

Sustainable Development Goals in the Republic of Uzbekistan: the effectiveness of innovative development reforms

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Abstract. The ongoing large-scale reforms in all spheres of the socio-economic, environmental and political spheres of Uzbekistan are directly related to the structural tasks defined in the Sustainable Development Goals. One of the key directions at the stage of development for Uzbekistan is the formation of an innovative economy.

In this regard, this article is devoted to the analysis of the ongoing reforms and, consequently, the results achieved in the formation of an innovative economy in the country. The conducted research is based on empirical research, analyzing official statistics and other international organizations for 2013-2022.

The article reveals the reforms carried out in Uzbekistan in the field of innovative development within the framework of the Sustainable Development Goals. Analyzed the number of enterprises and organizations that produced innovative goods, works and services on their own, the number of enterprises and organizations that produced innovative goods, works and services in the manufacturing industry on their own, number of research specialists (except for part-timers and by specialty) in R&D (2013–2022 yy.).

Based on the conducted research, it is important to conclude that, despite the positive dynamics of some results in this area, a broader analysis of the innovation sphere is required to deepen reforms. The sphere of high technology requires special attention in the ongoing reforms, the share of which remains the lowest during the analyzed period.

Keywords: Sustainable Development Goals, economy, analyze, innovation, R&D, research, industry, technologies, development.

1. Introduction

The purpose of this article is to analyze the reforms in the field of formation of an innovative economy, which gradually covers all areas of socio-economic development of Uzbekistan.

Thus, the article analyzes the most relevant areas reflecting the innovative development of the country and justifies that the ongoing reforms in the field of innovative development are directly based on the tasks defined in the SDG.

In the report of the United Nations Conference on Trade and Development «Technology and Innovation report 2023» it was noted that innovations and advanced technologies should contribute to changing the needs and needs of humanity (United Nations, 2023).

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Innovation is central to supporting sustainable and inclusive growth of an economy and is a main facilitator of the transition to a circular economy. By generating and effectively transferring knowledge and technologies, innovation can help reduce inequalities and encourage greater value creation for growth and employment and overall prosperity (United Nations, 2022).

In order to prevent future cataclysms, various socio-economic, political and environmental changes, the United Nations adopted the “Sustainable Development Goals until 2030” on September 25, 2015. This document consists of 17 goals and 169 tasks that cover the most important areas for humanity today. The 9th purpose of the SDG is dedicated to the problems of sustainable infrastructure, industrial development and the promotion of innovation.

Despite the fact that all 17 SDG goals have elements of innovative development, innovation is given by a separate sustainable development goal. In particular, SDG goal 9 is dedicated specifically to innovation, for example, Goal 9.5 is to increase R&D spending (9.5.1) as well as to increase the number of researchers (9.5.2) (Dutta et al., 2023).

2. Literature review

The theoretical foundations of the formation and development of innovation, its socio-economic importance have been studied by many scientists in the world. Based on the study of numerous theoretical definitions of innovation, it should be noted that there is no single and generally accepted theoretical definition of innovation. This allows us to conclude that innovation is a multifaceted concept that covers all areas of socio-economic, environmental and humanitarian.

The concept of “innovation” in economics was one of the first founders of the Austrian and American economist Schumpeter. It was Schumpeter (1962, pp. 81–85) who defined “innovation” and “invention” in his teachings.

Innovation, as defined by Cooke and Mayes (1996) this is a full cycle of turning an idea into a finished product and before its implementation on the market.

Maclaurin (1949), in his research studying industry and commercialization of technological processes, identified factors influencing the technological development of the industry. Manzoor et al. (2023) in their research identify innovation as the main force of economic well-being and study the internal mechanisms and measures of their impact on well-being.

In their research, Myers and Marquis (1969) divide innovation into several types, including fast innovation, slow innovation, declining innovation, stable innovation, growth innovation and changing innovation.

Gramma-Vigouroux et al. (2024) in their research studied the driving forces and barriers in the implementation of SDGs in the context of national innovation ecosystems (NIEs). According to

them, at the NIE level, the driving forces for participants and institutions, such as compliance, environmental innovation, intersectoral cooperation and human resources, are hindered by some barriers such as lack of networking skills, institutional gaps, totalitarian power and academic rigidity.

