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NEW UZBEKISTAN: PROSPECTS OF THE FURTHER IMPROVEMENT OF THE GLOBAL INNOVATION INDEX

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Abstract. Current rapid period requires comprehensive use of the achievements of innovations in the world economy. In this regard, the issues of evaluating the level of innovation development of countries are becoming crucially important. This article is devoted to the analysis of the dynamics of innovation development in the Republic of Uzbekistan, its role in the Global Innovation Index and system-related positive solutions to current problems, as well as advantages of enhancing its prestige in the international arena. In reliance upon the analysis held, relevant proposals aimed at promoting the factors that will enhance the status of Uzbekistan in the international arena, as well as necessary index indicators, have been developed.

Key words: economy, innovation, rating, innovation environment, Global Innovation Index, GDP, World Bank.

Introduction. The COVID-19 pandemic has imposed major negative barriers to innovation's long-term growth strategy throughout the world. This trend is alleviating some types of innovation, however, meanwhile, results in the increase in human ingenuity in other areas, primarily in the health sector. The country is implementing large-scale comprehensive activities aimed at creating an innovation-oriented economy in the short term and working out conditions for the widespread introduction of innovations. In particular, formulation of a single state policy body in the field of innovation and research, as well as technological development of the Republic, establishment of the Fund for Support of Innovative Development and Innovative Ideas has become one of the major and significant steps in this area.

Herewith, comprehensive and large-scale reforms being implemented at the current stage of the country's development demonstrate necessity to improve public administration mechanisms in research and innovation, raise transparency in the formation of state programs for research activities and accelerate the introduction of research achievements and innovative technologies. In reliance upon the objectives set in compliance with the Action Strategy to enhance the role of the national research and innovation system in socio-economic development, development of innovation in the regions, as well as in terms of the five priority areas of development of the Republic of Uzbekistan in 2017-2021, the following has been determined as essential points (Decree, 2017):

- improving organizational and legal mechanisms of public administration for the development of science, research and innovation;

- introduction of a system of management of research and innovative activities in the regions and development of regional innovation infrastructure;

- creation of a system of wide introduction of innovations at enterprises and entities of the economy in reliance upon advanced foreign experience;

- gradual increase in the amount of funds allocated from the state budget for science and research;

- introduction of new financing mechanisms in the field of research and innovation, expansion of private sector participation in the implementation of scientific and innovative projects;

- ensuring transparency and efficiency of the system of preparing the people claiming for the academic degrees and enhancing the responsibility of organizations of preparing the people claiming for the academic degrees and scientific councils;

- introduction of the national rating system of research agencies and enhancing efficiency of scientific organizations, introduction of new mechanisms of their management and coordination;

- training of qualified personnel for the management of research and innovation activities, development of innovative entrepreneurship in reliance upon supply of innovation managers.

Literature review. In issues of the analysis of innovative processes and factors, which make an impact on the socio-economic development of the country, activation of factors that enable to raise innovation potential and the position of Uzbekistan in the international arena have been considered in the research papers of such foreign scholars

and economists, as Y. Shumpeter, G. Mensh, K. Freeman, P. Druker, B. Santo, Sh. Tatsuno, R. Robinson, D. Sahal, M. Porter, B. Tviss, K. Kh. Oppenlender, A. Hamilton, P. White, E. Mensfield and others. A number of domestic scholars-economists such as F.M.Matmurodov, B. Abdullaev, N. Alimova, Z. Gaibnazarova, D. Kokurin, M. Maxkamova, Z. Muqumov, O. Nazarov, R. Nazarova, N. Namazova, Sh. Otajanov, Sh. Sindarov, T. Toshpulatov, G. Khamdamova, B. Kholikov have studies theoretical and practical issues of the innovation activity development and efficient use of the innovation potential taking into account the peculiarities of our country (Schumpeter, 1912).

The dynamics of innovation development indicators in the Republic of Uzbekistan, its place in the Global Innovation Index and a systematic analysis of the current problems demonstrate that there are a number of factors that prevent innovation development in our country, including:

- inefficient system of research funding, reduction of funding;
- problems of commercialization of inventions;
- low level of innovation infrastructure development (especially Free Economic Zones, business incubators);
- inadequate development of the telecommunications infrastructure;
- problems with statistics;
- fundamental science is unorganized and isolated from the world scientific community.

