The Ministry of Education of Azerbaijan Republic

DEVELOPMENT AND PROBLEMS OF NATIONAL INNOVATION SYSTEM IN AZERBAIJAN

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ABSTRACT

Evaluation of national innovation systems is crucial for identifying their development level, specifying strengths and weaknesses, learning the level of goals, and identifying new development goals. The main purpose of the research is to study the international experience in the formation of the National Innovation System in Azerbaijan. The study of the originality and scientific innovation of the research at the international level is the study of the "National Innovation System" and the directions of their development. The study of National Innovation Systems is a particular importance for the transformation of innovation activity into the main economic activity of the international scale, increase of economic activity, competitiveness of the country economy, increase of flexibility of business entities, increase of export potential of the countries, production of high quality products to domestic and foreign markets.

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INTRODUCTION

The "National Innovation System" is a system for the use of innovative technologies to ensure the development of the country's economy. The "National Innovation System" reflects the interconnected interaction of economic, social, technical and scientific systems interacting with each other. The main participants of this system are state, companies and scientific-educational complex. They are key figures in the interconnected process. The main purpose of the National Innovation System is to ensure the use of innovative technologies, the establishment of innovative technologies, the state support for their creation, the expansion of research institutions, ensuring the development of the economy, as well as increasing the country's competitiveness.

One of the important priorities of the state policy of the Republic of Azerbaijan in the modern period is the transition to a new path of economy - innovation economy. Knowledge-based economy has a global feature and is focused on the global market. According to world practice, the transition to a new economy requires the creation of new tools that will provide the appropriate innovation environment.

The main condition for the transition to the innovation economy of the Republic of Azerbaijan - the provision of competitiveness, success, economic growth, improvement of living standards and the realization of other national preferences is the efficient utilization of scientific and research results.

The study of National Innovation Systems is of particular importance for the transformation of innovation activity into the main economic activity of the international scale, increase of economic activity, competitiveness of the country economy, increase of flexibility of business entities, increase of export potential of the countries, production of high quality products to domestic and foreign markets. In this area, it is possible to create a more perfect and flexible National Innovation System by studying the experience of countries with pre-existing systems.

Innovation potential analysis is crucial for conducting socio-economic policy, identifying activities and measures of management bodies, innovation development and investment climate. To determine the dimensions of the innovation potential of the efficient macroeconomic system and to properly assess the impact of the innovation potential on the development of the national economy, firstly, it is necessary to give a clear definition of the concept of innovation potential, and secondly, its composition. To this end, it is necessary to clearly identify all the important factors that determine its dynamics.

The issues of innovation economics development and development, as well as the essence of innovation potential, are widely described in the scientific works of

domestic and foreign authors. However, the concept of innovation potential does not have an unambiguous explanation.

The concept of "National Innovation System" was a conceptual reflection of the phenomenon of innovation, developed and clarified in the course of methodological, theoretical and empirical studies, and began to evolve from the beginning of the 80s. The concept of innovation potential in economic literature is often identified by the concepts of scientific, intellectual, creative and scientific-technical potential.

At present there is no single idea of which economic relationships it is possible to identify. The analysis of the economic aspects of the concept of the national innovation system creates a broad spectrum of approaches to their study. The essence of the national innovation system is that it is a hierarchically organized economic system of economic relations.

The development prospects of the national innovation system take a special place in the state policy. In order to identify trends in development of the national innovation system and evaluate prospects, it is necessary to consider the types of economic innovations and types of national innovation systems.

After the transition to the modern market economy, the establishment of a strong economic system, ensuring the development of separate sectors of the economy, increasing the country's production capacity and ensuring the development of the country's non-oil sector have been defined as key economic goals. Creating a strong and flexible National Innovation System is essential to achieving these goals. Active work is being carried out in this area, the relevant legislative base and infrastructure are being established, the process of creating industrial parks, technoparks and industrial regions continues. Investigating various forms of the National Innovation Systems and studying their experiences in order to improve the organizational structure of its elements at a time when all of these processes are being implemented, namely, during the establishment of the National Innovation System of Azerbaijan, is of particular importance to us.

CHAPTER I

1.1 Development models of the national innovation system

The development prospects of the national innovation system take a special place in the state policy. In order to identify trends in development of the national innovation system and evaluate prospects, it is necessary to consider the types of economic innovations and types of national innovation systems.

The national innovation system must have a certain structure to operate, in other words, a set of interrelated blocks. All national innovation systems have the following five blocks:

- creative block - knowledge blocks;
- technology transfer block;
- financial block;
- production block;
- personnel training block.

The above-mentioned structural elements refer to all innovation systems. On the other hand, systems differ according to organizational and operational principles. The nature of the national innovation system depends on the development models of innovation. In many literatures, innovation development models are presented in different ways. Lundvall V., Freeman S., Nelson R., Ivanova NI, Qeys VM, Seminojenko V.P., Fedulova LI, Soloviev VP, Bubenko P.T., Koyuda A.P., Gasimov F.H, Aliyev T.N, Nadjefov N.Z. and so on. authors have some approaches to the classification of the NIS.

Some authors divide the NIS into two types, depending on the demand (internal and external). Others divide up to 6 types, depending on the economic activity that creates conditions for innovation and market innovation. There are 7 types of innovation development models for the domestic market and its position in the foreign market.

There are presented four types of innovation development models in the academic works of V.V Ivanov, T.Y.Mikusheva, A.V. Zverev:

1. Leading countries (USA, England, France) in the implementation of large-scale projects in science.
2. Countries that are oriented towards innovation-enhancing innovation environments, and those aimed at improving all aspects of the economy (Germany, Switzerland, Sweden).

3. Countries that stimulate innovation through development of innovation infrastructure (Japan, South Korea).
4. Countries oriented to the creation of an advanced industrial environment with the use of innovation factors (China, India).

Rapid development of the innovation environment of the economy, its improvement is implemented in various ways (table 1). Therefore, it is necessary to consider the basic base topology of the innovation development model and the national conditions corresponding to this or that model.

The main directions of state innovation policy in the world

Table1

Directions of innovation policy	**Feature**	**Countries**
Optimization of NSI structure	Managing and planning in the field of innovation, optimization of state system	Japan, Indıa, Norway, Chile
Optimization of public finance in science and innovation		USA, France, UK, Denmark, Norway, Australia, Switzerland, Taiwan
Fundamental research development		UK, Switzerland, Slovakia
Stimulation of country-wide business and science innovation cooperation	To encourage symmetric approximation of universities and corporations	USA, Finland
Attraction of large-scale state capital and national private capital to science and innovation		Israel, Finland
Promoting innovation in the private sector by involving foreign capital into the innovation field		UK, Irland, China, Korea, Malaysia, Indıa, Israel
Stimulation of the innovation initiative of the scientific sector		Germany, Japan, New Zealand, Denmark
Integration into international innovation network	Complex integration	Finland, Israel, The Netherlands, China
Technological specialization		Korea, Malaysia, Singapour, Taiwan, China
Setting up an internal	Establishing special	UK, Norway, Irland

innovation network	conditions for creating relations in the field of innovation	
Promoting initiatives of national regions		France, Germany, Finland
Formation of the NSI	Changing the structure of science in the public sector	Bulgaria, Lithuania, Poland
Integrantion of science and education		Lithuania, Estonia, Czech Republic
Involving small and medium-sized businesses into innovation area		Romania, Czech Republic, Slovakia, Lithuania, Estonia, Turkey, Chile
Identifying the prioritized expert direction in the field of high technology		Romania, Czech Republic, Turkey, Chile

The development of the innovation process and systematic approach to the NIS does not have a great history. With the development of innovation theory, the innovation process models evolve into a more sophisticated non-linear model than a simple line model.

Evolution of Innovation Process Models

Table 2

Generation	**Time Period**	**Innovation process model**
I	1940-1960	"Technological boost" model
II	1960-1970	“The Call of Demand” model
III	1970-1980	Adapted model, chain model
IV	1980-1990	Combined (integrated) model
V	1990-2000	System and network model

During the I generation innovation process, the simple linear model was widespread. This model was called "technological boost". (Technological push or science push) (figure 1)

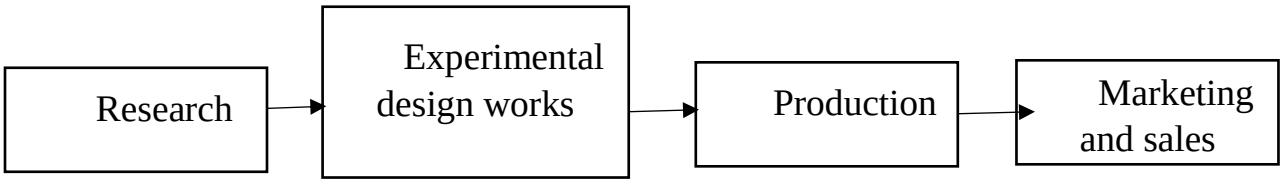

Figure 1. "Technological boost" model

This model is a classic model, and was described by the classics of the theory of innovation - J. Schumpeter, N. Rozenberg, A.Silins and others. The lack of this model is that only 5% of the research results are applied to production.

The model called “The Call of Demand” of the 2nd generation innovation processes (market pull or demand-pull) is a linear model shown in Figure 2. The lack of this model is the fact that consumer demand is the source of innovation.

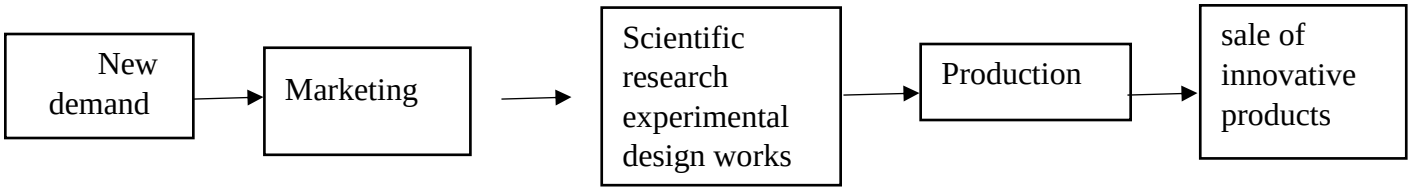

Figure 2. “The Call of Demand” model

Models of the III generation innovation process are adaptive and non-linear models, taking into account the drawbacks of the abovementioned models. These models are a combination of I and II generation models, considering the interconnection of technology and market demand.