Tu et al. (2023) in their empirical research, they have justified the impact of such economic activities as corporate social responsibility, eco-friendly supplier management, internal eco-friendly management and eco-friendly customer management on achieving the SDGs using data from seven developing countries. The results of the study were positive and the authors justified the impact of the above economic activities on the achievement of the SDGs.

Guo et al. (2022) in their research on the example of a Chinese province (within the framework of The provincial twinning programs), justified the importance of mutual assistance between provinces through the support of talent, capital and technological achievements to accelerate the process of poverty reduction. Using the example of this program, the researchers conclude that if a developed country, a major tech power, or a giant company supports and trains a less developed country to take full advantage of global public goods through this individual assistance program, it can significantly contribute to global sustainable development.

Vatananan-Thesenvitz et al. (2019) evaluated 1,690 journal articles extracted from the SCOPUS database on innovations in the field of sustainable development based on the scientific mapping method. Based on this study, the authors have identified the size, growth trajectory and geographical distribution of the literature on sustainable development.

The research by Cordova and Celone (2019) reveals the relationship between innovation and SDGs in an industrial context. SDGs are also analyzed in terms of the stakeholders involved, the reactions of companies and citizens. The results of the study revealed an increase in companies' interest in the SDGs.

3. Research method

The object of this study is the reforms carried out in Uzbekistan in the field of Sustainable Development Goals. The subject of the study is the trend of innovative development in Uzbekistan.

The analyzed period covers 2013–2022 years, which is based on official open data from the Statistics Agency under the President of the Republic of Uzbekistan, as well as data from the Global Innovation Index.

The conducted research is based on empirical analysis, statistical analysis, indicators of scientific and innovative development of the Republic of Uzbekistan. The data used are official and open sources of the Agency for Statistics under the President of the Republic of Uzbekistan.

4. Results and discussion

As noted by the President of the Republic of Uzbekistan Mirziyoyev (O'zbekiston Milliy axborot agentligi, 2020): “We have set ourselves the goal of joining a number of developed countries and will be able to achieve it only by carrying out accelerated reforms based on science, education and innovation”.

Today, reforms are being carried out in Uzbekistan to ensure the tasks defined in the SDG, within the framework of which the regulatory framework, institutional and economic foundations are being developed. In particular, at the 75th Assembly of the United Nations (December 14, 2022), the proposal of the President of the Republic of Uzbekistan Mirziyoyev “On strengthening the role of parliament in accelerating the achievement of the SDG” was adopted. Within the framework of this resolution, a special roadmap for 2023–2024 was adopted in order for Uzbekistan to achieve the SDG.

In particular, in order to implement certain SDG tasks, the Cabinet of Ministers of Uzbekistan adopted a resolution “Measures to implement National goals and objectives within the framework of SDG tasks until 2030”. Within the framework of this resolution, tasks were defined for each organization and ministry from the relevant SDG tasks (<https://lex.uz/docs/4013356>).

It is important to note that the fundamental foundations of Uzbekistan's innovative development are laid down in such strategic documents as:

- Decree of the President of the Republic of Uzbekistan “On the Strategy “Uzbekistan-2030””;
- Strategies of action on five priority areas of development of Uzbekistan in 2017–2021;
- Decree of the President of the Republic of Uzbekistan “On the establishment of the Ministry of Innovative Development”;
- Strategies of innovative development of the Republic of Uzbekistan for 2019–2021 and 2022–2026, etc.

In order to ensure the regulatory framework for the development of science and innovation in the period 2018–2022 yy., 88 documents were adopted in the country, including Laws (2), Decrees and Resolutions of the President (34), Resolutions and Orders of the Cabinet of Ministers (52).

