

Analysis of National Rating Indicators Aimed at Assessing the Effectiveness of Scientific and Innovative Activities of Scientific Organizations in Uzbekistan

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Abstract; This article provides an analysis of the national ranking of scientific organizations funded from the state budget in the field of science. Also analyzed in terms of the number of researchers working in scientific organizations and their academic degrees and titles, the number of scientific articles published by them in prestigious international journals, the number of research projects implemented.

Keywords: National rating system, indicators, comparative analysis, h-index, publications, grants, international projects.

Introduction. In recent years, great attention has been paid in our country to the development of science and scientific and innovative activities. Because the development of any country directly depends on the achievements of this country in various fields through the work carried out in the field of science and cooperation with foreign countries. There is no doubt that the development of science in the country will contribute to the development of all areas and the discovery of innovative solutions. The impact of scientific organizations on the development of the country is huge, and the introduction of innovations in every field and industry is based on scientific research. By developing and publishing a national scientific ranking of scientific organizations funded from the state budget, it is possible to clearly see the work being done in the field and see the effectiveness of the results.

Discussion. At present, in order to develop science in the country, the Center for Scientific and Technical Information under the Ministry of Innovative Development has for the first time launched a free 3-month pilot training course "English for Science" for young scientists in the country. This course will greatly help its participants to prepare their scientific articles in English, to publish articles in international scientific journals using academic writing. The purpose of this program is to increase the use of our scientists from the database of leading scientific articles such as Web of Science, Scopus, Springer, Wiley.

In order to improve the management system in the field of science, one of the priorities of the "Concept of development of science until 2030", approved by the Decree of the President of the Republic of Uzbekistan dated October 29, 2020 No PF-6097, introduced a national rating system marked Also, in paragraph 39 of the "Roadmap" for the implementation of the Concept of Science Development until 2030, approved by Annex 2 to the Decree, the assessment of scientific and technical potential of the country, including the analysis of the state of science and its further

development Assess the effectiveness and efficiency of research programs based on the identification and analysis of "strengths" and "weaknesses" of local scientific and technical capacity.

In Uzbekistan, active work is underway to improve the state system of scientific and technical information. This work is extremely important both for providing the necessary, reliable and complete data for the processes of making operational and strategic management decisions on the development of science and innovation, and for high-quality information and analytical services for all subjects of the national innovation system.

Work is underway on information and analytical services for the branches of science, including the preparation of digests and bulletins on the latest innovative technologies and scientific developments in the country and in the world, as well as the national report on the science of the Republic of Uzbekistan for 2017-2020. COVID-19 vaccine development digests are prepared and published on a daily basis.

According to the "Concept of development of science until 2030", approved by the Decree of the President of the Republic of Uzbekistan dated October 29, 2020 No PF-6097:

Systematically (once every three years) to assess the status and activities of scientific organizations, coordinate state policy for the development of science and define the tasks and directions of strategic development, identify negative and positive aspects of the development of research; scientific and technical expertise and priorities for the development of science are independently audited by international audit organizations;

The Ministry of Innovation Development is the state body directly responsible for conducting independent scientific audits. Based on the results of the audit, new infrastructure and areas of science will be created, existing ones will be expanded (or reduced) and reorganized to work on new areas. Critical study of research institutions operating in our country, transparent assessment of the quality of their research work, the formation of a competitive environment with other research institutions and raising them to the level of the world's leading research institutions;

Formation of a database on a systematic basis describing the level of research and innovation activities of research institutions, the quality of research work, the results of scientific and innovative activities and their evaluation in accordance with the rating indicators;

Cooperation with the world's leading rating agencies and practical assistance in the inclusion of national research institutions in the ranking of the world's leading research institutions.

In order to ensure the implementation of the task, the Ministry of Innovative Development held an international tender to audit the scientific and innovative activities of all state scientific organizations of the country. According to the results of the international tender, the Belarusian Institute of System Analysis and Information Support (BelISAIS) won and a contract was signed with the organization.

This organization evaluates the scientific results of scientific organizations operating in the country and calculates them by scoring in each area. The Ministry of Innovative Development analyzed the official data of 75 indicators in 27 areas of their scientific and innovative activities on the basis of a survey of 105 scientific organizations operating in 26 ministries and departments, based on the results of scientific and innovative activities of scientific organizations in 2020 developed a national ranking. According to it, the top 10 scientific organizations with the highest scores were developed (Table 1).

