, and positive indicators are achieved due to the elimination of external competitors in the sanctioned environment and, accordingly, the implementation of the import substitution policy.

Therefore, the food security of the state is not an ephemeral, but a real situation. It means that the agro-industrial complex and the industries serving it have to develop competitive mechanisms that can be created in primary territorial entities - urban and rural districts of the region. It is impossible to solve these issues without state protectionism aimed at the functioning and development of the agro-industrial complex at the level of the primary links of territorial entities, which are the most competitive and mobile in the implementation of the problem of transforming regions into powerful economic territories.

All the spheres of activity that include the agro-industrial complex and which the socio-economic policy of the regional authorities should be based are equivalent in terms of the possibilities for progressive dynamic development and economic growth. An integrated approach to the solution of the agro-industrial complex issue relates to industries, making it possible to reduce the inter-territorial differentiation in the region and solve, ultimately, the problems of reducing the imbalance in society. The solution to this issue is especially relevant, considering the presence or absence of various resource types in a spatial context. Moreover, the spatial development of territories in the region is significantly influenced by digital technologies, which are developing at such a rapid pace that the legislative and regulatory framework does not correspond to such a high rate and slows down the process of introducing digital technologies. This is especially relevant and of paramount importance in the context of strengthening the structures of innovation, increasing production in the agro-industrial complex itself and adjacent industries.

The growing influence of the agro-industrial complex on the regional territorial development is determined by the growing influence of all its links (service industries, processing industries) on the organizational and economic mechanisms for the formation of conditions for accelerating innovation processes. One cannot argue with the opinion of A.S.Shurupova, who claims that the acceleration of the innovative development in agricultural production requires fulfillment of several conditions, including the availability of highly qualified staff, an effective system for the promotion, service of new technology, equipment, and broad financial opportunities for the acquisition of machinery, etc. [19].

Of course, the promotion of the agro-industrial complex and the industries associated with it in modern economic activity largely depends on incentives and coercion to develop advanced technologies with a high share of digitalization of technological processes. The latter will lead to infrastructural and social changes, the formation of a competitive agricultural production and technological cluster in the region. A systematic approach to addressing the development of the region at the expense of the agro-industrial complex and the industries associated with it requires combining the interests of all participants to enter the region into advanced innovation-oriented positions. The introduction of advanced management practices and the scientific-technological development of the agro-industrial complex, along with other issues, creates the problem of sustainable development of rural areas in the region.

The challenges of modern economic development, the transition to a new technological wave, taking into account the need for scientific and technological innovations, will lead to the fact that the agro-industrial complex market will become more complex and technologically advanced [18]. It means that the agro-industrial complex will be able to saturate the domestic market with competitive products and goods and enter the world market as a product supplier with a high degree of processing. The advantage of this approach is obvious. First, food security is ensured and strengthened, both internal and external, based on the implementation of key tasks. Secondly, the solution to the above problem will make it possible to use all the mobilization tools for the development of the territories of
the region, which will make it possible to implement sustainable spatial development, taking into account economic, social, natural resource, and environmental interests.

2. Materials and methods
Within the framework of this article, based on general scientific methods and analysis of the influence of the agro-industrial complex of the Kabardino-Balkarian Republic (KBR) on the spatial development of the region in the context of digital decision-making is carried out. In our opinion, the methodological base is the solution of individual and general issues and the formation of scientific ideas and approaches to the problems of agro-industrial complex management in the context of digital decision-making to level out intra-territorial disparities in development. An important methodological aspect is the formation of an understanding of research methods in the chain "AIC-related industries - spatial development - digital solutions", which becomes an integral part of the knowledge of the specifics of the development of the agro-industrial complex, taking into account the peculiarities of various methods, which include theoretical, empirical and particular ones.