The implementation of the tasks defined in the above-listed documents served as the basis for large-scale reforms in this area. Thus, in the direction of improving the system of financing innovation activities, the “Fund for Financing Science and Innovation Support” was created in the structure of the Ministry of Innovative Development. The funds of the Fund are directed to:

- financing of creation and implementation of innovations by subjects of innovative activity on a competitive basis;

- financing of research, innovation, development and startup projects on a competitive basis;
- financing the commercialization of the results of scientific and scientific-technical activities;
- financing of measures to equip scientific laboratories with modern high-tech equipment;
- covering the costs of registration and maintenance abroad of intellectual property rights (patents) created within the framework of state programs of scientific activity;
- payment of expenses for ensuring the free use of leading electronic databases of scientific data by research and higher educational institutions, as well as preparation for publication in international publications of scientific results;
- financing the creation of scientific and innovative accelerators and business incubators, advanced training of gifted youth in prestigious research centers, universities, technology parks and industrial organizations in developed countries, conducting scientific and practical events (symposiums, conferences, seminars, trainings, round tables, master classes and others), as well as their participation in international scientific and practical events;
- financing of scientific internships of young scientists in leading foreign scientific organizations (centers, universities and others);
- financing of expenses (wages, transportation and other expenses) of highly qualified specialists from foreign countries attracted by the Ministry of Innovative Development of the Republic of Uzbekistan, etc.

In order to introduce venture financing and attract financial resources from business entities for the implementation of innovative projects, the National Venture Fund “UzVC” was established by Resolution of the Cabinet of Ministers No. PKM-684 dated 11.03.2020, the purpose of which is to create an infrastructure to support innovative ideas and a startup ecosystem. The Fund is aimed at financing venture projects of legal entities and individuals, including in partnership with foreign entities.

Work has been established to develop innovative activities in the regions. Innovation centers are located in the territorial centers, on the basis of which, together with the regional administration, joint competitions are held to finance scientific and innovative projects. The winning projects will be financed in equal shares from the republican budget – 50% and the local budget – 50%. Thus, as of December 2021, 137 projects are being implemented, upon completion of which it is planned to create 1290 new jobs. To date, as part of the implementation of these projects, 80 companies have produced 230 types of products.

A system of commercialization of scientific developments has been created thanks to the Decree of the President of the Republic of Uzbekistan “On additional measures to improve the efficiency of commercialization of the results of scientific and scientific-technical activities”. This system is aimed at ensuring accelerated implementation of domestic scientific, applied and innovative

projects and developments, increasing the contribution of science to strengthening the competitiveness of the country's economy, and also, the creation of effective mechanisms for promoting promising domestic achievements in scientific and innovative activities.

Special attention is paid to attracting young people to the field of science and innovation. In accordance with Presidential Decree No.PP-4433 “On measures to improve the system of attracting young people to science and supporting its initiatives” dated 30.08.2019, the Youth Academy was established under the Ministry of Innovative Development.

The Academy of Youth promotes the initiatives of gifted youth, strengthens the potential of existing scientific schools, as well as the development of innovative potential in them.

To support and stimulate the scientific and creative potential of the Youth Academy members, 4 platforms were created: “Idea Generators”, “Startups”, “Business Representatives”, “Future Academics”.

1. “Idea Generators” is a platform for teams with their own innovative ideas aimed at solving a specific problem corresponding to the main directions of the Youth Academy;
2. “Startups” is a platform for teams with their own ideas and startup projects aimed at implementing real ideas with a specific plan for their implementation;
3. “Business Representatives” is a platform for teams applying the achievements of science and innovation in their activities, with at least one year of experience in the relevant field;
4. “Future Academicians” is a platform of scientists with high scientific potential who actively participate in the above-mentioned platforms, making a great contribution to the development of science in the country.

As part of the activities of the Youth Academy, a total of 6 major competitions were organized, 115 projects were implemented, upon completion of which 567 new jobs were created.

By Resolution of the Cabinet of Ministers of the PCM-No.133 “On measures to further improve the regulatory framework for scientific research” dated 03.19.2020, the Regulation “On the procedure for approving, financing and implementing startup projects” was adopted. The regulation defines the basic concepts and principles of the implementation of startup projects. Startup projects approved in accordance with this Regulation are financed through the Fund for Support of Innovative Development and Innovative Ideas, as well as from funds allocated to the Ministry from the state budget.

To strengthen the achieved results and define new goals for the development of scientific and innovative activities, on 11.09.2023, the Decree of the President of the Republic of Uzbekistan “On the Strategy “Uzbekistan-2030”” was issued. One of the goals of the decree was the entry of Uzbekistan into the number of countries with an above-average income through sustainable

economic development. As the implementation of this goal, the tasks in the field of scientific and innovative development were also noted in Appendix No.1 (Table 1).

