

**FORMATION OF CLUSTERS AS AN EFFECTIVE INSTRUMENT OF INCREASING COMPETITIVENESS OF THE ECONOMY OF KAZAKHSTAN****Salimbaeva R.O., Tagay A.A., Boltaeva A.Zh., Meirambek K.***Almaty University**Republic of Kazakhstan, Almaty, 050051, 36 Aksay-3 micro region*

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**Key words:**

Innovative cluster, innovative development, competitive development model, innovative process, modernization, stimulating clusters.

The article analyses the experience accumulated by the Republic of Kazakhstan in the implementation of cluster initiatives. Based on the study of progressive foreign practice of building a cluster policy, the economic advantages associated with the formation of innovative clusters are substantiated. The methodological approaches described in the scientific literature to the creation and development of clusters of both quantitative and qualitative nature are considered. In conclusion, measures of managerial influence aimed at the formation of clusters in order to ensure the competitiveness of the national economy of the Republic of Kazakhstan are proposed. Tools include both direct and indirect government support. The main ones are: direct financial support for specific projects; enforcement of administrative procedures; the provision of knowledge or other components of infrastructure; tax cuts on research and innovation costs; organization of public events (fairs, trade missions, etc.); providing networks with universities, administration; providing networks with firms; support for the development of incubators; support in improving the reputation of the region (cluster); providing information transfer (market requests, market situation, new rules, etc.); providing transport links with other clusters or geographical areas.

**ФОРМИРОВАНИЕ КЛАСТЕРОВ КАК ЭФФЕКТИВНОГО ИНСТРУМЕНТА ПОВЫШЕНИЯ КОНКУРЕНТОСПОСОБНОСТИ ЭКОНОМИКИ КАЗАХСТАНА****Салимбаева Р.О., Тагай А.А., Болтаева А.Ж., Мейрамбек К.***Университет «Алматы»**Республика Казахстан, 050051, г. Алматы, 36 Аксай-3 мкр.***Ключевые слова:**

инновационные кластеры, инновационное развитие, конкурентоспособные модели развития, инновационные процессы, модернизация, стимулирование кластеров.

Анализируется опыт, накопленный Республикой Казахстан в реализации кластерных инициатив. На основе изучения прогрессивной зарубежной практики построения кластерной политики обоснованы экономические преимущества, связанные с формированием инновационных кластеров. Рассмотрены методологические подходы к развитию кластеров количественного, а также качественного характера, описанные в научной литературе. Предложены меры управленческого воздействия, направленные на формирование кластеров с целью обеспечения конкурентоспособности национальной экономики Республики Казахстан. Инструменты включают как прямую, так и косвенную государственную поддержку. Основными являются: обеспечение соблюдения административных процедур; предоставление различных компонентов инфраструктуры; снижение налогов, связанных с исследованиями и инновациями; организация общественных мероприятий (ярмарок и т.д.); обеспечение связей с университетами, администрацией, фирмами; поддержка развития инкубаторов; поддержка в улучшении репутации региона (кластера); обеспечение передачи информации (запросы рынка, ситуация на рынке, новые правила и т.д.); обеспечение транспортных связей с другими кластерами или географическими районами.

**Statement of the problem**

At the present stage of development of the Republic of Kazakhstan, one of the main economic problems is the choice of a competitive model of economic development that allows you to maximize the potential. Competitiveness is determined by the pace of implementation of the latest scientific and technical solutions and the development of high-tech industries, the effectiveness of innovative processes. The experience

of developed European and Asian countries confirms that the cluster approach is an effective tool to increase the competitiveness of the economy of the country as a whole and of its individual regions.

**Analysis of recent studies and publications**

In the Address of the President of the Republic of Kazakhstan, the Leader of the nation N.A. Nazarbayev to the people of Kazakhstan dated December 14, 2012, "The Kazakhstan-2050 Strategy: A New Political Course

of the Fulfilled State,” notes that “the cluster approach should become a key tool for its implementation” [1]. The main task of cluster policy is to choose a promising model of cluster development and the formation of new generation clusters, the basis of which will be not industrial enterprises, but innovation and knowledge centres, universities, and technological engineering organizations. Thus, the specifics of the functioning of new generation clusters aimed at creating new technologies, implementing in-depth technological modernization and innovative development of the industry, as well as training personnel for working in the new industrial and technological formation, are characterized by the presence of three organizationally related components: the presence of fundamental practice - oriented science, innovative industry, developing education.

