



#### IT'S THE FIRST TIME WHEN UZBEKISTAN IS IN THE TOP THREE OF SOUTH ASIA REGION BY INTERNATIONAL INNOVATION INDEX

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**Abstract:** *The article presents the results of the ranking of Uzbekistan by the World Intellectual Property Organization (WIPO) in the International Innovation Index (GII-2022) at the end of 2022 and a comprehensive analysis of seven indicators applied for achieving this ranking. In addition, there are the proposals for further improvement of the figures by some indicators including Business sophistication, Creative outputs and Knowledge & technology outputs. Moreover, the article provides opinions and scientific conclusions on the measures that should be undertaken in the future in the implementation of the top-target objectives determined in the "Science Development Concept until 2030".*

**Keywords:** *innovation index, institutions, human capital and research, infrastructure, market attractiveness, business attractiveness, knowledge and technology output, creative output.*

#### 1. Introduction

As a result of ensuring the implementation of the top-target objectives determined in the Decree "On approval of the innovation-based development strategy of the Republic of Uzbekistan in 2019-2021" in Uzbekistan, the economy of Uzbekistan in 2020, as the only country in Central Asia, ranked 93 in the famous "The Global Innovation Index" - GII.

As far as we know, the International Innovation Index (GII-2022) in the question by the World Intellectual Property Organization (WIPO) "What is the future of innovation-driven growth?" Uzbekistan ranked 82 among 132 countries improving 4 points compared to 2021.

It should be noted, Uzbekistan ranked 93 in this rating in the first attempt in 2020. As a result, our country has succeeded in joining TOP-10. So, the words of our respected President, which could enhance the confidence of our people in the future and which he said with determination, are being currently proved.

In 2030 Uzbekistan was supposed to be among the top 50 in the International Innovation Index. Despite the short period that has passed since then, it is worth looking forward to the results, firstly, our country entered this rating in 2020 and ranked 93, and secondly in 2021 it improved by 7 points and ranked 86. According to the indicators of the current year, it has risen 4 points and ranked 82. The dynamics of the past years illustrate that Uzbekistan will only go higher.

It should be noted that on December 23, 2021, at the meeting of the Republican Council on International Ratings and Indices, it was noted that our position in the Global Innovation Index has improved and that there is a lot of work to be done in this regard. Nevertheless, it is a huge and historic achievement for the indicators of the economy

of Uzbekistan, which has not been ranked in the last decade. So, if we try, we will definitely achieve our goals.

## **2. Literature review.**

Currently there are over 200 rating evaluation companies in the world, one of the most influential of which is the Global Innovation Index (GII).

The World Intellectual Property Organization (WIPO) is currently facing problems and difficulties in assessing the world economies due to the global coronavirus pandemic, as well as ongoing conflicts and wars between countries. The Global Innovation Index (GII-2021) is jointly published by Cornell University, the European Institute of Business Administration (INSEAD) and the World Intellectual Property Organization (WIPO), as well as a specialized UN agency. This year the index has presented its fifteenth edition dedicated to the topic "What is the future, is it innovation-based growth?".

According to the World Intellectual Property Organization (WIPO), the *Global Innovation Index* is a ranking of countries' innovation capabilities and performance. It measures the level of innovation based on the criteria of institutions, human capital and research, infrastructure, lending facilities, investment, and communication.

According to the Ministry of Innovative Development of the Republic of Uzbekistan, the *Global Innovation Index* is a comprehensive study that ranks the countries of the world according to the level of innovative development. Therefore, the Global Innovation Index is an annual ranking of countries based on their ability and success in innovation. This ranking is usually used by corporations and governments to compare countries' innovations.

This Global Innovation Index consists of several assessment components divided into sub-indices. The indicators of the global innovation index rating cover the economy of the world countries and it is determined on the basis of about 80 indicators.

## **3. Research methodology.**

In the research of the ranking results of the position of Uzbekistan and indicators in the international innovation index such methods as induction and deduction, analysis and synthesis, systematic approach, logical thinking, comparison, and factor analysis have been widely used. The indicator-based data have been analyzed in a comprehensive manner and relevant research-grounded proposals have been developed.