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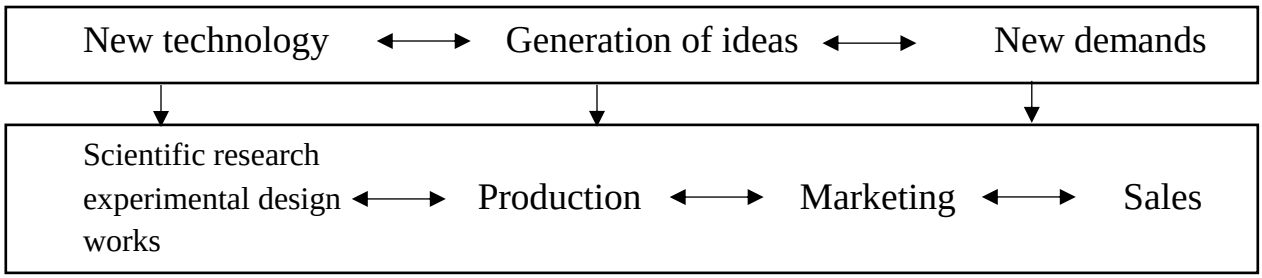


Figure 3. Adapted model

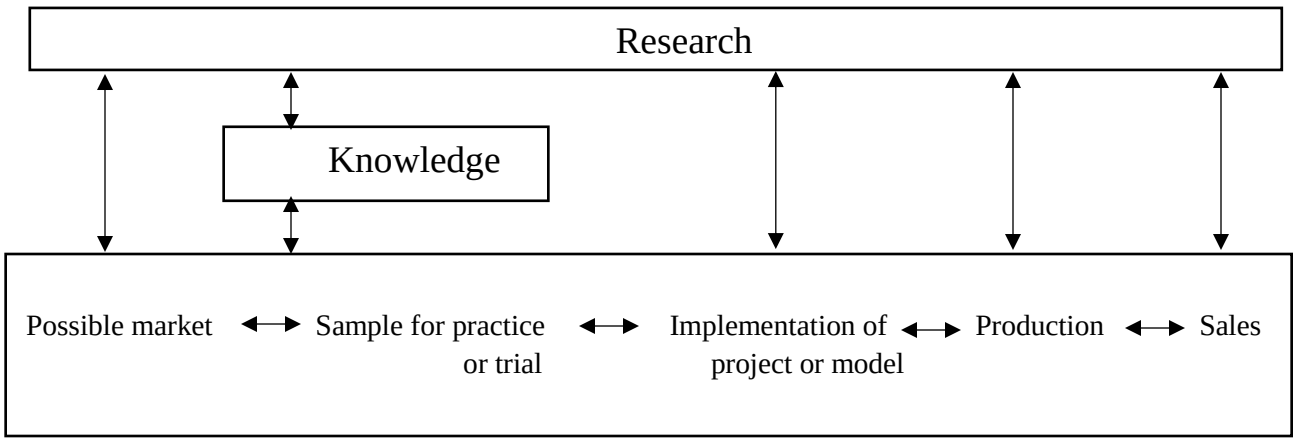


Figure 3. Chain model

According to K.Friman in the 1980s, the national innovation system is a complex system of interaction between the economic entities and public institutions (value, norm, law) that produces and spreads new knowledge, new technologies and products.

The concept of the establishment of the national innovation system is one of the main results of the development of the theory of innovation processes. The national innovation system provides a systematic approach to innovation. Maximum productivity of innovation activities in the country can only be achieved through the development of national innovation system.

P.Koyuda, V.Sergeyev, A.Alekseyenkova, V.Nechayev noted three other models of innovation development: "Euro-Atlantic", "eastern", "alternative". The "Euro-Atlantic" model is also called "traditional".

We have reviewed the external experience of the economy towards innovation development. The "Alternative" model for Azerbaijan is more relevant at the initial stage.This model focuses on national culture and national psychology, traditions and national features. Different elements of the experience gained by other countries in the formulation of the NIS can be used: Government support and supervision of the technoparks of the European Union, support for small business, experience of creating high-tech regional development of Asian countries and so on.

Table 3 *Basic models of innovation development*

Model	**Characteristic**	**Countries**
Traditional	The model of a complete innovation period - covers all components of the innovation system structure, from the formation of the idea of innovation to production of product; fundamental and applied science, ETTY, preparation of experimental samples, production, financial mechanism, personnel training	USA, UK, Germany, France, Italy, Sweden, The Netherlands, Switzerland, Finland
Eastern - Asia	This model does not have any fundamental and applied science components during the innovation period. This model is aimed at exporting the high-	Japan

	tech product from the "traditional integration model" countries.	
Alternative	This model is used in non-agricultural countries. This model has no fundamental and applied science blocks, no high-tech components during the innovation period. The innovation policies of these countries are focused on the acquisition and dissemination of high technologies, personnel training, light industry, and creative industry development.	Tailand, Turkey, Chile, Jordan, Portugal

On the other hand, the "alternative" model in the creation of some regional innovation systems needs special attention (no scientific potential, in developed agricultural regions).

In some regions of Azerbaijan, innovation potential of the region can be developed by the third model, for example, the use of new technologies, education and training, service areas and tourism.

1.2 Formation of the national innovation system

The main purpose of socio-economic development of the Azerbaijan Republic is transition to an innovation-driven economy. Legal and administrative ground should be created for the effective environment for the formation of a national innovation system in Azerbaijan, the effective functioning of this system and its separate subsystems.

In general, in order to activate innovation processes in all developed countries, they create a national innovation system, which is the basis of the development of the innovative economy. The innovation system will increase the intensity of economic development of the country by utilizing efficient mechanisms for collecting, transmitting and using the results of scientific, technical and innovation activities. Transition of the Azerbaijani economy to a new stage of development identifies the activation of innovation activity requiring fundamental changes in functional, regional and regional subsystems. Therefore, it is possible to make radical changes, taking into

account the institutional environment of business, and the progress in the use of modern information and communication technologies, knowledge and innovations.

It is important to form conceptual foundations of the national innovation system in order to ensure sustainable economic development in Azerbaijan. Systems research in this direction has not yet been carried out properly. According to many indicators, there is a lack of application of innovation development, the methodological basis of the national innovation system has not been fully developed. The analysis of the world experience of the innovation system for our state, the possibility of using models in them in Azerbaijan is of great importance. Comprehensive approach to the national innovation system of Azerbaijan: It is important to consider the elements of each of the functional, regional and regional subsystems separately and in a coherent way.

New knowledge and technologies, their effective application to socio-economic development determine the place of the world, the level of life of the people and the national security.

The introduction of a systematic approach to the formation of innovation policy in the developed countries on the basis of modern trends in world economic development creates conditions for the solution of important issues:

- competitiveness for good quality human capital is a key feature of world-class innovation development, it provides the process of sharing knowledge, enhancing the flexibility of highly qualified staff;
- also realizes the role of information technology in the process of sharing knowledge for the future development of innovation activity;
- globalization campaigns compete for a higher-tech technology and encourage innovation expertise and localization;

Countries implementing a concept of a systematic approach to innovation policy have recently been able to create an effective national innovation system (NIS), which enables countries to engage in a mechanism of mutual impact, business, science and education and GDP growth in the short run.

The rapid development of the "new economy" in Azerbaijan Republic, the increased interaction between the capital market and new technologies, the enhancement of the social dimensions of new technologies, the scale of the creation and utilization of new knowledge, technologies, food and services create the NIS as an institutional basis of country's innovation development . However, the effect of the factors creating this system is possible under the following conditions:

- availability of sufficient mental and technological potential for innovation;
- constant increase of the number of participants in the innovation network, as well as the involvement of new social groups;

- establishing an institutional framework for innovation development (including formal and non-formal elements);
- innovations by the economic entity, the majority of individuals;
- an increase in the level of economic development (GDP per capita), which allows financing the innovation system.

The fulfillment of all these conditions - the existence of the system, the understanding of theoretical problems of innovation development, the creation and development of the NIS in the form of a set of interrelated organizations involved in the production and sale of knowledge within the national boundaries.

In each particular case, the NIS development strategy is defined by the state of macroeconomic policy, normative-legal safeguards, direct and direct state regulation, scientific and technological and industrial potential, domestic commodity market, labor market, and historical and cultural traditions and features. There is an important place in the provision of information-communication information on the basis of scientific-technical information system, information-communication technologies (ICT), the creation of an electronic environment for business and government activities, and the use of the Internet in the activity of the NIS.

The main position in the formation of the NIS is owned by the state providing the necessary backup, including the funding for the establishment of the NIS. Today, there is a tendency to increase the amount of funding for scientific researches and works. The state support scheme for the establishment and growth of high-tech enterprises is specifically implemented through public investment and venture fund, tax breaks, accelerated vaccination.

The subsequent development of the NIS is linked to its integration into regional and global systems. Today, an active policy has been pursued on the overall innovation development strategy and, first of all, the mechanism for the implementation of these processes in areas such as innovation systems, human resources development, information and communication technologies, and business environment. The new innovation business should focus on a model that has been tested by world-class MIS, operating in market conditions. The principle of competitive funding for research, the creation of new forms of management and economic support for innovation business, the beginning of the formation of a system of innovation and science tax reductions, and the provision of the law of intellectual property leads to the formation of new innovative enterprises.

To regulate the development of the NIS for the state: development of the strategy of innovation development of the economy; development of a technological development forecast for a certain period of time and determination of scientific and technological priorities; formation of scientific and technical and innovation policy of

the state, its norms, resources and staffing; promoting innovation entrepreneurship, improving interaction between the main subjects of the NIS; supporting the development of innovation infrastructure; development and implementation of direct and indirect stimulation of financial activities of innovation activity; training of personnel in the field of innovation management; great work should be done to support research and development. Innovation activity affects the economic development of the country.

Solution of the following issues in the direction of implementation of the National Innovation System and innovation development in Azerbaijan is crucial: establishing a legislative framework for the formation of a favorable technological-economic environment for innovation development; the development of a state program for the protection and management of intellectual property; preparation and implementation of state program of development of material and technical base of science.

It is a difficult process to focus on the economy in the direction of innovation. The Lisbon Strategy outlines the following reasons why European countries have faced some challenges in innovation development:

- unsatisfactory innovation development;
- the recovery of the economy in European countries;
- aging of productive labor forces;
- expansion of the European Union through weaker developed countries.

The "Innovation Policy: A Modern Approach in the Context of Lisbon Strategy" sets out specific proposals and priorities for improving the innovation policy in European countries:

- to improve the innovation environment by strengthening and integrating the ingredients of innovation in all aspects of national policy;
- to stimulate market demands for innovation;
- stimulation of innovations in the public sector;
- strengthening regional innovation policy.

