

Industrial Complex of the Orenburg Region: Challenges and Growth Prospects

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Abstract— In this article, we performed the analysis of the development of the industrial complex in Orenburg region; revealed trends (reduction in the share of industry in gross regional product; transition to more simplified types of industrial production; decrease in the share of manufacturing products in total industrial production) and imbalances (between mining and manufacturing; desynchronization of the growth rate of agriculture and industry; the gap between the possibilities of regional management and the needs of region's economy). We also mentioned a decrease in efficiency indicators (increased share of unprofitable enterprises, decreased profitability and production of innovative products) and competitive advantages (large natural resource potential, significant economic potential created during the Soviet period, skilled labor force), and also considered the growth problems of industrial complex (low level of management of region's socio-economic development, insufficient investment by the federal center and fuel and energy companies, lack of responsibility of regional elite for the future of the region). Recommendations were made on the development of region's industry in the future focusing on improving the efficiency of regional management based on the interaction of business elite, population and government, on professionalism and creation of partnership and trust institutions including improving the use of natural resources, labor and economic potential and geographical location of the region, as well as increased investments from the federal budget and implementation of a norm for the allocation of income in fuel and energy companies for the modernization of industry; deployment of high-tech production in the region and organization of equipment production for energy companies; increasing the role of vertically integrated companies in the creation of innovation cluster in the Orenburg Region; development of inter-regional integration and inter-country relations.

Keywords—region, industrial complex, efficiency, competitive advantages, problems, growth directions, management quality, regional elite, investments, innovation cluster.

I. INTRODUCTION

The level of development of country's economy largely depends on industry development level. In this regard, industrial production requires constant attention from society, government and business for the timely adoption and implementation of management decisions in order to improve the effectiveness of this critical sphere. Present-day industry in Russia is a symbiosis of high-tech production and backward technologies that exist since Soviet period. It is important to mention that modern technologies are implemented, first of all,

in financially intensive segments of industry, such as oil and gas, mining and other resource industries. Production process in these industries is dependent on foreign suppliers of equipment, software, components and materials. It appears from this that our industry is experiencing a shortage of domestic innovative technologies that would surpass the foreign ones.

The relevance of investigation of the problems of industrial complex is growing, especially nowadays, when we need to accelerate the industrial production growth rate through modernization and innovation in order to win globalized competition, to increase the level of economic development of the country and its regions, and to solve many social tasks [1].

The goal of this study is to define the of problems industrial development of the Orenburg Region and to develop recommendations for improving the efficiency of its development. During preparing this paper, the works of Russian economists D.A. Medvedev, S.Yu. Glazyev, O.S. Sukharev, M.G. Lapaeva, O.F. Lapaeva, S.P. Lapaev, V.I. Belov, D.A. Vasilevsky, E.E. Rummyantseva, A.Yu. Nikitaeva, Yu.S. Tsertseil, V.V. Kookuyeva, O.A. Romanova, D.V. Sirotin were used [1-12].

II. RESEARCH METHODOLOGY

This study was conducted on the basis of systematic approach that allows representing region's economy as a complex of interdependent elements that determine changes in system. Regional economic system has the features of a mixed economic system where the state and the private sector of economy play a significant role in production, distribution, exchange and consumption of all resources and material goods. Using systematic approach for regional economic processes involves the decomposition of economy: defining its subsystems and studying of their relationships, defining goals, functions and effectiveness, different aspects of self-organization. A spatial factor was considered as a system-forming feature, that is, the industrial complex located in the Orenburg Region is an object system that is characterized by limited space it occupies and unlimited existence period. Systematic approach made it possible to identify different specific aspects of the nature of the studied object, to holistically consider the object as a whole and at the same time as a subsystem of a higher level that interacts with other objects; to identify problems in the development of different elements of region's industrial complex, and to develop and to substantiate a descriptive model that presents growth directions of region's industrial complex in future based on

improving system elements, creating institutions, implementing infrastructure projects, improving personnel training that determine the transformation of the entire economic system of the region. Tabular analysis, methods of statistical, comparative, logical analysis, as well as modeling and problematization were used as research methods.

III. RESULTS

Regional industrial complex is a number of industrial enterprises that are located on the same territory and closely interact with each other [7]. The industrial complex of the Orenburg region was developed as a result of almost three hundred years of spatial, technological and economic development.

Industry is the basis for investment and innovation processes. Economic growth rate and the development of other regional spheres depend on the level of industrial development. In the Orenburg Region, industry has a dominant impact on the development of region's economy. This is due to the fact that the essential share of gross regional product (GRP) is created in industrial production. In the Orenburg Region, industry ranks first in the structure of GRP (see Table 1).