## **4. Analysis and results.**

Currently Uzbekistan is increasing this prestigious rating by which indicators and which aspects particular attention should be paid to. As we mentioned above, this rating is developed in reliance upon certain criteria. However, it should be noted that the main goal of the innovation-based development strategy determined by the President of the Republic of Uzbekistan in a coordinated manner with world economic development is focused on the "Human capital development". Therefore, as a result of achieving the main goal of the Strategy, by 2030 Uzbekistan has become one of the top 50 advanced countries of the world according to the Global Innovation Index rating. This can be evaluated and recognized as the essential factor determining the level of competitiveness and innovative development of our republic in the international arena.

It is inspiring fact that Uzbekistan has become the leading country in the top three in the Central and South Asian region (India - 40, Islamic Republic of Iran - 53 and Uzbekistan - 82). It is important that Uzbekistan ranked 4 in the South Asian region last year in 2021, and this year we left behind Kazakhstan and entered TOP-3, that is, Uzbekistan is proudly considered a new participant of the top three. However, Uzbekistan is still ranked 10 out of 36 countries with *Lower middle-income economies*.

According to the indicators of 2022, Uzbekistan ranked 10 in the “Income” category and 3 in the “Regional rating” category and has a total indicator of 27.4 degrees, which indicates that it has attained many achievements in the field of innovation. As it can be seen from the figures, according to the 2022 rating of the Global Innovation Index, Uzbekistan has increased by 0.3 points (25.3) (in 2021 it demonstrated the rating of 25.0 from 0-100). So, according to the information of the International Innovation Index (GII-2022) Uzbekistan demonstrates the following performance according to the following indicators:

- ranked 82 in GII-2022;
- admission rating - 68;
- on-exit rating -91;
- income level is below average – ranked 10;
- region-Central and South Asia;

GDP at purchasing power parity (RRR) - 291.2 bln. USD (103.2% growth), GDP per capita (RRR) - 8.4 thousand USD (113.5% growth).

As you know, the next summit of Shanghai Cooperation Organization (SCO) was held in Samarkand on September 15-16 of this year. The participating countries of this summit also have their place in GII-2022 rating, including China-11, Russia-47, India-40, Iran-53, Armenia-80, Kazakhstan-83, Pakistan-87, Azerbaijan-93, Kyrgyzstan-94, Tajikistan - 104. What we want to say is that the increasing activity of Uzbekistan with the countries of the Shanghai Cooperation Organization (SCO) in recent years (signing of more than 100 beneficial agreements, as well as membership in 23 prestigious organizations of the CIS) can be a guarantee for our level in international ratings to rise further.

The most important thing is that this year Uzbekistan has improved in the comparison of Central Asian countries through innovative developments (in 2021, Kazakhstan fell from 79 to 83, Kyrgyzstan improved by 4 and achieved 94, and Tajikistan fell by 1 point to 104). Therefore, gradual implementation of the tasks determined in the “Development Strategy of New Uzbekistan 2022-2026” in our country provides an opportunity to further increase in this rating because in 2030 we need to achieve a decent place in this ranking among the top 50 (we need to increase at least 32 places during the previous eight years).

**Table 1**
**Uzbekistan in Global Innovation Index (GII-2022)**

Assessment score (0-100)	Rank	Income	Region a (CSA)	Rank in the region
27.4	82	Low-middle (LM)	Central and South Asia	3*

*\*Uzbekistan entered the TOP-3 for the first time in the 2022 ranking.*

As we noted above, there is no doubt that it will definitely be possible to enter the top 50 in 2030 by 2026 (if the average increases by 2.4 points, it can be 9.6 in 4 years or 37.0 in total, while the bottom of the TOP-50 in the GII-2022 constitutes 34.0 points). So it is recommended to make any effort to strive towards the set goal, learn, search, use innovation-based products and be creative.

**Table 2**
**Dynamics of the change of the position of Uzbekistan in the global innovation index**

№	Indicators	“The Global Innovation Index”- GII			difference in relation to 2022, (increase / reduction)
		2020	2021	2022	
	<b>Uzbekistan</b>	<b>93</b>	<b>86</b>	<b>82</b>	<b>+9↑</b>
1.	Institutions	95	94	63	+32↑

2	Human capital & research	77	72	65	+12↑
3	Infrastructure	77	72	74	+3↑
4	Market sophistication	27	24	60	-33↓
5	Business sophistication	127	123	74	+53↑
6	Knowledge & technology outputs	90	77	80	+10↑
7	Creative outputs	127	113	102	+25↑

Below we try to find the answers to the question which indicators of Uzbekistan have promoted 9-score increase in the ranking of the Global Innovation Index in relation to 2020. This can be obvious from the data on the 7 most important indicators (components).