In addition, Uzbekistan has a negative trade balance on high-tech and research products, and the fact that the share of high-tech imports is growing, is featured by a low level of development of innovative infrastructure, which, in turn justifies the urgency of the research topic.

The aim of the research is development of proposals and recommendations on modernization of the innovation system of Uzbekistan, ensuring efficiency of national competitiveness and economic diversification in the global market through the activation of innovation factors, creating and developing a stable chain of innovative products on the international market, as well as enhancing Uzbekistan prestige in the Global Innovation Index.

Research methodology. The methods such as complex study of historical, systemic-structural, exact sociological, scientific sources, induction and deduction, analysis of statistical data, have been widely used in this research.

Discussion and analysis. The Global Innovation Index is a large-scale study that

ranks countries around the world according to their level of innovation development. It is calculated by the method of the INSEAD - French International Business School. It should be noted that in order to ensure full transparency, the statistics and other information required for inclusion in the GII ranking of countries, are not obtained directly from the listed countries. The data are provided by international organizations such as the World Intellectual Property Organization (WIPO), the International Energy Organization (IEA), the United Nations Educational, Scientific and Cultural Organization (UNESCO), the United Nations Industrial Development Organization (UNIDO), the International Trade Organization (WTO), the International Organization for Standardization (ISO), HIS Markit, Bureau van Dijk, ZOOkNIC Inx, Thomson Reuter and the Wikimedia Foundation. It is annually compiled by Cornell University (USA), INSEAD Business School (France) and a consortium of the World Intellectual Property Organization.

The index is calculated as the relative amount of the two groups of indicators. The first group includes the available resources and conditions for innovation (Innovation Input), development of institutions, human capital, research, infrastructure, domestic market and entrepreneurship. The second group is the Innovation Output, which is the result of the development of technology and science, as well as the results of creative activity.

Digital Indicators		
	2017	**2035**
Global Innovation Index (ranking)	-	Top 50
Expenditures on Research and Development	0,2%	1%

Figure 1. Ranking of Uzbekistan in the Global Innovation Index

(Global Innovation Index, 2019**)**

The Global Innovation Index consists of 82 indicators that demonstrate innovation development of countries at various stages of economic development. In particular, such indicators as the investment level in research and development, and a variety of other different indicators from the number of international applications for patents and trademark registration to more modern indicators, such as the number of mobile applications created and the level of exports of high-tech products are taken into account.

Changes in the Global Innovation Index ranking, top 10 [7]

	1	2	3	4	5	6	7	8	9	10	
2019	CH	SE	US	NL	GB	FI	DK	SG	DE	IL	In 2019 IL joined the top 10 of the Global Innovation Index for the first time
2018	CH	NL	SE	GB	SG	US	FI	DK	DE	IE	In 2018 SG joined the top 5 of the Global Innovation Index for the first time
2017	CH	SE	NL	US	GB	DK	SG	FI	DE	IE	In 2017 NL was in the top 3, and SG was ranked the second
2016	CH	SE	GB	US	FI	SG	IE	DK	NL	DE	In 2016 DE returned to the top 10 position
2015	CH	GB	SE	NL	US	FI	SG	IE	LU	DK	SC has been ranked the first since 2011
CH-Switzerland, GB – Great Britain, SE – SWEDEN, NL – Netherlands, US – USA, FI – Finland, SG – Singapore, IE – Ireland, LU – Luxembourg, DK – Denmark, DE – Germany, IL – Israel. Annex: Amendments in the GII model and availability of the relevant data make an impact on the annual comparison											

Figure 2. Amendments in the Global Innovation Index rating, top 10 (Global Innovation Index, 2019**)**

According to the press service of the Ministry of Innovative Development of Uzbekistan, Uzbekistan last ranked 122nd out of over 140 countries in this international ranking in 2015. For the first time since 2016, the Republic has been re-included in the Global Innovation Index. In 2015, the country had inadequate peculiarities on 11 indicators according to the methodology used in the Global Innovation Index, taking into account the insufficient data in this ranking among 141 countries (Economy of Uzbekistan, 2018)

Furthermore, Uzbekistan ranks high in the following indicators: simplicity of starting a business (ranked 55), simplicity of settling insolvency (recognition of bankruptcy) (ranked 72), the ratio of scholars and teachers in secondary education (ranked 47), the number of graduates in science and technology (ranked 47), gross capital accumulation (ranked 19), loan portfolio of microfinance institutions (ranked 39), applications for receiving patents (ranked 48), utility model application (ranked 24), GDP growth rates per capita (ranked 6), created national feature films (ranked 49) (Economy of Uzbekistan, 2018).