The NIS development program is a mechanism for implementing the concept of innovation development in the republic. The development of the NIS in Azerbaijan is being aggregated in all spheres. Azerbaijan's innovation situation has been analyzed in F. Gasimov's and Z.Najafov's works. In their opinion, the activity of the innovation process should be ensured in all segments of the economy of the republic.

It is necessary to create a unified innovation system to ensure sustainable economic growth and competitiveness in the country. The integrated innovation system enables the management of innovation processes, combining efforts and resources in the republic. This requires the joint development of the NIS 3 subsystem, which performs various functions in different directions.

It is possible to describe the structure of NIS proposed by F. Gasimov's and Z.Najafov's complex scheme as shown in Figure 4.

To achieve the implementation of the MIS complex, it is important to accelerate the solution of the following internal and external problems in innovation subjects in the country in the shortest possible time.

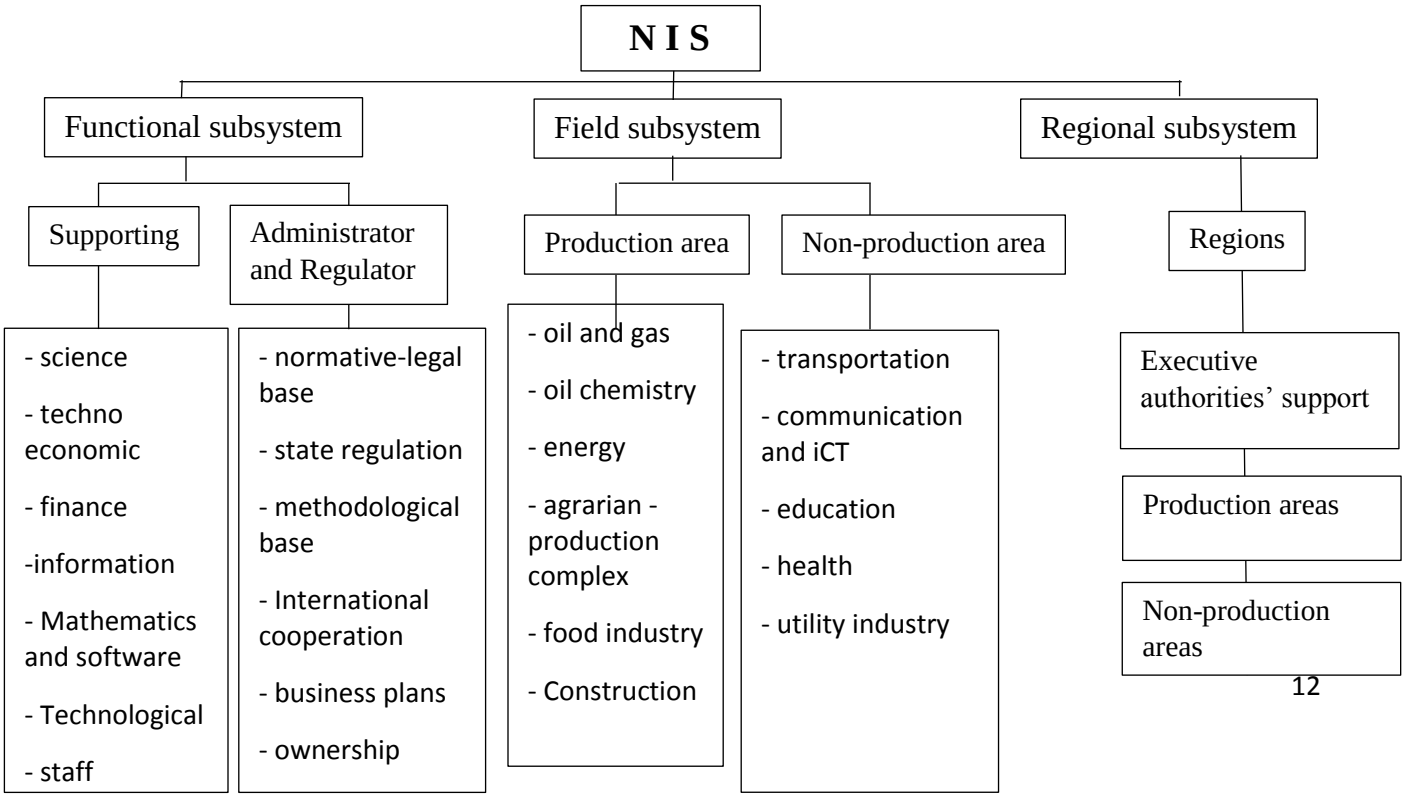
Internal problems:

- to coordinate and integrate innovation processes between innovation subjects and objects;
- accelerate innovation activity, regardless of ownership of ministries, committees, joint stock companies, enterprises and organizations;
- to support the development of small innovation business.

External problems:

- to develop intellectual property commercialization, accelerate the effective use of scientific potential;
- to increase the efficiency of the mechanism of involving technological and mental resources into economic turnover;
- expanding human resource management in innovation management;
- develop venture financing to expand innovation;
- to expand the scope of innovation infrastructure;
- strengthening science funding to increase the flow of young people into the scientific and technical environment, taking into account the age of scientific staff.
- Eliminating the problems we are facing will ensure the sustainable development of the economy and will continually increase the socio-economic level of the population.

Figure 4. Complex scheme of NIS



1.3 National Innovation System (NIS) assessment indicators

Innovation review monitoring (IRM) is being carried out in developed and developing countries participating in the Organization for Economic Cooperation and Development (OECD) to assess the country's innovation activity in modern times. These monitorings, on the one hand, are similar to some of their structures and indicators, on the other hand, their content and research areas are different, depending on the country's national and specific features. For example, IRMs were conducted in the Netherlands in 2002 in agriculture, in 1999 in the construction industry and the natural resources sector in Canada, and so on. In Azerbaijan, the issue of evaluation of innovation activity at the level of the country and the economic zone in different areas should be considered. These issues are the focus of many domestic and foreign researchers.

It is known that one of the components of the innovation potential is scientific and technological reserves. Therefore, evaluation of innovation development is considered as a comparative issue of the level of scientific and technological development. Analytical reviews, researches have been conducted and conducted in this area. The basis of the majority of these researches is international standards of international comparisons, in particular the "Europen Innovation Scoreboard". On the other hand, there is no accurate assessment system for scientific and technical development. Each methodology has its own drawbacks.

In the course of the study, the author studied the work related to this area, mainly monitoring and indicators carried out by the Council of Europe, OECD in the CIS countries. The author's attention was drawn to the work carried out in Russia and Ukraine in this field, A.K.Kazantsev, S.N.LeorK, I.A.Nikitina, D.A.Rubvalter, S.A.Firsova, F.F.Bezdudny, S.V.Valdaytsev, Q. Yoldstein, P.N.Zavlin, S.D.Ilyenkova, N.D.Kondratyev, V.V.Kobzev, N.P.Maslennikova, V.Q.Medinsky, L.E.Mindeli, Y.P.Morozov, A.I. Prigogin, K.F. Rumyantsev, V.A.Ustinov, A.N.Svetkov, Y.Vlenov, Y.V.Yakovets have been applied as a basis for the methodology of comparative analysis applied to Azerbaijan.

In the world practice, different systems are used to assess the NIS and its various components. The development innovation index is usually estimated within the complex competitiveness indices. In 2002, the core component of the World Economic Forum - NICI identified the competitiveness index of the economy's innovation capability index. The World Economic Forum annually lists countries based on the Global Competitiveness Index (GCI) and the Bisness Competitiveness Index (BCI).

Starting from 2001, they are based on three methods combining under the name of "innovation benchmarking"(bencmarking is the process of identifying, understanding, and adapting others' effective business practices in order to improve the company's business):

1. European Innovation Scoredoard - EIS;
2. Approach to Innovation Scale (Exploratory Approach to Innovation Scoreboards - EXIS);
3. European Innovation Policy Measures Database (DBIPM).

Today Azerbaijan faces development of innovation-oriented economy. In other words, Azerbaijan needs to assess its place in the innovation space. It is expedient to evaluate Azerbaijan's innovation activities with the methodology of the European Union. Based on the European Union methodology, the aggregate index is based on the seven composite indexes reflecting the country's level of innovation. The indicators used to calculate the composition index are divided into 3 groups.

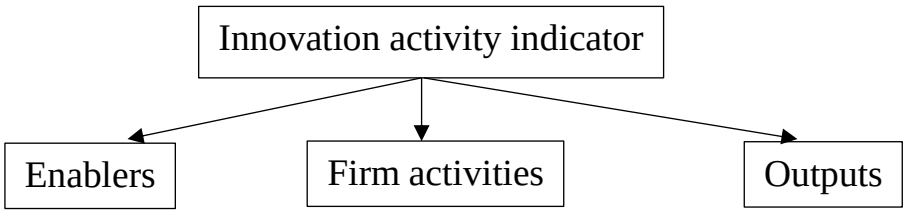


Figure 5. Innovative Activity Indicator Groups

Enablers - the main driving force of innovation activity that is beyond the firm. This group includes 2 composite indexes:

- I - human resources.
- II - financial resources and government support for innovation projects.

The firm's activities include indicators reflecting the firm's activities. Here are 3 compositional indicators:

- I - enterprise investments for research and development.
- II - relationship and entrepreneurship initiative. *This includes cooperation with other countries and firms in the field of innovation.*
- III - output throughputs

Output - reflects the company's innovation performance. Here are 2 indicators:

- I - innovators are the economic success of innovation in employment, expertise and sales.
- II - Economic effects give quantitative characteristics of national innovation in the market

29 indicators of European methodology are not suitable for Azerbaijan. Also, Azerbaijani statistics only have a form that characterizes the company's innovative

activity. According to the European methodology, the average annual rate for each index is 5 years for analysis of dynamics. Assessment of the NIS on these indixes is facing some difficulties. The adaptation of international experience to Azerbaijan is characterized by some national characteristics. In this case, appropriate economic and organizational problems, Azerbaijan's statistical records and reports, and information bases should be considered.

The 2 nd form in the statistics of the company (Enterprise Technology Innovations, Advanced Manufacturing Technology Reports and International Experience) brings to the OECD standards the improvement of the system of statistical indicators of innovation potential and innovation statistics. Systematization of indicators of innovation potential is given in Table 4. The proposed 40 indicators allow evaluating Azerbaijan's innovation potential.

