
REGIONAL INNOVATION SYSTEMS AS A PRIORITY FOR GOVERNMENT BODIES: FUNCTIONS AND MECHANISMS OF INFLUENCE (EXAMPLE OF THE KARAGANDA REGION)

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Abstract. *The topicality of the problem under study is due to the expansion of the contemporary concepts of the regional innovation system, and the increasing role of regions and local governments in the implementation of State programs of innovative industrial and technological development. This article aims toward the study of participants of regional innovation processes in the Karaganda region, and the definition of their goals in current conditions. The leading approach taken to the study is the analysis of the regional innovation policy issued by the authorized organizations, and the local government, allowing us to identify the tools of their relationship with other participants of the innovation system in the region. The key participants of the regional innovation system are characterized. The indicators of innovation activity in the region are considered. The factors influencing the innovation processes are identified. The materials contained in this article are useful for improving the management functions and positions of state authorities in the region, as well as for conducting a comparative analysis with other regions of Kazakhstan and the territorial subjects of nearby foreign countries.*

Keywords: *public administration; regional innovation system; government bodies, region, Republic of Kazakhstan (RK), state authorities, state program.*

Raktažodžiai: *viešasis administravimas; regioninė inovacijų sistema; valdžios institucijos, regionas, Kazachstano Respublika (RK), valstybės institucijos, valstybės programa.*

Introduction

Modern concepts of regional innovation systems (RIS) are relatively new in the framework of the state innovation policy in different countries, including in the industrial innovation policy of the Republic of Kazakhstan. Interest in the formation of specific relations in the field of innovation arose in the early to mid-1990s. The author-developer of the modern theory on regional innovation systems is Professor F. Cook at Cardiff University. Today he is one of the world's leading researchers in this field. In his works, Cook noted that one of the founders of the modern concept of national innovation systems, B. A. Lundvall, touched upon the processes of regionalization in the context of globalization changes, discussing innovation systems (technological systems, in particular) and referring to regional networks (Cooke 1992). However, Lundvall believed that the prospect of relations at the regional level is no more useful than the study of national innovation systems and their supranational structures (Lundvall 1992).

Nevertheless, as demonstrated in the experience of developed European countries, it is regional innovation strategies and plans for the technological development of territories that become relevant in the struggle to increase competitiveness with respect to the United States (European Commission 1995).

However, changes in the interaction between countries and the adoption of the Maastricht Treaty in Europe in 1993 have highlighted the relevance of the territorial innovation development concepts. In the European Union, the main goal at the time was to accelerate scientific and technological development in order to achieve the consolidation of European states and their regions.

Post-Soviet countries, following the objective tendencies of the need to form their own national innovation systems, initially directed their attention to the specifics of their functionality at state level, which is expected. However, over time the regionalization of innovation processes became increasingly important in formulating State development programs and implementing political, socio-economic, and administrative reforms.

Attention is also drawn to the fact that the very system of government is subject to change based on innovation, as with any other sphere of social relations. Back in 1997, in the long-term development strategy of Kazakhstan "Kazakhstan-2030", President N. A. Nazarbayev set a task before society, outlining the creation of a modern state administration adapted to a free market system. The basis for the modernization of Kazakhstan's public services should have been qualitative new structures, involved in the development of the main directions of state policy and forming open networks of state regulation, in which elements of healthy competition receive encouragement (Nazarbayev October 16, 1997). Reformation of the public administration system in Kazakhstan should have taken into account the specifics of regional development. Therefore, the "Strategy of Territorial Development of Kazakhstan until 2015" noted that one of the conceptual directions in this regard was the process of self-organization, presented as the basis for "competition of regional development ideologies" (Kazakhstan 2006).

Theoretical and methodological approaches. Returning to the theoretical and methodological basis of regional innovation systems, we note that this topic aroused interest among local researchers and scientists from neighboring countries relatively re-

cently (about 10-12 years ago). The regional innovation system has become the object of research in the works of both Russian and Kazakhstani scientists. Kazakhstani science in the field of innovation and development of the innovation system is represented by scientists Sabden (2007), Dnishev and Alzhanova (2013), Koshanov (Sukhanova 2015), Kenzheguzin et al. (2005), Ipalakov and Goltsev (2008), as well as a number of other researchers. According to most scientists, in general, the principles of research of innovation systems are similar at both state and regional levels. However, the analysis of the innovation system of the region (or territory) needs a more detailed approach, one that allows the taking into account of the specific features of each separately represented territorial unit, and, as a result, the possibility of creating objective conditions for managing the entire system.