If we analyze the Global Innovation Index in terms of expenditures on research and development in our country, the number of patents, the number of scientists (researchers), the evidence of research, we can see the following trend as it is shown in Figure 3.

In reliance upon Figure 3, it is obvious that Uzbekistan lags far behind the leading countries in terms of patent activity, and the number of existing patents is declining.

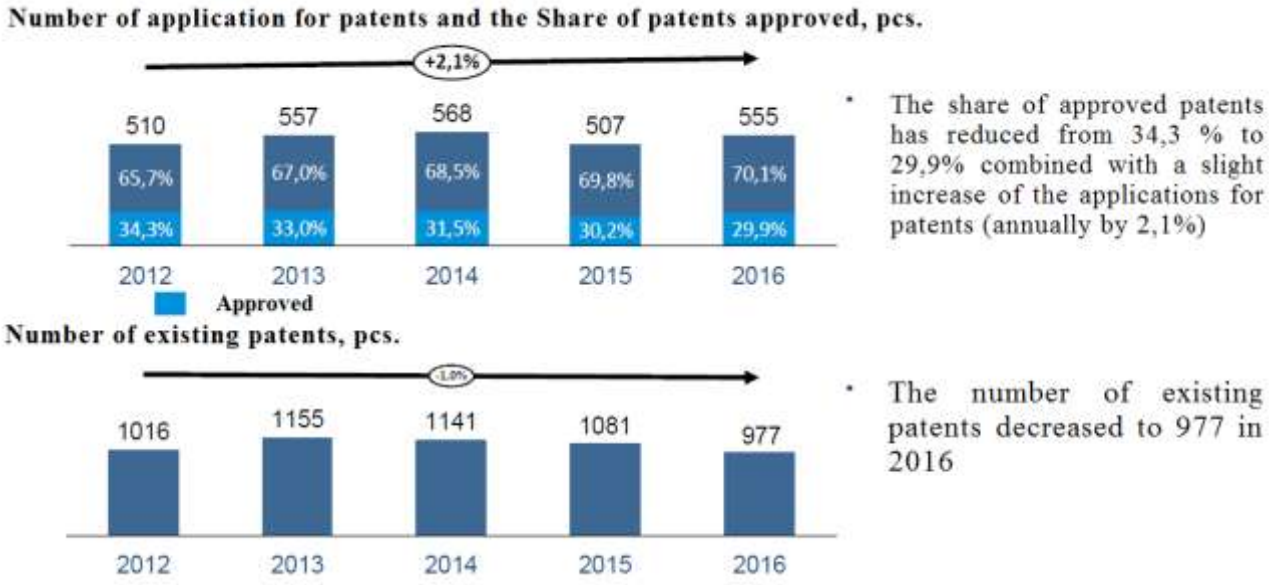

Figure 3. Indicators of the patent activity level in 2012-2016 (Economy of Uzbekistan, 2018**)**

In addition, in terms of GII rankings in 2015, the position also ranked lower in indicators related to innovation and funding for research developments. In this regard, the Ministry has introduced a new efficient mechanism for holding competitions and selection of research and technical projects within the state research and technical programs. Herewith, the practice of regularly announcing competitions on topical subject areas aimed at scientific solutions to specific problems of the economy and social sphere has been introduced.

