

# Problems of implementing regional industrial policies in the transboundary arctic regions of the Republic of Sakha (Yakutia)

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**Abstract.** The article focuses on the problems of creating industrial parks in the Arctic zone of the Republic of Sakha (Yakutia), in accordance with the need to implement regional industrial policy and the goals of improving the efficiency of industrial enterprises of the Russian Federation.

**Keywords:** industrial parks, public-private partnership, development, industrial policy

## 1. Introduction

Problems of planning and implementing industrial policy are considered in the works of many foreign (M. Porter [8], P. Krugman [4], etc.) and domestic researchers (V. G. Varnavsky [9], V. B. Kondratyev [10] and etc.). The directions, methods, and results of industrial policy, as well as the effectiveness of its implementation at various levels of government are widely discussed [5, 6]. Much attention is paid to the principles of public-private partnership in industrial policy [1; 9; 11; 13].

The regional industrial policy of the Republic of Sakha (Yakutia) is aimed at supporting the existing industry, increasing the production competitiveness, and ensuring the creation and development of innovative enterprises to eliminate imbalances in economic development, which is primarily of a raw material nature [12]. During the last 10-15 years, a whole complex of strategic documents of the republican and municipal decision-making levels has been developed, which is based on targeted sectoral programs. In recent years, the focus has been on the creation of advanced socio-economic development areas. For the implementation of industrial policy at the regional level, a number of institutions were created with different organizational and legal forms: GBU "Investment Promotion Agency RS (Y)," JSC "RS (Y) Development Corporation," JSC "Republican Investment Company," Ministry of Innovative Development and Entrepreneurship of RS (Y), etc.

Based on the principles of the need to implement a public-private partnership for the intensive industrial development, we evaluated the possibility of creating industrial and agro-industrial parks in the republic. In assessing, we took into account plans and forecasts of enterprises as potential investors, indicators of regional socio-economic development, as well as strategic planning documents at the federal, regional, and municipal levels of government. In accordance with the requirements of representatives of regional development institutions, we have allocated only 2 of the 12 possible industrial park locations on the territory of the RS (Y). We evaluated each of them for compliance with

the criteria governing the activities of industrial and agro-industrial parks in the Russian Federation. We have identified the main problems of creating industrial and agro-industrial parks associated with the peculiarities of the transport infrastructure and the inaccessibility of energy and water supply.

## 2. Materials and Methods

The starting point for assessing the possibility of creating industrial parks is to assess the overall level of territorial development. For a general assessment of the existing level of regional socio-economic development, we considered a number of key indicators for the period from 2005 to 2017, including gross regional product per capita, indicators of production volumes by types of economic activity, investments, and others [13].

The primary list of possible industrial and agricultural parks was developed by us on the basis of the principle of including all possible alternative solutions to support or create new industries, taking into account the intentions and applications submitted by representatives of business, municipalities, specifics of the mineral resource base and the availability of labor. The most promising settlements for industrial parks were identified, and the attractiveness of the projects and their compliance with the requirements of transport and energy infrastructure were assessed by us.

## 3. Results

At the present stage (2005-2017), the economic development of the Republic of Sakha (Yakutia) is characterized by a stable growth of the gross regional product. From 2005 to 2017, the gross regional product (GRP) increased by 5 times in absolute terms and amounted to 916.6 billion rubles in 2017 (Table 1). The main reason for the accelerated growth of GRP is large-scale investments in the construction of a number of production facilities, pipeline systems, railway lines, as well as field facilities.

**Table 1.** Criteria for determining project attractiveness.

Indicator $Y_i$	Weight
1. Presence of the approved projects of possible parks residents in the republican register of investment projects (yes - 1 / no - 0).	0.1
2. Projects of potential residents in the federal targeted programs (yes - 1 / no - 0).	0.45
3. Industry attractiveness, favorable market conditions (0 - no, 0.3 - weak; 0.5 - average; 0.8 - quite favorable; 1 - favorable).	0.28
4. The presence of an interested investor (yes - 1 / no - 0).	0.17