The problems arising in the modern agro-industrial complex are of a pronounced cross-sector nature, and their solution depends on the implementation of the macroeconomic policy of the state associated with failures in the development of the agro-industrial complex, which directly determine the level of food provision for citizens. [3]. Therefore, it is necessary to actualize the task of formation and implementation based on taking into account the regional features of the economic policy in the agricultural sector of the economy. The analysis and research methods indicate that the prospects for the development of the agro-industrial complex in the regions are aimed at creating large-scale industries, based on the established principles of spatial and industrial specialization. The imperfection of the management system, weak inadequate optimization of inter-sectoral economic ties, fragmentation in attracting investments, and introducing innovations require attracting small businesses that are more mobile and can more effectively organize management and production tasks at the regional and municipal levels. In this case, for the study, it is possible to use the analysis of the dynamics of the development of small and medium-sized businesses in the agro-industrial complex based on digitalization and the introduction of automated financial planning systems in the agro-industrial complex is associated with risks, therefore it is important and business liquidity using an effective analytical tool of an automated system"[7].

As part of the development of agricultural and industrial industries included in the agro-industrial complex, small and medium-sized businesses are becoming a large-scale sector of competitive industries, therefore, this form of business must create comfortable conditions. To do this, it is necessary to carry out a systematic analysis of the products and goods produced by small businesses, which will make it possible to form a theoretical model of the regional system of agricultural production. Based on the analysis, it is possible to resolve the issues of the multipolar distribution of regional "points of growth" within the region itself, which will ensure intra-territorial balanced development.

The importance of small and medium-sized businesses in the business community tends to grow, their mobility and activity, all other things being equal, are called upon to effectively address food security issues. At the same time, various segments of the population are involved in the processes of activity and production, new values are created, which expand the possibilities of entrepreneurial initiative on the ground, which has a positive effect on resolving the problems of development of municipalities. And again, the problem is returning to normal - there is no methodology for substantiating the spatial development of small territorial units, there are no scientifically grounded decision-making criteria on various issues of substantiating and implementing entrepreneurial initiatives at the level of municipalities in the region. It is known that there are no mechanisms for managing the spatial structure of the agro-industrial complex in the region, which can increase the economic territorial, and financial status of the territorial units of the region. The indicators of economic activity, in this case, are the population, GRP, the level of employment, fixed assets, which influence the transformation of “urban settlement - rural settlement”, “rural settlement - rural
settlement”. In this context, we can talk about a high degree of implementation of entrepreneurial initiatives at the local level in the agro-industrial complex, which increases the level of assistance to the development of inter-municipal cooperation through the creation of inter-municipal centers for the provision of various services. On the other hand, this approach contains very contradictory circumstances. Their essence lies in the fact that small and medium-sized businesses form a heavily inflected competitive environment, which gives a powerful impetus and incentive for the development of territorial units of the region. The entrepreneurial community begins to focus on production, financial, and labor potential generates new "points of growth" that begin to compete with each other for resources (financial, material, labor) and consumers. Such a community develops not only for itself but also for the territories in which they are located. Some scholars emphasize the destructive power of competition between companies within a local area and mobile capital [2].

One of the signs of the scientific substantiation of the development of the agro-industrial complex at present, especially in the context of import substitution, is the achievement of solid food security of the country, which is acquiring a global character. Along with the manifestation of signs of a food crisis, in parallel, there are positive trends that can “withstand the global food crisis”, including integration processes, the development of regional production markets, the creation of agri-food systems (APS) [12]. And here it is important to develop new theoretical and methodological approaches to the development of the agro-industrial complex in close connection with the spatial organization of regions and intraregional territories. Therefore, the level of development of the agro-industrial complex has a significant impact on the development of products and regions.

In the works of domestic and foreign researchers the issues of the formation of theoretical concepts and the practical implementation of erasing the gaps between regions due to positive trends in the agro-industrial complex [9] are investigated, and the problems of multifunctionality of agricultural production and the agri-food sector are identified, where arguments are given to substantiate the theoretical and methodological concept of the multifunctionality of the regional agri-food sector multifunctionality [11].