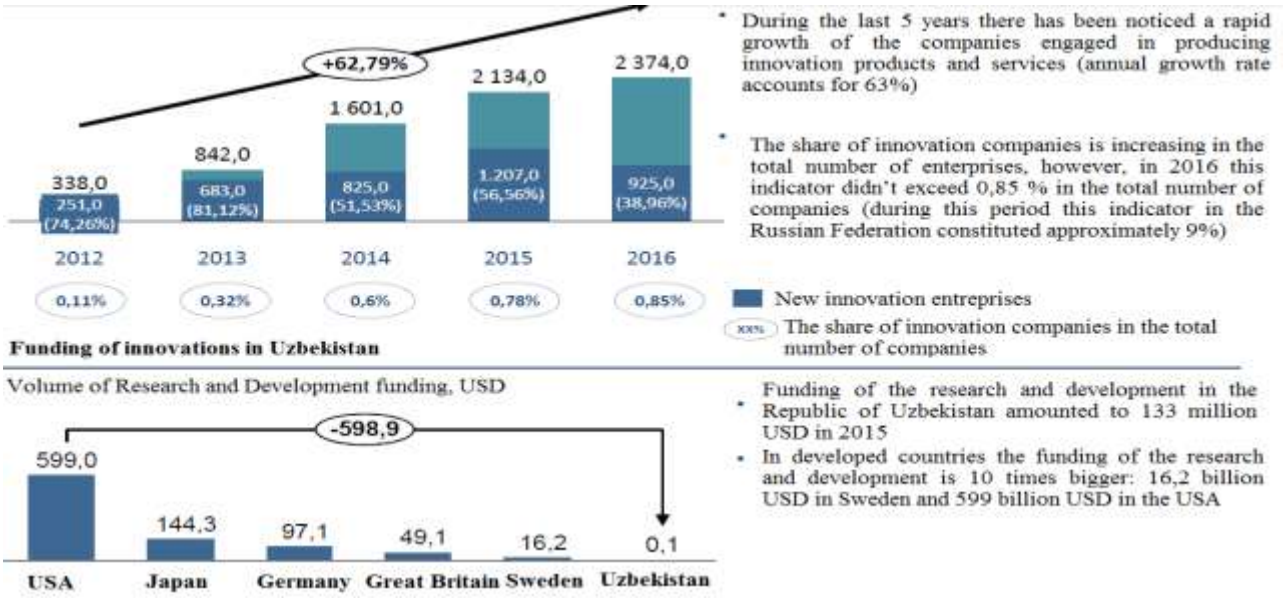

Figure 4. Number of innovation companies and the share of new innovation companies, number and % (Economy of Uzbekistan, 2018**)**

Thus, in the final index there is a correlation between costs and results, which in turn enables to conduct an objective assessment of the efficiency of expenditures on the development of innovations in a particular country. According to the results of contests by the new mechanism in the 1st half of 2019, 95 research and technical projects were financed for the total amount of 78,6 billion UZS. A total of 1480 fundamental, practical projects and innovative developments worth 349,3 billion UZS are being implemented within the framework of state research and technical programs. In July of 2020 in reliance upon the agreement with the British group of companies PETROMARUZ, it was the first time when in Uzbekistan the investment was made to finance grant projects on research and science of the private sector. All this will increase public spending on research and development to 0.8% of the GDP by 2021 (Socio-economic situation, 2020)

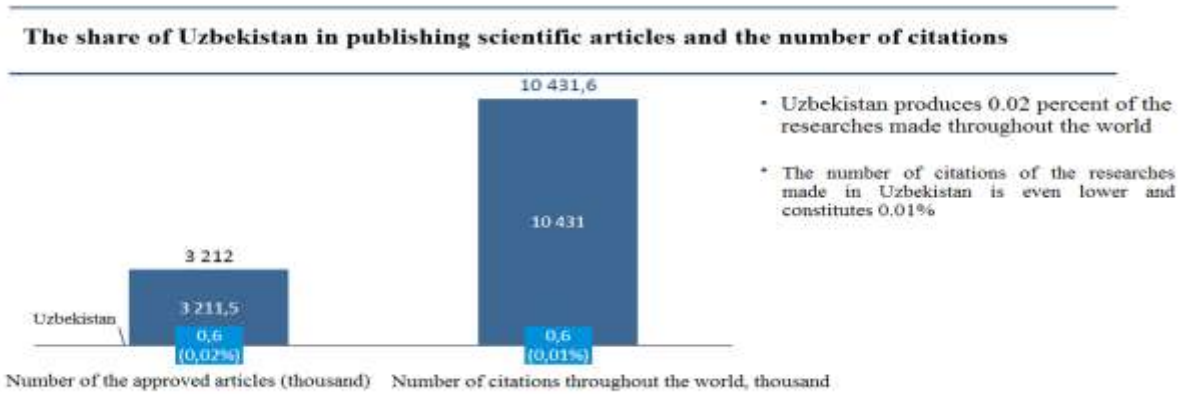

Figure 5. The share of Uzbekistan in producing scientific articles and their citations in 2016 (Economy of Uzbekistan, 2018**)**

In this regard, there has been commenced publishing of scientific journal “Science and Innovative Development” for publication of research papers in the field of innovative development and periodic promotion of innovations throughout the world to the general public and youth, popular scientific-technical, spiritual-educational journal “Technologies of the XXI century” for schoolchildren and the publication of the popular analytical journal “QVANT” for the general public. In addition, promotion and widespread of innovations make a positive impact on indicators, thus enabling to open competitive infrastructures and new areas in science.