Statement of the main material of the study. Russian author P. A. Sukhanova notes that the literature dedicated to issues with the regionalization of innovative systems (RIS) lists three main approaches to its definition (Fig. 1):

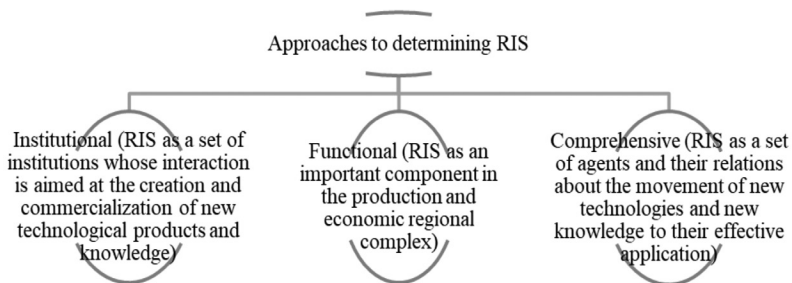


Figure 1. Definition of RIS from the point of view of various approaches (Sukhanova 2015). Note: compiled by the authors.

In general, the current trends in the study of the regional innovation system present it as:

1. One of the directions of modern research of innovation systems in general and territorial systems in particular;
2. One of the scientific and methodological approaches to the study of the innovative development of regions and their territories;
3. A set of recommendations and guidelines for improving relations of the innovation system, taking into account its scale, sectoral focus, geo-economic situation, etc. (Zarkovich 2013).

RIS is an integral part of the socio-economic and industrial complex of the territory; therefore, the indicators of innovation activity largely overlap with the socio-economic and other characteristics of the situation in the region as a whole. Innovation systems in the regions of Kazakhstan are at their formative stage, and so far progressive develop-

ment only occurs with support from the state authorized bodies of regional and local authorities.

Karaganda is the largest region in Kazakhstan, and it consists of 18 internal regional units. The main industries developing in the region are: coal, chemical and food industries, energy, nonferrous and ferrous metallurgy, and construction. The gross regional product (GRP) of the Karaganda region at the end of 2017 amounted to KZT 4,214.4 billion, or 7.9% of the gross domestic product (GDP) of the country, which corresponds to 4th place after the cities of Almaty (21.8%), Astana (10.6%) and Atyrau Oblast (10.9%). GRP per capita amounted to KZT 3,050.3 million and ranked 7th in the country (the average for Kazakhstan being– KZT 2,943.9 million).

In the structure of the GRP, the share of industry was 45.4%, with construction accounting for 3.3% and agriculture 3.4%. In the provision of services and the share of wholesale and retail trade, car and motorcycle repair contributes 13.5%, the service sector– 10.8%, and transport and warehousing– 8.1% (Akimat of Karaganda region 2016).

The need to develop innovative processes and systems in the regions is dictated by various factors. Internally, there is a need for a balanced territorial development within the country. On the outsideExternally, the country's national competitiveness is dependent on the socio-economic and scientific-technological changes in the regions (Gabdullina 2010).

Currently, the basis of the innovation system in the Karaganda region is:

- State institutions authorized to coordinate innovation matters and make decisions on their optimization;
- National companies, quasi-public sector, and development institutions;
- Research institutes and higher educational institutions conducting research in the field of new technologies and innovation policy;
- Large corporations, enterprises, firms, and their associates, that are innovative, investing in technological advancements and the expansion of fixed assets (Table 1).