Since today there are no conceptual methodological approaches to creating and stimulating clusters, to implement the vector of modernization of the national economy, it is necessary to develop a sound system for managing the clustering process, including a detailed mechanism for the formation and state support of new type clusters. All this confirms the expediency and timeliness of research aimed at developing the scientific and methodological foundations of economic management using the cluster approach tools.

An analysis of the literature on this issue showed that, in general, there are a lot of scientific publications of foreign authors on the issues of modernizing the economy and the role of cluster formations in these processes to create a system - holistic view of the subject of research. Scientific publications available in the subject area can be conditionally grouped by thematic focus as follows.

Leading foreign scientists A. Marshall, E. Hoover, F. Peru, G. Myrdal, R. Vernon, U. Isard, L. Moses, B. Chinitz, M. Enright, M. made a significant contribution to the development of the concept of “cluster”. Porter, P. Krugman et al.

The fundamental work on the development of techniques and methodologies for cluster formation, the practical use of the cluster approach should include the works of such foreign scholars as of P. Swann and M. Prevezer, Schmitz and K. Nadvi, R. Vom Hofe and K. Chen, S. Crouch, P. Le Gales, S. Rosenfeld, T. Roelandt and denHertog, D. Czamanski and of L. de Ablas, J. Redman, H. Roepke, D. Adams, R. Wiseman, H. Rocha, Feser and E. Bergman, E. Hill and J. Brennan and others. Among scientists from Russia and other CIS countries dealing with the cluster approach to economic development, one can distinguish S. Akulinin, A. Buryak, M. Voinarenko, A. Voronova, E. Dunenkova, O. Kirik, S. Lozinsky, V. Miteneva, T. Narolin, etc.

In recent years, there has been an increased interest of Kazakhstani economists to problems of creating and stimulating cluster initiatives. They are reflected in the works of such authors as A. Alimbaev, T. Pritvorova, A. Taubaev, R. Andarova, M. Abdrakhmanov, S. Plisak, A. Abaev, A. Kuandykov, A. Kalabaev, S. Umirzakov, L. Nurpeisov, M. Namazbekova, S. Lee, R. Rakhmetov, M. Tulegenov, A. Shalabekov and others.

Various aspects of solving the problem of cluster formation using the apparatus of economic and mathematical modelling are presented in the works of S. Aldiyarov, A. Bayzakova, O. Dyshkant, I. Kvyatkovskaya, L. Spankulova, D. Tazabekova and others.

Despite the considerable amount of work on individual areas of issues, a number of theoretical - methodological and applied aspects of the management of the economy on the basis of cluster approach, aimed at creating a new generation of clusters in view of Kazakhstan's economic conditions, on - still relevant and understudied. The cluster approach was put forward as one of the best practices with practical effect in the implementation of the Strategy for Industrial and Innovative Development of the Country until 2015, in the Presidential Address to the people of Kazakhstan dated March 19, 2004 “Towards a competitive Kazakhstan, a competitive economy, a competitive nation”.

### Objectives of the article

The purpose of the article is the study of progressive practice of building cluster policy substantiates the benefits for the economy, associated with the formation of innovation clusters.

### The main material of the research

In July 2004, in Kazakhstan, using the global experience of clustering the economy, the project “Diversification of the Kazakhstan economy through the development of clusters in non-extractive sectors of the economy” was launched, that is, the implementation of the first cluster initiative of Kazakhstan [2]. The participants of this project were: JSC “Centre for Marketing - Analytical Research of the Republic of Kazakhstan”, American consulting company “J. E. Austin Associates, Inc.”, The Economic Competitiveness Group (ECG), Professor Michael Porter (Project Scientific Advisor).

The objective of the project was to develop a plan of concrete actions to increase the competitiveness of key non-mining sectors of the economy of Kazakhstan.