In Yakutia, the predominance of mining not only persists, but it also tends to increase, which is to continue until 2030, according to our estimates. Taking into account the daily practice of the Russian Federation, the specifics of the extractive industries do not meet conditions for the functioning of industrial parks, and specific extractive industries are spread over a large area. With an underdeveloped transport infrastructure, the latter circumstance does not allow for the creation of ancillary productions that represent the subject, as well as for the environment stimulating the development of industrial parks, as a rule. In the Republic of Sakha (Yakutia), only those large land plots of industrial land meet the regulatory criteria for the creation of industrial and agro-industrial parks, which are located closer to the railway and large settlements. To substantiate our decision on the creation of industrial and agro-industrial parks, we developed the relevant indicators, which were divided into two independent groups that made up the complex variables.

The following criteria were assigned to the first group characterizing the attractiveness of the project:

- Availability of the approved projects of possible residents of parks in the republican register of investment projects;
- Projects of potential residents in the federal targeted programs;
- Industry attractiveness, favorable market conditions;
- Presence of an interested investor.

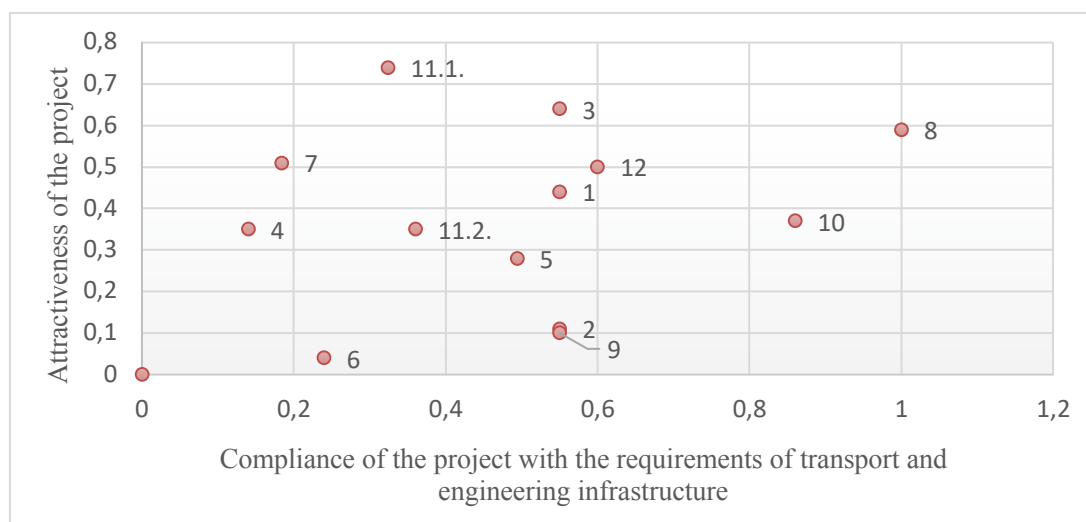
The second group, which characterizes the state of the transport and engineering infrastructure of the territory, includes the presence of the following objects in the immediate vicinity of the planned industrial site:

- Labor resources at a distance of no more than 100 km;
- Municipal roads;
- Trails of regional importance;
- Federal highway;
- Railways;
- International airport at a distance of not more than 100 km;
- River port at a distance of no more than 100 km;
- Electric networks;
- Gas supply;
- Water supply source.

**Table 2.** Criteria for compliance with the project requirements of transport and energy infrastructure.

No, i	Indicator $X_i$	Weight $\alpha$ , $\alpha \leq 1$
1	Availability of labor resources at a distance of no more than 100 km	0.03
2	Presence of a municipal road in the vicinity	0.01
3	Presence of the route of regional importance in the vicinity	0.01
4	Presence of the federal highway in close proximity	0.24
5	Railway tracks in close proximity	0.38
6	Presence of an international airport at a distance of no more than 100 km	0.09
7	Presence of a river port at a distance of no more than 100 km	0.15
8	Availability of electrical networks	0.06
9	Availability of gas supply	0.01
10	Availability of water supply source	0.02

During the peer review, weighting coefficients were assigned to each indicator. Integral weighted average complex characteristics of the attractiveness of the project and its compliance with the requirements of the transport and engineering infrastructure are calculated.