Table 1. Key subjects of the innovation system of the Karaganda region

№	The subject of the innovation system of the region	Characteristics and main activities
<i>Authorized state authorities and their administrative units</i>		
1	GU «Management of Industry and Industrial-Innovative Development of the Karaganda region» (MIID of the Karaganda region). Official website: http://uppkrg.kz	According to paragraph 13 of the MIID Regulations of the Karaganda region, the state body of the Republic of Kazakhstan, whose mission is represented by powers of state administration in industrial sectors, industrial innovation policy, in the sphere of investment, licensing of business entities. In clause 16 of this Provision it is indicated that MIID is positioning itself as the main coordinator of the work of regional entities on issues related to the industrial-innovative and investment development of the Karaganda region.

№	The subject of the innovation system of the region	Characteristics and main activities
2	Council on Science, Innovation and New Technologies under the Akim of Karaganda region.	The main goal of the Council's creation is to involve potential scientific methods in solving the technological problems of the industrial base of the region, including the implementation of key areas of the State operational and strategic programs (Digital Kazakhstan; Industry 4.0; Modernization 3.0, etc.)
<i>National companies, quasi-public sector and development institutions</i>		
3	AO National Company Social and Entrepreneurial Corporation Saryarka (SEC Saryarka). Official website: www.spk-saryarka.kz	According to the Development Strategy of SEC Saryarka for 2014-2023, approved by the Government of the Republic of Kazakhstan dated August 5, 2014 No. 887, the main idea of creating the SEC was the growing need for regional, economically sustainable business structures, that will focus their work on increasing socio-economic and cultural results in the region, as well as on the development of relationships between the state and business. One important vector of the SEC is making investments in the activities of industrial, innovative, processing enterprises and financial support for risky start-ups.
4	Regional Office of Innovation (ROI)	Established in 2018 under SPK Saryarka, a platform that seeks innovative projects of interest to the region, conducts events aimed at popularizing innovation activities in the region, attracts grants and loaning funds to finance innovation activities in the Karaganda region, and also provides a wide range of advisory innovation services. The urgency of creating an ROI was associated with the elimination of the Saryarka Technopark in the region, which is associated with the implementation of a comprehensive privatization plan in 2016-2020.
5	Investor Service Center (ISC).	A unit of SEC Saryarka engaged in attracting direct foreign and domestic investments to the Karaganda region. Its goal is to work with stakeholders on the "single-window" system, which simplifies and speeds up the procedures of interaction between government authorities, development institutions, and investors.
6	LLP "Industrial Park" Metallurgy – Metalworking (IPMM). Official site: http://ipm.kz	A subsidiary of SEC Saryarka, a natural monopolist whose main activity is industrial construction and the provision of engineering infrastructure services. LLP has no competitors, and is defined as the sole manager of budgetary funds.
7	National Chamber of Entrepreneurs "Atameken" (Regional unit of the Karaganda region). Official site: www.atameken.kz	A non-profit organization created in 2013 by a joint decision of the Government of the Republic of Kazakhstan and the National Economic Chamber of Kazakhstan "Union Atameken", re-registered in 2015, which represents the interests of big business and SMEs in the region. The company contributes to the development of a negotiation base for the Government of the Republic of Kazakhstan, regional authorities and business, and protects the rights of entrepreneurs, ensuring their involvement in the formation of regulatory and legal conditions for business.

