

# AGRICULTURAL COMPLEX OF ASTRAKHAN REGION IN DIGITAL ERA: CHALLENGES AND THREATS

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## ABSTRACT

Sustainable development of territories, management of its development take a key position in regional industrial policy. The authorities are looking for possible ways to increase the investment attractiveness of regional industries, access to new markets in condition of economy digitalization. The article analyses the problems of one of the leading sectors of the Astrakhan region - agriculture. The authors identify its investment attractiveness, offer possible ways to increase it through the cluster approach implementation taking into account new business processes caused by digitalization.

**Keywords:** digitalization, agriculture, investment attractiveness, sustainable development of territories, cluster policy.

## 1. INTRODUCTION

In the conditions of modern economic shocks, interest to the problems associated with the sustainable development of territories becomes urgent. Thus, investment appears to be an important component of sustainable development. Many economists agree that a steady inflow of capital (both foreign and domestic) facilitates a solution to the economic, demographic, ecological and social problems of the region. This issue takes a new meaning, in the context of digitalization of the economy.

Economic theory analyses two completely different sources of investment resources in the economy. One way (almost very popular approach from the point of view of the government) is to collect public resources through taxes and other budget revenues and allocate them these funds for different uses. And, also for state capital investment. However, public resources (budget resources) are limited. There is also an opinion that the efficiency of public investment because of many reasons is low, so they can't become a long run effective solution for this problem. The second way - attracting private investment - is more natural for a market economy. Since the main motive of a private investor is to make a profit, then while choosing a new object of investment, he pays special attention to the risks and the rate of return on

investments. Digitalization of some business processes can play a key role here.

The boom in development and implementation of digital technologies which could be seen recent years have significantly changed the key sectors of the economy and social sphere. More and more organizations search how to transfer their business processes into a digital environment, thereby significantly reducing transaction cost and greatly increasing the volume of economic activity [1-3].

## 2. FACTORS OF INVESTMENT ATTRACTIVENESS: REGIONAL ASPECT

Investment performs a number of important functions in terms of ensuring sustainable development of the region, as well as an element of its economic security [4]. Among them, it is possible to emphasize the social function, which is associated with an increase in employment, the reproduction of "human capital", the development of the social sphere and other social effects of investment. These «social results» become possible, first of all, through investment in the development of production (the implementation of investments of their "traditional" economic meaning). On the other hand, investments in "human capital" - in science, education,

healthcare - also improve the results of activities in the economy, increasing the productivity of economic agents, as they expand the amount of accumulated knowledge, promote the implementation of innovations and digitalization of the economy, strengthen human health, improve the quality of life, increase the period of dynamic labor activity of an individual, etc. [5, p. 10].

The investment climate is understood as a generalized characteristic of a whole set of prerequisites (social,

economic, organizational, legal, political, socio-cultural) that determine the process of investing in the regional economic system [6, p. 77].

In turn, the investment attractiveness of a region is an integral characteristic of the investment environment, which is formed on the basis of an assessment of the investment potential and investment risk of the region, reflecting the subjective perception of the region by a potential investor [7, p. 116].

**Table 1. Some Indicators of Socio-economic Development of Astrakhan Region [9]**

Indicators	2014	2015	2016	2017	2018	2019
Gross Regional Product at current basic prices (billion rubles)	296,3	322,3	346,8	420,6	553,4	578,9
Industrial production (million rubles)	173 012,1	209 192,1	222 167,1	306 178,6	431 197,9	441 345,1
Mining operations (million rubles)	100 786,0	125 007,8	137 637,0	226 960,9	342 688,6	331 897,9
Manufacturing industries (million rubles)	48 602,5	58 712,4	57 364,2	53 773,6	57 730,6	75 895,5
Supply of electricity, gas and steam; air conditioning (million rubles)	23 623,6	25 471,9	24 014,7	27 700,1	24 498,5	28 727,1
Agriculture in all categories of farms (million rubles)	29 070,4	36 287,3	37 312,5	41 051,0	43 707,0	46 289,3
Investment in fixed capital (million rubles)	116 856,1	113 168,8	117 999,3	146 660,0	110 279,5	95 657,8
Registered unemployment rate (%)	1,0	1,4	1,4	1,2	1,0	1,2
Average per capita monetary income (rubles)	21 979,5	23 832,2	22 840,5	22 748,2	23 669,7	24 845,7
Consumer price index (%)	107,36	115,47	106,26	103,11	102,63	104,16
Natural population growth (+)/ population decline (-) (thousand people)	2,3	2,2	2,0	0,7	0,05	-0,4

It should be considered that the investment attractiveness of both the region as a whole and its industries in particular is influenced by a large number of factors, such as: legislative, innovative, institutional, infrastructural, political, natural-resource, production, social, labor, financial, environmental, economic factors [8, p. 26]. The process of improving the investment attractiveness of the region, requires considering that some of these factors are subject to external changes, some factors can be changed from within, and some of them should be taken for granted.