Table 1. Goals in the field of scientific and innovative development in the part of the “Reform in the education system” of the Strategy “Uzbekistan-2030”

Goals	Performance indicators of the goals to be achieved by 2030
Enriching fundamental research with new directions based on modern requirements	<ul style="list-style-type: none"> - conducting basic research; - establishing cooperation with 8 leading foreign scientific schools in the field of fundamental research; - allocation for scientific programs in the fields of language and literature, history, archeology, culture and art.
Strengthening applied research in the most rapidly developing sectors of the economy, the introduction of the cluster system “enterprise – university – scientific organization”.	<ul style="list-style-type: none"> - the direction the State budget for applied research; - production of 850 types of innovative products in the “driver” areas of the economy; - creation of more than 2.5 thousand new scientific developments based on the results of applied research; - creation of 8 scientific and production clusters in such areas as transport and logistics, agricultural productivity, energy, biotechnology, geology and metalworking, mechanical engineering and electronics;
Increasing the proportion of young researchers, supporting their scientific research	<ul style="list-style-type: none"> - bringing the proportion of researchers under the age of 40 to at least 60 percent, increasing the salaries of employees of scientific organizations by an average of 2 times; - bringing to 20 the number of annual competitions for financing scientific, applied, innovative and startup projects; - bringing the number of quotas for a research intern, basic doctoral studies, doctoral studies and targeted doctoral studies to 5200.
Widespread implementation of innovative activities in all directions, support for scientific research and innovative initiatives	<ul style="list-style-type: none"> - ensuring the inclusion of Uzbekistan in the list of top 50 countries in the Global Innovation Index ranking; - bringing to 2 thousand the number of researchers for every million people; - a 2-fold increase in the number of new innovative developments created as a result of commercialization in the domestic and foreign markets.

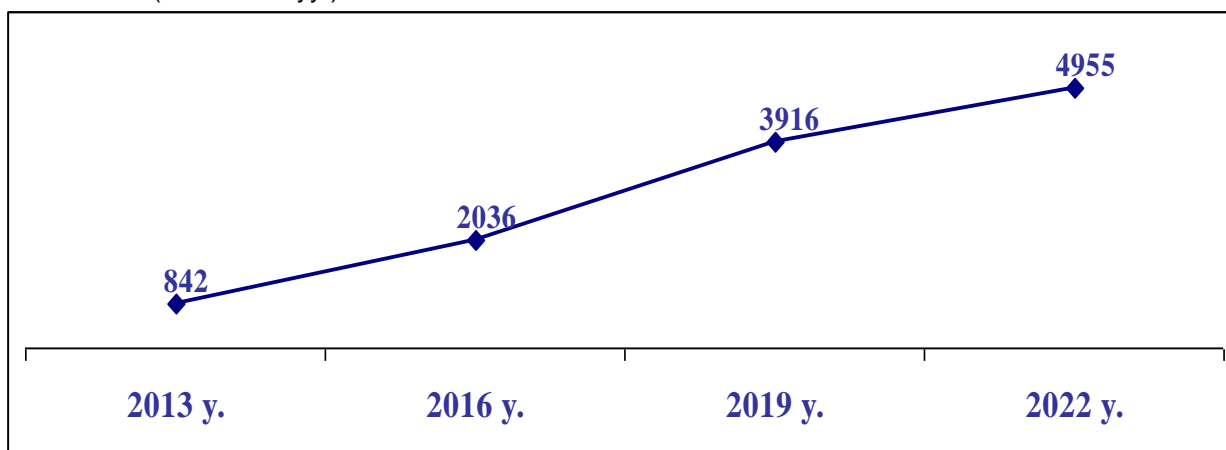
Source: author’s work based on literature review.

The goals and performance indicators provided for by the Strategy “Uzbekistan-2030” are complex in nature, and determine the priority directions for the development of the innovation infrastructure system of Uzbekistan.

The effectiveness of the reforms carried out in recent years in the field of scientific and innovative development allows us to identify positive trends in key indicators, including the number of enterprises and organizations producing innovative goods and services, including in industry, the number of specialists and researchers performing R&D.

