



# Priority Development Areas and "Industrialization 4.0": Do Not Overlap Trajectories

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## Abstract

The paper discusses the problems associated with the priority social and economic development areas (PSEDA) in Russia. The special role of high technologies in production processes in the priority social and economic development areas is noted. Attention is drawn to the goal of "advanced" development and to the functions of technological innovation and technological infrastructures in various fields of activity required for it. The methodological and technological foundations of "advanced development" are considered. The priority development in the Russian Federation is viewed through the prism of "industrialization 4.0", the industrial revolution developing in the USA and Germany. "Industrialization 4.0" is a new model of development which marks the end of the industrial and socio-economic formations of the 20th century and the beginning of the 21<sup>st</sup> century. As a result of the study, barriers to the creation of priority social and economic development areas were identified: the lack of a systematic approach to the implementation of a new type of special areas and an advanced scientific and technical base as the foundation for development in the modern world; the existence of a serious conflict of interest between stakeholders of the priority development areas; dominant decision making on survival strategies. The authors proposed to establish goal-setting as an important component in the national innovation system of Russia and determine technological directions, levels, criteria, qualimetric indicators based on the parameters and trends of the industrial revolution 4.0. The priority social and economic development areas should be considered as an important tool for the adaptation of technological clusters of Russia to international trends, regulations, key parameters, seeking to change the catch-up paradigm with the paradigm of economic development.

**Keywords:** priority social and economic development area (PSEDA), high technologies, "industrialization 4.0", synergistic effect, paradigm of economic development.

## 1. Introduction

The government of the Russian Federation estimates the economic situation in the country as the beginning of economic growth after three years of recession and depression. The government sees this by lowering the level of inflation, as measured by the Central Bank methods (based on the price index for "dressed herring" and "Russian salad"). There is a certain success in the gross grain harvest, the increase in production at the enterprises of the military-industrial complex. The ministers of the economic bloc count on GDP growth at the level of 2.0% with an average global level of global GDP growth of 3.6%, and growth of economic development rate leaders of China, India, Indonesia and others of 7-10%.

The achievements can be attributed to the growth in the number of development institutions, the total number of which exceeded 100 items. There are, of course, such institutions that have demonstrated effectiveness (venture funds, the Industry Development Fund, the Agency for Strategic Initiatives, youth technology parks, funds for national technology initiatives, resource centers...).

Special hopes are placed on development of institutions under the ambitious title "Priority social and economic development areas". The pioneers were 9 priority social and economic development areas created in the Far East in 2015. As of 07/10/2018 18 priority

social and economic development areas have been created in the Far East.

Since 2016, single-industry municipalities began to receive the status of a territory with a special mode of conduct of entrepreneurial activity. The first priority social and economic development areas were the monocities Naberezhnye Chelny (Republic of Tatarstan), Gukovo (Rostov Region), Usolye-Sibirskoye (Irkutsk Region). As of 10.07.2018, 62 priority social and economic development areas were created in single-industry municipalities and closed administrative-territorial entities.

## 2. Methods

The study is based on the methodology of the systemic approach, and general scientific methods of cognition. In identifying the problems of creating priority social and economic development areas, a trend analysis of technological innovations was used.

## 3. Results and discussion

The task of creating a priority social and economic development area is formulated as follows: it is necessary to turn a number of depressed areas into "advanced development areas" using some benefits for resident companies. So far, there are no facts allowing us to look at the tasks solved with optimism. The state project "Priority social and economic development areas", obviously,

stumbles upon some barriers that do not allow us to implement it with the expected result. The following versions of the occurrence of these barriers may be proposed.

Firstly, there is no systematic approach to the program in question. In the system view, it is difficult (or rather impossible to say) to pull out one local industrial object from the general economic activity. Modern transport and logistics infrastructure is becoming more complex. The more complicated are the technological processes of production that require continuous updating (2-3 times every 10 years), and this, in turn, requires a powerful machine tool base which the country does not have today. There is no effective system for training engineers, the need for which exceeds 1-2 million people, according to government data, etc. And yet there are no research centers (small and medium-sized businesses do not have them at all, and large corporations only have in rare cases). There is a need to develop in the coordinated manner new materials, structures, technology, supply chain, not allowing even the smallest gaps. In 1990-2010 there was interaction in the innovation sphere with the West. Due to that interaction, Russian infrastructure base and scientific and technological schools were destroyed. Currently, their reconstruction will take years (decades, in many cases).