Uzbekistan does not have an ecosystem that promotes innovation and ICT. In particular, technoparks, business incubators, crowdfunding platforms and other necessary elements of innovative infrastructure are currently in the early stages of development. Furthermore, the ICT use of is at the early stages of development as well.

The statutory framework in the field of innovation, which is one of the most essential issues in the formation of the innovation ecosystem and the GII ranking, is being improved. A number of laws and other statutory acts have been adopted in order to provide a legal foundation for the regulation of research and scientific-technical activities in the country, to ensure legal guarantees for those engaged in research activities, as well as the quality and efficiency of research and innovation. In this regard such laws and resolutions should be mentioned, as the Resolution “On additional measures to create conditions for the development of active entrepreneurship and innovation” (Resolution, 2018) and drafts of the laws “On the science and research activities” and “Innovation activity”. In addition, over 20 legal acts have been adopted at the initiative of the ministry (National database of the statutory acts, 2018).

This, in turn, will solve the problems that hinder the inclusion of Uzbekistan in the Global Innovation Index rating. Another important issue that can contribute to the formation of an innovative ecosystem and a high position in the GII rating is inadequate development of these infrastructures (technoparks, business accelerators, etc.). In recent years, a number of technoparks, research centers, startup accelerators and incubators have been established in Uzbekistan, all of which promote formation and development of the national innovation system. In particular, “Yashnabad” innovation technopark was transferred to the disposal of the Ministry and received 3.1 million UZS from 23 residents of the technopark. Investments in the amount of the USD have been used for the production of chemical technologies, machine building materials. It is noteworthy that such centers are being established not only in the capital, but also in remote areas of the

country. In particular, “Khorezm” technopark, established a short period of time ago in Urgench, will serve to enhance scientific, technical and innovative potential of Khorezm region. In order to provide the population with access to the information resource database offline, 100 Q-Box devices have been installed in schools, universities and public places in remote areas of the country (https://mininnovation.uz/uz/activities/09-07-2019).

The measures, specified above, constitute a part of the Ministry of Innovation Development’s performance to include the country in the GII rating. One of the prior objectives of the Innovation Development Strategy of Uzbekistan is the results of rapid positive reforms in recent years, close cooperation with relevant ministries and agencies and international organizations. It will be the basis for its inclusion in the GII rating and its place among the advanced countries.

Each year, Bloomberg analyzes the economies of 200 countries to determine which of them is the most innovative. For the past five years, our country has not been included in the ranking due to lack of data. Currently, the Ministry of Innovative Development in cooperation with the State Statistics Committee and the Ministry of Foreign Affairs is working on the inclusion of the Republic of Uzbekistan in the GII. In particular, through a series of meetings and negotiations with the founders of the GII international rating and the above-mentioned international organizations, the problems that hinder the inclusion of Uzbekistan in the ranking have been researched and relevant measures are being taken to solve them. The list of non-submitted and outdated data for inclusion in the ranking of the Global Innovation Index of Uzbekistan has been compiled due to the above cooperation and the issues of submission in compliance with the established international requirements have been successfully resolved.

In order to improve its position in the Global Innovation Index, Uzbekistan is studying the methodology for calculating index indicators. As a result, the mechanisms for cooperation with international organizations that compile the index have been developed and the process of information provision has been determined. First of all, particular attention has been paid to improving the situation on the indicators that previously did not contain data in the index and Uzbekistan ranked low. Radical positive changes and improvements in innovation in the country are regularly recognized by international organizations. In particular, this year’s edition of the Global Innovation Index takes into consideration changes in the country’s innovation activity. As a result of continuous and systemic reforms in recent years

Uzbekistan was included in the Global Innovation Index in 2020 and ranked fourth among Central Asia and South Asia (WIPO, 2020).