Table 4. Innovation potential indicators

Innovation potential indicators		
Key Performance Indicators (2)	- general level of innovation activity - The level of technological, organizational and marketing innovation development	
Innovation activities (3)	Number and composition of organizations Types	- according to innovation activities - organization on the type of corporate relations - small innovative organizations
Expenditure indicator (6)	- technological innovation - by types of innovation activities - on innovations - Financing sources - on organizational innovations - on marketing innovations	
Innovation works, products and services (4)	- volume indicators - innovation indicators - new for the base - new to company - improved - export figures - Quantity indicators produced by marketing innovation	
Innovation performance indicator (5)	- expansion of assortment - expansion of the market or market share - quality improvement	

	- Increasing employment - improvement of production
technological exchange indicators: new technology acquisition and transmission process (3)	- technology acquisition indicators - technology transmission indicators - technological exchange indicator
Intensity of cooperation in innovation research and development (5)	- constant co-operation indicator - co-operation indicator in project borders - one-off cooperative indicator - Cooperation indicator across countries and regions - Cooperative indicator for the type of partner
Indicator of Innovation Information Source (3)	- an indicator of the internal source of information - indicator of market source of information - an indicator of the institutional source of information
Safety indicator (2)	- formal security techniques indicator - informal security techniques indicator
Factors that interfere with innovation (2)	- economic factors indicator - internal factors indicator
Organizational innovation (1)	
Marketing Innovation Indicator (1)	
general organizational and economic indicators (4)	- life cycle of products, jobs, services - major sales markets - investment in fixed capital - average number of employees

Compared to the system of innovation-constant development indicators of the proposed region with the system of other indicators, it can be concluded that the method of determining the structure of the system of indicators and their measurement should still be studied and expanded.

CHAPTER II

2.1 State regulation of innovation activity in Azerbaijan

The position of innovation is an important indicator of the development of the economy of each society and state. In developed countries, innovation policy is a part of the state's social and economic policy. It allows the economy to be restructured, continuous renewal of the technical basis of production, the solution of competitive product issues, in other words, the creation of favorable economic climate for innovation processes and is a coordinating role in science and production.

Taking into account the relevance of innovation in socio-economic objectives, innovation and investment activity have been selected as one of the priorities in the Republic of Azerbaijan. In this regard, increasing the efficiency of application of scientific works in production is one of the important issues of socio-economic development of the Republic. However, the state of economic, financial and logistical support of the existing organizations does not allow the development of innovation processes in the Republic. The economic situation in our republic, the legal basis of the financial and credit system can not help attract investment in science-intensive industries.

Formation and implementation of innovation policy envisages the creation of a mechanism for improving the scientific and technical potential of the Republic, directing the results of scientific research and experimental-design works to the real sector of the economy, as well as the mechanism of preventing the slowdown in the economy. A number of important policy documents (concepts, strategies and programs) have been adopted to address such issues: "State Program on Small and Medium Entrepreneurship Support in the Republic of Azerbaijan", "State Program on Development of Small and Medium Enterprises in the Republic of Azerbaijan"; State Program on Development of Agrarian Sector in the Republic of Azerbaijan, State Program on Development of Tourism in the Republic of Azerbaijan), State Program on Poverty Reduction and Economic Development in the Republic of Azerbaijan, on Socio-Economic Development of the Regions of the Republic of Azerbaijan State Program "and so on. "Employment strategy in the Republic of Azerbaijan", "Integrated strategy on trade and investment in the oil sector" and other documents are at the stage of preparation.

Innovative activity issues for the majority of industrialized countries are a decisive factor. Scientific and technical products, which are the result of intellectual activity, require the establishment of a system for the protection of industrial property. Such

systems are one of the absolute attributes of developed countries. For example, the US technological policy, including the following:

- Creating favorable conditions for private sector development and product competitiveness improvement;
- promotion of technology commercialization;
- Capital investment in creation of 21st century technologies.

Innovative activity in our Republic is at the stage of formation. Recent fundamental changes in the economy of our country require the adoption of decisions that come from the current economic situation at the state level. Our republic has a strong scientific and technical potential, significant achievements in various fields of science and technology, and sufficient scientific base for fundamental researches. There is a unique scientific production base established in our republic for a long time, but the use of this base is inefficient in the economic conditions. It is used very poorly in the use of existing potentially in the creation and use of scientific and technical processes. The main reasons for this are the economic situation in the country, the absence of management and scientific staff in management, marketing skills, lack of funds of enterprises, limited financial support of the state and weak development of the country's financial and credit system. There is no organizational and economic environment, incentives and rules system that is important for innovation activities in our Republic and meets market economy requirements. In other words, the importance of innovation has not yet been fully understood in our republic.

In the structure of the general product of the Republic, the share of products in the structure of industrial products is 0, 2%, while in developed countries this ratio is **2-3%.** Most scientific and technical organizations and enterprises are not ready to work in the new economic conditions created in our Republic. Because of the high levels of scientific work, it is impossible to sell them as finished products and to apply them in production. In this regard, the tendency of the country's economy to be dangerous is to exacerbate the production of commodities and services from the country's market and the loss of existing markets.

Our country's national innovation strategy should be developed to prevent unpleasant trends and should be viewed as one of the central directions of the socio-economic and scientific-technical policy of the state. Such a strategy should be based on long-term forecasts based on a thorough assessment of the country's intellectual and production potential and the prospects for the development of the intellectual products market. The main purpose of the innovation policy of our Republic is to increase the technological level of production and to increase the production of competitive products.

At the initial stage, innovation activities should be supported by the state, and then stimulative measures aimed at its intensification and efficiency increase. It is also important to note that the technological achievements of a number of foreign countries have been achieved not only by the individual efforts, but also by the purposeful state intervention in innovation activities, including through the establishment of a legal basis for its development. State regulation of innovation activity is an important tool for the development of the economy in developed countries and long-term factor of national competitiveness is considered as a reliable factor of the welfare of the population.

The main tasks of the state in the field of innovation policy include:

- Formation of normative-legal base stimulating innovation activity activation:
- Providing financial support for innovation activities, creating conditions for the preservation and further strengthening of the Republic's innovation potential;
- Formation of innovation infrastructure and taking measures aimed at its development;
- preparation of personnel focused on innovation activities.

In order to achieve the objectives, the principal principles of the state's innovation policy should consist of:

- directing the country's economy to innovation-driven development, maximizing market mechanisms to intensify innovation activities;
- Effective use of scientific and technical potential of our country;
- equality of all subjects of innovation activity with the law;
- protection of intellectual property rights and recognition of their income;
- Implementation of flexible credit, tax and customs policy that promotes the development of innovation activities.

The local authorities have the legal right to participate as a founder in the process of creating innovation infrastructure subjects and to allocate their charter capital to land, buildings and facilities. Given the challenges facing research and development organizations, innovation organizations are encouraged to create space and equipment on favorable terms.

Great importance is given to the organization of the system of personnel preparation in the new economic conditions. This is explained by the fact that it is a very difficult task to be successful in innovation business in a strong competition without having the appropriate knowledge and experience.

It should be noted that there is a need to constantly improve the regulatory framework regulating innovation activities. In this regard, legal acts of national and foreign countries related to innovation activity were analyzed and existing legal documents were re-examined on them, and effective proposals came from the

President of the Republic of Azerbaijan. "Concept of innovation policy of the Republic of Azerbaijan", "Program of formation and development of the national innovation system", "The concept of national innovation system" has been prepared.

Azerbaijan's national interests require consistent action towards the formation and implementation of innovation policy.

Therefore, the creation of a large-scale scientific-technical strategy that meets the requirements of new economic and socio-political realities, and creates conditions for the re-establishment of production, should be regarded as one of the most important components of this policy.

In accordance with the solution of the above-mentioned issues, on April 10, 2008, the President of the Republic of Azerbaijan signed an order on "Establishing a State Concept on Reforms in the Science of Azerbaijan". It is of great importance of order to implement the National Strategy for Science Development in the Republic of Azerbaijan in 2009-2015 and the preparation of State projects coming from that strategy.

In contrast to the innovation systems of developed countries, the innovation system of the Republic of Azerbaijan is formed at a time when unstable economic environment is not fully regulated, and where sufficient private capital is not available for the acquisition of new techniques and technologies. The basis of regional relations is the provision of equal rights of economic subjects and provision of freedom to regions in solving various socio-economic development problems.

One of the most important directions of the national state policy is the reduction of the degree of differentiation in the socio-economic development of the regions. International experience shows that national (state) innovation systems are a very effective tool for the development of territories. By studying the situation in each region, using individual approach, it is possible to solve their development problems.

Thus, in the region where political and economic it is possible, there should be created macro-level national regional innovation systems, taking into account economic characteristics, historical and cultural traditions, providing economic development tempo. At the same time, a system of innovation based on macroeconomic policy should be created at the state level. It is possible to form a unified national innovation system that can operate at a very high level by integrating these systems into relevant regional elements.

The national innovation system is understood as a regional economic system consisting of a range of economic subjects, derived from the state's economic policy and involved in the production, dissemination and use of new knowledge that is economically advantageous, and regulated by a relevant regulatory framework. The

main purpose of the national innovation system is to ensure the sustainable economic development of the country through efficient use of existing intellectual potential, generation, dissemination and implementation of new knowledge. In order to achieve this goal, the regional innovation policy, first of all, needs to be prioritized in the priority development of the country's scientific-technological complex and high-tech industry, increasing the competitiveness of products, especially the domestic market. At that time, special attention should be paid to raising the level of higher education to the world level and addressing the issues of personnel training, as well as the involvement of young people in science.

The following basic principal requirements must be met for the formation of the national innovation system:

- systematic approach to the formation of innovation policy;
- free formation of integrated regional innovation systems, taking into account the nature of the territories;
- coordination of regional priorities;
- Identify development priorities of fundamental sciences, higher education and high tech industries;
- concentrate resources in priority areas with specific indication of sources.

In addition to all these, the following situations should be considered when forming a national innovation system:

1. The experience of the last decade shows that there is very little hope for the country's involvement in the industrial sector as much as possible to make a substantial impact on the economic development of our country.
2. Areas of science and technology are not generally objects of direct foreign investment.
3. Generally, products can not be competitive in international markets.
4. Developing countries put their markets on the production limitations (where possible).
5. Domestic market can not normally resist the imported products from foreign countries.

