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Economic potential of the agro-industrial complex of the provincial region

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Abstract. The aim of the article is to analyze the economic potential of agro-industrial complex of the provincial region for the case of the Mari El Republic of Russia. A resource approach with the inclusion of a resultant component was used in the study of economic potential in the framework of system analysis. The strengths of the economic potential of the agro-industrial complex of the Mari El Republic are the low cost of labor, the availability of specialized educational institutions and personnel, high productivity and growth of livestock production. The positive dynamics of livestock production was achieved at the expense of state support of the agriculture modernization. The weaknesses of economic potential of the regional agro-industrial complex are the technological backwardness of local agricultural producers, a large share of non-cultivated land, low crop yields, and low level of land chemization. The outflow of population from rural areas and the deficit of the regional budget restrict the development of the sector. The increase in agricultural production is mainly due to the livestock industry. The production of cattle meat and milk are promising to growth paths.

1. Introduction

The relevance of the study of economic potential of agro-industrial complex (AIC) of the provincial region is determined by the high role of agribusiness in the socio-economic development of the Russian Federation. First, 25.6 % of the population lives in the province in rural areas, despite the growth of urbanization and agglomeration. The rural population forms a special way of life, preserves the cultural and national traditions of the country. The strategic importance of rural areas lies in the fact that its population provides social and administrative control over a significant part of Russian territory [1]. Second, the sustainable socio-economic development of the provincial regions of Russia is largely determined by the development of their agro-industrial complex. The share of the agro-industrial complex in the GRP of the provincial regions is significant and affects the tax base and budget revenues of the region. Third, agribusiness is the backbone not only in the economic and industrial spheres, but also a social driver of the territory development. According to the results of 2017, employment in agriculture in Russia was 6.7 % of the total number of people employed in the national economy. Fourth, the quantity and quality of agricultural products determine the food basket, the quality of life of the population. Fifth, the development of economic potential of AIC of the Russian regions connects with the issues of food security of the country and determines economic security of Russia and its global competitiveness.

The object of the study is the economic potential of agro-industrial complex in the provincial region for the case of the Mari El Republic. The aim of the study is to analyze the economic potential



of agribusiness in the region and determine the prospects for its development. AIC includes the production of agricultural products, their processing and sale. Effective development of AIC is especially important for regions with a large share of rural population such as the Mari El Republic. 30.2 % of the population of the Republic live in rural areas (figure 1).

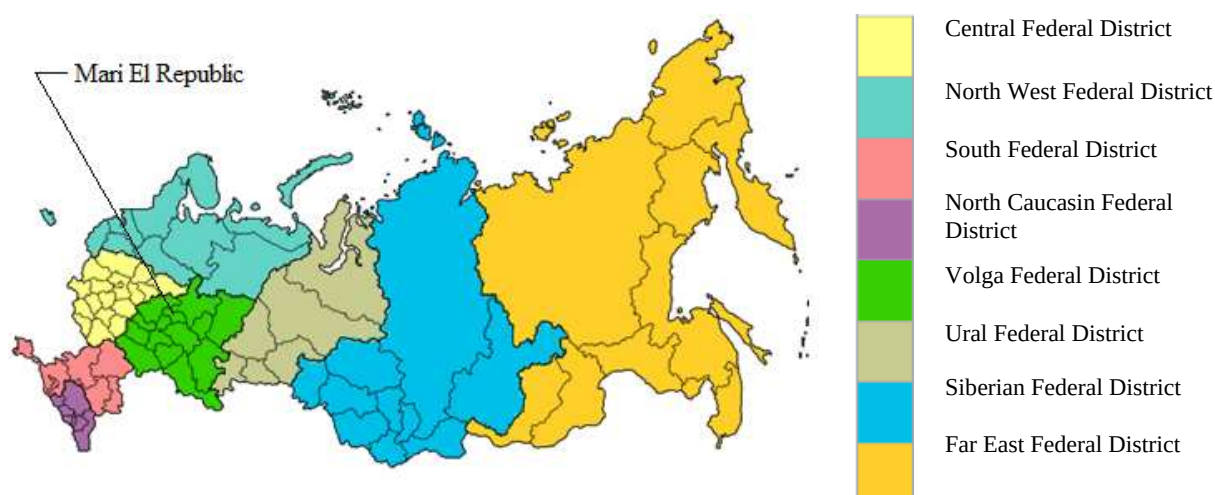


Figure 1. The Mari El Republic on the map of Russia.