The results of scientific and innovative activities of scientific organizations in 2020

№	Directions	Total
1	The number of articles in scientific journals included in the WoS and Scopus databases	1709
2	The number of articles published in international scientific journals and conferences (Except for scientific journals included in WoS and Scopus databases)	6599
3	The number of published monographs	579 (international 86 + local 493)
4	The number of security documents (patents) obtained from intellectual property	305
5	The number of certificates for software products	300
6	The amount of funds attracted from extra-budgetary sources in the reporting year (million soums)	177 155,7
7	Export of scientific products (thousand dollars)	18 120,194
8	The number of applications for patents for intellectual property	432

Source: www.mininnovation.uz Official website of the Ministry of Innovative Development of the Republic of Uzbekistan.

Table 1. General information on the results of scientific organizations funded from the state budget according to the results of the national ranking

According to the results of scientific and innovative activities of scientific organizations in 2020, the number of articles in scientific journals included in WoS and Scopus databases was 1709 and the number of articles published by all scientific organizations in international scientific journals and conferences (excluding scientific journals included in WoS and Scopus databases) was 6599 . The number of monographs published by scientific organizations was 579 (86 international + 493 local). In the reporting year, the amount of funds attracted from extra-budgetary sources for research organizations reached 177,155.7 (million soums), and exports of scientific products amounted to 18,120,194 (thousand US dollars). The number of security documents (patents) obtained as a result of research by intellectual organizations from the objects of intellectual property reached 305, the number of certificates for software products - 300 and the number of applications for patents for intellectual property - 432.

Based on the results of the national ranking, the effectiveness of scientific activities of scientific organizations was assessed and the top 10 scientific organizations were developed. This list consists of those with the highest organizational results (Figure 1).

