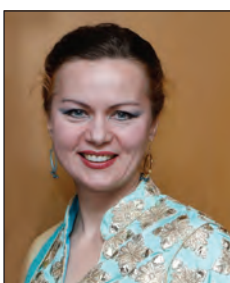




Science Diplomacy for Innovation Policy of Russian Universities



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Introduction

Russian Federation is in a state of economic instability as is the whole world. This fact is for understanding the need for a deep modernization of all sectors of the Russian economy. Development of the strategy for an advanced society and for cultural modernization of the country is an important mission. This can mostly be possible by adoption of innovation technologies. As Science diplomacy can accelerate exchange of technologies, it would be useful for all the participants of the global process.

Research Results

Development of innovation strategies in Russia can be divided into two main phases. At the first phase, which was up to 2014, the Government of Russia created basic elements of innovation infrastructure and supported innovation projects and initiated transformation of scientific sphere. Government programmes were aimed at developing high-tech sectors of the economy and in creating system of institutional development in the innovation sphere including SKOLKOVO (2010), Association of Innovation Regions of Russia (2010), Fund for Infrastructure and Educational Programs (2010), Fund “VEB-Innovations” (2011) and Russian private equity fund (2011).

During the second stage, there has been a rethinking on the functioning of the currently existing system. At present, the main focus is on improving efficiency of state power, promoting development of state-owned companies and private businesses, besides development and improvement of the institutional system¹. Priority goals for 2016 were as follows:

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- Analysing innovation development programme of state companies;
- Evaluating development of institution activities;
- Investing in research work; and
- Initiating national projects with high innovation constituent.

Programme supporting 21 Russian universities. The Project 5-100 has been initiated. Its objective is to maximize competitive position of a group of leading Russian universities in the global market of educational services and research programme.²

At the same time, another programme on fundamental scientific research and forecast of scientific and technological development of the Russian Federation up to 2030 was approved. Thirty-five technology platforms in 13 areas of scientific and technological development in the framework of the Federal Target Program, viz “Research and development on priority directions of scientific and technological complex of Russia 2014-2020” has also been initiated.

Russian universities are making great contributions in the innovation development of the Russian Federation. Being public institutions, the universities are the best suited for transferring knowledge to intellectual capital. They are global, open, dynamic sites with a constant inflow of young people. Universities are the centres of excellence and of creation of new technological industries. They are actively engaged in inventing new technologies and transferring them to relevant companies.

The competitive advantages of the universities as centres of innovations are as follows:

- Availability of technical human- resource base;
- Platform for implementation of multidisciplinary research projects;
- Ability to enroll specialists in new areas of knowledge and skill meeting needs of business community; and
- Becoming interactive platform for economic supremacy on a global scale.

However ,there are following problems which

need need to be solved. They are summarized as follows:

- To overcome backwardness, universities need to be leaders for building promising future of students ;
- To eliminate clan system as the administrative authorities of the universities have only limited number of people;
- To stop retaining human resources;
- To overcome narrowness in functions;
- University is considered to be a supplier of employees as well as some ideas and technologies. And the University of the forthcoming future would be a reactor transforming regions, industries and countries; and
- Without adequate horizon of prospects, there would not be necessary resources and results.

For attending to these problems, following are required:

- To focus on the future by firmly adhering to targets of quality of work, which would be evaluated by external visionaries (global professionals);
- To emphasise on cooperation with market and companies;
- To create an advanced HR-market with Russian and global industrial leaders;
- To organize transparency in management;
- To make it open for professionals; and
- To develop management ecosystem contributing in the formulation of universities into centres of regional and sectoral ecosystems, focusing on tools and resources of cluster and sector development.
- The university should be a hub for the implementation of the plans for the National Technology Initiation (NTI). The NTI includes a number of activities at the federal level-aiming at formation of alternative approach to innovation policy of the Russian Federation and also to work with promising markets, rather than with scientific developments and existing industries. The NTI is based on an innovation network approach. It is a

programme of measures, designed to create Russian “champions” in fundamentally new markets and striving to make Russia join innovation and technological leaders by 2035.

- The NTI is divided into two areas-“Markets” and “Technologies”-and each includes a certain group of activities. The technology includes digital design and simulation, new materials, additive technology, quantum communication, sensing, bionics, genomics and synthetic biology, neuroscience, Big Data, artificial intelligence and control systems, and new energy sources.⁴
- Development Strategy of NTI continues till date. The basic provisions were formulated at the Foresight Fleet in spring 2016. One of the main goals of the NTI was the foundation of university-based integrators (SR) and innovation hubs (LR) for NTI market networks.