Secondly, in order to advance in modern technologies, one must have, above all, an advanced scientific and technical base. Where are enterprises with research units in their composition? There are almost none. How many of our universities are in the 100 best universities in the world? They are not there, etc.

Under these conditions, it is possible to create advanced development areas in depressed and underdeveloped areas only with the simultaneous creation of a powerful scientific and technical infrastructure in the "wastelands". And this dramatically increases the cost of "advance". Sophisticated innovative technologies require international standardization and certification, which take years and also require an international infrastructure. Thus, the task of "faster social and economic development", which solving starts with ensuring the function of a technological breakthrough, becomes more and more complicated and expensive with the transition to social, economic, personnel, etc. infrastructure areas.

Modern industry is a deeply interconnected complex of industrial (foundry, forge, welding, thermo-galvanic, aggregate, assembly, tool) industries, machine-tool construction, transport and logistics infrastructure, control and measurement, standardization and certification bases for electrical generation, materials, systems, training specialists who meet continuously tightening environmental requirements, trends of the "green revolution" and "industrialization 4.0" [1, 2].

Modern production, by and large, cannot but be innovative, and in this case a national innovation system and a regional base for research and development are needed [3-5]. These are the vulnerable sides of Russian industry and science. The breeding of rabbits may not require such a complex infrastructure, but even there are "difficulties" with food supply and waste disposal. Creating the priority social and economic development areas, the initial positions of success in the competitive struggle with those manufacturers that previously entered the market should be thought out at the initial stage for the priority social and economic development areas at the system level. This is the presence of high-tech laboratories, scientific schools, world-class universities and a pronounced political will [6]. The missions of a priority social and economic development area as a development tool is understated. It does not exceed the level of an ordinary small or medium-sized business, but with expanded conditions for lobbying interests.

Thirdly, the barriers in the successful development of priority social and economic development areas include conflicts of interests. Within the market elements, where there is a "war of all against all", an emergence of a new manufacturer does not increase the enthusiasm of local entrepreneurs already existing hear. Enterprises that have previously entered the market for a

product, as a rule, have warehousing, marketing, measuring, etc. infrastructure, they have resolved issues with the connection of energy and waste. A new resident, as a rule, has nothing and its products are more expensive. The Roman gladiators slogan "kill them or they'd kill you" is not an empty phrase, but the harsh reality of the market struggle [7-8].

In 1992-1998, Russia went through a phase of complete chaos. Large, medium and small enterprises, and construction sites were closed (there are 12 thousand unfinished objects in the country so far). The economic situation was uncertain and unpredictable. Everything was drowned out by the crescendo with the mantra "freedom, liberalism, open market." Since 1998 (default of a liberal market economy), elements of orderliness and systemism have begun to enter the Russian economy. There were even moments of weak economic growth (199 -2000, 2002-2008, 2012-2013.). Then deep depression occurred again.

Areas with a special mode of introducing entrepreneurial activity could play the role of a system-forming factor if the concept of their creation pursued such a goal. In fact with their help, they are trying to close, figuratively speaking, "leaks in the hull of a sinking ship" (to support some single-industry towns, to promise the flowering of some regions...). Nothing positive happened. The created areas did not demonstrate efficiency even where they seemed to be done for success ("Titanium Valley" Salda - Nizhny Tagil, Far Eastern port centers, industrial valley "Samara - Tolyatti", etc.). Priority social and economic development areas could play the role of an order parameter in the "Russian Economy" system. Unfortunately, it did not happen.

Land plots allocated to residents of priority social and economic development areas often make neighbors and "partners" not friends in a common cause, but fighting opponents. The Government of the Russian Federation did not provide for direct investment support of the priority social and economic development areas. There are very few investors for a number of reasons. Even China has not yet made significant investments in the Far Eastern priority social and economic development areas, although they were supposed to be located in the zone of interests of this giant.

Corruption and bureaucracy explain failures in all areas of activity. But in the case of priority social and economic development areas, conflicts of interest in this area have an objective basis. Local ("aborigines") and foreign residents of priority social and economic development areas often have different "weight categories" in competition and different material interests.