Table 1

GLOBAL INNOVATION INDEX RATING OF THE WORLD COUNTRIES INSEAD, WIPO, Cornell University: The Global Innovation Index 2020.		
RATING	**ECONOMY**	**INDEX**
1	**Switzerland**	66.1
2	**Sweden**	62.5
3	**United States of America**	60.6
4	**Great Britain**	59.8
5	**the Netherlands**	58.8
6	**Denmark**	57.5
7	**Finland**	57.0
8	**Singapore**	56.6
9	**Germany**	56.5
10	**South Korea**	56.1
93	**Uzbekistan**	24.5
122	**Zambia**	19.4
123	**Mali**	19.2
124	**Mozambique**	18.7
125	**Togo**	18.5
126	**Benin**	18.1
127	**Ephiopia**	18.1
128	**Niger**	17.8
129	**Myanmar**	17.7
130	**Guinea**	17.3
131	**Yemen**	13.6

Analyzing the data in the table above, it is obvious that Uzbekistan last ranked 122nd out of over 140 countries in this international ranking in 2015. In 2020, Uzbekistan ranked 93rd out of more than 131 countries in the world as a result of comprehensive performance of the Ministry of Innovative Development in close cooperation with relevant government agencies and organizations aimed at enhancing the image of Uzbekistan in the international arena and its inclusion in the Global Innovation Index.

In the ranking of the Global Innovation Index, which consists of 80 indicators in 2020, Uzbekistan demonstrates favorable performance in such indicators as institutional development (Institutions), Human Capital & Research, Infrastructure, Knowledge and Technology Outputs and Creative Outputs. In addition, it can be seen, that Uzbekistan occupies leading positions in such indicators as “Graduates in science & engineering, %”, “Ease of starting a business”, “Cultural & creative services exports, % total trade”, “Expenditure on education, % GDP” (WIPO, 2020).

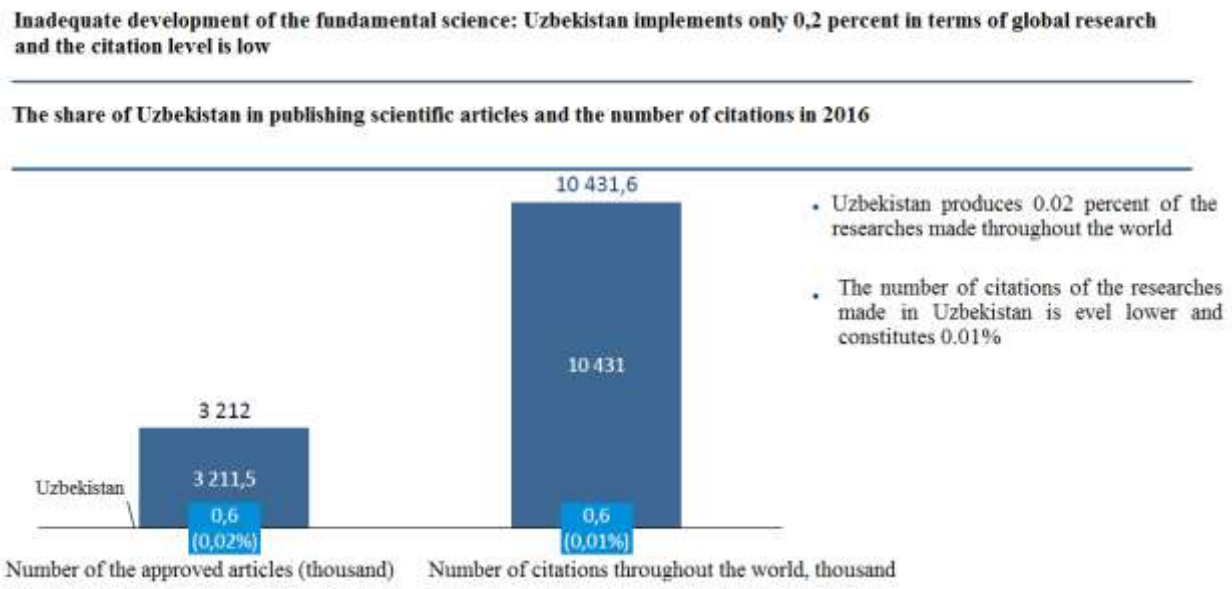

Figure 6. Development of fundamental science in Uzbekistan

(Economy of Uzbekistan, 2018**)**

It should be noted that the Global Innovation Index depends on the level of economic development of the country and the level of exports. Companies of the Republic of Uzbekistan are not high-tech exporters, and their value and share of high-tech exports remain low. Consumer demand for high-tech products is limited by low incomes.