The theoretical platform of research was formed by the work of scientists in the field of regional studies and Economics of agriculture. The authors relied on the theoretical and methodological concepts of strategic development of Russian regions, designed in the works of A. A. Adamescu [2], A. G. Granberg [3], N. V. Zubarevich [4], A. I. Tatarkin & A. A. Kuklin [5]. Russian authors' research on the economic potential of agriculture in Russia and sustainable development of rural areas was carried out by E. N. Krylatyh [6], T. V. Uskova [7], V. A. Tsvetkov [8], O. V. Pruschak [9], R. G. Yanbykh [10], P. Drucker [11], P. Samuelson [12] and A. Marshall [13] were engaged in research of the potential of economic subjects as accumulated capital. In assessing the economic potential we will rely on a systematic approach. According to J. B. Say [14], John. B. Clark [15] on the one hand, we consider the economic potential as a set of means of production and available resources, regional factors and conditions. On the other hand, we complement the resource component of the economic potential with a resultant component, taking into account the final effect (figure 2).

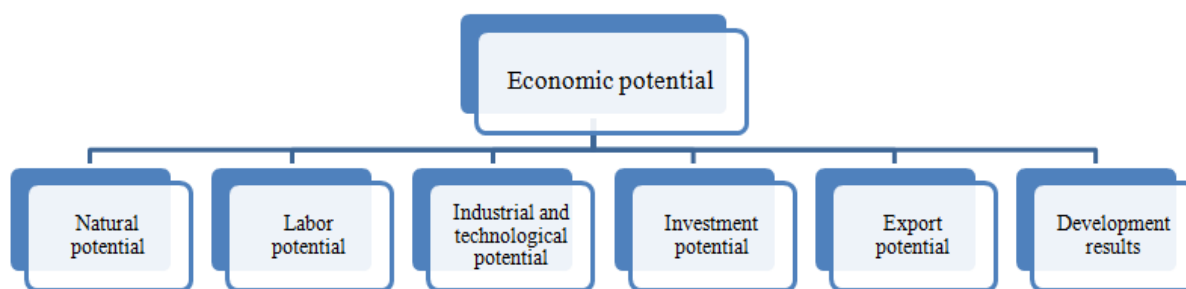


Figure 2. The composition of the economic potential of AIC.

2. Data and methods

The information basis of the research constituted the statistical data of the Federal State Statistics Service of the Russian Federation (Rosstat), Ministry of agriculture of Russian Federation, Government of the Mari El Republic, Ministry of agriculture and food of the Mari El Republic for the period 2014-2018. The study is based on a systematic approach, methods of descriptive, structural and empirical analysis.

3. Results and discussion

The Mari El Republic is part of the Volga Federal district (VFD). It is an agro-industrial region according to the methodology of the Analytical Center for the Government of the Russian Federation. In 2017, the share of agricultural products was 16.8 % in the GRP of the Republic. In the Mari El Republic there are 3 urban districts and 16 urban settlements, 14 rural municipal districts and 105 rural settlements. At the end of 2018, the population of the Republic was 680.2 thousand people, while 33.2 % of the population lived in rural areas. The share of the rural population of the Mari El Republic in the rural population of the Russian Federation is 0.6 %, while the share of agricultural production of the Republic reaches 0.8 % in the total agricultural production of Russia, livestock and poultry for slaughter – 2 %, milk – 0.6 %, eggs – 0.8 %. Mari El ranks 17th in Russia in the livestock production and poultry for slaughter and 35th in the production of eggs. Agriculture is specialized in the livestock production. Livestock takes 76 % in the structure of agricultural production. Large agricultural organizations are the main producers of agricultural products.