The aim of the project was to identify 57 promising pilot clusters with the aim of creating an industrial basis for improving the competitiveness and diversification of the economy, as well as confirming the viability of the cluster approach in Kazakhstan. The implementation of the project involved the implementation of three stages.

As part of the first stage, an analysis was made of about 150 non-extractive industries and sub-sectors of the economy in order to identify industry clusters and market segments in which Kazakhstan has competitive advantages. Competitiveness was assessed by two fundamental parameters: the presence in Kazakhstan of an economic base for the development of this industry, that is, the presence of companies, human resources, technologies, infrastructure; the role of the industry in the economy of Kazakhstan - the industry's contribution to the provision of general employment, GDP, non-resource exports industry growth in dynamics, etc.

The study of industries by these parameters made it possible to identify 23 industries and sub-sectors of the economy that have the greatest potential for competitiveness.

At the second stage of the project, the attractiveness of the market and its dynamics for 23 industry clusters and market segments at the regional, country and world levels were evaluated. During the marketing research of market conditions over the past 510 years, nine of the most attractive clusters were identified: tourism, construction materials cluster, textile, furniture, food industry cluster, financial services cluster, freight and transportation, cluster for the production of equipment for the mining industry, metallurgical cluster.

At the final stage, seven promising clusters were identified. These are tourism, food industry, oil and gas engineering, textile industry, transport and logistics services, metallurgy, construction materials. These are the industries whose development will allow Kazakhstan to enter the world markets and serve as the basis for creating an industrial basis for increasing the competitiveness and diversification of the economy of the republic.

In 2005, Decree of the Government of the Republic of Kazakhstan dated June 25, 2005 No. 633 formed and approved plans for the creation and development of 7 pilot clusters in the priority sectors of the economy identified as part of the Kazakhstan cluster initiative project [3]. These plans include both measures to solve the systemic problems of these industries (improving legislation to stimulate industry development, training and retraining of personnel, standardization, infrastructure development, etc.), and measures aimed at solving the problems of each individual cluster (development of business - strategy, implementation of investment projects within the cluster, strengthening in - cluster cooperation, etc.).

The successful implementation of cluster initiatives implied the achievement of the following results: a steady increase in the growth of the national economy and a more even distribution of benefits from such growth; diversification of the economy through a shift in emphasis from extractive industries;

increase in productivity and activity efficiency of enterprises - individual participants of pilot clusters, increase in the volume of exports and production of high value-added products, as well as increase in the value of an export unit; growth in domestic investment; a strong business community in non-extractive sectors, focusing on sustainable competitiveness; significant improvement in the quality of the business and investment climate; international recognition of Kazakhstan as a competitive country; optimized foreign economic relations with neighbouring countries.

The need for cluster development is noted in the State Program for the Forced Industrial - Innovative Development of the Republic of Kazakhstan for 2010-2014, approved by Decree of the President of the Republic of Kazakhstan dated March 19, 2010 No. 958 [4]. In particular, it is emphasized that state policy should be focused on stimulating the development of high value-added industries, supporting breakthrough projects, creating auxiliary, maintenance and processing blocks of small and medium enterprises through outsourcing and strengthening the local component in large projects, as well as the formation of clusters around large backbone

companies by combining the efforts of service and support companies. The importance of the creation of innovation clusters and stated in the Program for the development of innovation and promote technological modernization in the Republic of Kazakhstan for 2010 - 2014 years, approved by the Government of the Republic of Kazakhstan dated November 30, 2010 number 1308. The development of innovation clusters will provide the synergy of education, science, finance and business and will contribute to the formation of an innovative environment that provides communication between large universities, research centres, enterprises, domestic and foreign investors and other entities involved in technology transfer and innovative production. In the Message to the People of Kazakhstan "Kazakhstan-2050 Strategy: A New Political Course for a Successful State" dated 12/14/2012, the President of the country noted that "now, taking into account international practice and our experience, we must radically adjust our cluster policy" - it is absolutely necessary to form clusters new innovative generation [1].

