



Article

The Formation of an Effective State Innovation Policy and the Specifics of Creating Innovation Clusters in Uzbekistan

Malikha Azizova Farrukh qizi*¹

1. National University of Uzbekistan named after Mirzo Ulugbek, Tashkent, Uzbekistan

*Correspondence: abdugafurovamaliha@gmail.com

Abstract: This study investigates the establishment of a sound state innovation policy and the innovation clusters in Uzbekistan as the world economy is becoming increasingly competitive. Internationally, innovation clusters are known as powerful industrial engines that accelerate the translation of science into business and then into economic activity and involve triple-helix collaboration between science, business and government. While these developments are positive and reflect progress, a number of hurdles remain for Uzbekistan to unleash its full cluster potential. There is little research to date that analyzes systemic barriers and offers integrated policy solutions on a national level. It is based on qualitative methodology with the use of a comparative analysis, a systematic approach and review of scientific literature and regulatory documents. It assesses the landscape of the innovation ecosystem of a nation across four dimensions of institutional, human capital, financial, and infrastructure. The results highlight a number of important limitations, such as an absence of strong legislation, a low level of research commercialization, limited access to funding, a lack of qualified experts, and poor infrastructure. Cluster effectiveness is also constrained by frail coordination amid stakeholders and a relatively low involvement of small-and-medium-sized enterprises (SMEs). The findings underscore the need for a holistic and integrated policy response. The main recommendations focus on improving legal frameworks, investment mechanisms and human capital, infrastructure and demand, as well as regional and inclusive cluster development. The study emphasizes that if the lifestyle measures are combined then one could create a sustainable innovation system with enhanced economic competitiveness and an easier shift in direction towards knowledge-based economy. The results of this research are useful for policymakers and can also be used for the practical purpose of reinforcing innovation-driven economic growth in Uzbekistan.

Keywords: Innovation Policy, Innovation Clusters, Uzbekistan, Cluster Development, Innovations

Citation: Farrukh qizi, M. A. The Formation of an Effective State Innovation Policy and the Specifics of Creating Innovation Clusters in Uzbekistan. American Journal of Economics and Business Management 2026, 9(4), 281-286.

Received: 20th Feb 2026

Revised: 06th Mar 2026

Accepted: 20th Mar 2026

Published: 05th Apr 2026



Copyright: © 2026 by the authors. Submitted for open access publication under the terms and conditions of the Creative Commons Attribution (CC BY) license

(<https://creativecommons.org/licenses/by/4.0/>)

1. Introduction

Innovation has emerged as a pivotal catalyst for sustainable economic growth and competitiveness in the globalized and technologically transformed environment. In an age where innovation policies and cluster-based development have become a dominant model of development for many countries to spur technological advancement, productivity, and economic interlinkages amongst actors [1]. Innovation clusters are considered as the prime mechanism for new knowledge creation and research commercialization and combines business, science and education. In case of emerging economies as Uzbekistan innovation clusters development is not only a strategic-priorities but an institutional challenge to accomplish.

While recent reforms and development of innovation Performance show improvement in Uzbekistan, the cluster approach is still at an early stage of development. While these existing initiatives show promise, they are typically hindered by fragmented policies, low levels of stakeholder coordination, and weak integration between research institutions and industry [2]. Innovation policy also has far-reaching implications for cluster development because clusters can only flourish where coherent regulatory frameworks, funding arrangements and national and regional development strategies are aligned. While theoretical foundations of “triple helix” model highlight the significance of interaction dimensions between the government, academia and industry, their practical application stagnates in Uzbekistan [3], [4].

It is known that clusters promote competitiveness and innovation capacity, but there were not enough studies that thoroughly explore a systemic view on barriers of project implementation in Uzbekistan context. More specifically, the relationship of human capital shortages, access to finance, poor infrastructure and under commercialization of scientific research have not been comprehensively studied in an integrated policy framework. This study fills that gap by delivering a systematic assessment of the current state of the innovation ecosystem and outlining major limitations to successful cluster development [5].