The issues of analyzing the development of the agro-industrial complex in the region are studied by many authors to create high-tech industries, based on the introduction of digital technologies, creating territorial production clusters in the industry and the region, and forming an innovative base. A comprehensive solution to issues contributes to the acceleration of erasing the boundaries of inter-territorial and intra-territorial imbalances, which will lead to an increase in economic indicators, the emergence of new centers of innovative growth. According to some researchers, “the formation of clusters makes it possible to solve not only sectoral problems but also contributes to the multipolar distribution of growth points throughout the country” [17]. The choice of methods for assessing the innovative potential of a region is based on the calculation of indicators in space - these are indicators for intraregional territories, agricultural enterprises, and districts. To construct spatial indices to assess the innovative potential, the comparison base, and the level at which the indicators will be fixed are selected [21]. In another study, mechanisms of control over the innovation sphere in the subcomplexes of the agro-industrial complex are assumed, where attention is paid to the step-by-step analysis and assessment of the results of innovation to make operational decisions [22].

According to some scientists - analysts, as a promising solution, it is envisaged the repeated use of funds received by agricultural producers as investment, which will ensure a high return. One cannot but agree that each ruble aimed at supporting agricultural production, as the basic branch of the agro-industrial complex, will return by a multiple of an increase in investments directly related to agriculture in industries [16]. The accelerated development of the agro-industrial complex for 2018-2020, which provides for the activation of the domestic commodity and raw material markets for agro-industrial products, is associated, among other things, with the ban on the import of food products and components from other Western countries. It should be noted that the recovery is one-sided, and therefore the expected decline in prices for wholesale purchases and retail prices is not visible [8]. It turns out that the potential for the development of the agro-industrial complex in the context of the
implementation of import substitution decreases due to the influence of factors from climatic conditions to appraisal and the pricing system [5].

In part, successes and failures in the agro-industrial complex largely depend on a digital platform developed on the basis of information resource technologies and information systems. The latter are based on the application of new technologies, the rate of modernization of the industry, the application of innovations and other indicators.

Studies show that digitalization will improve the efficiency of agricultural producers' business by creating reference digital models of production processes in agriculture. We can safely say that the digital transformation of the agro-industrial complex allows us to solve a wide range of tasks - from increasing labor productivity in the sectors of the sector to increasing the export potential of domestic agricultural products.

At present, according to the results of a study by the Ministry of Agriculture of the Russian Federation, 20% of Russian regions are characterized by a high level of development of information technologies, which is associated with a small amount of investments in information and communication technologies, the volume of which in 2017 as a whole in the agro-industrial complex fluctuated within 3.2-3.6 billion rubles (about 0.5% of the total volume of investment resources in fixed assets). This situation directly affects the formation of innovations in the agro-industrial complex, and the consequence is insufficient provision of material and technical resources, a high level of unemployment, irrational use of the potential opportunities of the agricultural sector of the economy, a decrease in the rate of development of related industries directly related to the agro-industrial complex. Another aspect of introducing digitalization is ensuring food security, reducing the cost of producing agricultural products, increasing the country's competitiveness in the world food market [4].

3. Results and discussion

The tasks of digitalization of the agro-industrial complex of Russia and the degree of development of information and communication technologies at the regional and municipal levels are the basis for solving the problems of using digital technologies everywhere at the institutional, organizational and other levels in order to form an innovative economy. Disparities at the municipal level, the level of an individual agro-industrial complex and the state level when using information technologies are significant. The formation of the digital economy in order to successfully implement digitalization processes is based on the postulate - the collection, accumulation and processing of a huge amount of information. Therefore, all work in the context of the transition to intelligent management systems in order to improve the economic, territorial and financial status of the region is impossible without an appropriate financial analysis of the agro-industrial complex located in a particular municipality. The purpose of this analysis is an objective and accurate picture of the financial condition of the agro-industrial complex of the region, the results of economic and financial activities, changes in the structure of assets and liabilities, settlements with debtors and creditors. At the same time, the head and the person responsible for analytical work may be interested in both the current financial condition of the agro-industrial complex and its forecast for the near or more distant future [13]. And here one cannot do without digitalization and the introduction of automated financial planning systems (Figure 1).
These tasks are designed to give a synergistic effect of spatial territorial development, which will positively affect the formation of new economic relations in the digital age and lead to an increase in GRP, the creation of clusters, and the development of artificial intelligence.