Despite active attempts to form clusters, strong and developed clusters have not yet been created in the Kazakhstani economy. This is often due to the fact that clusters are forced to import the production and specialized equipment they need to produce competitive final products. In addition, in practice, small and medium-sized enterprises are not able to effectively cooperate with large companies due to the opacity of the domestic market and the isolation of information about the capabilities of small enterprises. Large enterprises have problems such as conservatism of managerial staff, financial insecurity of orders, lack of financial resources for joint projects, and a low level of competitiveness. All these circumstances slow down the clustering process in the Republic of Kazakhstan.

The accumulated experience of cluster policy was taken into account in the formation of the State program of industrial and innovative development of the Republic of Kazakhstan for 2015 - 2019 [5]. The program focuses on the development of manufacturing. It is planned to concentrate efforts and resources on a limited number of sectors using a cluster approach. In particular, the efforts of the state will be directed to the development and support of one national cluster of basic resource sectors related to the extraction and processing of oil and gas, petrochemicals, petrochemical engineering and services for the oil and gas industry; three territorial clusters in market-oriented manufacturing sectors; two innovation clusters (Nazarbayev University in Astana and the Park of Innovative Technologies in Almaty).

It is obvious that the clustering of the economy of Kazakhstan should be carried out taking into account the territorial organization of the republic. Clusters are inextricably linked with regional development and cannot exist outside the context and conditions of a region. Therefore, the extension of cluster activities to the regional level is an important issue. The initiative here should belong to the private sector.

The state program of industrial and innovative development of the Republic of Kazakhstan for 2015-2019 stipulates that state support will be provided to

clusters with the greatest development potential. Clusters will be selected on a competitive basis. Support will be provided in several areas. In - First, to expand the cluster, and the integration of its members, that is, the creation of cluster associations, the formation of a unified database of suppliers and information platform, market research and consulting services. The state will allocate up to 60 million tenge per year for this for 5 years. In the first two years, cluster participants will be reimbursed 75% of the costs, in the remaining three years - 40%. Also, money will be allocated for the creation and maintenance of engineering centres (up to 50% cost recovery, but not more than 100 million tenge). And finally, it will provide financial support to create a business - climate and infrastructure. Its volumes will be determined according to the roadmaps provided by the initiators of the clusters.

World practice indicates that in the last two decades, the formation of clusters has been quite active. In general, according to experts, to date, clustering covers about 50% of the economies of the leading countries of the world [6]. The level of clustering of the economies of the world. In the USA, more than half of enterprises operate within the clusters, and the share of GDP produced in them exceeded 60%. In the EU, there are over 2 thousand clusters, in which 38% of its workforce is employed. The Danish, Finnish, Norwegian and Swedish industries are fully covered by clustering. Thus, Finland, whose economic policy is based on clustering, has occupied leading positions in the global competitiveness ratings throughout the 2000s. Due to the clusters characterized by high productivity, this country, having only 0.5% of the world's forest resources, provides 10% of the world export of wood products and 25% of paper. In the telecommunications market, it provides 30% of the global export of mobile communications equipment and 40% of mobile phones. Italy's industrial clusters account for 43% of the number of people employed in the industry and more than 30% of national exports. Cluster structures operate successfully in Germany (chemistry and engineering), in France (food and cosmetics). It is actively cluster formation process, and in South - East Asia and China, in particular, in Singapore (in the field of petrochemistry), Japanese (automobiles) and in other countries. In China today there are more than 60 special zones - clusters, in which there are about 30 thousand firms with a staff of 3.5 million people. and sales of approximately \$ 200 billion per year. Improving competitiveness through cluster initiatives is becoming a basic element of development strategies in the vast majority of countries. An analysis of more than 500 cluster initiatives implemented over the past 10 years in 20 countries shows that the high competitiveness of these countries is based on the strong positions of individual clusters - competitiveness locomotives. Thus, Sweden's competitiveness in the pulp and paper sector extends to high-tech equipment for woodworking and paper production, conveyor lines and some related industries - consumers (for example, industrial and consumer packaging). Denmark has developed specific innovative technologies for agribusiness and the food industry. German machine builders and car makers benefit from the presence in Germany of a highly developed production of components for these

industries. In Italy, industry combinations have developed: metalworking - cutting tools; fashion - design; leather - shoes; woodworking - furniture.