The situation in the field of innovation in Azerbaijan is the result of negative objective and subjective factors that interfere with the development of innovation processes. One of them is the absence of a scientific and methodological framework for the formation of Azerbaijan's innovation system. In our country, the public institutions responsible for the development of innovation activities have not been fully utilized to conduct the necessary research from the potential of scientists and experts. Thus, the issue of scientific provision of innovation processes has not been put in front of Azerbaijan National Academy of Sciences responsible for the

development of science and technology in our country. Although separate scientists and collectives of ANAS have participated in the implementation of certain research programs, it has not been systematic since the great scientific potential has remained unused for a long time. The lack of scientific support for innovation activities has also prevented the formation of a state-of-the-art innovation policy at a conceptual level. Different structures, including government agencies, are not systematically tackled, and in some cases these structures do not consider the country's scientific and educational potential as a basis for a knowledge-based economy. As a result, state support for scientific, technical, educational and educational complexes is inadequate, and the solution of the country's economy to innovation-driven development is difficult.

The world experience shows that it is the principal initiator of the creation of national innovation systems and its development as a source of resources, including financial resources. As a rule, fundamental research is funded from the state budget. Applied research is carried out at the expense of budget and non-government funds, including through large corporations' funds. Organization of production based on innovation products is carried out at the expense of own resources of the private sector of the economy. State-funded financial support is primarily provided in the form of allocation of funds directly from the state or subjects. As mentioned above, innovation activities are not just fundamental and applied research but also production. The efficiency of innovation is determined not only by the level of scientific work and technology, but also by the state of the industry that has no access to them. In this regard, one of the main issues is the involvement of funds in upgrading and modernization of production.

While talking about providing innovation activities, it is not possible to touch on property issues. Recently, the opinions of the state scientific-research organizations on 'more efficient owners' have been frequently heard. This is not justified because the state structures are now more efficient owners. This applies to the state higher education system. The participation of private business in the development of the scientific and technological field is still episodic. Therefore, it is early to speak of other "more efficient owners" apart from the state. And there is almost no property ownership criteria. World practice shows that enterprises' activity depends not on their ownership, but on the quality of management, on the professionalism of specific professionals. It is very important to benefit from the current scientific potential of ANAS for the establishment of the scientific and technological base of the economy and the establishment of innovation economy leading to development.

At present, the process of creating innovative systems for industry development is being completed in most countries around the world. A crucial role belongs to the

state in this process. It sets out the rules and procedures of the NIS and various funding mechanisms, including financial arrangements. The NIS's technological base is fundamental and applied research and development organizations, large corporations producing mass-produced mass products (which provide development of small businesses, especially small businesses). The development of the MIS is carried out in their hyper systems and the creation of global innovation systems. Certain work is being carried out in this direction in the US, European Union countries and Asia.

2.2 National Innovation System Formation and Development Program

The structural changes in the reformed economy of our country should be made possible to create a competitive industrial complex. The development of innovation spheres is crucial for mainstream structural transformations, and scientific and technical progress creates realistic conditions for uninterrupted renewal of obsolete technologies with the development and application of more advanced technological processes. It is impossible to achieve sustainable economic development without the use of innovations in our country, without the major capital upgrade. This is confirmed by the experience of developed countries, which provides 90% of economic growth, with the introduction of new knowledge and technologies in the industry. Developed countries have long recognized the importance of new technologies. In the 21st century, the rest of the countries in the field of biotechnology, microelectronics, information and communication technologies are facing the challenge of forming a highly competitive economy.

It is impossible to force businesses to use innovations in the market economy. However, the state has the ability to effectively influence the country's economy through the implementation of organizational measures to support the specific scientific and technical aspects of the economy. This should be reflected in the formulation and implementation of the scientific and technical and innovation policy, one of the components of the country's industrial policy. The importance of the state's involvement in innovation processes is explained by the fact that the long-term cycle of the science-production cycle involves extensive costs and its final outcome. The market can not solve the problem of long-term risk investing problems. These functions must be taken over by the state. In such cases the state can achieve certain positive results. Revenues are more than losses when innovation is preferred in industrial policy. Innovations related to different fields of knowledge and production create long-term effects that can lead to dynamic development.

The national interests of our country require the formation of an innovation policy based on existing socio-political and economic realities and the implementation of certain practical measures in this direction. In this way, large-scale investment flows can be provided to fundamentally modernize production.

It is not expected that a substantial turnaround will be expected in the near future in increasing the innovation activity in industrial enterprises. In the light and food industries, which produce products on the domestic market, innovation in the building materials industry is weaker. The main changes in the national economy in these areas can only be achieved by enhancing innovation. Organizations engaged in industry research and development are 5%. There are certain organizational and legal issues related to the protection of intellectual property, certification of innovation products.

Scientific and technological developments are transformed into an innovative product ready for efficient use in production. There are certain legal and organizational issues in this area. They may include organizational and legal issues related to the protection and transfer of intellectual property rights, the certification of intellectual products and the transformation into commercial substance.

In order to change the situation in this area, state bodies and economic entities should take certain purposeful measures. First and foremost, a strategy for activating technological innovation should be developed. In other words, special attention must be paid to the conduct of applied research based on market economy criteria and commercial relationships. In order to achieve economic changes during the economic period, it would be expedient to choose a strategy for bringing new technology and technology into production in Azerbaijan. In this regard, establishment of joint ventures with juridical and physical persons of foreign countries, possessing the possibility of bringing new technology to Azerbaijan, should be considered as prospective. In this way, the organization of production of highly competitive products and the promotion of domestic and foreign markets can become a reality. Such processes are observed in the production of separate elements of electronic technique and the accumulation of complex household appliances. By organizing joint activities, we can bring innovative products to our country, effectively use existing potential and labor. At the same time it is possible to realize innovation projects jointly. Extensive involvement of small-scale innovation enterprises into this process is also important. Because they are flexible and collaborate with large manufacturing facilities to upgrade existing technological processes and soon release a productive product.

Expanding the scope of oil production, oil refining and some mechanical engineering products is a promising one. Because of limited financial resources, this strategy will help to effectively utilize existing potential and be focused on

implementing innovation projects. At the same time, the priority should be given to the application of technologies created in priority scientific-technical directions no more than 2-5 years. It is important for the government to provide government guarantees for the financing of projects on the basis of competition, as well as involve private owners and investors on the principle of dividend distribution.

It should be noted that there are favorable conditions for investment activity in Azerbaijan. Large state-owned enterprises have been privatized in many areas, private property-based production areas have been created, government intervention in the formulation and distribution of profits of enterprises, there is great scientific and technical potential over the decades and the state supports the implementation of priority projects. But despite all this, the level of innovation activity in our country is not high, the existing innovation mechanisms do not work.

As a result of privatization of state property and development of entrepreneurship, the share of the private sector in the GDP increased to 75% in 2008. Investment in the country's economy has grown considerably. After the economic independence of our country, the volume of investments to the economy from various sources of funding was more than $ 25 billion. The country's resources and capabilities are not properly coordinated with the implementation of structural reforms in the economy. There has not been a substantial increase in the efficiency of production in the non-oil sector. The expected outcome from economic reforms has not been achieved. Because innovation processes are beyond reform. Investment in innovation is not satisfactory. The lack of investment in investment activity is observed. Investment activity does not cover all phases of the "Scientific-Technical Progress-Innovation-Production" era. Therefore, innovation policy requires a systematic approach and the creation of a single mechanism covering all the elements of the innovation process. In this case it is possible to provide the production of new technical and technological means and products, which can be used at the expense of mobilizing available resources and implementing promising innovation projects. At the same time, the features of the creation of individual and publicly available innovative products should not also be ignored.

Azerbaijani science is also dynamically developing. But we can not justify the achievements we have. Therefore, several targeted programs have been adopted at the state level. Presidential Decrees directed to creation of technological business incubators, technoparks of innovation centers were adopted. The State Program on Socio-Economic Development of the Regions adopted on February 11, 2004 has addressed the issue of efficient use of the natural resources and socio-economic potential of the regions of the Republic taking into account local and regional natural conditions. Improving the infrastructure of the regions, supporting the development of

agricultural products, tourism, processing industry, opening of more than 600,000 new jobs for the population, employment of various industrial enterprises and so on. All of these, of course, serve to the development of the regions and to improve the well-being of the population.

Along with the above-mentioned measures, the measures aimed at further improving the investment climate in our country were also implemented. The existing legal framework has been improved. The laws of the Republic of Azerbaijan "On Investment Activity" and "On Special Zones" have been adopted, which create conditions for the development of private entrepreneurship and investment-innovation processes.

The "State Program on the Socio-Economic Development of Regions" has been reflected in concrete projects, based on the innovation factors of our country and regions. It is planned to create production and processing enterprises, which will use new technical and technological means in the implementation of a number of regional projects. And this fact itself indicates the beginning of a new knowledge-innovation-based economy course in our country. The main and most effective mechanism for the transition to such an economic development system is the **national innovation system**. World experience shows that national innovation systems play a special role in creating new products, technologies and services in society as the most progressive and efficient institutional model of generating new ideas, dissemination of knowledge and their use in production.

The project of the **"National Innovation System Development and Development Program of the Republic of Azerbaijan"** has been prepared. The strategic goal of this program is to promote the development of a socially oriented economy, which is based on innovation-based, resource-saving technologies in Azerbaijan, providing high-tech, competitive products in the world market, leading to sustainable socioeconomic development and improving the environment and welfare of the people. forming.

The main responsibilities of the program include the following:

- establishment of national innovation system;
- establishment of economic legal and socio-cultural environment essential for innovation activity;
- Modernization of material and technical base of new and high technology based production and social sphere;
- Creation of a qualitatively new level of technological development in different sectors of the economy;
- Increase the specific weight of high technology products and equipment in export and import operations;

- Increasing the intellectual potential of the country, regions, businesses and scientific organizations;

- raising the creative activity of scientists, inventors, creative people;

- determination of economic and energy security of our country.

From the point of view of preserving and developing the personnel potential of the science-innovation complex of our country, the main directions of the state policy can be summarized *as follows*: Transformation of scientific activity into prestigious activity; protection of socio-economic interests of academics and scientific specialists; raising the salaries of scientific workers; enriching the composition of academic staff, taking additional measures to attract talented young people to science and technology, and preventing intellectuals from emigrating from the country; creation of appropriate conditions for return of scientists, specialists to the country. In order to increase the efficiency of human resources policy, it is important to stimulate scientific activities, improve the planning of highly skilled scientific personnel, and pay close attention to the needs of science and individual sectors of the economy as well as the public administration structures to highly qualified specialists.