It presents a qualitative methodology through comparative analysis, systematic approach and a review of academic and regulatory sources. It is meant to assess the status quo, understand the most pressing binding constraints, and provide data-driven conclusions and policy recommendations on the same; The anticipated results include a better grasp of the interconnectedness of institutional, economic and infrastructural elements, and the practical guidance for enhancing cluster-based development. The results will lay the foundations for a better coordinated and responsive innovation policy, which will also be supportive of sustainable economic development and enhanced integration of Uzbekistan into the system of the global knowledge economy [6].

2. Methodology

The qualitative research design of this study investigates on successful policy of innovation and development of innovation clusters in Uzbekistan. The current status of the national innovation ecosystem is evaluated with a systematic approach and comparison with the international context. This research draws upon secondary data, including scientific literature, policy documents, government strategies, and regulatory frameworks related to innovation and cluster development. Institutional, financial, human capital and infrastructural dimensions are more pronounced and contextually relevant in impacting cluster performance [7]. This provides a comparative perspective to help spot the differences between the current practices in Uzbekistan and the generally recognized models of cluster development. Also, some aspects of content analysis are applied to analyze policy preferences and policy directions described in policy and strategy documents. It also synthesizes findings from the literature on the recurrent issues of insufficient commercialization, poor stakeholder coordination, and limited access to capitalization. This combined methodological perspective facilitates a holistic consideration of systemic barriers, thereby aiding in generation of actionable, evidence-based recommendations.

3. Results and Discussion

The In Uzbekistan, innovation clusters are seen as a key tool for enhancing the economy's competitiveness, bringing together business, science, and education to jointly develop new technologies and products. The country has already made notable progress; for instance, the republic has climbed 36 places since 2015 in the Global Innovation Index, which is assessed using 81 indicators. Nevertheless, significant barriers remain, hindering the full realization of the cluster potential. Specifically, the commercialization of scientific

research and the level of cooperation between science, education, and industry are still low, which indicates insufficient interaction among participants [8]. There is also a shortage of qualified personnel and managerial competencies, a weak regulatory framework for cluster policy, investment barriers, and a deficit in innovation funding.

Improving Legislation and Institutions for Clusters. The cluster approach has been applied in Uzbekistan only recently, and legislative support in this area remains fragmented. There is no systemic law or comprehensive policy on the development of innovation clusters (with the exception of individual sector-specific resolutions, such as those for cotton and textile clusters). This weak legal framework leads to uncertainty regarding the status of clusters, the rights and obligations of their participants, and the inadequate protection of their interests. It is necessary to develop and adopt a comprehensive regulatory framework to govern the creation and operation of innovation clusters. Such a legal framework should provide a clear definition of a "cluster," establish transparent criteria for obtaining cluster status, and outline state support measures. It is important to legally formalize the rights of cluster participants (companies, universities, startups, etc.) and the mechanisms for protecting their interests, which will increase confidence in cluster initiatives. It is recommended that a specialized coordinating body for cluster policy be established, responsible for inter-agency coordination and the implementation of cluster programs [9].

Investing in education, training, and talent acquisition. One of the most acute problems is the shortage of qualified specialists - engineers, technologists, researchers, and managers - capable of working effectively within a cluster model. The existing gap between the needs of modern industries and the skill level of the workforce is recognized at the very highest level. As President Shavkat Mirziyoyev emphasized, the personnel training system does not yet meet the real needs of the economy: even large enterprises face a deficit of specialists and are forced to hire foreign experts. In the coming years, the industry will require hundreds of thousands of new qualified employees, including for the implementation of cluster initiatives. This skills gap is evident not only in blue-collar professions but also at the management level - there is also a shortage of effective cluster managers who can foster cooperation among diverse participants. This talent shortage constrains the growth of clusters: promising projects may not be realized due to a lack of necessary specialists, and existing clusters risk suffering from ineffective management [10].

A set of measures to stimulate investment in clusters. Innovative projects and cluster associations often require significant investment - for scientific research, new product development, equipment acquisition, and infrastructure creation. In Uzbekistan, companies' access to innovation financing remains difficult. While budget allocations for science and innovation have increased in recent years, their volume is still small relative to the needs. Private investment and venture capital are only just beginning to develop, and banks often consider high-tech projects too risky. As a result, many enterprises, especially small firms and startups, face a lack of funding for their innovative ideas. Investment barriers also include difficulty in accessing loans, high collateral requirements, and a lack of risk-sharing instruments. International financial organizations and funds are still minimally involved in cluster projects [11]. Although state support for clusters exists (for example, preferential loans for agro-clusters), it is fragmented and does not cover the entire innovation chain - from R&D to implementation and scaling. Without resolving these issues, the financial deficit will impede cluster growth and reduce motivation.