If in the past decade, most clusters specialized in the production of consumer goods and were created with the aim of increasing the competitiveness of individual regions and territories, then at the turn of the XXI century. industrial clusters of a new generation began to appear, dealing with computer science, design, ecology, logistics, the production of medicines, etc. The innovative orientation of clusters gradually increased, and today it is the most important characteristic that determines the competitiveness of cluster formations. Unlike traditional industrial clusters, innovation clusters are a system of close relationships not only between firms, their suppliers and customers, but also knowledge institutions, among which large research centres and universities, as generators of new knowledge and innovations, provide a high educational level of the region. There is an opportunity to coordinate efforts and financial resources to create a new product and technologies and enter the market with them. In fact, within the framework of the cluster, it becomes possible to build a closed technological chain - from creating a product to its production and launching it on the market. It should be noted one more difference between innovative clusters and traditional industrial ones, which is determined by the creation in their framework of predominantly export - oriented products and technologies, i.e. intra - cluster competitive advantages are significant internationally.

Thus, a distinctive feature of the new generation clusters is their innovative orientation, they should be formed in those industries where a "breakthrough" is made or expected in the field of engineering and production technology with subsequent access to new "market niches". In this regard, an important task of public policy is the identification of the most competitive clusters in breakthrough industries with a view to their development.

In methodological terms, the issue of determining the composition and participants of the cluster is one of the most difficult. Systematization of the scientific views of scientific economists allows us to distinguish three conceptual approaches to the identification of clusters: industrial clusters based on the theoretical principles of localization economics by A. Marshall [7] and described in the works of S. Rosenfeld [8]; H. Schmitz and K. Nadvi [9]; definition of industrial clusters based on the establishment of intersectoral relations using input-output tables. This approach is found in the works of D. Czamanski and L. de Ablas [10], J. Redman [11], E. Bergman and E. Feser [12]; concepts of industrial clusters, which include a wide range of evidence: the economics of localization and urbanization, the internal economies of scale, the value chain, technological innovations, etc. that explain the unification of institutions in the geographical space, and developed by M. Porter [13, 14].

In the first approach, the regional specialization of a region is determined using the location factor method to identify industrial clusters. Location factors that

determine regional specialization by comparing the values of a particular type of activity for a territory (region, city, district) with the values of a reference region (for example, a national economy) are simple to interpret, simple to use, and do not require much time required data for analysis are available.

In the second approach, the main methods used when using the input-output tables are a direct analysis of the relationships in the value chain and analysis of sales patterns. A direct analysis of the relationships in the value chain groups industries into clusters based on relationships in the vertical product chain. The main criterion is that industries with strong transactional bonds above the required threshold level are grouped into industrial clusters. The next step is to identify co-located industries using a separate location analysis.

For the grouping of industries in accordance with the similarity of their product samples, two main methods are described in the literature under study: statistical cluster and discriminant analysis and factor analysis using the principal component method.

The third cluster concept is associated with the name of M. Porter and his Diamond of Advantages. Determining the components of the cluster begins with a review of a large firm or a concentration of similar businesses, and then reveal the presence of chains of associated vertically below and upstream firms and organizations. Then they find sectors that pass through common channels or produce by-products and services. Additional horizontal chains are established on the basis of the use of similar specialized factors of production or technology or are interconnected through deliveries. The next step after the establishment of industries and firms included in the cluster is to identify organizations that provide it with special skills, technologies, information, capital or infrastructure, as well as any group formations that include cluster members. The final step is the search for government or other legislative structures that have a significant impact on cluster members.

Porter's cluster concept is rather intuitive; the cluster composition is not clearly defined. It should be noted that the research of domestic scientists is based mainly on the approach of M. Porter, which requires clarification of the identification methods of industrial clusters for Kazakhstan.

Cluster identification approaches include both quantitative and qualitative methods [15]. There is a general opinion that for cluster recognition it is necessary to combine qualitative and quantitative analysis.