TABLE I. GRP STRUCTURE OF THE ORENBURG REGION BY TYPE OF ECONOMIC ACTIVITY, %

Types of economic activity	2005	2010	2013	2014	2015	2016
Agriculture, hunting and forestry	8.8	6.8	7.2	8.5	9.0	10.4
Mining	37.0	35.9	40.7	36.0	37.0	34.6
Manufacturing	16.0	10.2	11.6	12.8	12.4	13.1

TABLE II. CONDITION OF FIXED ASSETS (END OF YEAR), %

Types of economic activity	2014		2015		2017	
	Depreciation coefficient	Depreciation coefficient	Depreciation coefficient	Depreciation coefficient	Depreciation coefficient	Depreciation coefficient
Mining	63.9	36.1	46.6	53.4	55.0	45.0
Manufacturing	41.0	59.0	40.4	59.6	46.5	53.5
Production and distribution of electricity, gas and water	43.0	57.0	44.3	56.7	44.5	55.5

The most important indicator of the efficiency of industrial production is its profitability. The highest level of profitability of sold goods and products is demonstrated in mining (28.8 % in 2017). In the manufacturing industry, this value is 6.6%. In general, these values tend to decrease (see Table 3).

TABLE III. PROFITABILITY OF SOLD GOODS AND PRODUCTS (WORKS, SERVICES) BY TYPE OF ECONOMIC ACTIVITY, %

Types of economic activity	2005	2010	2013	2014	2015	2016	2017
Total in the region's economy	15.8	18.0	15.1	18.6	20.9	18.1	16.6
including: Mining	30.4	37.4	27.8	31.3	35.4	33.4	28.8
Manufacturing	6.5	3.8	-1.3	7.3	10.5	9.3	6.6
Production and distribution of electricity, gas and water	5.1	8.2	4.9	6.4	4.0	2.2	5.7

^a. Source: The Orenburg Region. Statistical abstract. 2018.

Production and distribution of electricity, gas and water	3.6	9.5	3.9	3.4	3.7	3.7
Building and constructing	3.9	4.6	5.4	6.3	6.4	6.9
Wholesale and retail trade	8.2	8.8	8.5	8.6	7.6	7.4
Transport and communications	7.7	8.0	6.3	6.7	6.5	6.2
Financial activities	0.0	0.3	0.1	0.2	0.2	0.2
Real estate operations, provision of services	4.5	4.2	4.4	4.8	5.50	5.1
Public administration	3.0	4.2	4.3	4.4	4.1	4.1
Education	2.6	2.6	2.9	2.9	2.8	2.8
Healthcare	4.0	3.4	3.2	3.6	3.5	3.8

^a. Source: The Orenburg Region. Statistical abstract. 2018.

Table 1 shows that region's industry in 2016 created 51.3% of GRP. Its largest share is mining – 34.6%, the contribution of manufacturing industries is 13.1% (a decrease by 2.9 % compared to 2005). Changes in these parameters for the period of 2005-2015 indicates the ongoing processes of deindustrialization in the region, i.e. transition to more simplified types of industrial production.

The industry of this region is characterized by aging material base and increased depreciation of fixed assets. More than half of fixed assets in the mining industry of the region have a high degree of depreciation (55%), in the manufacturing industry this value is slightly less than half (46.5%) (Table 2).

^a. Source: The Orenburg Region. Statistical abstract. 2018, pp. 342-343.

The share of unprofitable enterprises is growing in the region (40.1%), especially in mining industry and in the production and distribution of electricity, gas and steam (see Table 4).

TABLE IV. SHARE OF UNPROFITABLE ENTERPRISES, %

Types of economic activity	2005	2010	2013	2014	2015	2016	2017
Total in the region's economy	44.4	28.2	30.7	34.4	33.1	33.6	40.1
including: Mining	18.5	32.5	28.6	37.7	37.3	40.7	43.6
Manufacturing	33.7	24.2	35.7	32.6	31.3	27.0	34.3
Production and distribution of electricity, gas and water	51.2	36.4	50.7	61.8	56.6	51.1	60.0

^a. Source: The Orenburg Region. Statistical abstract. 2018.