For example, in 2013–2022 yy., the number of enterprises and organizations producing innovative goods, works and services on their own increased by 4113 units (Figure 1).

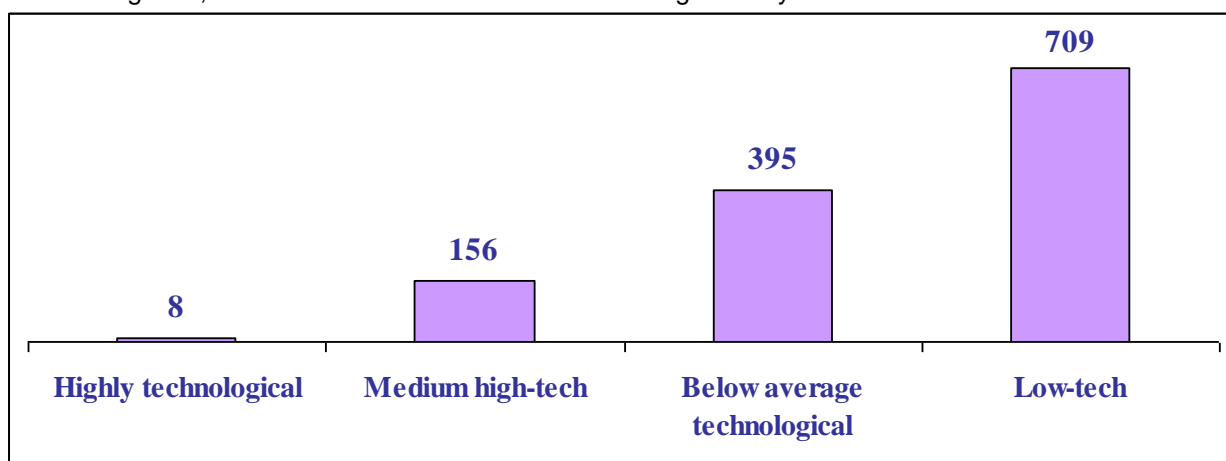
Figure 1. The number of enterprises and organizations that produced innovative goods, works and services on their own (2013-2022 yy.)



Source: author's work.

Also, during the analyzed period, there was a quantitative growth of enterprises and organizations in the field of manufacturing industry, which produced goods, works and services on their own, the number of which increased by 1268 units (Figure 2).

Figure 2. An increase in the number of enterprises and organizations in 2013-2022 yy. that produced innovative goods, works and services in the manufacturing industry on their own

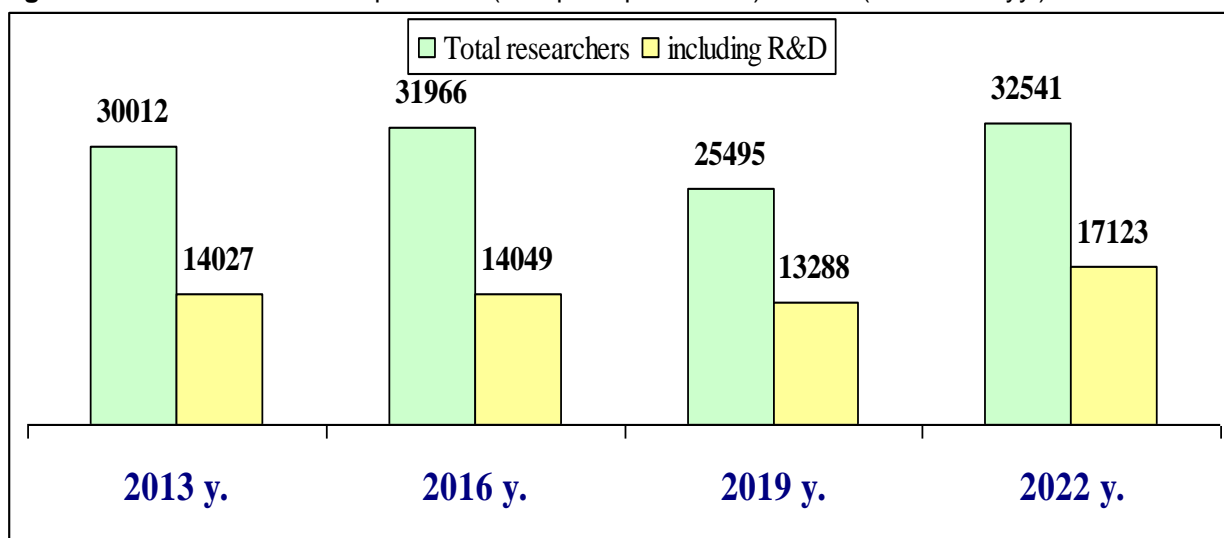


Source: author's work.