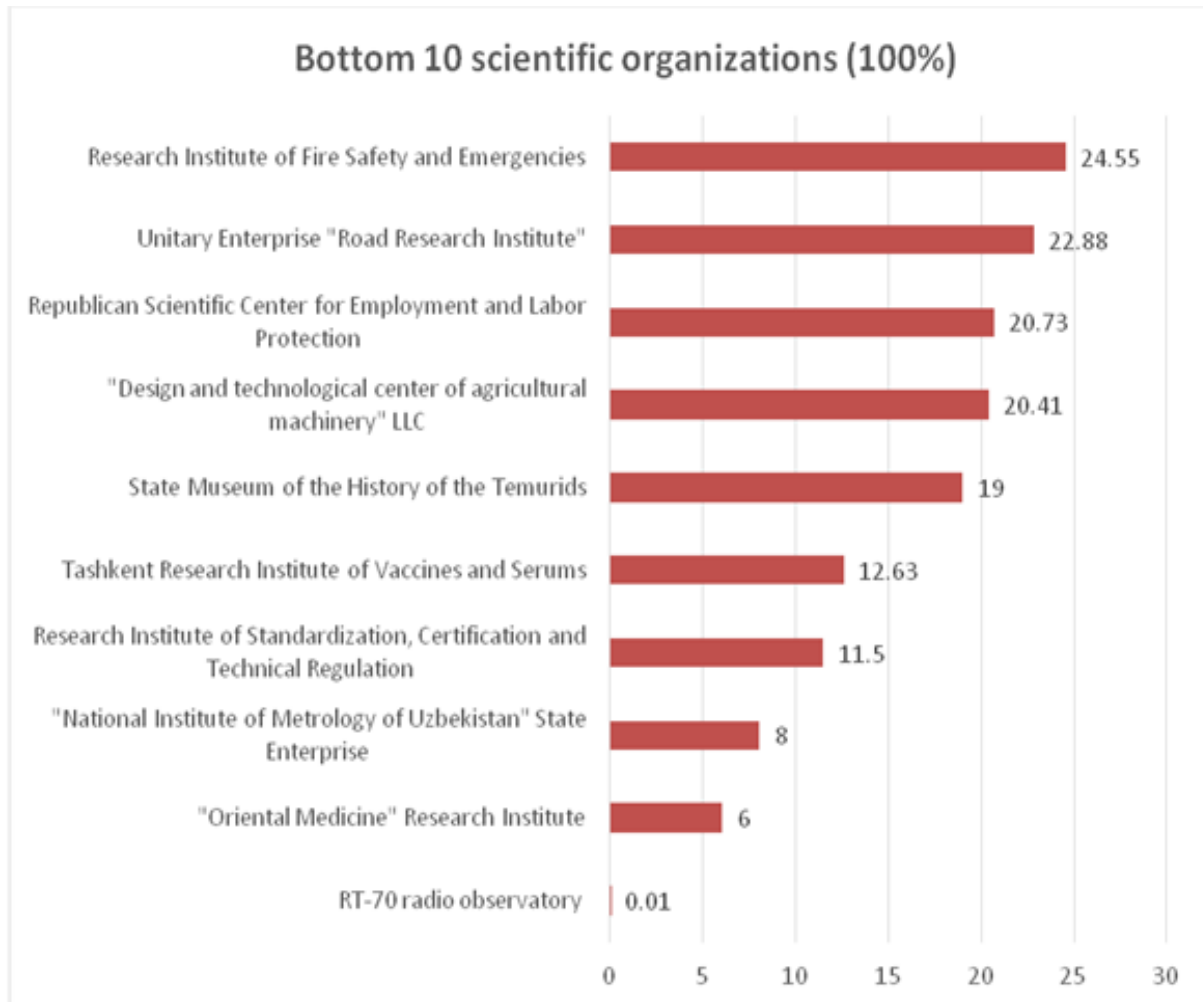


Source: www.mininnovation.uz Official website of the Ministry of Innovative Development of the Republic of Uzbekistan.

Figure 1. The list of organizations in the top 10 in the ranking of scientific organizations according to the results of the national ranking.

Based on the above data, it can be seen that the Institute of Plant Chemistry was found to be the organization with the highest results among the 105 scientific organizations operating in the country. This organization took the first place with 90.77 points based on the results of 75 indicators, while the Forestry Research Institute took the 10th place with 72 points based on the results of scientific and innovative results. Taking into account the diversity of directions of the scientific organizations in the top-10 list, each of them was evaluated by scoring in their own direction.

List of organizations with the lowest scores in the national ranking of scientific organizations funded from the state budget according to the results of scientific and innovative activities (Figure2).