Implementation of the Innovation Program serves the formation and establishment of the NIS, which will further improve the socio-economic results of the organization of innovation processes in the Republic of Azerbaijan. There is no doubt that new and high-tech enterprises, production areas will be created, production facilities of existing production facilities will be upgraded, production of highly competitive products will be organized, marketable for domestic and foreign markets will be used more efficiently than the intellectual potential of enterprises and creative people.

It seems to us that our Republic is able to say its word in the market of intellectual products, which is the result of the creative work of creative people. With this intent, we must strive to use all the resources and resources to implement the innovation program. It is possible to produce highly competitive products in certain areas of the real economy, with purposeful efforts in this direction and by creating the necessary resources by creating the infrastructure facilities that are important. Because we have sufficient foreign exchange reserves to bring our new technology and technology to our country, which is very promising in terms of the development of our country in the short term. The problem is only the fact that the new technique or technology is technically-economically justified and chosen and brought to our country in one way or another. This is the shortest way of looking at scientific and technical progress. But this path may not be so important from the point of view of economic security.

The innovation system infrastructure will include the creation and development of technology transfer centers, technology innovation centers, technoparks, business incubators, training centers for innovation activities, global innovation networks

(joining scientific, technical and business information bases), innovation processes and outcomes monitoring system and so on.

The implementation of the innovation program envisages the formation of certain **financial resources**. The sources of funding for the measures envisaged in the innovation program are *as follows*:

- innovation funds;
- resources allocated from the state budget to the innovation programs and projects;
- own funds of economic objects;
- bank loans (long-term loans and investments);
- equity capital;
- foreign investment;
- other sources of funding.

The following results are expected from the implementation of the innovation program:

- creation of economic, legal and socio-cultural environment essential for innovation activity;
- innovation activities, innovation infrastructure renewal;
- Increase the specific weight of new products in the total volume of industrial products;
- Increase the number of businesses selected by innovation in the structure of industrial enterprises;
- Increase the share of certified products in the total volume of industrial production;
- Increasing the level of renewal of basic production assets (assets) in the industry;
- Improvement of fundamental and scientific-technical information on new motives for stimulating innovation activities;
- improvement of mechanisms for intellectual property and property protection and commercialization;
- Increase the number of inventions, patents and rational proposals;
- to improve the system of highly qualified personnel for the activation and expansion of innovation processes;
- Increase the volume of imported and exported high-tech products, equipment;
- Ensuring energy and economic security of our country.

Thus, the implementation of the innovation program will ensure the creation and development of a new national innovation system.

2.3 Development priorities of the innovation system in the Republic of Azerbaijan

By choosing a completely new economic relationship course, the Republic of Azerbaijan determines the development priorities of the innovation system by integrating into processes in the world, including the European space.

Recently, the main factors in the development of Azerbaijan's economy are innovative activities based on the introduction of new ideas, scientific knowledge, technologies and products in various sectors of production and society.

The main purpose of the formation and effective utilization of scientific and technical information (STI) resources is their integration into world information, creation of information products and services base, one of the main functions is the implementation of state policy in the sphere of scientific, scientific and technical and innovation activity, information provision.

The following objectives are essential to achieving this goal:

- taking measures to increase the funds;
- Increasing the efficiency of information resources of scientific and technical work (STI) for innovation activity in the country and information infrastructure in science and technology;
- Improvement of technological processes for the collection, processing and maintenance of STI and preparation of services;
- Application of modern network technologies to facilitate the use of STI;
- Increasing the information culture and level of users and experts of the STI.

In this regard, the state undertakes extensive reforms. However, there are many difficulties in this area. In Azerbaijan, innovation and information development, information security and intellectual property should be improved. Legislative-normative documents, technology transfer law, innovation development program should be developed in the Republic.

It is necessary to analyze innovation activity in Azerbaijan, to define common indicators and standards in this field, to conduct statistics on indicators. Work on the development of the innovation development program in the country, the transfer of the technology transfer law, the generalization of indicators and the preparation of statistical forms, and the definition of terms should be done. In order to meet the needs of the Republic in scientific and technical information, it is necessary to organize a market of information products and services within the state, to enter the foreign information market. For this purpose, it is necessary to organize catalogs of innovative products, services of innovation technologies, print out bulletins.

Many information systems have been created and should be created. Information about innovation projects and surveys, and academic staff potentials are collected at different times and must be collected, updated and complied with the requirements of international catalogs. In order to improve the efficiency of registration of scientific research works and introduction of innovation technologies in Azerbaijan, to study the advanced technologies of foreign countries in the field of science development and to increase the effectiveness of the works done in the field of database creation, the following are the main tasks:

- to prepare and distribute textbooks and manuals in this field;
- To study theoretical problems of advanced technology and innovation process, to develop theoretical training of innovation in the country and to create a database in this field, to take part in the interstate innovation network, apply their experience in Azerbaijan;
- preparation of the state classification of scientific and technical information;
- creation of the republican scientific-technical development network, innovation projects in the country, scientific potential, analysis and forecasting of research works and marketing, creation and dissemination of generalized funds in various scientific fields;
- to organize the publication of periodical scientific-practical magazine devoted to science and innovation achievements in the Republic and abroad;
- Preparation and dissemination of methodical aids, books and textbooks in this field;
- Organization and carrying out of round-the-clock courses in the field of information and innovation in the republic;

First of all, the normative legal and methodological assurance in the world practice should be studied, analyzed, investigated by the scientific and technical information sources of the Azerbaijan Republic in the field of information, as a national identification system for the organization of information services should be established in accordance with international standards, its security must be ensured, Access to international information resources should be ensured by Azerbaijan.

Today, Azerbaijan is actively working on the creation of an innovation system. This will stimulate the country's intensive development and bring it to the development of innovation. The main force in this area is focused on the development of the elements of the National Innovation System (NIS), increasing the production areas, innovative development of the regions and increasing the demand for innovation. Lots of work have been done in the social-economic development of Azerbaijan during the years of independence. 2014 was declared the **"Year of**

Industry" in Azerbaijan and more than 230 industrial enterprises were established. 123,000 new jobs have been created, of which about 100,000 are permanent jobs.

2014 was an important milestone in the development of the industry. "Azerbaijan Steel Production Complex" Joint Stock Company was established, continuous operation of "Dashkasanfilizisaflashma" enterprise was provided.

Establishment of Sumgait Technology Park, Aluminum Production Complex and Azerbaijan Steel Production Complex, commencement of shipbuilding plant in Baku, construction of gold and copper refineries in Gadabay and Dashkasan, modernization of petrochemical industry in Sumgait and construction of Urea plant, increase of production capacity of Cement Plant in Garadagh and construction of a new plant, commissioning and commissioning of new cement plants in Gazakh and Nakhchivan will create extensive opportunities for the deeper diversification of the non-oil industry at the next stage.

In recent years, new competitive enterprises have been created in the fields of machine-building, equipment production, instrumentation and construction materials, which are the main non-oil industry branches in the country, including tractors and agricultural machinery in Ganja, cars in Nakhchivan, electronic equipment in Mingachevir, solar panels in Sumgayit, metal structures in Garadagh, Ceramic tiles production facilities were established in Hajigabul. At the same time, important projects have been implemented in recent years to establish a strong defense industry, and in the short term 50 new production areas have been created in this area. In addition to military products, civil defense products were also manufactured by the defense industry enterprises, whose volume has been doubled in recent years.

In this case, it is expected that the creation of industrial parks in Azerbaijan will be wider. Establishment of such parks can play an important role in reducing imports of imported products from abroad. It should be noted that the establishment of industrial parks in Azerbaijan is of great importance in terms of some parameters. Thus, experience of foreign countries shows that industrial parks have the opportunity to support entrepreneurship, to ensure the sustainable development of the non-oil sector and to increase employment in the population. Therefore, those who want to develop different industries, countries interested in balanced development of the country's economy, attach special importance to the creation of industrial parks in their economic policies. The experience of Turkey, Germany, Poland, Russia, China and South Korea shows that the creation of industrial parks is aimed at the implementation of priority tasks such as increasing the production of export-oriented, competitive products, import-substituting products, providing employment in the surrounding regions, attracting investments and modern technologies. is of particular importance. In this sense, experts highly appreciate the steps taken in our country.

Despite all this, the mutual principal mechanisms of the various elements of the NIS do not work. Although a number of legislative and normative acts have been adopted in the innovation sphere in the republic, however, no laws, innovations, science and state scientific and technical policies, laws and innovations have been adopted so far. . The work on forming a legal framework for incubators, innovation centers, technoparks, technicians, innovation, leasing and other organizations' regulatory and innovation infrastructure has not been completed. At the regional level, the issues of strengthening the innovation potential have remained unresolved.

One of the key issues in reforming Azerbaijan's economy is to increase the innovation activity of enterprises and organizations, enterprises, firms and companies. At this stage, a different aspect of innovation development is the transition to more advanced technological processes and flexible production that enables us to produce new competitive, world-class products.

Today, the importance of the non-oil sector of the economy is increasing. In the entrepreneurship sector, these are large and medium-sized enterprises producing competitive products. This sector is invested by the state.

CHAPTER III

3.1 Global trends in development of national innovation system

New knowledge and technologies, their effective application to socio-economic development determine the place of the world, the level of life of the people and the national security.

The introduction of a systematic approach to the formation of innovation policy in the background of the modern trends in world economy development in developed countries is one of the first issues:

- Competitive human capital is a key feature of world-class innovation development, the process of increasing the mobility of highly qualified personnel and sharing the knowledge;
- The role of information technology in the process of sharing knowledge for the future development of innovation activity becomes more relevant;
- globalization forces companies to compete for a higher-tech technology and to stimulate the process of innovation specialization and localization.

Countries implementing the concept of a systematic approach to the innovation policy could create an efficient NIS, allowing for a short period of time to increase the interaction mechanism of the states, business, science and education and the overall scientific capacity of GDP. 80-95% of GDP growth in industrialized countries accounts for new knowledge of technology. The possibility of transition to innovation development was possible through the establishment of a national innovation system (NIS). According to US research, NIS is the key achievement of the 20th century. A legitimate outcome of the industrial development, the NIS allows the institutions to operate in a technologically advanced manner in developed countries and to ensure the highest competitiveness of their economies.

The rapid development of the "new economy" in the Republic of Azerbaijan, the increased interaction between the capital market and new technologies, the enhancement of the social dimensions of new technologies, the scale of the creation and utilization of new knowledge, technologies, food and services create the NIS as an institutional basis of country's innovation development

These processes have created the necessary conditions in response to global changes. Without this condition, it would not be possible for the original innovation cells, subjects and objects of innovation to be limited to a single system or the NIS. Such a basis has been shaped as national "associations": *education system* (machine system, technological chain and macrotechnology systems, qualified personnel

resources system), *network technology, unified information space, integrated economic and legal environment, large national projects, integration of state, innovation culture*.