Innovative activity of industrial enterprises is declining. The share of innovative goods and services in 2017 amounted to 3.2% of the total volume of goods shipped, work performed, and services rendered (on average 7.2% in Russia). Innovative

processes in region's industry are carried out mainly due to the implementation of foreign technologies and equipment. So, in 2017, 1,154 advanced production technologies were implemented in the Orenburg region; 308 of these were Russian ones, 836 were acquired abroad, 654 of them were implemented in communications and management sphere. Industrial growth parameters in the region indicate either its decrease or unstable growth (see Table 5). There is also a desynchronization in the growth rates of industry and agriculture.

TABLE V. PARAMETERS OF INDUSTRIAL AND AGRICULTURAL PRODUCTION, IN %

Economic sphere	2005	2010	2015	2016	2017
Industrial production	104.0	106.7	92.3	94.6	100.1
Agriculture	93.5	109.0

a. Source: The Orenburg Region. Statistical abstract. 2018.

The low level of average annual production capacity utilization of organizations in the terms of certain types of products of mining and processing industries should also be

mentioned; in 2016 it amounted to 12.2-25.9% in the production of machinery and equipment, 44.7 -78.5% in metallurgical production, 2.9-90.4% in food production.

Thus, the analysis of the current state of industry in the Orenburg Region shows that its development is characterized by imbalances between extractive and manufacturing industries, a high level of depreciation of fixed assets, a high share of unprofitable enterprises, and low parameters of innovative development. Natural resources, labor and economic potential of the region is underutilized. Such condition of industry indicates, among other things, the insufficient interaction between business community, population and regional authorities, as well as the existing gap between the possibilities of regional management and the needs of region's economy.

Based on this analysis, we have developed directions for increasing industrial efficiency (see Fig. 1).