Creating and modernizing infrastructure for the needs of clusters. The productive work of clusters also requires a material, technical, and informational environment in which participants can interact and innovate. Currently, Uzbekistan's innovation infrastructure is in its formative stages. There are technology parks, incubators, and special economic zones, but their number and equipment levels are still limited. Many clusters, especially outside the capital, lack laboratories, centers for the shared use of high-tech

equipment, testing grounds, modern coworking facilities, and office spaces for teams from different organizations. This hinders joint research and development: companies lack access to necessary technologies, and university laboratories are often disconnected from industrial needs [12] [13]. Furthermore, infrastructural constraints affect logistics and communication within clusters - transport is underdeveloped for effective cooperation between producers and suppliers, and there are no unified digital platforms for data exchange among participants. As a result, innovation processes are fragmented: there is no single ecosystem connecting enterprises, regions, and research and educational organizations in a continuous "research-implementation-production" cycle. This fragmentation of infrastructure leads to scattered efforts and duplication of work, instead of the synergistic effect of clustering.

The government should incorporate the principles of regionalization into its cluster policy. Firstly, it is necessary to develop and approve regional roadmaps for innovative development that are integrated into the national strategy [14]. These roadmaps should identify priority areas for clustering in each region based on its specialization (e.g., agro-innovations in the Fergana Valley, mining and mineral processing in the Navoi region, tourism in the Bukhara region, etc.). Secondly, it is advisable to create regional innovation development centers - subdivisions (for instance, under the khokimiyats or regional branches of the Ministry of Economy/Ministry of Innovation) responsible for coordinating cluster projects at the local level. Such centers would be able to provide targeted support for local initiatives, form coalitions between local businesses and universities, and put forward proposals for investor incentives in the region. Thirdly, the financing system should take the territorial aspect into account by allocating targeted grants and subventions for cluster development, specifically in underdeveloped or high-potential areas, to stimulate the equalization of opportunities. For example, a "100 Ideas for the Region" competition could be established to support the best cluster projects from different areas [15]. It is also important to disseminate successful experiences. For instance, if a cluster (such as textile or IT) has achieved success in a particular region, its best practices should be transferred to other regions with similar potential, adapting them to local conditions.

Inclusive clusters and support for small innovative businesses. In modern innovation-driven economies, it is small and medium-sized enterprises (SMEs) and startups that are the drivers of radical innovation and flexibility. However, in Uzbekistan's cluster practices, large enterprises still dominate, while SMEs are often not fully involved. The reasons for this are varied: small firms may lack the resources or competencies to integrate into cluster value chains, or they may face entry barriers such as a lack of information or difficulty meeting the formal criteria for technopark residency [16]. Startups are an even more vulnerable category, finding it difficult to forge collaborations with large corporations or gain access to cluster infrastructure. Furthermore, there have been no optimal mechanisms to allow successful startup projects to transition to the next stage of development within the cluster ecosystem. The Innovation Development Strategy notes that mechanisms for admitting successful startups into technoparks and free economic zones at the mass production stage have not been developed, nor are there special incentives for the private sector to co-finance innovation. As a result, small innovative players often remain outside of clusters, and the economy misses out on their contribution to innovative renewal.

To foster the dynamic growth of Uzbekistan's economic competitiveness through innovation, it is essential to comprehensively develop the cluster model while eliminating existing barriers [17]. The preceding sections offered recommendations across eight interconnected areas. However, only the integrated implementation of all these recommendations will enable the formation of a favorable ecosystem. Consequently, by implementing the proposed recommendations, Uzbekistan can transform its innovation clusters into an effective mechanism for boosting the national economy's competitiveness,

where current barriers are overcome and all participants are united by common development goals and the pursuit of mutual benefits from innovation. Such a holistic and balanced approach will promote technological progress, create high-productivity jobs, and strengthen the country's position in the global knowledge economy.