Agriculture is the basis of AIC in the region. The basic characteristic of natural potential is the quality and area of land. The area of the territory of the Republic is 23.4 thousand km² (0.1 % of the area of Russia), the area of arable land for harvest amounted to 297.5 thousand hectares (38.5 % of all farmland) in 2018. Since 2010, the acreage has not decreased. The Mari El Republic is part of the Central Russian province of the Nonchernozem belt of Russia, which is dominated by sod-podzolic soils with low natural soil fertility. Relative indicators of the area of farmland and arable land per person are less than the average values for the VFD and Russia (table 1).

Table 1. Natural potential of AIC of the Mari El Republic^a.

Indicators	2014	2015	2016	2017	2018
Area of farmland per person, ha/person					
Russia	1.51	1.52	1.51	1.51	-
VF	1.85	1.86	1.86	1.86	-
Mari El	1.13	1.13	1.13	1.13	1.14
Arable land area per person, ha/person					
Russia	0.54	0.54	0.54	0.55	-
VFD	0.79	0.80	0.81	0.81	-
Mari El	0.43	0.43	0.44	0.44	0.44

^a Compiled on the basis of data from the Ministry of agriculture of the Russian Federation: <http://mcx.ru/analytics/>; Russian Federation Federal State Statistics Service: <http://www.gks.ru/>

The labour potential is characterized, first of all, by the number of employees in agricultural production. In 2018, the agricultural sector employed 26.6 thousand people, or 9 % of the total working population of the region, of which 6.8 thousand people were classified as “qualified specialists”. 8.3 thousand people work in the food and beverage industry. The unemployment rate of the rural population exceeds the level of urban unemployment. It amounted to 6.6 % in 2017. One third of the officially registered unemployed live in rural areas. In 2018, the average monthly salary in agriculture is 6 % less than the national average and 30 % less than the salary in industrial production. This causes migration of the population to cities and outflow of qualified personnel. Since 2010, the number of people employed in agriculture has decreased by a quarter. Male able-bodied population goes to work in other regions without registering officially in the employment services. However, the wages in the food industry are higher than the average regional level. This provides stabilization of personnel in the food industry. Labor productivity in agriculture of Mari El increased at a faster pace than in the Volga Federal district and Russia. Mari State University, Volga State University of Technology, colleges and technical schools train specialists of agro-industrial complex in the Republic. The region is fully able to provide itself with specialists of this profile.

Industrial and technological potential is the material and technical basis for the development of AIC. The level of mechanization, the technical condition of fixed assets, depreciation of fixed assets and the possibility of their upgrade are the most important characteristics of industrial and technological potential (table 2). The efficiency of the use of fixed assets is reduced, as the capital

productivity has decreased slightly. Capital-labor ratio is growing mainly due to the decrease in the number of employees in the agricultural sector. The capital-area ratio has increased, which ensures the intensification of agricultural production. On the other hand, there is an expanded reproduction of fixed assets, as the coefficient of renewal of fixed assets of agriculture exceeds the coefficient of their disposal. Availability of tractors and combine harvesters is reduced, despite the Federal leasing (table 2). In 2018, the budget financing of the subprogram “Technical modernization of the agro-industrial complex” was not carried out. Upgrading agricultural machinery was made, but it was purchased 30 units less than planned. As a result, 418 agricultural vehicles (54 tractors, 4 combine harvesters, 10 forage harvesters, etc.) were purchased. The application of mineral fertilizers is increasing, despite the lack of financial resources for the purchase of fertilizers. The application of mineral fertilizers does not reach the average level in Russia or the Volga Federal District. The application of cheaper organic fertilizers is increased in order to improve soil fertility. The application of organic fertilizers is one and a half times higher than the average Russian indicators. The average Russian level of feed consumption per livestock unit was achieved in the republic. This indicates a stable feed base capable of ensuring the growth of livestock production.