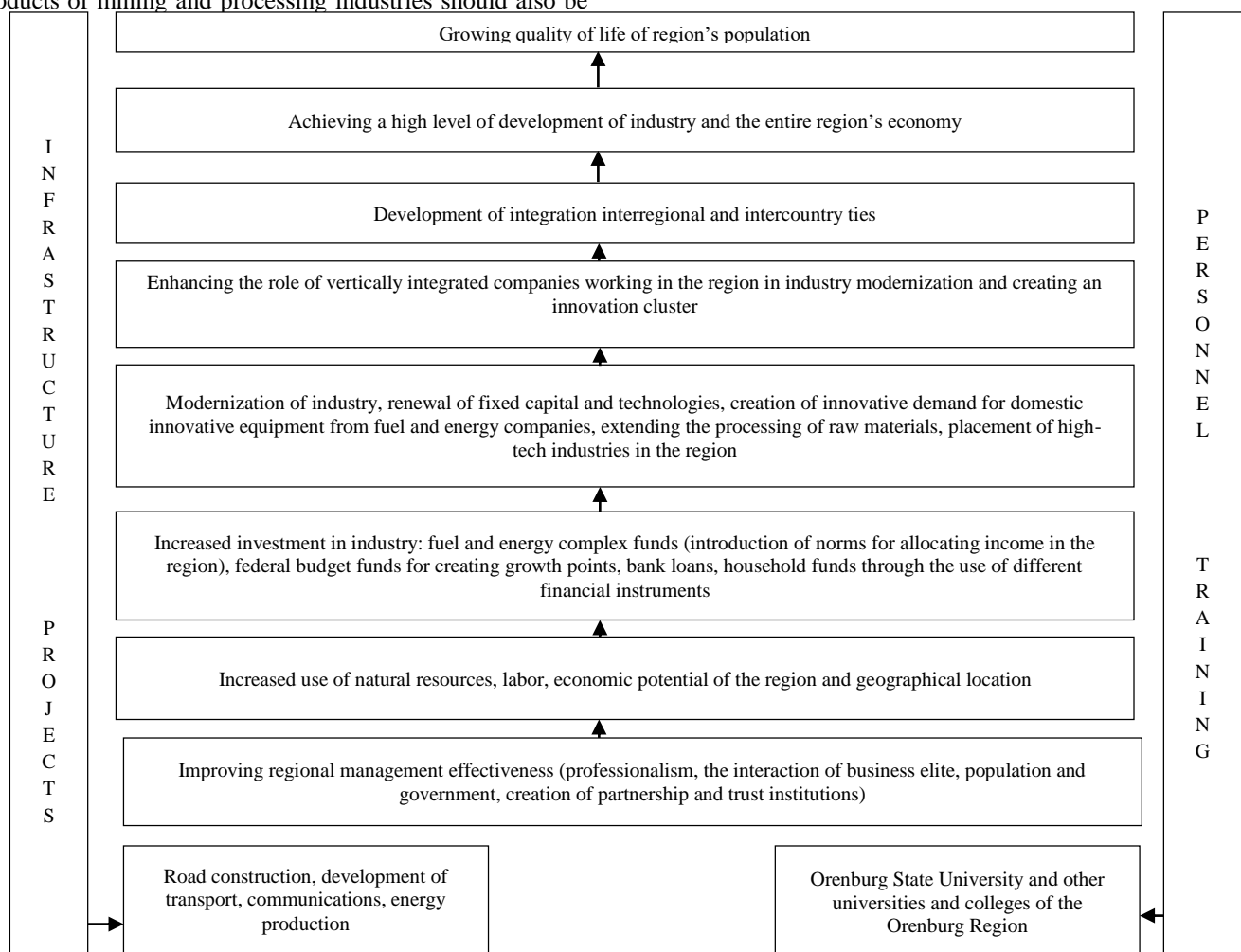


Fig. 1. Directions of industrial development of the Orenburg Region

First of all, it is necessary to improve the management of economic growth of the region; it allows for a more rational and efficient use of natural resources, labor and economic potential of the region, as well as of its geographical location. The region should be managed by a professional team of young enthusiasts with innovative thinking. It is also important to resolve the issue of increasing investments in industry.

The funds of organizations are the main investment source (68.7% in 2017). It seems that regional fuel and energy complex should be more widely involved in the investments in region's economy. For this, it is necessary to legislatively introduce a norm for the allocation of the income of raw materials enterprises into resource processing projects within the region in order to overcome "resource addiction". In addition, it is necessary to use the capital of energy companies

to organize the production of equipment for these companies in the region. It should be emphasized that budget funds at all levels in 2017 amounted to only 4.5% of the total investment. Compared to 2016, this share decreased by 3.1%. In our opinion, the state capital which is concentrated in the federal center should be partially turned to the creation of growth points in the regions and the construction of new enterprises.

Orenburg Region is a border one. Job cuts in the region lead to the outflow of youth to other regions (approximately 50-60 thousand annually). The depopulation of border areas cannot be allowed; it may have adverse consequences for the country. It is important to more effectively use the geographical position of the region that allows developing integration interregional ties, as well as cross-border cooperation.

It is now necessary to modernize existing industries, to extend the processing of raw materials in fuel and mining industries, to increase the level of production of finished products in food industry, and also to think about the deployment of high-tech industries in the region. For the innovative development of industry in the region, it is necessary to generate demand for innovative products, first of all, within the region, at the expense of fuel and energy complex that currently satisfies its equipment needs through the acquisition of new technologies and equipment abroad. It is especially important to stimulate the involvement of intellectual factor in the economy. Intelligence should bring more income than labor engaged, for example, in trade. The organization of high-tech industries in the region will solve this problem.

The region requires implementation of infrastructure projects in the field of road construction, communications, energy and transport that will allow developing integration ties with neighboring regions and countries of Central Asia and China. Russian economists believe that the main institutional reasons for the imbalance of economic development programs are mistakes in choosing development priorities, lack of concentration of efforts and resources in development areas, and insufficient financial support [3, 10, 11, 12]. Vertically and horizontally integrated structures that should ensure victory in competition with transnational corporations are the backbone of industry. Large fuel and energy and raw materials companies operating in the region should make a significant contribution to improving the efficiency of state investments in the construction of factories and the creation of manufacturing industries. The fulfillment of these tasks is possible only if the region is provided with qualified personnel: managers, engineers, technicians, workers; their training should be carried out in Orenburg State University and other universities and colleges of the region.

Practical significance of this study involves the fact that the results can be used to develop a strategy for the growth of industrial complex of the Orenburg Region, for improving its investment support, both at the expense of federal financial resources and the resources of regional fuel and energy companies. The emphasis of this study is on the need to improve the quality of regional management at all levels; it allows drawing attention of regional elite to its role and responsibility for solving the defined tasks.

IV. CONCLUSION

We revealed the main problems and developed directions for the growth of industrial production in future, which are associated with increased investment in the region's industry by fuel and energy and raw materials companies, with the use of state capital which is concentrated in federal center, as well as with loan and households resources. To use the latter, it is necessary to develop tools for attracting them for creating high-tech industries. This will allow extending the processing of raw materials, organizing high-tech industries for the production of equipment for fuel and raw materials industries, modernizing food industry, and raising the development of agricultural production to a new level. It is important that regional elite recognizes the need to solve these regional problems which are also the problems of the country as a whole. The first and the most important task for regional elite is to improve the quality of regional management including the management of its natural, labor and economic resources.

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