Finally, a trend analysis based on "industrialization 4.0" criteria shows that the near future will be behind the technological revolution, and routine technologies will quickly die [2-10]. Robots, BTS, STS, drones, biotechnologies, hybrid technologies, the green revolution, and new energy based on renewable resources, etc. rapidly change the face of Europe, America, China, and the ASEAN countries. According to experts, Russia is far behind in the deployment of the industrial revolution 4.0 [11]. The costs of the United States and China in technological research exceed \$ 400 billion in each country. China builds technology development strategies for 50 years and involves tens of millions of researchers in the implementation of innovative programs and projects. In Russia, no more than 15% of enterprises participate in research and development, there are no real industrial development strategies, there is no even a balanced industrial policy in the future for 15-20 years (preparation of future technologies requires huge financial and labor resources and is calculated for 25 or more years). Solving the problems caused by the clash of market chaos and strategic programming does not require the competition of routine technologies, but the mobilization of all national potentials and intellectual resources. A priority social and economic development area could play such a role if there was a unified strategy for their creation based on the synergy of necessary and sufficient force factors. The maximum synergistic effect in production systems arises only with coherent

interaction and coincidence of the development azimuths of the whole and its components. If the components of the system will have multidirectional azimuths of development, it can only degrade.

The system of technological standards could coordinate the goals, tasks, terms, algorithms of individual priority development areas into a single synergistic system. Allocation of trigger points, congenial and even ahead of the "industrial revolution 4.0" is a critical condition for the success of the priority social and economic development area in the Russian Federation.

Strategic, medium-term and current planning do not match in terms of performance indicators. The dominant decision-making strategy for survival is like driving a car with the help of a rear-view mirror. It cannot meet the requirements of the "industrial revolution 4.0" where emergence (time compression) has become one of the key success factors. By itself, the concept of a priority social and economic development area as an institution of development is quite acceptable, but in the specific conditions of Russia, where the strategy is tackled by operational actions to survive, the chance is lost to take a worthy place in the industrial revolution and reduce the technological lag.

#### 4. Summary

Despite all the difficulties with the priority social and economic development areas, their potential in Russia has not been exhausted. First of all, it is advisable to establish goal-setting as an important component in the national innovation system of Russia and determine technological directions, levels, criteria, qualimetric indicators, based on the parameters and trends of the industrial revolution 4.0. The priority social and economic development areas should be considered as an important tool for the adaptation of technological clusters of Russia to international trends, regulations, key parameters, seeking to change the catch-up paradigm with the paradigm of economic development.

The philosophy, principles, methods of "technological revolution 4.0" are distinguished by deep immersion in the nano-level of physical, chemical, biological processes, nonlinearity, disequilibrium, unpredictability, and are accompanied by "order-chaos" transitions. The combination of these qualities is called "complexity", and the science of complexity is called synergy [12]. The complexity of technology is the main problem of the XXI century. Currently, there are no reliable algorithms to overcome the "difficulties" in technological development. Each "complexity" is solved individually. "Difficulties" include not only logic, knowledge, but also the neural network approach, intuition, creativity, synthesis of heterogeneous plexuses-interweaving of processes of different nature. Each priority social and economic development area should be given with the task of overcoming the "complexity" in order not to reproduce routine prototyping, but to carry out technological breakthroughs. Breakthrough into a new technological space requires a lot of money, skilled personnel, and cultivation of leaders for world-class scientific schools.

The priority social and economic development areas should be created where there is a creative potential, where the formation of scientific schools is possible. In Russia, the role of scientific schools and their leaders is still underestimated. Everything is simplified to the level of unacceptable primitivism ("you have a profit — you are a winner"). Sustainable development is currently being achieved through innovative reengineering of technological systems. Reengineering technologies in specific fields of knowledge have penetrated deeply up to the nanoscale, and at the same time require an interdisciplinary approach ("think globally, act locally").

#### 5. Conclusions

In Russia, there is a problem of areas capable of being leaders of economic development. There are depressed areas in which you can solve the problem of the survival of the population. There are areas whose development is of strategic importance for any field of activity in Russia. All areas are equivalent and, of course, important for the country. But to solve their problems you need in different ways and you need to set different tasks for them. The term "priority social and economic development area" is misleading. "Advance development" in Gukovo cannot be made according to a model of development for Zelenograd.

As shown by the first three years of their existence, the future of priority social and economic development areas does not cause optimism. But their fate is not sealed. If to introduce standards, regulations, and goal setting linked to the industrial revolution developed (to increase the set of functions related to high technology, innovation, investment, increase in the quality of life, human factor development) into the existing standard provisions, the priority social and economic development areas would obtain second wind.

If the priority social and economic development areas are considered as clusters of a new, emerging technological revolution 4.0, then they do not reach such a level in terms of the legal, technological, economic, humanitarian and social norms of the near future. For the distant future, the current model of the priority social and economic development area is not suitable in principle. Three years of experience in creating and functioning of the first priority social and economic development areas did not kill them, but did not provide role models. There is a need for them. The chance of success remains.

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