However, the effect of the factors creating this system is possible under the following conditions:

- have enough mental and technological potential to launch the innovation process;
- Continuously increase the number of innovation network participants, as well as involve new social groups;
- Creating an institutional framework for innovation development (including formal and non-formal elements);
- the innovation, demand for a full NIS by the majority of individuals, the economic entity;
- Level of economic development (GDP per capita), which allows financing the innovation system.

Understanding all these conditions, understanding theoretical problems of innovation development, the presence of the system, the opportunity to create and develop the NIS as a set of interrelated organizations dealing with the production and sale of knowledge within the national boundaries. Small and large companies, universities, labs, technoparks and incubators, law, financial and social institutions that provide innovative processes and national roots, cultural traditions, political and cultural features. The strong methodological basis of the establishment of the NIS is to follow Y. Shumpeter's ideas. These ideas are about the role of institutional context that affects the content and structure of innovation, as well as innovation-based competition as the main factor of economic dynamics in corporations.

MIS ideology has gained wide popularity in the majority of European Union countries, the United States and Japan. There is no single explanation for the MES today. The uniform formulation methodology of the NIS has not been developed yet. Different goals may also exist in the NIS of different countries. For example, the purpose of the NIS in ***France*** was the creation of additional jobs, the development of advanced technologies in ***Germany***.

In each particular case, the NIS development strategy is defined by the state of the macroeconomic policy, normative legal provision, direct and indirect state regulation, scientific- technological and industrial potential, domestic commodity market, labor market, as well as historical and cultural traditions and characteristics.

In spite of this structure, the structure of real NIS elements in developed countries has a common feature on their functional classification and interaction schemes.

The main part of the national economy, which forms the basis of the NIS, is:

- generation of knowledge (science and its other sectors);
- dissemination and application of knowledge, commercialization of innovation (production and service of research and development products) (scientific and technical product, market institute);
- training and professional training of staff;
- innovation-financed infrastructure;
- governance and regulation (legal framework, state macroeconomic and innovation policy, corporate governance, market mechanism).

The government stimulates the growth of private sector participation in research and development. As a result, it provides a large portion of domestic expenditure on research and development in modern times (EU - 56%, USA - 63%, Japan - 74%). The share of national research and development in the total cost of corporations in the Economic Cooperation and Development Organization (OECD) countries is about 70%. The high-tech sector is dynamically developing. In the 25 European Union countries, 137,000 enterprises belong to the high-tech sector. The share of those engaged in high-tech business in the US is 7% in the industry, 3.5% in the service sector, and labor productivity is 1.5 times higher than the industry.

Organizations that transmit innovation from the knowledge field to the production process in the developing countries are particularly important. This is achieved through the creation of a market of intellectual property and innovation infrastructure. The latter includes business-innovation, telecommunications and trading networks, technoparks, business incubators, innovation-technological centers, consulting firms, financial and other structures. Universities and industry co-operation are supported in the EU through the development of university innovation centers, technology transfer centers, technology brokerage agencies and new centers of new technologies.

Developed countries activate learning of innovation management. This is see at the organization of courses for entrepreneurship chairs in universities (*Germany*), organization of training courses for engineers and academics (*UK*), innovation policy for leading employees and special courses for innovation management (*Portugal*), students, managers and entrepreneurs of small businesses entrepreneurship trainings (*Belgium*).

The main position in the formation of the NIS is owned by the state providing the necessary resource support, including the funding for the establishment of the NIS. Today, there is a tendency to increase the amount of funding for scientific researches and works. Developed countries are trying to bring science to 3% of GDP. The volume of GDP in 2003 was 1.93% in the **EU**; 2.59% in the **United States**; In **Japan**, it was 3.15%. The leader in science is **Sweden** (4.3%) and **Finland** (3.5%).

The state support scheme for the establishment and growth of high-tech enterprises is specifically implemented through public investment and venture fund, tax breaks, and accelerated vaccination.

In Russia in the 90s after the severe recession of all segments of the scientific and technical field, innovation began to be formed in new market conditions. However, the current state of the NIS in Russia is still characterized by strict structural stereotypes, irregularities in public policy and relatively poor innovative activity of the private sector. There are actually all the elements of the NIS in Russia. However, Russia's NIS is characterized by a relatively weak development of venture capital, such as high share of the public sector, slow-growing large-scale corporations, relatively weak development of innovation business, and financial resources of stock market and innovation projects. Adaptation of the Russian innovation system is reflected in the change of innovation activity model.

It focuses on a new model of innovation business and NIS world-wide experience. The principle of competition financing through research, the creation of new forms of management and economic support for innovation business, the beginning of the formation of a system of innovation and science tax reductions, the provision of the law of intellectual property, the formation of new innovation enterprises.

However, new issues of state policy are not fully implemented. This is especially evident in the government's innovation, structural, investment policy. In this regard, in August 2005, the "Main directions of the policy in the field of innovation system development till 2010" was adopted in ***Russia*** in August 2005, "Strategy of Science and Innovation Policy in the Russian Federation till 2015" was adopted in February 2006.

In 2004, **Ukraine** adopted the "Strategy for Economic and Social Development of Ukraine in 2004-2015". When implementing this strategy, scientists began to develop the concept of innovation model of economic development. However, this concept does not define the role and place of the MIS, its structure has not been finalized, it has been identified that certain segments (institutional development of innovation economics, technological advantages of innovation development in the economy, scientific and technical and innovation activities, innovation entrepreneurship, legal property market, The development of state policy was analyzed.

According to experts in Ukraine, the modern crisis of the NIS was not only due to lack of financial resources. This is due to the decline in the demand for scientific and technical product by the state and entrepreneurship sector, deterioration of quality characteristics, scientific cadres and material and technical research market. The formation of a new type of innovation system has begun.

In 2005, the "Program of Formation and Development of the NIS of the **Republic of Kazakhstan** for 2005-2015", "State Program for the Formation and Development of the NIS of the Kyrgyz Republic for 2006-2010" was adopted.

The structure of these programs is appropriate. These programs include scientific capacity development measures, innovation entrepreneurship, innovation and financing infrastructure, and public administration and supply arrangements between the NIS elements. According to their trends and ideology, these programs are close to the documents developed in the Russian Federation, Belarus, and Ukraine.

Studying the experience of establishing NIS in foreign and CIS countries, adapting it to its conditions and applying best practices of the world experience will allow to optimize the use of Azerbaijan's innovation potential and increase the competitiveness of the national economy on the basis of the establishment of the NIS.

3.2 Local trends in national innovation system: problems and development

2001-2005 was the turn of the year for the science of Azerbaijan, both for the economy and for the society and the country. In the advanced states, processes that meet modern trends in scientific and technical development are activated. For example: the formation of innovation activity infrastructure, the commercialization of scientific activity of the transitional society, the organization of scientific achievements, intellectual products and high technology marketing systems.

Priority directions of scientific and technical activity, fundamental and applied scientific researches are confirmed. Accordingly, the state scientific and technical program, fundamental and applied research program is formed.

Consider the costs involved in scientific research. If we look at the percentage of work done in Azerbaijan relative to GDP, we can see that since 1995, this figure is constant at 0.2%. This is a very small number compared to other countries. Only CIS countries are close to Azerbaijan (Belarus - 0.7%, Georgia - 0.2%, Moldova - 0.5%, Ukraine - 1.1%, Russia 1.4%). As it is seen from UN reports, the funds allocated for scientific research (as a percentage of GDP) are 2.2% in the world; is more than 2.4% in developed countries and continues to grow.

There is a positive trend in the dynamics of change in the number of scientific staff in these years. In recent years, the flow of scientists from science and the emigration of scholars have dropped dramatically.

The state provides great support to the financial interests of scholars. The key factor in the field of science is stabilization of wages. Particular attention is paid to the development of scientific cadres in the Republic of Azerbaijan. In the future, demand

for highly qualified specialists will grow in areas with a high level of science. For this reason, a new system for the preparation of highly skilled scientists is being created.

Innovation infrastructure is expanding in the regions of the country. It was decided to establish a regional innovation zone in 2007. Scientific-practical (technical) centers and agencies should be established in order to increase the efficiency of the use of material and financial resources and scientific potential in the scientific and innovation activities of the Republic of Azerbaijan.

Innovation activity affects the economic development of the country.

In recent years, new relationships have been established in the area of innovation activities and informatization. At the state level, agreements on scientific cooperation with CIS countries and countries of the world have been concluded. International cooperation has wide range: CIS, European Union, USA, Japan and others.

It is necessary to solve the following issues in the direction of implementation of the advantages of the formation of the national innovation system and innovation development of the Republic of Azerbaijan:

- Creating a legal framework for the formation of an appropriate technological economic environment for innovation development;

- development of the state program of protection and management of intellectual property;

- development and implementation of state program of material and technical base of science.

Innovation infrastructure has been actively developing in recent years as an important part of the modern Azerbaijan Republic's NIS.

It is possible to study the theoretical and practical basis of the development and development of innovation infrastructure and to develop an organizational-economic model of the republic's innovation infrastructure based on the analysis of the national innovation system of Azerbaijan. The most important element of the innovation infrastructure should be production technology, on the basis of which there are very few innovation centers. Despite the national economy, it is expedient to use three models of innovation centers in our republic: - national techno parks; - regional innovation centers; - high-tech areas.