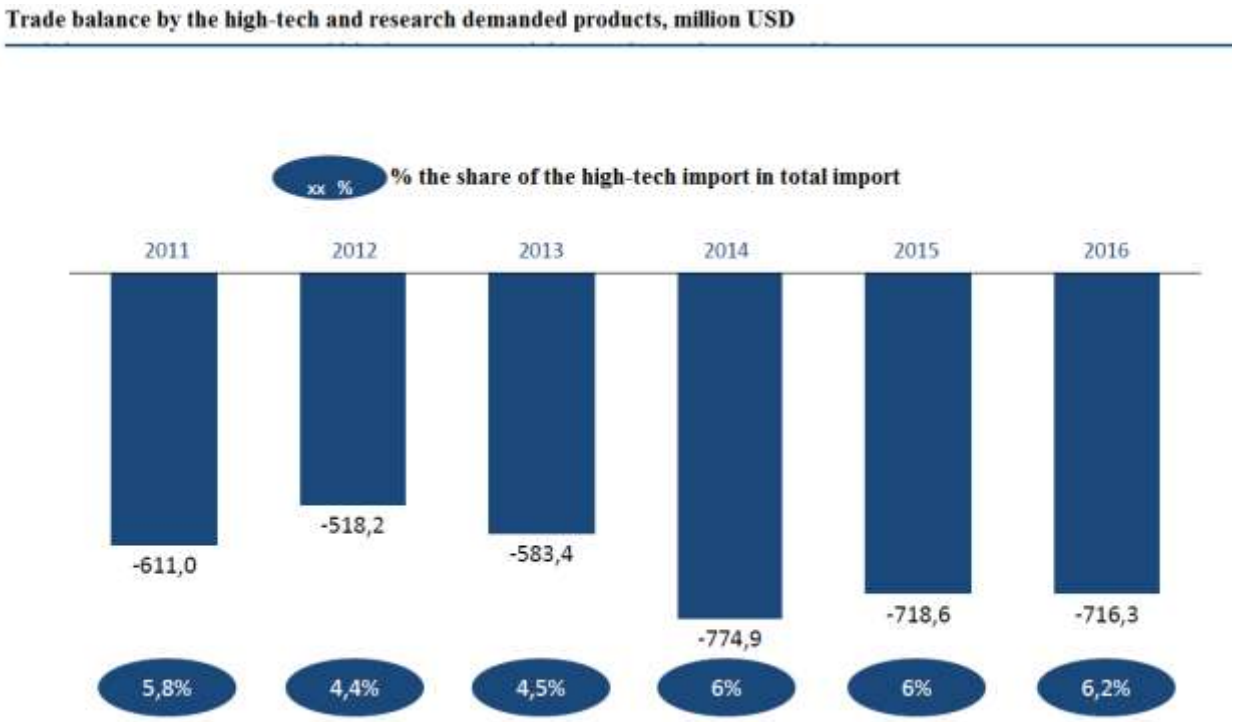

Figure 7. Trade balance by high-tech and research demanded products of Uzbekistan

(Economy of Uzbekistan, 2018**)**

Uzbekistan is a net importer of high-tech and research-intensive products, but their share in total imports constitutes only 6.2%. Moreover, it is obvious that Uzbekistan occupies leading positions in such indicators as “Graduates in science & engineering, %”, “Ease of starting a business”, “Cultural & creative services exports, % total trade”, “Expenditure on education, % GDP. It should be noted, that one of the top-target objectives of the Decree of the President of Uzbekistan PD-5544 “On the Strategy of Innovative Development of the Republic of Uzbekistan in 2019-2021” is to include the country in the top 50 countries in the Global Innovation Index by 2030 (https://www.norma.uz/).