**Table 3**

**Position of Uzbekistan in the indicators of the Global Innovation Index  
(GII-2022)**

Nº	Indicators	Rating result
In GII-2022rating: Uzbekistan ranked 82		
1.	Institutions	ranked 63 (ranked 94 in 2021)
2.	Human capital & research	ranked 65 (ranked 72 in 2021)
3.	Infrastructure	ranked 72 (ranked 72 in 2021)
4.	Market sophistication	ranked 60 (ranked 27 in 2021)
5.	Business sophistication	ranked 74 (ranked 123 in 2021)
6.	Knowledge & technology outputs	ranked 80 (ranked 77 in 2021)
7.	Creative outputs	ranked 102 (ranked 113 in 2021)

Below we provide an analysis of which data they have used to receive rating scores for each indicator.

If we consider the data on the *first* indicator, in the “Institutions” category there has been an increase by one point from 94 to 63 (57.3 scores) and herewith assessment has been made according to the following parameters:

*first*, the political environment constitutes 52.1 scores or ranked 94 (political and operational stability - 65.5/74, government efficiency - 38,8/98),

*second*, the legislative base accounts for 50,7 scores or ranked 104 (quality of laws - 21,3/123, the law priority- 18.5/123, dismissal costs -17.3/73),

*third*, the business environment amounts to 69.2 scores or ranked 21 (ease of starting a business 69,2/21, ease of resolving insolvency – no data available).

It must be admitted that currently there are many things that need to be solved in order to strengthen the legislative base of our republic and ensure its priority. On the other hand, in this rating the legislative base is described as a weakness (ranked 104). The Assembly of the Republican Council for International Ratings and Indices have also identified special measures to improve the international rating in this political and legal sphere. We are proud of the fact, that in terms of this parameter, our performance in the business environment is assessed as strong and ranked 21 (*indicates a strength; an income group strength*).

In the *second* indicator, Human Capital & Research, there has been 7 score increase to 30.8 and ranked 65. This happened mainly due to the following factors:

*first*, education accounts for 57.4 scores or ranked 50. Unfortunately, according to the educational indicator, compared to 2021, it has decreased by 8 points. It does not provide any information on some columns (expenses on education in relation to GDP constitute 4.9

percent or ranked 45, public funding/student, percentage of GDP - data not available, duration of secondary education (school), year-12.5/88, PISA scale of the international student assessment program - no data available, student-teacher ratio, average -10.9/37),

second, higher education accounts for 33,9 scores or ranked 54 (enrollment in higher education, gross percentage -15.9/101, graduates in science and engineering, percentage - 36,9/6, mobility in higher education- 0.2/106),

third, research and development (R&D) 1.2 scores or ranked 93 (researchers, FTE-full-time equivalent/person-439,9/73, research and development expenditures in relation to GDP, in percent - 0.1/98, research and investors, million USD - 0.0/38, QS- university rating - 0.0/72).

In this parameter there are few positive cases due to insufficient or inadequate information provided. These include the international student assessment program PISA scale and government funding/student in relation to GDP, etc. However, in the ranking, the student-teacher ratio and the performance of graduates in science and engineering are recognized as strong (ranked 6, while India ranked 11 and Russia ranked 14).

The *third parameter* in the ranking - Infrastructure - also rose by 5 points compared to 2021, from 72 to 74 (41.7 scores).

According to this, first, information and communication technologies (ICT) constituted 76.1 scores or ranked 55 (access to ICT 82,7/78, use of ICT 62,3/ 66, online government service - 78.2/46, electronic users 81.0/46),

second, general infrastructure accounts for 32.6 scores or ranked 56 (electricity generation -1891,9/ 84, logistics - 24.7/92, gross capital formation in percent in relation to GDP - 40.6/6),

third, ecological balance accounts for 16.4 scores or ranked 117 (GDP/energy consumption unit 5.2/118, environmental impact -38.2/77, ISO 14001 environmental certificates/billion USD in relation to GDP-0.1/125).