Therefore, the tasks of the financial planning of the agro-industrial complex should include:
- Provision of the necessary financial resources for the implementation of investment and financial activities in the sectors of the industry, which will lead to an economy created based on the use of intelligence;
- Determination of ways of efficient capital investment and assessment of the degree of its rational use in the implementation of economic processes;
- Identification of on-farm reserves for increasing profits due to the rational use of financial resources;
- Establishing economically sound financial relations with creditors, the budget, credit institutions, and other counterparties;
- Monitoring the financial condition, solvency, and creditworthiness of the agro-industrial complex to reduce the risks identified as a result of the analysis of the technology for constructing digital models of spatial, territorial, economic, and social systems;
- Observance of the interests of shareholders and other investors, which can be realized based on modern means of developing the digital economy.

The implemented system of financial planning will allow the heads of the agro-industrial complex and the industries associated with it to make real forecasts of financial and economic activities, identify "bottlenecks" in management using multivariate analysis tools, calculate the economic consequences of possible deviations using financial models and make an effective management decision [14], as well as to improve the manageability of the agro-industrial complex due to the operational tracking of deviations from regulatory data.

Microsoft Corporation offers a modern approach to the creation of information systems - a single and functionally complete platform for all these tasks. The solution is based on the Microsoft SQL Server database management system, with which you can not only reliably store analytical information, but also efficiently perform data extraction procedures from heterogeneous sources, coordinate, aggregate and transform this data into analytical information, upload it to the repository [15].
ten]. In addition, the same product supports various methods of data analysis, including multivariate analysis, forecasting, and search for patterns. All of these features are implemented by specific components of Microsoft SQL Server.

It is proposed to use the following structure to classify the main types of analytical activities (Figure 2).

Such a classification will justify "not only the processes of technological re-equipment of agro-industrial, environmental and social activities, but also the procedure for the formation of new inter-level interactions to involve various sets of elements of regional and municipal infrastructure ..." [6].

![Figure 2. Structure for the classification of the main types of analytical activities](image)

Modern conditions for the agro-industrial complex regional development generates the transformation processes in the complex itself and other sectors of the economy. Absolute and relative changes in the quality of development of the regional economy make it possible to determine reasonable recommendations for inter-level interaction, determine the interdependence and relationship between the sectors of the regional economy, taking into account potential labor resources, the formation of economic indicators, and the final results of activities. As a result, the agro-industrial complex, in conjunction with other sectors of the regional economy, as a result of the intensification of activities, contributes to an increase in employment in the territory of a particular municipality, an increase in tax and social contributions, and trade. Therefore, the share of the added value created is increasing, which leads to an increase in the GRP and the formation of budgets of territorial entities to a greater extent at the expense of their revenues. In addition to the growth of quantitative indicators, prerequisites are created for the systemic balance and integrity of the region's economy (Figure 3).

![Figure 3. Model of spatial - territorial development of municipalities in the region](image)
4. Conclusion
It can be argued that regional entities with the potential for the development of their economies will have a strategic impact on the sustainability of the economy within the framework of strengthening the subjectivity of industries developing in a particular territory. During the study, it was revealed that the level of socio-economic development of the region is influenced in the aggregate by a number of factors that determine economic growth. Due to the heterogeneous structure of the region's economy and farms, the influence of the agro-industrial complex is significant. Therefore, it is necessary to identify and identify promising points of growth that make it possible to use the potential of the region for further development.

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