This requires transformation of universities according to the following objectives:

- To prepare universities for networking with NTI markets;
- To create a chain of basic NTI universities (consortia members) for solving scientific and technical problems; and
- To transform universities into universities-hubs for synchronizing business needs and opportunities of academic community.

For achieving these goals, following needs to be done:

- Develop tools to attract talent;
- Create tools for transition from fundamental to applied research;
- Participate in formulation of measures for creation of innovation ecosystem;
- Develop measures for promoting professions of scientists and entrepreneurs; and

Create a system of material and non-material incentives to engage in research activities.

Universities should become more active participants in the innovation development of Russia. Countries at large, including Russia, have prioritized formation of global innovation society by developing and integrating “knowledge

triangle” (education, research and innovations), large-scale investment in human resource, development of professional skills and research, and also by supporting modernization of education system to satisfy needs of global knowledge-based economy. The development of relations through science diplomacy would help Russian universities achieving their goals. The exchange of innovation technologies would be mutually beneficial for all.

The world has accumulated considerable experience in innovation development. Countries successful in innovation development have a highly developed friendly environment for scientists, innovators, and entrepreneurs. Europe and the United States have a “down-up” innovation ecosystem, founded on the basis of market needs. Asian countries generally set their own innovation agenda “up-down” which is founded on Government supported projects. Western Governments at present are actively investing in specific research and innovation projects directly or through special funds. Priority in public funding allocation is given to fundamental research.

The Russian Federation should be guided by leaders of innovations. The best practice is to create favorable conditions for supporting the innovations. The Federation allocates sufficient funds for supporting innovation but the environment is still not very congenial. Russia spends money for targeted support to innovation projects but development of favourable environment is lacking; which is typical of Asian countries than Western countries. Russia is far behind Western and Asian leaders of innovations in certain civil, public and business institutions.

Problems in the implementation of innovation policy are not felt in the Russian Federation alone. For example, in some countries, lack of proper infrastructure inhibits significantly development of economy. In India, power generation fulfils to the extent of 90 per cent of electricity demand. Shortage of electricity is the reason for decline in revenue by about 6-9per cent per year. The Government of India and governments of other

Asian countries are working on designing effective measures for modernization of infrastructure, including improvement of techno-legal base.

Inconsistencies in the management and complex regulatory framework are the major obstacles for using business opportunities in developing countries of Asia. This indicates that the priority goal of a number of Asian countries is to go in for reforming legal-base. The Government of India has implemented a series of reforms for improving the investment climate. In the framework of "Make in India" campaign, which aims help India to become a global Production Base, the Government has initiated a programme called "red carpet, not red tape". Creation of "Facilitation for investors' Group" should help foreign companies to resolve regulatory issues. The Indian Government also intends to improve its bureaucratic structure by abolishing a number of government committees and by optimizing allocation of responsibilities to different ministries, which often overlap. Furthermore, the Government plans to simplify tax system of the country.⁵

Similar problems exist in the Russian Federation also. The "intelligent" aspect of innovation culture in Russia is traditionally strong, but public opinion is opposed to scientists and innovators. Dynamics of public interest in scientific topics is negative: the Russian society is indifferent to science. In the Russian Federation only 20 per cent of the respondents are interested in scientific discoveries and technological advances, and in the United States and China the number comes to around 40 per cent. Modern Russian society does not consider it is necessary to develop knowledge- base,

Policy of improving public attitude towards innovation in the Russian Federation should be aimed at young people. Young people are more open to learning and are willing for generation of innovations. In view of this, role of universities is important.

Following are the ways how the Government of Russia can help universities engage young people in science and innovation.

- To use media for promoting achievements of scientists, innovators and entrepreneurs;
- To reshape school and university curricula in a way incorporating relevant disciplines and teaching methods, thereby awakening interest;
- To encourage training and further training of middle-aged men;
- To encourage scientists and innovators for communicating with a wider audience; and
- To create a platform for communication (exhibitions, fora, magazines, public urban spaces, etc.)

Increasing interest in learning and involvement of young people in the innovation sphere would contribute to upgradation of components right at the school curricula. The existing curricula are based on memorization of basic knowledge and checking using standard tests. This does not pinpoint individual talent of each student. It reduces learning outcomes at the university. Young people have an impression that science is a complex and boring thing. Such an attitude towards science and innovation stops development of active life and thus reduces professional opportunities of young people. This is not true typically for Russia but also for the world as a whole. In some countries, need to improve school education system was realized at the level of society. One of them is Finland, which created "educational miracle" in the second part of the twentieth century.

The Russian Federation also has significant examples of implementation of innovation infrastructures in higher education institutions. On the basis of the active participation of the Russian universities, many forms and patterns of scientific and production integrations, such as training, research and innovation systems (TRIS), educational and scientific-industrial complexes (ESIC) and science parks, were created.

