



National Innovation System of the Republic of Belarus



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Introduction

The challenge of an effective National Innovation System (NIS) would require a complex and a dynamic change in the structure of the organisation; in its innovation activities. Innovation process means a number of interactions among institutions and organisations regarding their functions and aims and also among individuals with their original knowledge and interest.

For building a NIS, it is a must to take into account the specific environment of the nation for which the innovation system would become a part. The point to be noted here is the coherence of the innovation system with the external economic, social and environmental systems. Internal stability of the innovation system also needs to be pursued. It should not be confused with the static state of the system; it is an ability to change dynamically pursuing general aim.

Belarus is a small, open, upper-middle income economy. It is not well-endowed with natural resources, and thus largely relies on the imported energy and raw materials. The country's main activities in the industrial sector are on engineering (agricultural technology and specialized heavy vehicles) and refining (relying on oil supplies from Russia) activities, which depend heavily on the external demand. Trade openness is one of the highest in the region with a ratio of 44 per cent in merchandise exports and GDP in 2009.

The disintegration of the former Soviet Union was accompanied by sharp contraction in output; resulting from losses of external markets and also owing to economic dislocation. The contraction in Belarus was, however, somewhat milder in comparison to other successor states of the Soviet Union; as the domestic

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policies continued to support demand and manage in reducing impact of post-Soviet economic dislocation. Following a cumulative 40 per cent output decline in 1990-1995, the economy returned to track in 1996, ushering in a phase of rapid expansion when Belarus posted one of the best performances in the Central Innovation System(CIS). In 2000-04, real GDP grew by an average annual rate of 6.8 per cent, accelerating to 9.6 per cent in 2005-08. In spite of a less favourable external environment as a consequence of the worldwide financial crisis and changes in the trade relations with Russia, its economy continued to grow in 2009, albeit at a much reduced rate of 0.2 per cent. Belarusian authorities are following a path of gradual transition towards market economy.

The State has retained significant levers of influence over economy, and privatization of large enterprises has remained limited. In the recent years, authorities have taken many initiatives to improve business environment and promote development of small and medium enterprises. In addition, privatization options are also being considered. State companies continue to dominate production and exports, while rate of creation of new firms is low.

National Innovation System

Innovation in the modern economy is a highly complex process. In accordance with the internationally agreed understanding of the notion of innovation, there are four broad types of innovations: product innovation; process innovation; marketing innovation and organizational innovation. Each type can be associated with different undertakings, and can have various quantitative and qualitative performance characteristics. In addition, every product, which is new to a given market, is also usually considered and counted as an innovation, although the product may have been earlier already introduced to other markets.

For any innovation system to emerge and develop it starts with environment for the innovation, as it provides the overall framework. Next, special attention is to be given to

subsystems of the country's NIS, which can be developed further to achieve improvements in the functioning of the NIS .

Belarusian Innovation Potential

To estimate Belarus chances for high rank in the world economic system, the need is to consider objectively its suitability for dealing with the science-intensive production; or the hope would be illusory. The basis of sustainable innovation system depends on the availability of the scientific and research potential.

Belarus has been formerly integrated into the general Soviet scientific and technological framework; ranking high in applied researches in civil industries such as mechanical engineering (29 per cent of all works' costs), electronics (11 per cent), automatics and computer facilities (9 per cent), construction and architecture (8 per cent), chemical technology (7 per cent) (Nehorosheva 1996). Industry is the basis of Belarusian economy: its share in the gross domestic product accounted for 65 per cent. This made Belarus one of the most heavily industrialized countries of the world. Generally, 79 per cent of technologies applied in Belarus related to the traditional level and 21 per cent to the advanced level. Of them, 38 per cent worked out in Belarus (*Development of Science in Belarus in 2000*). About 48 per cent applied technologies were introduced before 1985, and 23 per cent were used in the last years (Slonimski 2001).

Scientific, technical and innovation policies in Belarus are being oriented towards building a National Innovation System. Management of R&D in the country is by realisation of the state scientific and technical programmes in fundamental and applied sciences. Belarus was one of the first CIS members to work out legal base and operate on managing state scientific and technical programmes, which are the major tools at present for setting prior directions for R&D activities.

Applied R&D is mostly carried out in a common framework of: (i) state scientific and technical programmes (SSTP); (ii) innovation

projects; and (iii) branch and regional scientific and technical programmes. Sources of the SSTP finances are budget funds, funds of the enterprise, funds of state customers, budgets of the regions and borrowed funds (Anna I. Pobol **year?**). The legal framework for the SSTP consists of more than 150 papers, worked out for different levels of management [participants, several stages, and aspects of innovation process (financing, intellectual property protection, tax, customer, and other preferences, etc.)]. In general, the system of the SSTP is logically built and prospectively-oriented. Yet, the maximum use of its opportunities is expected to be provided by the economic situation and stabilization in a country with market mechanisms.

