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OPPORTUNITIES FOR ENHANCING THE EFFICIENCY OF REGIONAL INNOVATION INFRASTRUCTURE

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Abstract: This article discusses the issues of increasing the efficiency of regional innovative infrastructure and the possibilities of its implementation. It also substantiates the possibility of applying proposals and recommendations to increase the efficiency of regional innovative infrastructure.
Key words: Territory, infrastructure, innovative infrastructure, efficiency, technology, innovation, innovative activity.

Introduction

In today's context of global competition, the development of regional innovation infrastructure and the enhancement of its efficiency hold strategic importance. As a critical task, the effective functioning of infrastructure contributes to increasing the economic potential of regions, introducing new technologies, and stimulating innovative activity. Therefore, it is essential to improve the efficiency of regional innovation infrastructure.

In this regard, several regulatory and legal documents have been adopted in Uzbekistan. In particular, with the aim of accelerating innovative development, ensuring the widespread application of innovations and technologies across all sectors of the economy, and fostering human capital, science, and innovation, the Presidential Decree of the Republic of Uzbekistan No. PO-165 of July 6, 2022, was issued [1]. Consequently, enhancing the efficiency of regional innovation infrastructure is considered one of the most important strategic directions.

Literature review

Enhancing the efficiency of regional innovation infrastructures, based directly on global experience and national needs, is regarded as an important task that serves the sustainable socio-economic development of regions. Therefore, an innovation-based development model has become a decisive factor in strengthening regional competitiveness, creating new jobs, and expanding the production of high value-added goods. In this regard, a number of studies have been conducted on improving the efficiency of regional innovation infrastructure. In particular, the literature on endogenous growth indicates that regional potential to support innovation is embodied in the institutions and resources of the region, that is, in its core technological infrastructure [2].

Improving the efficiency of innovation infrastructure should be directly linked to governance. Specifically, under the conditions of economic modernization, the principles of state governance should shift towards an active policy aimed at stimulating economic growth, supporting innovations, financing housing construction, and developing infrastructure [3]. Accordingly, the enhancement of regional innovation infrastructure efficiency is based directly on the governance system. Innovation activity requires strengthening the technical base of small and medium-sized enterprises, attracting qualified personnel, ensuring effective use of innovation infrastructure elements, and establishing a management system that promotes the utilization of innovations [4].

Other studies emphasize that innovative enterprises face a number of challenges at the initial stage of their development. These difficulties include a lack of working capital, shortage of

employees with the required qualifications, absence of consulting and informational support, as well as a cautious approach by investors and potential partners due to the high-risk nature of innovation-based business activities [5]. Consequently, innovative enterprises demand a strong scientific foundation and typically evolve into long-term ventures focused on prototype creation. Moreover, improving the efficiency of regional innovation infrastructure is considered directly dependent on innovative development. For instance, as a result of the economic policies currently being implemented in Uzbekistan, the shift from exporting raw material reserves to exporting finished products is associated with innovation-driven development [6].

In this respect, enhancing the efficiency of innovation infrastructure is based on the advancement of the actors of innovation activity. In other words, the infrastructure of innovation activity consists of a set of organizations that provide services necessary for innovation actors to carry out their innovative activities [7]. Furthermore, research has also been conducted on exploring the innovation development environment as a means of improving the efficiency of regional innovation infrastructure. In this regard, innovation infrastructure, as the most important component of the innovation system, reflects the environment in which innovations are developed [8].

Analysis and Results

In order to enhance the effectiveness of regional innovation development strategies, it is necessary to implement the following measures:

- Development of science and technology. This includes analyzing the future state of market relations and defining long-term objectives;
- Designing an innovation planning strategy. At this stage, it is essential to develop alternative methods and instruments to achieve the objectives identified in the previous stage;
- Advancement of digital technologies**.** Proposals should be developed for the effective integration of scientific and start-up project outcomes in the field of science and innovation into the regional economy;
- Enhancement of regional intellectual and technological potential**.** This requires the implementation of measures aimed at improving the country's position in international rankings in the fields of science and innovation;
- Formation of modern infrastructure. Proposals should be prepared for the effective introduction of scientific and start-up project outcomes related to the development of digital technologies in the fields of science and innovation into the regional economy;
- Achievement of target indicators. Measures should be taken to achieve the target indicators that assess the effectiveness of regional economic innovation development strategies;
- Development of solutions and recommendations to address challenges.

In cooperation with the responsible regional structures, it is necessary to identify systemic shortcomings that hinder the implementation of measures aimed at improving the country's position in international rankings in the fields of science and innovation.