At present, Peter the Great St. Petersburg Polytechnic University-one of the leading polytechnic universities in the country-provides training to specialists and researchers to benefit high-tech industries of the national economy. The main strategic partners of Peter the Great St.

Petersburg Polytechnic University are more than 250 industrial enterprises, research institutes, design bureaus and scientific-innovation firms of high-tech industries. The main foreign partners are more than 220 research centres and universities from 37 countries, and 70 industrial companies and organizations from 19 countries. The University has created a unique structure for Russian educational space -- science and innovation institutes (Institute of Materials and Technologies and Energy, Institute of Ecology and Nanobiotechnology).⁶

Tomsk is a good example of how science and education acquires city-forming status, and development of human resource becomes relevant. Despite the dominance of the primary sector in the economy of the Tomsk region, many experts opinionated the need of innovation development for contributing to the modernization of the regions and the country as a whole. There are many programmes in Tomsk, which are vectors of innovation development.

One of the projects carried out in Tomsk was a special economic zone of technology-innovation, created in 2005. Residents of this zone are high-tech companies involved in areas of medical and biotechnology, high-tech development, and information technologies. The prerequisite for the creation of technology-innovation zone in Tomsk was: high concentration of research centres, nanotech production availability and training of innovation specialists in the city high schools. The purpose of the zone was transition towards innovation economy based on the advanced technology development. These technologies should be implemented in all areas of production, which in future would change the region from resource-based economy to innovation-based economy.

Such an approach helped Tomsk in strengthening its position among innovation cities. Transition to high-tech production became noticeable in all areas of industry. According to experts' evaluation, Tomsk is among the Top-3 leader cities at the country level with following indicators-industrialization, informatization, and implementation of innovations. Some experts

distinguish Tomsk region as the leading region in establishing a new innovation cluster. A huge contribution for achieving success was made by two leading universities of Tomsk-National viz Research Tomsk State University and National Research Tomsk Polytechnic University. Both were participants of the Project 5-1007.⁷ Another example of the serious impact of the university on the innovation development of the region is the National Research Lobachevsky State University of Nizhny Novgorod. This University occupies a high position in the world rankings for research in physics and biology, and it was also a participant in the Project 5-100. The Lobachevsky State University has entered into a strategic partnership with the leading industrial enterprises of the region, research organizations and institutes of the Russian Academy of Sciences. The new direction for development in the Lobachevsky State University is biomedicine. Developing the system and culture of knowledge transfer, introduction of effective mechanisms for the management of interaction between the University and external customers, and forming a team of qualified experts in the sphere of knowledge transfer for an effective socio-economic development of the Lobachevsky State University are the fundamentals for the success of the university's international strategy. The system for supporting knowledge transfer includes the following:- Innovation Technology Centre, Department of technology transfer and business in the field of science and technology; Centre for network integration with external enterprises; Methodological Centre for Knowledge Transfer; and Regional Centre for International Scientific and Technical Cooperation, and Graduate employment centre.

Siberian Federal University(SFU) is another example of successful venture of the Project 5-100. The most competitive educational fields in SFU are: radio engineering, mining engineering, biology and biotechnology, climate change and biogeochemistry. The SFU is planning to focus on the priority sectors which are traditional for Siberian Federal District:- oil and gas sector, energy, biomedicine, environmental management and ecology as well as the development of

human capital. The main goal for the University up to 2021 is to become a part of the global market of research and educational services. The University recognizes the need for accreditation and implementation of innovation educational programmes for entering into the global educational space.⁸

A number of universities participated in implementing innovation development programme of the state-owned companies - Bauman Moscow State Technical University, Tomsk Polytechnic University, etc. Every university has been recommended to create a centre of commercialization – technology transfer – that would contribute in the implementation of the patents (other intellectual properties) to economic entities of the Russian Federation. The universities which received the mentioned income are:- Irkutsk National Research Technical University, Kazan National Research technical University named after A.N. Tupolev, National Research University “Higher School of Economics”, Gubkin Russian State University of Oil and Gas, Peter the Great St. Petersburg Polytechnic University, Moscow State University of Technology “STANKIN” and others.⁹

On 14-15 December 2016 participating universities of the Project 5-100 presented their innovations at the IV National Exhibition VUZPROMEXPO at Moscow. This annual forum is a platform for exchange and cooperation among universities, research institutes and businesses. Participants discussed about ways for accelerating technology transfer. One of the main ways for achieving it was the establishment of technology parks by participating universities of the Project 5-100.¹⁰ The next step is to expand international contacts of universities of the Project 5-100 through science diplomacy. The development of mechanisms of cooperation in science and technology between Russia and other countries of the world is one of the important tasks. Russia understands that cooperation and science diplomacy is a promising way forward for the development of Russian state and society.