4. Conclusion

The formation of an effective innovation policy and the development of innovation clusters are key conditions for long-term economic growth and an increase in the country's global competitiveness. The analysis conducted has shown that despite positive trends and ongoing reforms, a number of systemic limitations - institutional, human resources, financial, and infrastructural - persist in Uzbekistan, hindering the realization of its cluster potential.

Addressing these challenges requires a comprehensive and coordinated approach from the state, the business sector, and the scientific and educational community. Specifically, it is necessary to strengthen the regulatory framework, establish sustainable mechanisms for financing innovation, develop human capital and modern infrastructure, and implement effective interaction models within the "triple helix" framework. Supporting regional initiatives and ensuring the inclusiveness of cluster policy by involving small and medium-sized enterprises and startups is of particular importance.

The practical implementation of the proposed measures will facilitate the creation of an integrated innovation ecosystem that ensures a continuous link between scientific research and its commercialization. This, in turn, will contribute to productivity growth, the creation of highly skilled jobs, and an increase in the country's investment attractiveness. In the future, further research could be directed toward the quantitative assessment of cluster policy effectiveness, a comparative analysis of international experience, and the development of tools for monitoring and evaluating the innovative activity of clusters. Thus, the formation of a balanced and adaptive innovation policy will become a crucial factor in the sustainable development of Uzbekistan's economy amidst global competition.

REFERENCES

- [1] President of the Republic of Uzbekistan, "On approval of the Innovation Development Strategy of the Republic of Uzbekistan for 2022–2026." 2022. [Online]. Available: <https://nrm.uz/contentf?doc=696819>
- [2] UPL.uz, "Uzbekistan faces shortage of qualified specialists – President." 2022. [Online]. Available: <https://upl.uz/economy/55172-news.html>
- [3] OECD, *Clusters, Innovation and Entrepreneurship*. Paris: OECD Publishing, 2009.
- [4] OECD, *The OECD Innovation Strategy: Getting a Head Start on Tomorrow*. Paris: OECD Publishing, 2010.
- [5] World Bank, *Innovation Policy: A Guide for Developing Countries*. Washington, DC: World Bank, 2010.
- [6] P. Cooke, "Regional Innovation Systems: Competitive Regulation in the New Europe," *Geoforum*, vol. 23, no. 3, pp. 365–382, 1992.
- [7] P. Cooke, M. Uranga, and G. Etzebarria, "Regional Innovation Systems: Institutional and Organisational Dimensions," *Res. Policy*, vol. 26, no. 4–5, pp. 475–491, 1997.
- [8] A. Saxenian, *Regional Advantage: Culture and Competition in Silicon Valley and Route 128*. Cambridge: Harvard University Press, 1994.
- [9] H. Etzkowitz and L. Leydesdorff, "The Triple Helix of University–Industry–Government Relations," *Res. Policy*, vol. 29, no. 2, pp. 109–123, 2000.
- [10] M. E. Porter, *The Competitive Advantage of Nations*. New York, NY, USA: Free Press, 1990.
- [11] B. Asheim and A. Isaksen, "Location, Agglomeration and Innovation: Towards Regional Innovation Systems in Norway?," *Eur. Plan. Stud.*, vol. 5, no. 3, pp. 299–330, 1997.
- [12] R. Baptista and P. Swann, "Do Firms in Clusters Innovate More?," *Res. Policy*, vol. 27, no. 5, pp. 525–540, 1998.

-
- [13] M. E. Porter, "Clusters and the New Economics of Competition," *Harv. Bus. Rev.*, vol. 76, no. 6, pp. 77–90, Nov. 1998.
 - [14] S. A. Rosenfeld, "Bringing Business Clusters into the Mainstream of Economic Development," *Eur. Plan. Stud.*, vol. 5, no. 1, pp. 3–23, 1997.
 - [15] D. B. Audretsch and M. P. Feldman, "R&D Spillovers and the Geography of Innovation," *Am. Econ. Rev.*, vol. 86, no. 3, pp. 630–640, 1996.
 - [16] J. Fagerberg, D. C. Mowery, and R. R. Nelson, *The Oxford Handbook of Innovation*. Oxford: Oxford University Press, 2005.
 - [17] UNIDO, *Industrial Development Report 2020: Industrializing in the Digital Age*. Vienna: United Nations Industrial Development Organization, 2020.