**Figure 1.** Evaluation of projects for the placement of industrial parks in the territory of the Republic of Sakha (Yakutia).

The Arctic territories of the possible location of industrial parks are indicated in Figure 1: No. 6 *Industrial Park "Ust-Yana"* and No 9 *Industrial Park "Zapadno-Anabarsky."* Obviously, they

noticeably lose in their characteristics to other projects, which are located mainly in the central and western part of the republic.

#### 4. Discussion

In the process of research, there was no opportunity to use foreign experience, since there is not a single situation comparable in characteristics. For example, Canada (which created 253 industrial parks on its territory) has not yet moved north of the 55th parallel. This indicates the problems that the Republic of Sakha (Yakutia) intends to solve, knowing that most of its territory is located north of this latitude. On the territory of the Republic of Sakha (Yakutia), the formation of the North-Yakut base zone for the socio-economic development of the Arctic zone of the Russian Federation is planned. The North-Yakut zone should become a base for the entire North-East of Russia and a bridge for expanding cooperation with China and other countries of the Asia-Pacific region. According to the regional industrial policy, the implementation of large investment projects should be synchronized with the resumption and development of the Northern Sea Route system. This will give impetus to the full-scale development of the Arctic through the creation of new jobs, organization of new industries, growing GRP, an influx of economically active population with a further consolidation in the field, and an increase in the share of own revenues of local budgets. Enterprises of the mineral-industrial complex "Ust-Yana" for the extraction of gold, tin, and rare metals can participate in the creation of a pool of residents of the industrial park for the processing of minerals. However, the creation of industrial parks in the Arctic economic zone is difficult due to the problems of creating transport and energy infrastructure. Traditionally, communication is carried out by air and all-terrain vehicles. The high cost of air travel and the lack of transport with high traffic is a limiting factor in socio-economic development.

#### 5. Conclusion

In the conditions of the economic crisis, issues on the creation of industrial parks are considered by regional bodies primarily in terms of saving public funds, focusing on funding from private business and the federal budget, primarily. Therefore, the probability of organizing industrial sites is the highest for territories where there is already an appropriate transport, energy, and social infrastructure.

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#### References

- [1] Hayter R 1997 *The dynamics of industrial location: The factory, the firm and the production system* (Chichester: John Wiley)
- [2] Hoover E M 1963 *The location of economic activity* (New York, NY: McGraw Hill)
- [3] Lösch A 1940 *The economics of location* (New Haven, CT: Yale University Press)
- [4] Krugman P R, and Obstfeld M 2006 *International economics: Trade and policy* (Boston, MA: Pearson Addison Wesley)
- [5] Mérenne-Schoumaker B 2011 *La localisation des industries: enjeux et dynamiques* (Rennes, France: Presses universitaires de Rennes, 3rd edition)
- [6] Warwick K 2013 Beyond industrial policy: Emerging issues and new trends *OECD Science, Technology and Industry Policy Papers 2*
- [7] Weber 1909 *Theories of the location of industries* (Chicago, IL: University of Chicago Press)
- [8] Porter M, Ketels K, Delgado M, and Bryden R 2006 *Competitiveness at the crossroads: directions for the development of the Russian economy* (Moscow, Russia: Center for Strategic Research)
- [9] Varnavsky V G 2009 *Public-private partnership* (Vol. 1) (Moscow, Russia: IPU RAS)
- [10] Kondratiev V B 2015 *Sectors and sectors of the global economy: features and development trends* (Moscow, Russia: International relationships)

- [11] Bogoviz A V, Alekseev A N, Ragulina J V 2019 Budget limitations in the process of formation of the digital economy *Lecture Notes in Networks and Systems* **57** pp 578-585
- [12] Fedorova N A 2008 Industry of the Republic of Sakha (Yakutia): main problems and their solutions *Problems of Theory and Practice of Management* **7** pp 35-43
- [13] Fedorova N A, Mordinova M A, and Nikolaeva I V 2013 Forecasting the balance of labor resources in a region in the process of strategic planning using the example of the Republic of Sakha (Yakutia) *All-Russian Economic Journal ECO* **9** pp 122-132