Conclusion

Russian universities can become generators of positive changes in Russian society through translation of ideas about the need to introduce innovation technologies in various fields. The main thing that needs to be done is the creation of favourable conditions to accelerate transfer cycle from fundamental to applied research, as well as to transfer of focus of distribution of state support towards the most priority technologies and developments. Main activities in this field include: forming a system for stimulating research and academic teams aimed at encouraging activities in the development of knowledge transfer; developing a knowledge transfer culture and appropriate skills by means of professional development of researchers, academics and administrative staff of the University; and development of a system for international scientific and technical cooperation. International cooperation in the innovation sphere is important. Science diplomacy is one of the important ways of promoting this cooperation. The more mechanisms there are for international exchange, more opportunities they can create to build links on an international level.

Endnotes

1. Karandashev A., *et al.* Innovation Policy of University. Program: Leaders of Changes for Global Universities. Moscow School of Management SKOLKOVO, Presentation slides, Moscow, pp. 2-5 (in Russian).
2. National Report about Innovations in Russia 2015. Project. Part II. *View of the Future*, p. 32 (in Russian).
3. Kuznetsov E. Universities 3.0 on NTI. Presentation slides, Moscow, 2016, pp. 2-4 (in Russian).
4. Danilin I., and Mamedyarov Z. *National Technology Initiative: New Focus and Challenges for Realization of Russian Innovation Policy. Year of Planet 2016.* Preliminary version. https://www.researchgate.net/publication/312197696_National_Technology_Initiative_new_focus_and_challenges_for_realization_of_Russian_innovation_policy_in_Russian (in Russian).
5. National Report about Innovations in Russia 2015. Project. Part III. *Seven Secrets of Innovation*, pp. 44-46 (in Russian).

6. Pertaya, M.V. The Role of Universities in the Innovation Development of Russian Economy. *Universum: messenger of Herzen University*, 2014 vol. 1, pp. 104-115 (in Russian).
7. Galitskaya V., and Bulatova T. Innovation Region in the views of the Community of Experts. *Review of Tomsk State University. Philosophy. Sociology. Political Science*. 2016, n. 4 (36), pp. 280-289 (in Russian).
8. Development Program of SFU for 2011-2021 years. Site of SFU, February 14, 2017. <http://about.sfu-kras.ru/node/8232>.
9. Pukhova M. M., Gruzina Y.M., Kharchilava K. P. The Role of Universities Innovation Infrastructure in the Region Development in the Russian Federation. *Indian Journal of Science and Technology*. 2016, vol. 9 (42).
10. Universities and technology transfer: Project 5-100 participants present their latest know-how at VUZPROMEXPO. Site of Project 5-100, December 20, 2016. <http://5top100.com/news/49691>.

References

- Karandashev A. *et.al.* 2016. Innovation Policy of University. Program: Leaders of Changes for Global Universities. Moscow School of Management SKOLKOVO. Presentation slides, Moscow, pp. 2-5 (in Russian).
- National Report about Innovations in Russia 2015. Project. Part II. *View of the Future*, p. 32 (in Russian).
- Kuznetsov E. 2016. Universities 3.0 on NTI. Presentation slides. Moscow, 2016, pp. 2-4 (in Russian).
- Danilin I., and Mamedyarov Z. National Technology Initiative: New Focus and Challenges for Realization of Russian Innovation Policy. Year of Planet 2016. Preliminary version. https://www.researchgate.net/publication/312197696_National_Technology_Initiative_new_focus_and_challenges_for_realization_of_Russian_innovation_policy_in_Russian (in Russian).
- National Report about Innovations in Russia 2015. Project. Part III. *Seven Secrets of Innovation*, pp. 44-46 (in Russian).
- Pertaya M.V. 2014. The Role of Universities in the Innovation Development of Russian Economy. *Universum: messenger of Herzen University*, 2014 vol. 1, pp. 104-115 (in Russian).
- Galitskaya V. and Bulatova T. 2016. Innovation Region in the views of the Community of Experts. *Review of Tomsk State University. Philosophy Sociology Political Science*, n. 4 (36), pp. 280-289 (in Russian).
- Development Program of SFU for 2011-2021 years. Site of SFU, February 14, 2017. <http://about.sfu-kras.ru/node/8232>.
- Pukhova M. M. Gruzina Y.M. and Kharchilava K. P. 2016. The Role of Universities Innovation Infrastructure in the Region Development in the Russian Federation. *Indian Journal of Science and Technology*. vol. 9 (42).
- Universities and technology transfer: Project 5-100 participants present their latest know-how at VUZPROMEXPO. Site of Project 5-100, December 20, 2016. <http://5top100.com/news/49691/>.