Table 2. Industrial and technological potential of AIC of the Mari El Republic ^a.

Indicators	2014	2015	2016	2017
Share of fixed assets of agriculture in the total volume of fixed assets of the region, %	9.8	10.1	9.4	10.8
Capital productivity, RUB/RUB	1.2	1.3	1.1	1.0
Capital-labor ratio, million rubles/person	1.0	1.1	1.3	1.7
Capital-area ratio, thousand rubles/ha	107.8	121.6	126.6	150.6
Coefficient of fixed assets renewal	13.0	12.2	5.4	5.4
Coefficient of fixed assets disposal	1.3	1.1	2.0	1.0
Depreciation of fixed assets, %	27.7	44.9	47.5	33.2
Number of tractors per 1000 ha of arable land, pieces	4.3	3.9	3.8	3.6
Number of combine harvesters per 1000 ha of arable land, pieces	2.4	2.3	2.4	2.2
Number of potato harvesters per 1000 ha of potato planting, pieces	60	60	56	88
Application of mineral fertilizers, kg/ha				
- Russia	40.0	42.2	48.8	55.0
- VFD	22.0	21.8	25.3	32.1
- Mari El	13.7	12.2	17.8	19.7
Application of organic fertilizers, t/ha				
- Russia	1.3	1.3	1.4	1.5
- VFD	1.0	1.0	1.2	1.2
- Mari El	1.5	1.3	2	2.2
Feed consumption for livestock unit, centners of fodder units				
- Russia	29.2	28.6	28.9	28.6
- VFD	31.8	32.1	32.1	32.2
- Mari El	31.5	26.7	25.4	28.0

^a Compiled on the basis of data from the Ministry of agriculture of the Russian Federation: <http://mcx.ru/analytics/>; Russian Federation Federal State Statistics Service: <http://www.gks.ru>

Investment potential characterizes the possibility of agricultural production intensification, renewal of agriculture fixed assets and growth of agricultural production. Subsidies and grants are widely used tools to support agribusiness entities. They are aimed at maintaining profitability and stimulating agricultural production. Subsidies and grants are allocated from the state budget and extra-budgetary funds. Subsidies are provided on the terms of co-financing from the regional and federal budgets. Every year the Mari El Republic does not receive funding in full due to the lack of funds in the regional budget. In the republic, the State Program for the Development of Agriculture and Regulation

of Markets for Agricultural Products, Raw Materials and Food in the Republic of Mari El for the years 2014-2025 is being implemented. In 2018, state support for agricultural production amounted to 1,143.5 million rubles, including 1,030.7 million rubles (100% of the limit) from the federal budget, 112.8 million rubles (100% of the limit) from regional budget. A number of projects for the modernization of the material and technical base of the agricultural sector have been implemented in the republic, e.g. Akashevskaya Poultry Farm LLC, Semenovskiy Plemzavod CJSC, Sernursky Syrzhavod CJSC and others.

The Mari El Republic is fully self-sufficient in livestock production. The republic establishes actively the supplies of agricultural products to other regions and for export (table 3). In 2017, the export of agricultural products amounted to \$12.9 million, import - \$12.1 million. Large agribusiness enterprises have real export potential, for example: Akashevskaya Poultry Factory LLC, Mariyskoye CJSC, Yoshkar-Ola Meat Processing Plant CJSC, Zvenigovsky Meat Processing Plant LLC, Sernursky Syrzhavod CJSC. The export potential of the agro-industrial complex of the Mari El Republic is high.

Table 3. Interregional trade in food products, 2017^a.