According to experts, the agricultural sector is extremely important for ensuring the economic security of the region. The agriculture of the Astrakhan region is endowed with significant potential. This industry occupies a significant share in the economy of the Astrakhan region (table), it employs up to 40% of the regional population, taking into account the functioning of subsidiary farms owned by citizens. In particular, the cattle breeding (as a sector of agriculture) by the State program for the development of the agro-industrial complex of the Astrakhan region is classified to the first level of priorities in the sphere of milk production as a core industry that provides certain advantages of the region.

As a strategic sector of the national economy, agriculture provides food security for the state and sustainable development of countryside. However, the share of investment in this sector is only about 1.5% of the total amount of the regional investment. While, for example, the share of investments in mining in 2019 was 74% of the total amount of the investment in the region.

In the context of the digitalization of the economy, agriculture does not leave behind. Digital technologies are also actively used to increase the efficiency of the agricultural sector of the economy: precision farming, sensors, robotization, electronic field maps, self-driving agricultural machinery, smart farm, etc. All this, in turn, transform familiar business processes, increase the efficiency of agriculture and contribute to the sustainable development of the region as a whole.

### **3. INVESTMENT ATTRACTIVENESS OF AGRICULTURE: THREATS AND CHALLENGES**

The key problems of the investment climate in the agricultural sector of the Astrakhan region can be identified:

1. A high share of unused land resources (arable land). Further development of plant-growing and

horticulture depends on the active involvement of idle land resources in agricultural circulation. On average, in the region, the share of unused arable land is over 50%.

The main reasons for the non-use of the most valuable agricultural land is its belonging to an unscrupulous owner or lessee, as well as the presence of so-called unclaimed land shares in common shared ownership. So, on the territory of the Astrakhan region, the approximate area of unclaimed land shares is about 118 thousand hectares.

2. Low degree of Research and Development implementation. It should be noted that one of the reasons of a significant backwardness of agricultural technologies used in practice in recent years is an extreme depreciation of technical base.

Seed production is rather costly. For example, the production of tomato seeds is connected with a large output of by-products, without the sale and (or) processing of which the cost of the obtained seed material cannot compete with other suppliers.

At present, there are no research institutions in the sphere of cattle-breeding on the territory of the Astrakhan region. It does not allow to carry out scientific and methodological support of selection and breeding work and hinder a systematic analysis of selection and genetic processes in breeding, as well as prevents from genetic monitoring and examination of breeding products in full measure.

3. Lack of appropriate technical equipment and a high degree of the production facilities depreciation of enterprises in the agricultural sector.

One of the problems in the development of the processing industry is a low technological level of production and a high degree of capital depreciation of. This situation has arisen due to insufficient investment in recent years in the processing of fruit and vegetable raw materials. A similar situation has developed with the depreciation of agricultural machinery and the quality of technological equipment in the cattle-breeding industry.

4. Insufficient level of food-market infrastructure. The Astrakhan market of plant products is subject to significant seasonal price fluctuations. During the harvest season, many agricultural producers are forced to sell the main part of their production from the fields at low prices. At least 40% of agricultural products are lost on their way from the producer to the final consumer.

5. The prevalence of extensive farming methods.

6. Degradation of rural areas, low attractiveness of agriculture for skilled labor (stuff).

The main reason for the current unfavorable situation in the integrated development of rural areas is the

extremely low level of the comfort of living in countryside, which affects the migration flows of the rural population, especially young people, thereby reducing the source of expanded reproduction of the labor resource available of the agricultural sector.

Furthermore, evidence show that an increase in the amount of specialists does not solve the problem of providing the agro-complex with skilled labour, because the living conditions in the countryside have a negative impact, young specialists prefer move to cities for higher earnings.

In the conditions of the COVID-19 pandemic, the introduction of the necessary quarantine measures entails economic costs associated with a reduction in economic activity. The stricter the measures to contain the spread of the virus, the higher the economic costs of firms. A drop in production level, decrease in population income, increase in uncertainty, and also a forced change in consumer habits lead to an increase in costs due to prices growth for imported production means and materials; decrease in investments due to budgetary constraints both by the state and private investors; additional costs for disinfection, labor and other measures. The pandemic has struck significantly to the distribution network of the agro-complex, and this is especially true for small and medium business, since farming households mainly sold their products at small fairs, which were closed.

In turn one shouldn't omit that changes in patterns of social and business life, caused by the COVID-19 pandemic, has accelerated the development of different new trends. Among them should be noted the expedite transition to a new world economic structure. It appears to be that COVID-19 pandemic along with the digitalization plays a decisive role in transforming the production processes in all countries of the world, in creation of new logistic schemes, putting forward new challenges to society.