According to some of these indicators, we are in the top 50, for example, ranked 46 by online services of our government! In terms of e-commerce we possess the same result and according to the level of capital formation in relation to GDP we can even compete for the top 10, as we ranked 7 in terms of generating capital in relation to GDP! (Russia ranked 59, Kazakhstan ranked 24). In general, our indicators of "Infrastructure" have demonstrated their strengths in many parameters.

"Market sophistication" is considered another important indicator of the global rating, which has demonstrated a decrease by 36 points. In other words, this indicator accounts for 33.9 scores or ranked 60.

First, the lending is rated at 7.1 scores or ranked 119 (ease of borrowing - no data available this year, but in 2021 it constituted 65.0/61, domestic loans to the private sector in percent in relation to GDP - 35.7/87, microfinance gross loans in percent in relation to GDP - 0.2/51),

second, in terms of investments no data available. However, last year this indicator was rated at 70.0 scores or incomplete data (ease of protection of minority investors - 70.0/36, market capitalization- no data available, venture capital investors, transactions/billion USD - no data available, venture capital recipients, transactions/billion USD - no data available),

third, trade, diversification and market size have been rated at 60.7 or ranked 51 (applicable tariff rate, average weight, 2,6/69, local industry diversification - 92,9/37, domestic market size, billion USD (PPP) - 291,2/59).



According to “*Business sophistication*”, the fifth indicator in 2022 is admitted as an absolute record of the rating, which has increased by 49 points compared to 2021 (improved its position from 123 ranking to 74).

Herewith, the first, no data available in terms of educated employees (however, this indicator amounted to 22.8 scores last year), knowledge-intensive employment in percent – 16.9/98, firms offering formal training in percent – 16.9/98 compared to GERD in relation to GDP – 0.1/69, GERD funded by business in relation to GDP – 13.7/56, women with academic degree- no data available),

second, innovation relations have been scored at 24.7 or ranked 59. Due to the fact that the data is inadequate (university-industry collaboration-data on research is not available, development status of the cluster - no data available, foreign-funded GERD in percent in relation to GDP - 0.0/93, joint ventures/strategic partnership agreements/billion USD (PPP) in percent in relation to GDP -0.0/62, patent families/billion USD in percent in relation to GDP - 0.0/91),

third, mastering knowledge - 22.8 scores and ranked 100 (intellectual property fees, total sales percentage - 0.4/74, high technology imports, total sales in percent - 9.1/54, ICT services import, total sales in percent - 0.7/98, net inflow of foreign direct investment in percent in relation to GDP - 2.6/54, research potential at enterprises in percent - 12.9/58).

The rating has no strengths in these business attractiveness indicators, with the exception of the business-funded GERD.

In terms of Knowledge & technology outputs, the *sixth* indicator, the figure accounts for 17.9 scores and ranked 80. However, last year our country demonstrated the greatest increase of 13 scores. Unfortunately this year Uzbekistan ranked 77. Although this figure should have been even better, but our patents, research and technical articles and the information we quote are not in a position to be proud of.

First, knowledge creation (creative approach) - 9.1 scores or ranked 78 (patents billion dollars (PPP) in percent in relation to GDP, 1.3/56, RST patents/billion USD (RRR), 0.0/95 percent in relation to GDP, utility models /billion USD, in percent in relation to GDP 1.3/18, research and technical articles/billion USD (PPP), 2.4/124 in percent in relation to GDP, h-index of cited documents 3.4/113),

second, the impact of knowledge - 33.9 scores or ranked 42 in the rating! (labor productivity growth in percent - 4.7/7, new businesses - 2.7/49, software costs, in percent in relation to GDP - no data available, ISO 9001 quality certificates/billion USD (PPP) in relation to GDP – 1.5/92, high-tech production, in percent - 27.3/46),

third, the spread of knowledge - 10.7 scores or ranked 101 in the rating (revenues on the object of intellectual property, 0.0/106 in percent, attractiveness of production and exports 30.3/85, exports of high technologies, 0.3/98 in percent in relation to the overall trade, exports of ICT services, in percent in relation to overall trade - 0.9/87).