The main purpose of creation of national parks is to attract additional resources for the future development of these fields through the involvement of national scientific and technical potential in priority areas of modern science in the economic processes and the commercial realization of scientific researches. Analysis of the experience of establishing foreign parks and summarized in this area provides grounds for the proper selection of the technology park model taking into account public-political realities and natural-economic resources, as well as the development

of scientific and technical and innovative potential of a particular region the level of impacts on a more successful solution of socio-economic issues. It can be noted that in the United States, Great Britain, Europe (France, Germany, Spain, Finland), Russia, Japan, Turkey and so on. A comprehensive analysis of the technology parks' creation and functioning in countries can be an example for Azerbaijan in the field of technology parks. Thus, the first steps have already been taken in this area.22 In December 2009, the first stage of the Sumgait Technologies Park (STP) was put into operation by the order of President Ilham Aliyev. The park area is 45 hectares. The area of the factory buildings is 140,000 square meters. More than 2300 people have been employed in the construction and installation works within the first phase of the technopark. Upon completion of the enterprise, 3000 people, including highly qualified engineers, will be provided with permanent jobs. The Sumgayit Technology Park will produce products for the power industry, establish factories, shops and production lines. Sumgait Technologies Park: 1) Equipments that allow alternative energy sources to be used; 2) Equipment of wind power and low power hydropower plants; 3) Large diameter plastic, high-strength resistant metal-plastic tubes; 4) Argon, oxygen, nitrogen and other technical gases; 5) hot-rolling metal structures; 6) Devices used for solar energy; 7) Different types of plastic, isolated, modern, low, medium, high and extreme high power cables (500 kV copper and aluminum core, corrosion-resistant underwater lead shell, underground steel aluminum armor, etc.); 8) It has factories that allow producing bare and plastic insulated electric wires and modern power transformers. The plant is one of the largest and hi-tech enterprises in the region, which has no analogues in the country. Currently, the plants operating in the STP (Sumgait Technology Park) are: 1) Cable plant; 2) Manufacture of copper and aluminum electrotechnical sticks of cable plant; 3) Production of aluminum and copper profiles; 4) Heavy machine building plant; 5) Mechanical repair shop of Heavy machine building plant; 6) Hot galvanizing plant; 7) Plant of precision machining centers; 8) Production of technical gases; 9) Metal molding plant; 10) Electronics factory; 11) Solar collector shop; 12) High-voltage electrical equipment plant; 13) Powder painting shop. In the future, the number of plants is expected to reach 30.

The main purpose of creation of regional innovation centers is the activation of innovation processes on a wide spectrum of technological directions in the regions of Azerbaijan. Areas of high technology are considered to be subjects of innovation infrastructure and operate on the basis of establishing joint ventures with foreign companies for the production of high-tech consumer products. The purpose of creation of such organizations is to attract the advanced technologies of consumer goods production to the economy of Azerbaijan. Prerequisites for high-tech landfill

are favorable geographical position, availability of rich mineral resources, sufficient economic development and economic and political stability. The most important conditions for the effective development of high-tech areas are the development of a relevant legislative framework and the application of discounts for potential partners. High-tech areas can be created in associations. The development of high-tech areas helps to increase the share of high-tech products in GDP in a relatively short period of time by bringing the local scientific and technical and production staff into a high-tech sphere, creating favorable conditions for entering the world market with competitive products and copying the transition to an international quality standard.

Domestic producers' intellectual property facilities, legal security and commercial use are provided by organizational and methodological and state stimulation processes in the field of safety and use of intellectual property objects

The state-sponsored support for innovation often does not give its effectiveness because innovation services and infrastructure are not developed at the required level.

There is a system approach to the development of the NIS in the country.

Close collaboration between technoparks and other elements of innovation infrastructure (enterprises, universities, etc.), sharing information is almost at a loss. Each structure operates individually and is not aware of the work of the other. Therefore, repetitions occur in cases. Responding to market demands in a timely manner among the members of the innovation process, increasing competitiveness and enhancing the effectiveness of all organizations. Purposeful political events would have impeded the development of the innovation process.

Today, we need to unite Azerbaijan's resources and capacities to address key issues of sustainable economic growth. It is possible, on the one hand, to strengthen relations between fundamental and applied sciences, and on the other hand, the production of innovative products and market capture. Priority directions of the development of the country's innovation system are the creation of a mechanism for the development of the intellectual and industrial property market.

Innovation infrastructure is constantly developing and new facilities are being created. Today, the innovation system infrastructure includes technology transfer centers, innovation-technology centers, technoparks, business incubators, personnel training centers for innovation activities, venture funds and so on. It concerns.

In order to ensure innovation processes in the country, it is necessary to create innovation information base in innovation management in organizations.

In the field of innovation, in the strategic and tactical policy, the following should take into consideration:

- Improvement of the legal and regulatory framework
- Improving innovation practices

• financial support from the government

• development of venture financing system

• Supporting and stimulating the interaction of small, medium and large businesses in the field of innovation

• Innovation infrastructure development: technoparks, nanotechnology centers and business incubators, etc.

They are essential in establishing a complex system of innovative activity in the country. On the other hand, in the modern era, new forms of science and technology development are sought. One of the solutions to these issues is the creation and development of technoparks.

Taking into account the above-mentioned factors, it is necessary to create a network of innovation subjects, the infrastructure of innovation development.

Creation of innovation economy is one of the priorities of development of the Republic of Azerbaijan. Today, Azerbaijan, a natural resource center, is focusing on the development of non-oil fields. This requires the acceleration of the development of the scientific and educational complex in the republic. The opportunities for creating a new innovation business based on knowledge in Azerbaijan should be improved.

The purpose of diversification of the economy of the Republic is to increase GDP, including the production of new types of goods and services, to increase the competitiveness of high-tech products at local and world markets, to create new technologies and advanced technologies for increasing productivity,

Therefore, the concept of innovation network focuses on the development of science-based business (entrepreneurial activity).

Let's note two main factors affecting the creation and effective functioning of innovation subjects:

1) The functioning normative-legal base is almost non-existent

2) The state supportive measures system has not been fully implemented

According to the research, the effectiveness of innovation subjects is only possible with the establishment of a system of measures at different levels of management, creating an effective state support mechanism at all stages of its establishment.

CONCLUSION

Methods for evaluating innovation potential have been analyzed and specific problems have been identified for evaluating innovation potential at all levels of the economic system. The adaptation of international experience to Azerbaijan is characterized by some national characteristics. In this case, it is necessary to take into account the relevant economic and organizational problems, the statistical records and reports of Azerbaijan and national information bases. The system of indicators characterizing the innovation development of Azerbaijan has been developed taking into account the experience of the Oslo administration, the experience of Russia and the CIS, the possibilities of statistics in Azerbaijan.

1. The existing classification systems for the evaluation of the innovative potential of economic systems can be expanded by the mathematical methods of the theory of fuzzy masses.

Innovation potential level assessment is carried out with the help of multilineal analysis of the development of a balanced indicator system and determining their relationships within such a model, and logically, the essence of innovative activity of subjects (country, zone of economy, region, enterprises) is predetermined.

2. Traditional forms of innovation performance assessment are not universal. Implementation of new methodologies in monitoring research, improvement of diagnostic methods of innovation activity creates a basis for finding optimal directions of innovation policy. This ensures an increase in the number of active innovation organizations and innovative development of the country.

The method of measuring the innovation activity offered in this study will allow regular monitoring to determine the innovation potential of the subjects and the effectiveness of innovation activities in the country.

3. To increase the efficiency of innovation activities of economic entities management system should be improved.

When monitoring the system, it is important to take into account the possibilities for improving management techniques without touching upon its basis. In this case, the system of international standards in the field of science, technology and innovation statistics can be combined with the official state statistical system.

4. Some of the factors influencing the activities of organizations on the basis of the results of statistical data has been monitored.The developed system of indicators that allows evaluating various aspects of the organizations' activities has become a methodological basis for the realization of the issues. Indicators system is reflected in a set of methodological tools. This indicator system has been developed taking into

consideration the results of international sociological studies in this area and local characteristics.

The development of potential and innovation in economic zones is one of the key issues in the development of the national innovation system in the country. Formation of the national innovation system requires the development of economic zones. As a result of the research two methods were adapted and calculated for Azerbaijan:

- methodology for assessing innovation potential development;
- multinational analysis methodology of innovation potential development.

5. Based on the internationally accepted principles, the innovation index has been formulated and the innovation index for each economic zone has been found for a comparative assessment of Azerbaijan's innovation potential, and the cluster analysis has been conducted for this index.

The selected indicator system allows evaluating the level of innovation development of different areas and analyzing the factors affecting the innovation index in the economic zones.

6. The innovation potential indicator system has been developed and designed as an element of the overall management system. The role of innovation potential of the subjects in the system and the role of innovation potential in this system has been studied in detail. The functioning of such a management system prevents the development of negative processes in innovation activities.

A complex valuation technique has been developed based on the analysis of innovation potential assessment techniques. With the help of the proposed methodology, it is possible to analyze the level of innovation potential that is essential for the strategic management of innovation activity

7. The method of complex assessment of the innovation potential, based on proposed theory of fuzzy clusters, has not been applied previously for multidimensional analysis of the socio-economic environment of innovation potential of economic zones.

8. Methods of innovation capability development and innovation potential management mechanisms have been successfully applied to address strategic issues in the state enterprises and economic zones. Also, the developed methodological instrument can be used in the practice of subjects in order to achieve the potential for maximum economic outcomes.

9. It would be expedient for the State to have a coordinating body dealing with subjects of state legislation and subjects of innovative activity on all subjects of innovation infrastructure in the Republic of Azerbaijan (industrial parks, technoparks, agro-parks, industrial neighborhoods, etc.). The presence of such a co-ordinating system is centralized registration and monitoring of the scope, location and content of all

subjects of innovation infrastructure, as well as other issues, updating information on them, and identifying state and local self-government bodies, as well as physical persons it is expedient to create a single state register to increase the efficiency of interaction between government agencies involved in information systems on innovation infrastructure subjects.

Using the functional approach, we have identified the following eight functions of the national innovation system of the Republic: study of the characteristics of different countries' NIS and their adaptation to the socio-cultural and economic environment of Azerbaijan: formation of innovation policy; establishing regulatory environment and mechanisms essential for the organization and implementation of innovation processes; identifying perspective scientific directions and choosing priority innovation processes; Formation and distribution of resources; the formation of human capital that meets the development needs of innovation activities and the creation of essential material assets; creating incentives for innovations; supporting the development of new production and service industries based on high technology.

10. The draft of the Law on the Formation and Development of the National Innovation System of the Republic of Azerbaijan, the Law on the Formation and Development of Innovation Infrastructure in the Republic of Azerbaijan and the Regulation on the Procedure for the Unified State Register of Innovation Infrastructure Agents of the Republic of Azerbaijan. The strategic goal of these projects is to create a socially-oriented economy, which is based on innovation-based, resource-efficient use in Azerbaijan, with high scientific potential, competitive products on the world market, producing sustainable socio-economic development, improving the environment and welfare of the people forming.

In order to succeed in these areas, implementers of the measures to be implemented at different levels of the innovation program, implementation period, economic and organizational mechanisms, funding sources and legal bases have been specified. Innovation program management structure consists of 6 levels (from the President of the Republic, from the Cabinet of Ministers to the specific enterprises).

In order to create a legal basis for the implementation of the innovation program, some modifications and additions have been made to existing legal and regulatory documents. Implementation of the innovation program will contribute to the creation and development of a new national innovation system.

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