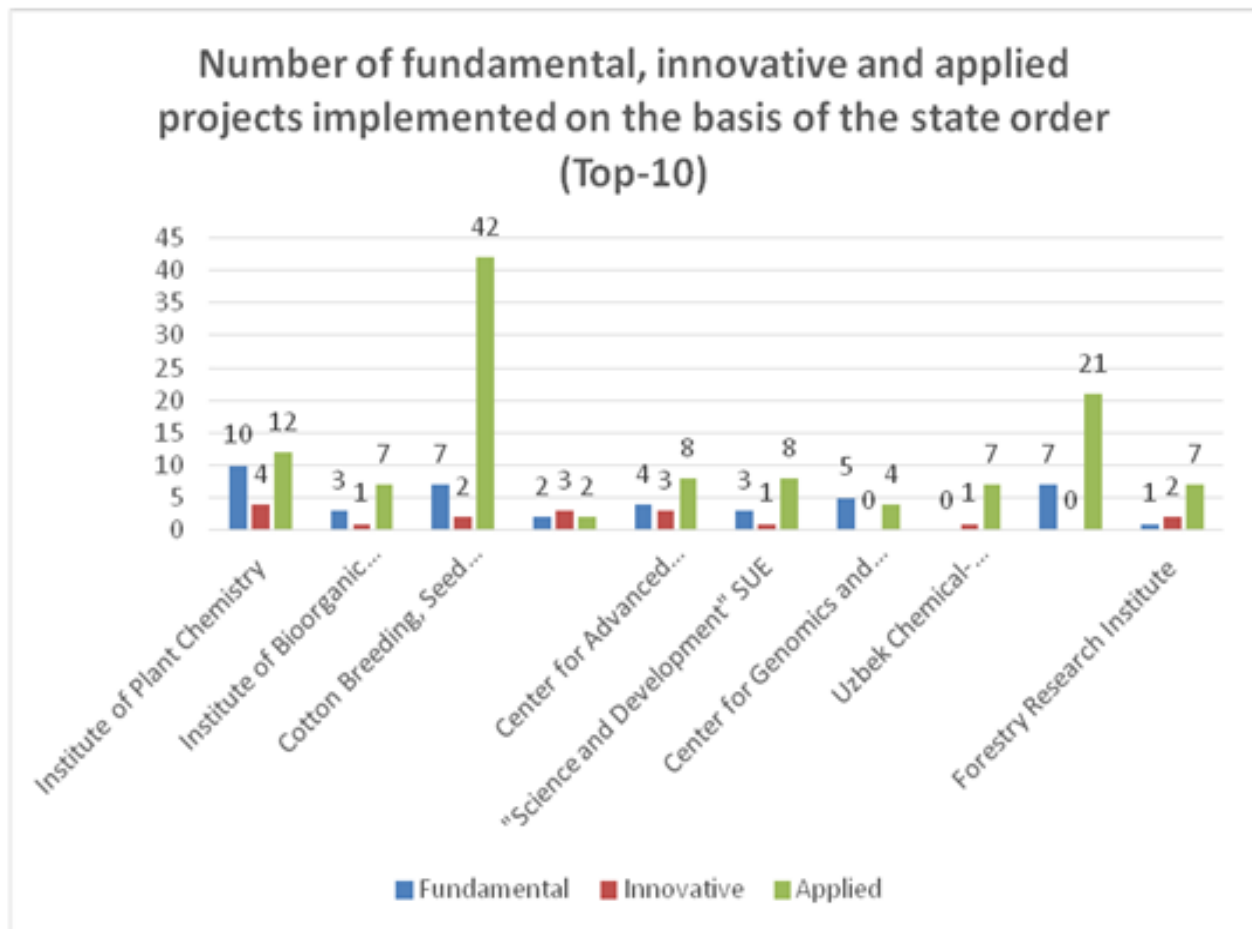


Source: www.mininnovation.uz Official website of the Ministry of Innovative Development of the Republic of Uzbekistan.

Figure 2. The list of organizations in the bottom 10 in the ranking of scientific organizations according to the results of the national ranking.

Based on these data, according to the analysis of the results of scientific activities in all areas of scientific organizations, the Research Institute of Fire Safety and Emergency Situations took the first place among the top 10 scientific organizations with 24.55 points (96th place), RT-70 radio observatory - 0.01 points. with the lowest ranking (105th place). We can see that research and studies focused on scientific and innovative activities by this scientific organization are not well developed.

Results. Information on the number of projects implemented by scientific organizations and the funds allocated to them from the state budget, participating in the competition of fundamental, practical and innovative projects under the state programs of scientific activity of the Ministry of Innovative Development (Figure 3).



Source: www.mininnovation.uz Official website of the Ministry of Innovative Development of the Republic of Uzbekistan¹.