Indicators	Meat and poultry, except by-products, tons	Canned meat, in thousands of standard cans	Canned meat-containing, in thousands of standard cans	Sausage products, tons	Cheese, tons	Butter, pastes, melted butter, tons
Export of main types of food products to other regions	92801	22686	2083	17121	1051	472
Import of food products to the Mari El Republic	1112	344	-	303	11,1	52.9

^a Compiled on the basis of data from the Territorial Department of the Russian Federation Federal State Statistics Service for the Republic of Mari El: <http://maristat.gks.ru/>

Agro-industrial complex is developing more rapidly than the industry. The increase in agricultural production was 9.9 %, food production - 23.8 %, and industry - only 5.8 % in 2018 compared with 2014. Key performance indicators of agribusiness are shown in table 4.

Table 4. Performance indicators of AIC of the Mari El Republic^a.

Indicators	2014	2015	2016	2017	Place in the Russian ranking
Gross grain harvest after processing, thousand tons	225.8	219.4	213.9	237.1	51
Production of livestock and poultry for slaughter, thousand tons	165.2	206.8	180.6	201.1	17
Milk production, thousand tons	191.2	181.7	176.5	171.5	52
Egg production, million pieces	346.6	394	380	366.6	35
Number of cattle, thousand heads	78.3	76.1	73.8	76.0	62
Number of pigs, thousand heads	229.1	247.8	249.5	256.0	28
Number of sheep and goats, thousand heads	44.8	40.5	39.1	37.9	55
Milk yield per cow in VFD, kg	4761	5069	5273	5534	-
Milk yield per cow in the Mari El Republic, kg	5027	5294	5526	5713	-
Yield of grain and bean in the VFD, centners /ha	17.1	16.5	19.4	24.0	-
Yield of grain and bean in the Mari El Republic, centners /ha	15.7	16.3	15.8	17.0	-
Profitability of crop production, %	6.8	11	-1.5	-58.2	-
Profitability of livestock production, %	24.9	23.1	3.1	12.6	-

^a Compiled on the basis of data from the Ministry of agriculture of the Russian Federation: <http://mcx.ru/analytics/>; Russian Federation Federal State Statistics Service: <http://www.gks.ru/>

The Mari El Republic has high productivity and positive dynamics in the production of pork, poultry and eggs. However, the profitability of livestock is positive due to budget subsidies. The yield of grain and leguminous crops is lower than the average level in the Volga Federal District, which is explained by the low natural fertility and low chemicalization of land. Crop production is unprofitable in the Mari El Republic.

4. Conclusion

The common problems of the agro-industrial complex of Russia are characteristic of the economic potential of the agro-industrial complex of the Mari El Republic: extremely high depreciation of fixed assets; withdrawal of land from agricultural use; low crop yields and low labor productivity in comparison with the world leaders in the agribusiness [8].

The strengths of the economic potential of regional agro-industrial complex are environmental friendliness of products, low cost of labor, the presence of specialized educational institutions that are able to train specialists with a high level of competence, as well as high productivity and high growth of livestock production. The positive dynamics of livestock production was achieved owing to state support of the agriculture modernization. Leaders of the agro-industrial complex implement a full production cycle: production, processing, sales. The weak sides of the economic potential of the regional agro-industrial complex are the technological lag of local agricultural producers, the high proportion of uncultivated land and lands withdrawn from agricultural use, low productivity and low level of land chemicalization.

The outflow of the population from rural areas, the rising cost of equipment for the fixed assets renewal, the debt of the regional budget and, consequently, the reduction of agribusiness subsidies are constraining factors in the development of agriculture in the Mari El Republic. The agro-industrial complex of the region is characterized by a high degree of production concentration in the hands of large producers with more developed production technologies, processing and storage of agricultural products, as well as low production costs due to economies of scale, which makes small producers uncompetitive. The experience of European development shows that small farms can play an important role in the agricultural sector of the region, acting as subcontractors, suppliers and producers of specific products (goat milk, cheese, honey, etc.). The importance of small forms of agribusiness for the economy of the provincial region makes it necessary to develop strategic directions of support and development of small businesses in agriculture. The growth of agricultural production is mainly due to beef cattle, at the same time there are serious prospects in the production of beef and milk products

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