Table 2

Republic of Uzbekistan in “Global Innovation Index”						
№	**Structural units**	**2015**		**2020**		**Changes ↓↑**
		Index	**Rating**	**Index**	**Rating**	
1	Number of institutions	49,0	106	55,1	95	**↓6,1**
2	Human capital and research activities	27,0	76	27,5	77	**↓0,5**
3	Infrastructure	29,0	101	38,5	72	**↓9,5**
4	Market development	44,4	85	54,9	27	**↓10,5**
5	Business development	20,0	138	15,2	127	**↑4,8**
6	Knowledge and technology output	27,2	61	14,1	90	**↑13,1**
7	Creative outputs	8,5	138	7,5	127	**↑1,0**

In compliance with the data provided in the table, according to the general criteria, in 2020 the Republic of Uzbekistan has gained 55.1 points in terms of Institutions (ranked 95), Human Capital & Research - 27.5 points (ranked 77), Infrastructure - 38.5 points (ranked 72), Market Development - 54.9 points, (ranked 27), Business Development - 15.2 points (ranked 127), Knowledge and Technology Output- 14.1 points (ranked 90), Creative Outputs - 5 points (ranked 127) (www.mininnovation.uz)

The long-term strategy of innovative development of our country reflects the goals until 2030. Herewith, short-term development measures have been determined to gradually achieve the targets set for the next 10 years. The Strategy of Innovative Development of the Republic of Uzbekistan for 2019-2021 sets a number of tasks aimed at fully mobilizing the efforts of the younger generation.

Table 3

Institutional description of innovative development of the Republic of Uzbekistan in 2019-2021 (https://www.norma.uz/)

MAIN AREAS				
Development of transfers of science, inventions and technology	**Improving the system of innovation activity development**	**Development of the infrastructure and ICT**	**Improving the education system and human capital development**	**Competition development and reducing the number of administrative barriers**
Institutional measures				
With the aim of elaborating and introducing advanced technologies, to establish technopark hubs, free economic zones, free industrial zones, small industrial zones and scientific production clusters.	In terms of financing innovation activity to establish specialized institutions – innovation funds, innovation banks, venture funds.	Developing the network of developing software in our country through establishing technoparks for start-up projects.	Organizing short-term trainings at the professional colleges for the youth, who need retraining at the labor market.	Improving the anti-monopoly policy, in particular, due to the introduction of public-private partnership.
Measures implemented in 2019				
Technopark for children has been established in Akhangaran. Seed-raising clusters in "Peng-Sheng cluster" and "Bek cluster" have been established in Syrdarya region. 23 residents of "Yashnabad" technopark have invested the amount worth 3/1 million USD for chemistry technologies, machinery and manufacturing of construction materials.	Funds for supporting innovation development and innovative ideas have been established at nearly 20 entities and the amount of 45.46 billion UZS has been allocated. 2 investment companies – "Venture Capital Invest" and "Uzbek – Emirate Investment Company have been established.	19 innovation start-ups have been established by total 30 developments. 15 research agencies, 6 commercial banks and 6 investors participated in this project. 33 start-up projects have been approved in "Start-up Initiative" contest.	Education and Practical Centre "Business-accelerator" in Syrdarya region has been established in cooperation with the companies from India and China. Establishment of such kind of centres has been scheduled in other regions as well.	LLC "Kokand seed-raising cluster" in Fergana region, "Fluffy towels" in Namangan region, "Peng-Sheng" seed-raising cluster in Syrdarya region have been established in reliance upon public-private partnership.

Conclusion. The implementation of the following measures, modernization of the innovation system of Uzbekistan, ensuring efficiency of the national competitiveness and

economic diversification in the global market, as well as improving living standards of the population in 2020 will enhance the image of Uzbekistan in the international arena:

• Development of telecommunications for business, government and the population;

• Development of legislation in the field of intellectual property rights;

• Modernization of telecom infrastructure (broadband);

• Creation of state information systems;

• Raising attractiveness of the IT industry;

• Expanding (especially fundamental) government grant programs to support science and research;

• Involvement of foreign companies to create Research and Development centers;

• Attracting internationally-reputed specialists for the creation of private education and formation of new universities, as well as the development of engineering higher education;

• Creation and reform of innovative infrastructure in each region of the Republic of Uzbekistan (Free Economic Zones, innopolises, innovation centers, business incubators, etc.);

• Providing maximum tax and customs benefits to innovation centers;

• Creating an extension service;

• Creating an accelerated system of training personnel;

• Introduction of ethical bases of education;

• Renewal of the system of the Research and Development;

• Replacing outdated national standards with international standards;

• Development of the Fund for Support of Innovation Development and Innovative Ideas – raise funding and consulting;

• Protection of intellectual property rights: combating copying and plagiarism, piracy and copying of international trademarks.

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