Despite the problems, the agriculture of the Astrakhan region has significant potential, which made it possible to identify the direction prospects of its development and formulate general recommendations for increasing the investment attractiveness of this branch of the regional economy.

While the COVID-19 pandemic was exacerbating it were mostly small businesses who suffered greatly also from the sanitary measures which should have protect human health. So now, when it seems that situation gets better and it have become possible to ease (or even completely remove) some sanitary restrictions, it is necessary to develop competition in the agri-food market through the formation of cooperative trade and marketing, and this will increase the products availability of small enterprises and farms for the consumers.

The creation and further promotion of the cluster can promote the development of agriculture in the region.

Applying the cluster approach during the COVID-19 pandemic will allow its participants to:

- satisfy demands of internal region market, which needs regular supplies of products manufactured within the cluster enterprises;
- ensure food security in the region;
- obtain return to scale from the materials purchases, raw materials and equipment, as well as a synergistic effect from interaction and exchange of experience, joint sales of product sets;
- develop new sales markets for products based on dynamic marketing activities and innovation policy;
- establish consistent long run mutually beneficial relations with financial and credit organizations due to accumulation and spillover of information (also financial, technical etc.) and externalities caused by interconnections of the firms-members of the cluster based on the formed image of the cluster;
- improve the quality of life of the population living both in the city (access to quality and healthier products also improves economic security of the household and encourage people to choose healthy lifestyle) and in the countryside (additional jobs, better infrastructure, modern logistic motivates people not to leave for the city, increase the profile of work in the agriculture also among young qualified specialists).

In addition, the clustering of agriculture can contribute to the introduction of new technologies, partial digitalization, as well as the creation of a digital ecosystem. Partial digitalization of production processes involves the use of modern digital solutions (sensors, detectors, drones, elements of precision farming, etc.). Full automation of all production processes provides for the formation of a digital platform for the management of agricultural activities. The use of such ecosystem will allow integrate individual participants in the region's agricultural market into a single system based on the digital-platform of an agricultural company.

The pandemic of the 21st century provides a powerful incentive to economic restructuring and emphasized the importance of digital technologies, stimulating their accelerated development. Changes caused by coronavirus infection is encouraging participants of the agricultural industry to adopt online product sales. Designing of web sites and social networks pages, which provide the creation of business accounts (Facebook, Instagram), cooperation with delivery services could help firms survive in this situation.

According to modern economic research, there is the connection between investment activity and the digitalization of industries and regions [10, 11]. The development of information technologies has a positive effect on investment attractiveness, production growth, labor productivity, and provides employment in the industry and in the region [12].

Nowadays, implementation of internal (network business) and external (e-commerce) business transactions through ICT, algorithmization of the decision-making process and the use of digital automation technologies in various sectors of the economy are identified as components of the digital economy [13] [14].

#### 4. CONCLUSION

Thus, the organization of integrated structures based on a cluster approach during a pandemic, as well as the introduction of digital technologies, will allow to improve the investment climate of industries, which produce agricultural products, stimulate innovation processes, and adapt continuous changes in the competitive environment and market demand. The cluster approach, combined with digitalization, is a powerful tool to stimulate regional development, which ultimately contributes to an increase in employment, wages, budget allocations at various levels, improving the sustainability and competitiveness of regional agricultural sector.

At the moment, attracting investment into the regional economy is one of the most important tasks. In order to solve it as rationally as possible, it is necessary to increase the investment attractiveness of the region for potential investors. However, at the present stage there is a growing problem of intensifying the investment process in most Russian regions. The tendencies of the nineties of the twentieth century are repeated from year to year, characterized by the fact that foreign economic conditions are deteriorating, bank lending is contracting, industrial production and exports are falling, work in construction is decreasing, tax revenues are falling, capital outflow grows and there are clear signs of a crisis of investment activity [15, p. 302].

Therefore, digitalization (especially in modern conditions of economic shock and volatile prices for energy resources) with all its advantages could become a useful instrument of modernization of the regional economy as a whole and its industries in particular (also agriculture, although it is usually not associated with high technology). And it can't be denied that under the urgent need for modernization, investments become the crucial factor, and mostly they vector the innovative processes.

## AUTHORS' CONTRIBUTIONS

The article has been written by a team of authors, all authors have taken equal part in the theoretical analysis of the problem and in carrying out the research.

E. Vostrikova analysed and generalized ideas of the Russian and foreign authors on the problem of the research.

I. Chertina were responsible for the monitoring of the problems in agriculture of Astrakhan region.

A. Meshkova summarized the data and wrote the original manuscript.

E. Surina made an analysis of the survey results and contributed to revising and editing the paper.

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