№	The subject of the innovation system of the region	Characteristics and main activities
8	JSC Entrepreneurship Fund DAMU. Official site: www.damu.kz	The DAMU Fund was established in 1997 in accordance with the Decree of the Government of the Republic of Kazakhstan No. 665 "On the establishment of a small business development fund". After a series of organizational changes in 2013, 100% of the Fund's shares were transferred to National JSC Baiterek Holding. The mission of the fund is to provide effective and comprehensive tools for supporting Kazakhstan's businesses of all sizes. The main focus is on financing entrepreneurship development projects.
<i>Research institutes and higher education institutions engaged in research and development</i>		
9	Institute of Organic Synthesis and Coal Chemistry (IOSU). Official site: www.iosu.kz	Kazakhstan's leading scientific institution studying the field of coal chemistry, engaged in basic research on the technology of obtaining industrially important products in the coal industry and coal processing industries, etc.
10	Institute of the Problems of Integrated Subsoil Development (IPKON). Official site: www.ipkon.kz	Formed in Karaganda in September 1991, a research center that is engaged in conducting fundamental and applied research in the field of geology, chemistry, mining, mineral composition of ores
11	Chemical and Metallurgical Institute. J. Abisheva. Official site: www.hmi.kz	One of the authoritative research institutes of Central Kazakhstan, formed in 1958 in the USSR, conducting research in the field of processing of Kazakhstan's raw minerals and metallurgical waste.
12	Karaganda State University. E.A. Buketova (KarSU). Official site: www.ksu.kz	The university focuses its activities on strengthening its position as a scientific and educational leader in the region, conducting scientific and educational modernization and acquiring the status of a research university. University scientists implement more than 200 scientific topics on priority vectors for the development of Kazakhstani science.
13	Karaganda State Technical University (KSTU). Official site: www.kstu.kz	KSTU is one of the leading universities of the Republic of Kazakhstan, which was a platform for the creation of an innovative educational consortium "Corporate University". Its participants are large industrial subjects of the region, scientific organizations, and universities of the Republic of Kazakhstan and the Russian Federation.
14	Karaganda State Medical University (KarSMU). Official site: www.kgmu.kz	KarSMU is a university with a high educational and scientific reputation. The subjects of modern research at the university are issues of ecology and public health, and the vaccination and prevention of occupational diseases, etc.
15	Karaganda Economic University of Kazpotrebooyuz (KEU). Official site: www.keu.kz	KEU is an authoritative innovative university in the region that conducts research in the fields of economics and law, the monetary and financial system of society, environmental economics, competitiveness of industrial-innovative industries, regional integration processes, human capital development, etc.

№	The subject of the innovation system of the region	Characteristics and main activities
<i>Large corporations, enterprises, firms and their associations</i>		
16	Corporation Kazakhmys. Official site: www.kazakhmys.kz	The largest copper producer in Kazakhstan, the Kazakhmys Corporation, dates back to 1913. In 1992, the Decree of the Government of the Republic of Kazakhstan established the company OJSC Zhezkazgantsvetmet, which later became privately owned. In 1997, Kazakhmys Corporation became the official name. The Corporation conducts pilot tests of innovative technologies for the processing of copper ore, etc.
17	AO ArcelorMittal Temirtau. Official site: www.arcelormittal.kz	The largest mining and metallurgical company in Kazakhstan, and the location of the building of the first industrial facility. ArcelorMittal Temirtau is an integrated industry sector with its own coal and iron ore, and energy industry.
18	Eurasian Foods JSC, Karaganda Official site: www.efc.kz	Karaganda Eurasian Foods JSC is part of a large holding of the Eurasian Foods Corporation. One of the leading enterprises of the food industry in Kazakhstan that takes part in systematically introducing process and product innovations.
19	Special economic zone Saryarka (SEZ Saryarka). Official site: http://investinq.kz	The FEZ is a part of the republican territory located in the Karaganda region and has precisely designated borders. According to the Decree of the President of the Republic of Kazakhstan in November 2011, the SEZ Saryarka was created on the basis of the industrial park of metallurgy and metalworking. The purpose of its creation is the development of metallurgy and metalworking industries, in particular, the creation of finished metal products with the involvement of representatives of world brands. The interests of the participants of the SEZ Saryarka are represented by the management company, which provides control over the special legal regime in priority activities. On the territory of the SEZ, small and medium-sized businesses mainly carry out their activities.

Source: materials presented on the official websites of the organizations listed in the table.

Note: compiled by the authors.

Of course, Table 1 does not cover the full extent of subjects related to innovation activities in the region due to their large number. However, the more substantial are outlined.

The diversity of participants in the regional innovation system can be attributed to the quality indicator of the processes taking place in the Karaganda region. That is not always the case though however, due to the fact that relations between various parties can be subjective and even sometimes inhibit a regional innovation mechanism. In this connection, a number of parameters that have a quantitative dimension, reflecting the innovative activities of enterprises and organizations of the region, become relevant.

During the study of the Karaganda region, the analysis included quantitative indicators of innovation activity (Table 2).