On the basis of the reforms ongoing in the socio-economic areas of the country, the emergence of business entities and their high labor productivity deserves a high ranking in the international ratings. That is, our country has been ranked 8 in terms of the labor productivity growth! (For comparison: Republic of Belarus ranked 38, Russia ranked 44, Kazakhstan-48), in percent - 4.6/8. In addition, favourable position can be observed in terms of the conditions created for the performance of new businesses. We can confidently ascertain that the analytical data presented in these indicators have shown their strengths.

In the *seventh* indicator “Creative outputs” Uzbekistan has improved by 11 scores (ranked 102 in 2022). At the same time, it has reached 7.7 scores in the rating.

first, intangible assets have been assessed at 12.5 scores or ranked 94 (it is the first time to be included in the rating), on trademarks/billion USD (PPP) in relation to GDP 30.9/75, global brand value with the highest value of 5000 in GDP - no data available, on industrial samples/billion USD (PPP) in relation to GDP - 0.6/82;

second, creative goods and services -5.3 scores or ranked 100 in the rating (export of cultural and creative services, in percent to total trade - 0.0/132, national feature films - 1.2/79, entertainment and media market - no data available, printing and other media, production as a percentage - 0.5/79, exports of creative products, as a percentage of total trade - 0.3/68),

third, online creativity - 0.5 scores or ranked 109 in the rating (total top-level domains (TLDs) - 0.0/132, country code TLD - 1.2/79, wikipedia edits - 0.9/104, mobile application creation/billion USD (RRR), in relation to GDP - 0.0/107).

It should be noted, we still have a lot of work to do on these indicators. However, despite of improving our rating from 113 to 102 we are still far behind the foreign experience in the creation and commercialization of intellectual property (creation of intellectual property ecosystem), which has been repeatedly mentioned by the President of our country. Moreover, the President has determined it as one of the priorities.

We can say with confidence that today on the basis of the “Third Renaissance”, the “Concept of Science Development until 2030”, adopted as one of the significant steps in achieving international indices and rankings of Uzbekistan, is being implemented. It is not difficult to understand this, as we are gradually rising in the above International rankings because in 2020, when we scored the International Innovation Index (GII) by this World Intellectual Property Organization (WIPO), in 2021 it was ranked 82.

## **5. Conclusion and proposals.**

Currently the funds allocated for science and research in Uzbekistan account for only 0.5 percent of the national GDP. This figure is much lower than the funds allocated to science by developed and developing countries. In addition, the level of commercialization of research results is not high. It is noted that this does not enable research institutions and innovative enterprises established by them to attract investment and bank loans. As a result, by 2030, some low-rated indicators will need to be improved in order to rank high in the Global Innovation Index rankings. In this case, we consider it necessary to pay attention to the following aspects:

first, increase the research and development expenses on the component of human capital and research, as well as the development of technology transfer;

second, to further improve the performance of foreign-funded (GERD) indicators on the business attractiveness component and to develop ICT services;

third, to further increase and develop the dissemination of knowledge on the science and technology outcome component;

fourth, to further improve Internet creativity and mobile application development on the creative outcomes component.

The period of the “Third Renaissance”, which began in new Uzbekistan, has never yet been included in the international rankings and indices, in particular: Global Competitiveness Index, World Economic Forum, INSEAD international business-school, Cornell University, World Intellectual Property Organization, (WIPO), Global Green Economy Index - Dual Citizen LLC organization, as well as Competitive Industrial Performance Index developed by United Nations Industrial Development Organization (UNIDO), however, in future our country is striving to get high ranking in the assessment of this reputable ranking agencies.

Despite the impact of the global pandemic, in accordance with the “Concept of Science Development until 2030” and the “Third Renaissance” launched in our country, it is crucially important to intensify and develop activities aimed at raising the number of published research articles, citation index, participation in international conferences and seminars, research activities of higher education institutions on the basis of state support of higher education institutions.

Uzbekistan has already undertaken its first steps in the Global Innovation Index (GII) rating, which has been recognized by reputable international organizations.

In conclusion, the experience of the past two years have shown that Uzbekistan has succeeded in achieving a worthy rating in the Global Innovation Index alongside with economically developed countries, which development history accounts for several hundred years. Following this active development rates, no doubt, will result in achieving the goals and objectives set in the Concept of development of Uzbekistan by 2030. Thus, as the President of the Republic of Uzbekistan said, "The changes that have been launched in our country will not be reversed ... despite the challenges experienced nowadays, we are able to adapt to difficult conditions and find new "points for growth".

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