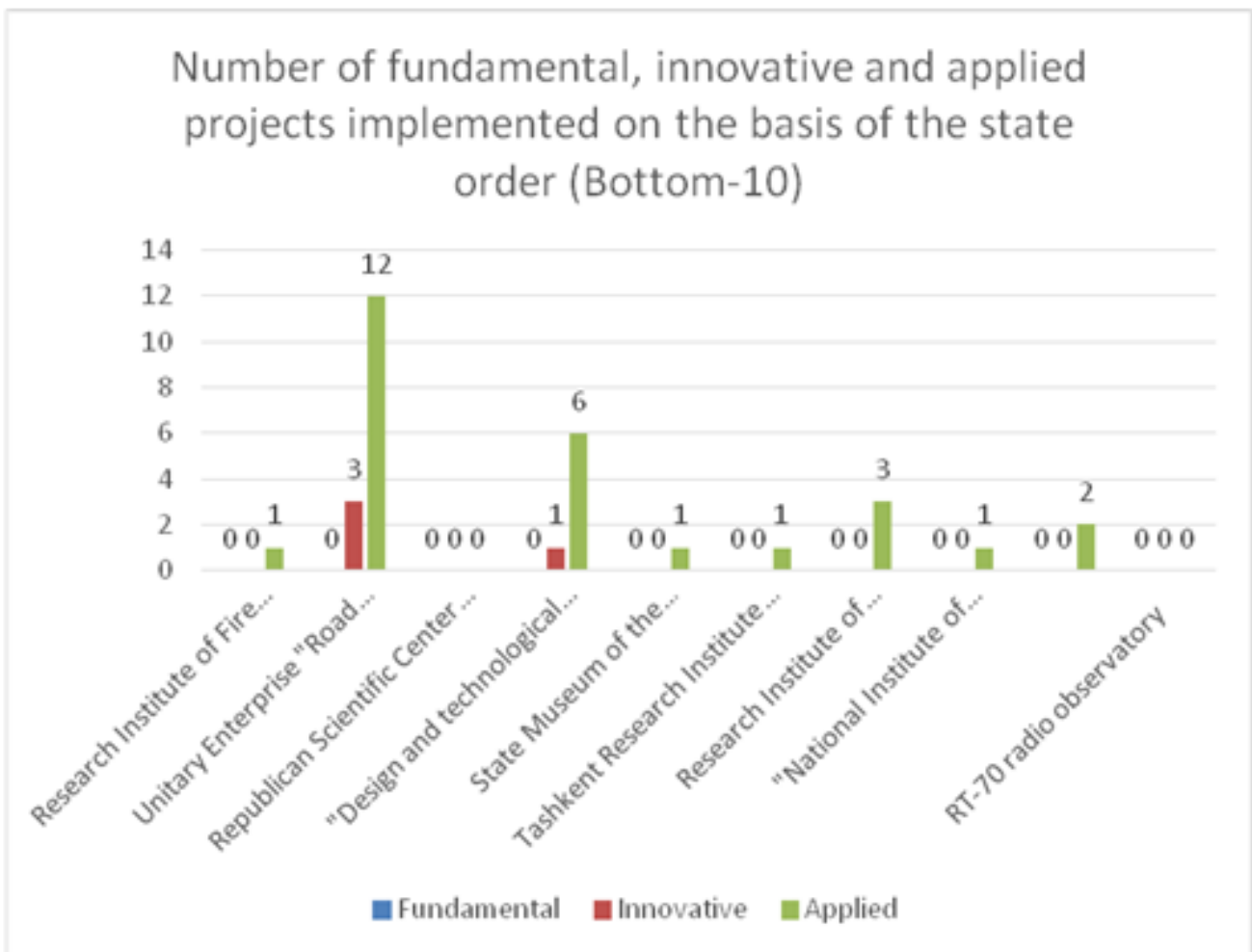
Figure 3. Analysis of the number of research projects implemented by scientific organizations.

In order to implement fundamental, applied and innovative projects announced in the framework of state programs related to scientific activity, funds are allocated from the state budget to scientific organizations and projects are implemented using these funds. According to the results of the national ranking, the Institute of Plant Chemistry, which took first place, has implemented a total of 26 scientific projects, including 10 fundamental, 4 innovative and 12 applied projects.

It is noteworthy that the organization that took 3rd place in the ranking is the Research Institute of Cotton Breeding, Seed Production and Agrotechnology. However, the organization has implemented a total of 51 research projects, including 7 fundamental, 2 innovative and 42 applied projects. This means more than the organization that ranked first in the ranking system.

Information on the number of fundamental, applied and innovative projects published within the framework of state programs on scientific activity and implemented by the bottom 10 scientific organizations in the national ranking system (Figure 4).

¹ Developed based on author's analysis.