Table 2. Indicators characterizing the innovative development of the Karaganda region (with the inclusion of relative parameters)

Criteria	Number of enterprises in the region, units	K Number of enterprises with innovations, units	Share of enterprises with innovations *, %	Number of organizations engaged in R & D, units	Investments in fixed capital, million KZT	Investments in technological innovations, million KZT	Share of investments in technological innovations **, %	Domestic costs of R & D, million KZT	The volume of innovative products, million KZT
2003	980	16	1.6	33	67,157	-***	-	673.1	34,798.00
2004	715	30	4	43	96,650	4,613.30	4.8	823.3	37,483.80
2005	934	42	4.5	51	153,438	21,244.50	13.8	1,037.80	56,239.00
2006	894	57	6.4	51	134,157	20,770.80	15.5	1,169.60	59,871.80
2007	981	60	6.1	46	151,887	10,437.30	6.9	1,148.30	37,986.50
2008	986	64	6.5	40	210,247	17,607.10	8.4	1,190.20	16,473.80
2009	908	56	6.2	29	214,076	688.8	0.3	1,206.00	14,412.40
2010	963	67	7	28	211,085	2,204.10	1.0	939.4	14,897.70
2011	982	71	7.2	29	253,048	6,900.90	2.7	1,528.40	14,388.60
2012	2,046	78	3.8	26	323,816	4,989.70	1.5	2,947.00	30,891.50
2013	1,957	148	7.6	23	405,015	25,168.00	6.2	3,407.70	53,731.20
2014	1,902	159	8.4	31	411,852	32,744.20	8.0	4,048.90	21,578.10
2015	2,340	216	9.2	32	343,351	12,854.50	3.7	3,597.80	18,442.50
2016	2,235	238	10.6	33	317,571	22,151.00	7.0	4,279.10	31,327.20
2017	2,309	257	11.1	29	363,267	25,079.00	6.9	3,488.10	32,048.00

Source: Committee on Statistics of the Republic of Kazakhstan (Committee on Statistics of the Republic of Kazakhstan 2003-2017). Note: compiled by the author;

* - attitude of enterprises with innovations to the total number of enterprises in the region;

** - the ratio of investments in technological innovations to investments in fixed capital;

*** - data not shown

The data range of Table 2 is based on the period of implementation of the main directives of the Strategy for Industrial-Innovative Development of Kazakhstan for 2003-2015, approved by Decree of the President of the Republic of Kazakhstan dated May 17, 2003, No. 1096. This strategy became the basis for the development and implementation of two subsequent state programs for industrial-innovative development for 2010-2014

(Decree of the President of the Republic of Kazakhstan dated March 19, 2010 No. 958) and 2015-2019 (Decree of the President of the Republic of Kazakhstan dated August 01, 2014, No. 874).

Some periods are characterized by sharp dynamics (both negative and positive). The reasons are different and represent the influence of both external and internal factors in relation to the region.

For example, in February 2009, Kazakhstan experienced another round of devaluation which led to an increase in the cost of upgrading technological processes in production (investment in innovations reduced to KZT 688.8 million). In July 2011, the President of Kazakhstan approved the “Employment 2020 Program”, which was implemented in 2012 and probably contributed to an increase in the number of enterprises in the Karaganda region (from 982 in 2011 to 2,046 in 2012). Internal reasons include the repair major overhaul of fixed assets of the enterprises or, conversely, the commissioning of updated equipment or the completion of the term of contracts for the implementation of investment projects, or their conclusion with the use of innovations.

It should be noted that the change in indicators of innovation in the region has been a positive one, associated not only with the active position of the enterprises themselves, but also with the regional policy of state authorities and their authorized divisions.

Practice shows that quite recently the development of innovation processes in the regions of Kazakhstan faced common problems, such as: the unwillingness of potential innovators to use innovative technologies as a basis for further development; the lack of a legal and organizational basis for the regionalization of the innovation system and the innovation infrastructure; the lack of mechanisms for financial support for innovative projects; and the uncertain position of local and regional authorities in the implementation of the main directives of the country’s strategic programs and innovation policy. However, at present, regional authorities and local governments are gradually forming a strong regional center for the coordination and management of ongoing innovation programs of national and regional significance. It was noted that the Directorate of Industry and Industrial-Innovative Development of Karaganda Oblast under the regional akimat [local government] positions itself as such a coordinating body, performing the following functions:

- executing the Decree of the President of the Republic of Kazakhstan dated August 01, 2014, No. 874 “On the implementation of the State program of industrial-innovative development of the Republic of Kazakhstan for 2015-2019” and other state programs;
- creating conditions for the development of entrepreneurship and the investment climate in the region;
- providing assistance in drawing up and presenting projects to regional development institutions.