A combined method for identifying industrial clusters in a region was proposed in [16]. At the first stage, to identify the set of industries that form the economic base, it is proposed to use the EW Hill and JF Brennan methods. In accordance with it, industries in which the region has the greatest competitive advantages are defined as industries - drivers. Methods of determining the industries - drivers involves a combination of cluster and discriminant analyses.

At the second stage, to determine the composition of the participants in the industrial cluster, a model was developed, developed by E. Feser and E. Bergman, and

based on the study of interindustry relationships of national tables "output costs" using factor analysis using the principal component method.

At the third stage, to assess the structural influence of the cluster on the regional economy, a methodology was used based on the calculation of multipliers of gross profit, value added and household income.

The developed method identification region industrial clusters was tested on the example of the East - Kazakhstan (EBA).

Classification of aerospace defence industries in accordance with their competitiveness using hierarchical cluster analysis by the Ward method made it possible to group 21 aerospace defence industries into 7 groups. The discriminant analysis made it possible to divide the identified groups of branches of aerospace defence into three subgroups: 1) the industries of these clusters are non-core or non-competitive; 2) middle cluster groups; 3) the industries of these clusters are competitive and constitute the economic base of the region, these are drivers in the industry - drivers.

In the course of the analysis, it was determined that the core of a potential industrial cluster of East Kazakhstan oblast should be the non-ferrous metals production and the production of machinery and equipment sectors that contribute to accelerating the region's economic growth.

When factor analysis data of intersectoral relationships obtained in the analysis of data on intermediate consumption of 20 manufacturing industries tables' costs - Issue "the Republic of Kazakhstan, 7 own factors explaining 88% of the variance in the data matrix has been selected. To explain the selected factors, each row of the rotated factor matrix (Table 2) indicates the factor load that has the highest absolute value (in bold).

Based on an assessment of sectoral specialization of the region and the results of the factor analysis, the potential of mining - metallurgical cluster of East - Kazakhstan region will make the sector: "Mining of metal ores"; "Metallurgical industry and metal processing"; "Other manufacturing industries"; "Production and repair of machinery and equipment, spare parts"; "Coal and lignite mining, peat mining." Each of the identified industries is a link in the price chain, which adds its price to the final product.

### Conclusions

The analysis of multipliers confirms the advisability of forming a mining and metallurgical cluster in East Kazakhstan region, since the development of subsequent redistributions will increase the multiplier effect and help accelerate the region's economic growth.

The variety of policies pursued determines the variety of directions and forms of state support for new generation clusters, among which: direct financial support for specific projects; enforcement of administrative procedures; the provision of knowledge or other components of infrastructure; tax cuts on research and innovation costs; organization of public events (fairs, trade missions, etc.); providing networks with universities, administration; providing networks with firms; support for the development of incubators; support in improving the reputation of the region

(cluster); providing information transfer (market requests, market situation, new rules, etc.); providing transport links with other clusters or geographical areas.

Thus, the multiplicity of approaches to identifying the composition and participants of clusters, combining quantitative and qualitative parameters, and a large number of tools for regulating the processes of clustering confirm the scientific significance and relevance of the issues.

It is obvious that clusters ensure the economic development of the regions and the country in which they are located by intensifying research and accelerating innovation. The formation of clusters as an effective tool to increase the competitiveness of the economy of Kazakhstan will allow to increase productivity and competitiveness of enterprises and sectors of the economy; cost reduction due to the effect of synergy and unification of approaches in the field of quality management, logistics, engineering, information technology; increase innovative capacity; stimulating the

emergence of new enterprises; provide employment in the regions, a positive change in its structure, increase the level of wages. Clustering the national economy, laid down in the plan for the next phase of industrialization, involves the formation of new market niches for domestic producers. The prospects of the Third Industrial Revolution and the transition of the world economy to a new technological order equalize the chances of all countries to make a technological breakthrough. This is very important for the economy of Kazakhstan, which is still heavily dependent on the commodity sector. The right choice of development directions, support for innovative clusters will allow Kazakhstan to make a breakthrough in the development of technologies, to carry out structural restructuring of the economy, which will contribute to fulfilling the goal of Kazakhstan becoming one of the thirty most developed countries in the world.

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