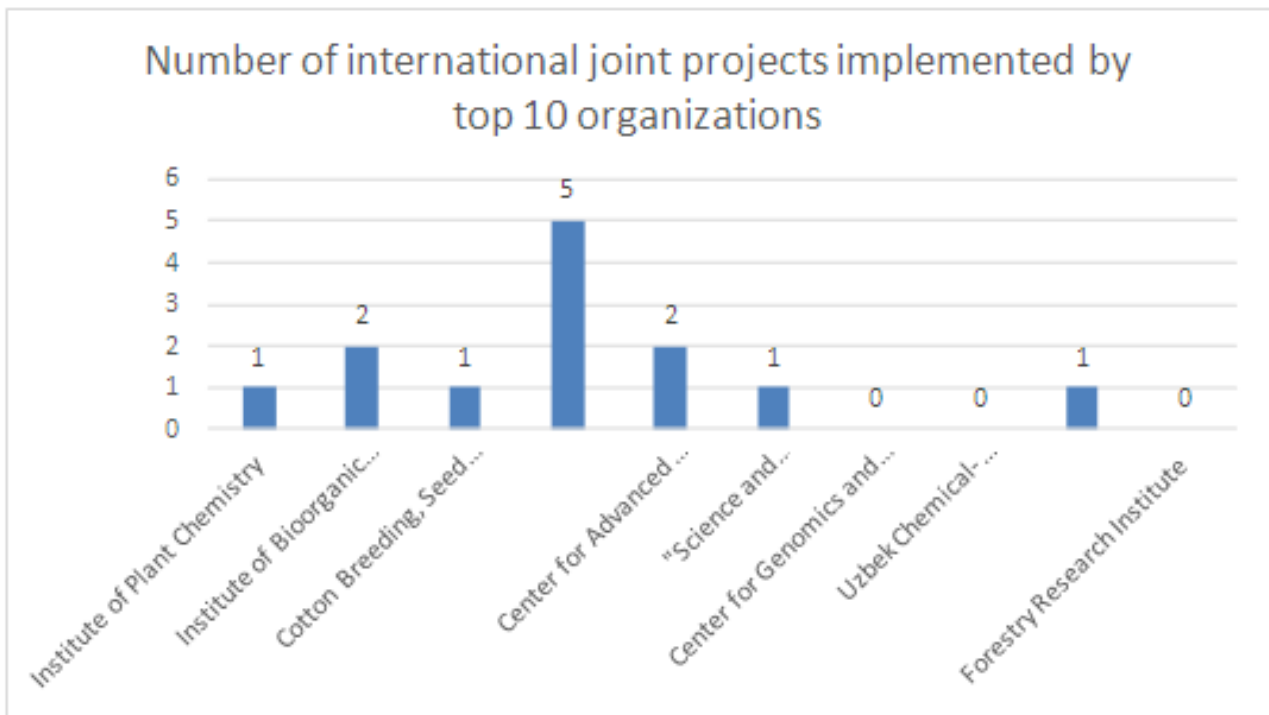
Source: www.mininnovation.uz Official website of the Ministry of Innovative Development of the Republic of Uzbekistan.

Figure 4. Analysis of the number of research projects implemented by the top 10 scientific organizations based on the results of the national ranking.

Fundamental, applied and innovative projects are implemented by scientific organizations financed from the state budget. According to the results of the rating, even some scientific projects have been implemented by some scientific organizations. These are:

Republican Scientific Center for Employment and Labor Protection and Radio Observatory RT-70.

The Ministry of Innovative Development announces international joint projects. Information on the number of research projects implemented by scientific organizations is available (Figure 5).



Source: www.mininnovation.uz Official website of the Ministry of Innovative Development of the Republic of Uzbekistan.

Figure 5. The number of international joint projects implemented by scientific organizations in the top 10 according to the results of the national ranking.

International joint scientific projects implemented by scientific organizations 1 project was implemented by the Institute of Plant Chemistry (the organization that took 1st place in the national ranking). Cotton Research Center Joint Stock Company (in the national ranking) 5 international joint projects were implemented by the 5th place organization). It is no secret that the development of scientific cooperation with other countries will make a significant contribution to the country's economy, given that the further development of the mechanism of implementation of international joint projects of scientific organizations operating in our country will open wide opportunities for our scientists. Consistent work is being done to expand the scope of these international joint projects and to carry out well-thought-out and mutually beneficial work.

Conclusion. In conclusion, it should be noted that the monitoring of the activities of scientific organizations operating in our country and the development of a national ranking based on the results will provide a great opportunity to identify the weaknesses of scientific organizations and encourage their strengths. Auditing of scientific organizations by a foreign company on the basis of an international tender also helps to ensure transparency.

The issue of commercialization of the system of scientific works and projects carried out by scientific organizations also needs to be radically reformed. This is because when an industrial design of a technique is developed by a particular scientist, the problem of commercializing it becomes difficult to solve. As an improvement in the funding of scientific organizations from the state budget, funds can always be allocated not only from the Republican budget, but also from the local budget.

In order to ensure the publication of articles in prestigious foreign journals by scientists working in our country, the Ministry of Innovation Development has introduced a system of free English language training within the English for science program, which greatly helps them to work and exchange views with foreign partners. Such programs need to be expanded. The work of our scientists with foreign scientists will help them to exchange ideas and implement international projects.

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