A number of state and regional programs are being implemented in the region aimed at supporting the business sector, innovation activity, and the development of the innovation infrastructure, as well as the improvement of relations between production and the scientific sphere of the region.

The Department of Industry and Industrial-Innovative Development of the region is in charge of monitoring the main results and stages of implementation of state and government policy documents. In the current period, the UPIID of the Karaganda region monitors and provides support for the projects of the Map of Industrialization and supports entrepreneurship within the framework of the State Program for Industrial Innovation Development for 2015-2019. 103 projects totaling KZT 771.4 billion were included in the Business Support Card in the region with the prospect of creating 11,520 jobs (Akimat of Karaganda region 2018) [1].

Conclusions and prospects for further development. The Karaganda region, being a large-scale industrial region in the Republic of Kazakhstan, has a lot of potential for the implementation of industrial-innovative development programs and the formation of a national innovation system. A competent combination of the main areas of science, technology, industrial innovation, investment, and other types of regional policy can accelerate this symbiosis.

Some problems remain unsolved, including:

- passivity (with regards to innovation) of small and medium-sized entrepreneurs, who do not want to disturb their stable economic position and therefore resist innovative changes in the absence of clear mechanisms for planning and forecasting activities. In addition, the introduction of innovations requires an increase in costs, often significantly outweighing the usual operational expenses.
- inadequate funding for research and development, primarily due to the lack of consensus between research institutions, universities and production structures in determining areas of joint research and development, that focus on regional issues.
- the lack of a regional institute of venture investors, which also indicates the need to improve the region's innovation infrastructure.

Relations between the actors of the innovation system of the region are developing rather slowly, but the main contributors have already become apparent. These include: regional and local governments, large industrial corporations and joint stock companies, development institutions, and national companies.

At present, regional government bodies play the role of key initiator of both innovation activity and interconnections arising from the functioning of the regional innovation system. They should take a particularly stable position in monitoring and coordinating activities that ensure the ongoing development of regional innovation systems, and in the formation of a favorable environment for investment and innovation. Guided by the main features of the executive, the authorized bodies of the region should demonstrate the universal nature of the control action. Depending on the situation, such an impact can be not only mobilizing and stimulating but also, importantly, administratively coercive.

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Regioninė inovacijų sistema kaip prioritetinga valstybės valdymo institucijų veiklos sritis: įtakos funkcijos ir mechanizmai (Karagandos regiono pavyzdys)

Mokslinės problemos svarbumas yra susijęs su modernių regioninės inovacijų sistemos koncepcijų išplėtimu ir didėjančiu regionų bei jų valdymo organų vaidmeniu įgyvendinant pagrindines valstybinių pramonės inovacijų ir technologijų plėtros kryptis. Straipsnio tikslas – iširti regioninių inovacijų procesų dalyvius Karagandos regione ir apibrėžti jų tikslus šiuolaikinėmis sąlygomis. Pagrindinis tyrimo metodas yra regioninės inovacijų politikos analizė, kurią atlieka įgaliotos valdžios institucijos ir vietos savivalda, leidžianti nustatyti jų santykių su kitais regiono inovacijų sistemos subjektais priemonės. Apibūdinami pagrindiniai regioninės inovacijų sistemos dalyviai, nagrinėjami regiono inovacinės veiklos rodikliai, nustatyti naujovių procesams įtaką darantys veiksniai. Straipsnio medžiaga gali būti naudinga tobulinant valdymo funkcijas ir pareigas valstybinės valdžios regione, taip pat atliekant palyginamąją analizę su kitais Kazachstano regionais ir teritoriniais subjektais artimose šalyse.

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