In Figure 3 indicate an increase in the number of enterprises and organizations that produced innovative goods, works and services on their own in all areas of the manufacturing industry. Nevertheless, as the experience of developed and developing countries shows, one of the main indicators of the effectiveness of innovative reforms is the effectiveness of high-tech enterprises and organizations. In this regard, one of the priorities for Uzbekistan should be the maximum increase in the number of high-tech enterprises and organizations, which had the lowest growth during the analyzed period in Uzbekistan (8 units).

The number of research specialists in R&D increased by 2529 people and totaled 32541 people, which is more than 1% of the total population of the country (Figure 3).

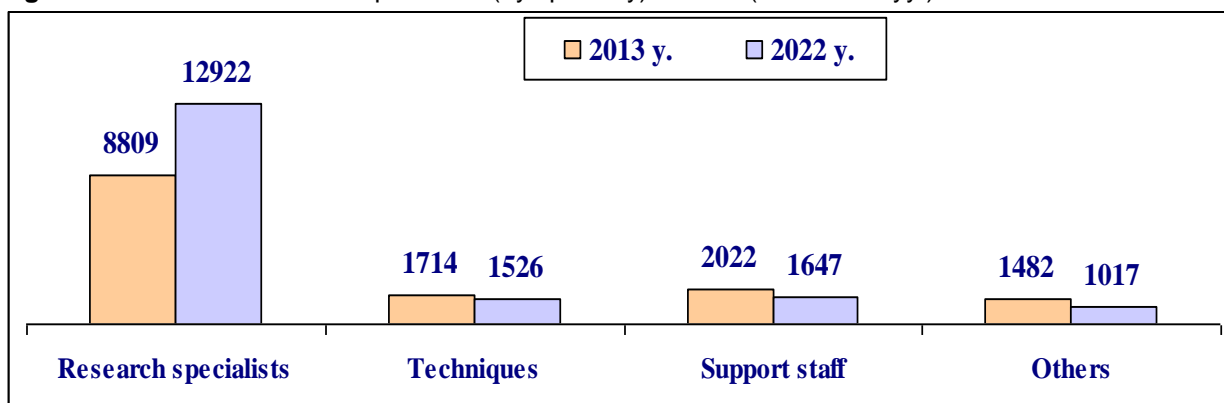
Figure 3. Number of research specialists (except for part-timers) in R&D (2013-2022 yy.)



Source: author's work.

It is important to note that against the background of an increase in the total number of research specialists by 2529 people, the number of researchers in R&D increased by 3096 people, which confirms the increase in the share of research specialists in R&D in Uzbekistan. So if in 2013 the share of research specialists in R&D was 46,7% of the total, then in 2022 this figure was 52,6%. There is also a change in the number of research specialists in R&D in favor of research specialists, whose number has increased by 4113 people (Figure 4).

Figure 4. Number of research specialists (by specialty) in R&D (2013-2022 yy.)



Source: author's work.

According to the indicators in Figure 5, against the background of an increase in research specialists, a relative decrease is observed in the number of technicians (by 188 people), support staff (by 375 people) and other specialists (by 465 people).

5. Conclusion

An analysis of the effectiveness of the reforms carried out in Uzbekistan in recent years in the scientific and innovative field allows us to conclude the following conclusions and suggestions:

- the formation and development of innovative in many countries is based on the socio-economic and strategic directions of the development of the national economy of the country itself. Since the construction of the system is based primarily on the strong and priority structures of the national economy;
- Reforms in the field of higher education, science and innovative development indicate the complexity and social orientation of the emerging innovative in the country;
- A stable regulatory and legal innovative of Uzbekistan is being created, which forms the necessary elements and mechanisms for creating an effective innovative.

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