Moreover, opportunities for enhancing the efficiency of infrastructure can be realized through the following directions:

- Strengthening the integration of education and science – ensuring the active involvement of universities and research centers in innovation processes;
- Development of innovation clusters and technoparks – supporting projects based on regional specialization;
- Utilization of digital technologies – introducing modern IT solutions in the management and dissemination of innovation;
- Public-private sector cooperation – improving the investment climate and fostering start-ups;
- Support for small and medium-sized enterprises (SMEs) – expanding opportunities for the commercialization of innovative ideas;
- Enhancement of local human capital – through training courses, incubators, and professional development programs;

- Improvement of the regulatory and legal framework – ensuring the effective organization of financial support mechanisms and creating an institutional environment open to innovation.

Indeed, the key directions for enhancing the effectiveness of regional innovation infrastructure include the following:

1) Defining strategy and focus:

- Region-specific strategy: Developing an innovation development strategy tailored to the unique economic, social, and scientific-technical potential of each region;
- Goal-oriented tasks: Setting objectives that are Specific, Measurable, Achievable, Relevant, and Time-bound (SMART);
- Continuous analysis and monitoring: Regularly analyzing and monitoring the development of innovation infrastructures, identifying existing challenges, and taking measures to address them.

2) Strengthening the innovation ecosystem:

- Engaging all stakeholders: Establishing strong cooperation between the state, academic and educational institutions, the private sector (start-ups, enterprises, and investors), non-governmental organizations, and civil society institutions;
- Development of incubators, accelerators, and technoparks: Enhancing the material and technical base of these institutions, ensuring their provision with qualified specialists, and increasing the efficiency of their activities;
- Project preparation and financing: Developing innovation projects, improving mechanisms for attracting investments, and allocating grants and loans;
- Knowledge and experience exchange: Promoting the study and dissemination of best practices from successful experts, entrepreneurs, and foreign specialists in implementing innovative projects.

3) Developing intellectual potential:

- Training and skills development: Preparing new specialists in line with the needs of the economy and upgrading the knowledge of existing personnel in innovation technologies and management;
- Encouraging scientific research: Supporting the generation of new ideas and discoveries at research institutes and higher education institutions;
- Fostering entrepreneurial spirit: Cultivating an entrepreneurial mindset among youth and talented individuals and motivating them to realize their ideas;
- “Brain marketing”: Attracting talented specialists working abroad or in other regions and leveraging their potential for local development.

4) Establishment and Utilization of Modern Infrastructure

- Digital transformation: Digitalizing innovation infrastructures, automating data exchange, and project management processes;
- Creating conditions for business and innovative activities: Establishing a favorable business environment for new enterprises, startups, and small and medium-sized enterprises, while expanding access to office spaces, laboratories, equipment, and other essential resources;
- Protection of intellectual property: Improving legal and practical mechanisms for protecting new inventions, technologies, and ideas.

5) State Support and Development of the Regulatory-Legal Framework

- Innovation-friendly legislation: Continuously improving the regulatory and legal framework that promotes innovation, facilitates entrepreneurship, and attracts investment;
- Tax incentives and preferences: Introducing tax benefits, customs exemptions, and other support measures for entities engaged in innovative activities;
- Stimulating innovation through public procurement: Giving priority to domestic innovative products and services in public procurement processes;
- Financial resources: Allocating state funds for financing innovative projects, as well as attracting international financial institutions and private investors.

6) International Cooperation

- Development of scientific and technical relations: Expanding cooperation with foreign research centers, universities, and companies;
- Knowledge and experience sharing: Studying and implementing advanced international practices in the management and development of innovation infrastructures;
- Attraction of investment and technologies: Engaging foreign investors and introducing modern technologies into the region through such partnerships.

Conclusion

First and foremost, regional innovation infrastructure is a system that ensures cooperation between science, production, and entrepreneurship entities within a region, serving as a mechanism for the practical implementation of new technologies and ideas. The effective organization of such infrastructure plays a crucial role in modernizing the regional economy, creating new jobs, and increasing the share of innovative products.

Accordingly, through systematic and consistent efforts to enhance the efficiency of regional innovation infrastructure, it becomes possible to strengthen its contribution to the economic and social development of the region. Enhancing efficiency in this sphere allows for the rational use of existing resources, the identification of local opportunities, and their development through a coordinated policy approach.

Thus, improving the efficiency of regional innovation infrastructure is a complex and multifaceted process, the outcomes of which depend on a number of factors. As a result, the evaluation of innovative projects aimed at developing regional innovation infrastructure should be carried out, thereby substantiating the strategic directions for enhancing competitiveness and long-term sustainability.

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