Environment conducive to innovation

In early 1990s, Belarus declared openly its strategic policy objective to develop an economy based on the science and technology. Since then, more than 25 Laws and Presidential decrees have been introduced; some 40 governmental decrees were issued and many other legal acts were relevantly placed to be contributing to this aim. All these have created an effect of broad awareness and recognition of science and technology for economic prosperity of the country.

In 2007, with the approval of the State Programme for Innovative Development (SPID), the main emphasis was on the innovation, resulting from commercialization of scientific outputs. This programme introduced the concept of national innovation system and governance. Subsequently, substantial efforts were made to organize institutional element of the National Innovation System. Role of different levels of government as well as national and regional level governmental institutions has been defined. The strategic goal of the SPID is for an innovative, competitive, science-based, sustainable and socially-oriented economy of Belarus.

Components of the innovation system

- Laws and regulations;
- National strategic priorities and their translation into programmes at all levels;

- Sources of financing and human resources; and
- Allocation of responsibilities at the national, regional, local as well as the institutional levels for management, organization and control of programmes.

The Concept of the National Innovation System has been developed on the basis of the National Strategy 2020; the Technology forecast 2006-2025 and other strategic documents of the ministries and other governmental bodies. The Science and Technological Policy Committee of the Council of Ministers had approved the concept on 8 June 2006. The concept recognizes sectoral approach as the predominant one in the development and implementation of the science and innovation policy. It rightly points out some of the weak points of the existing NIS; in particular, the entrepreneurial sector, which still does not perform adequately the role of being one of the main catalysts for development of the innovation infrastructure and market.

State programmes of innovation development

The main objectives are creation of globally competitive, innovative, high-tech, resource and energy-saving, environment-friendly economy, ensuring sustainable socio-economic development of the country, and thus enhancing quality of life of Belarusian people.

Key tasks

Creation of new high-tech and knowledge-intensive sectors (biotechnology, nanotechnology, microelectronics, technology, fine chemistry, information technology, new materials, laser-optical technologies, communication technologies, alternative energy, genetic engineering, etc.);

- Creation of new industries, and reconstruction and modernization of existing ones in export-oriented industries (pharmaceutical, chemical, agricultural machinery, wood-working, etc.);
- Creation of new multi-holdings, cluster structures, entry into world's global corporations and alliances, attracting TNCs, reducing material-energy and import-

- production, increasing its ecological safety;
- Regional innovation development acceleration;
- Escalation in export potential of Belarus; to be in the top 30 most competitive countries; and
- Formation of an innovative society (Innovative education).

Recommendations

Science Diplomacy is as like deepening international integration and cooperation can result in improved opportunities for scientific and technological progress and enhanced access to new technologies, including through diffusion of tacit knowledge. These beneficial effects can take place through a variety of channels, including projects, technology transfer to lesser developed sectors and improved employment prospects for scientific staff.

The prevailing understanding of the notion of innovation in Belarus, which is also embodied in the policy domain, emphasizes on the science-based technological innovation. The internationally agreed understanding of innovation is much broader in scope, and distinguishes four types of innovations. From this perspective, the actual coverage of the policy measures that fall into the domain of “innovation policy” in Belarus are probably narrower in scope and coverage than corresponding measures in other countries which adhere to a broader interpretation of the notion of innovation. A truncated innovation policy may lead to inefficiencies in performance of the National Innovation System.

Some of the recommendations are as follows:

- Broaden the scope of policy measures and instruments that fall into the domain of “innovation policy,” with a view to align national with international coverage of innovation policy and raising efficiency of the policy mix;
- Undertake critical assessment of the innovation policy mix in Belarus with a view to compare its coverage with other countries and identifying mismatches;
- Based on the assessment, plan steps for broadening scope of policy measures and the instruments falling into the domain of “innovation policy” (some policy measures of this type are contained in further recommendations);
- Undertake an awareness-raising campaign related to above changes, targeting policy-makers with responsibility for innovation policy, and all policy-makers and general public.

There is a broad awareness and recognition of the importance of innovation for future growth and competitiveness of Belarus by the authorities. As the result, substantial efforts have been made to organize institutional element of the National Innovation System. There have also been important steps to create essential elements of innovation infrastructure. However, the focus has largely placed on the administrative (institutional) elements of the NIS rather than on the links and interactions among different subsystems (e.g. business, science, education, infrastructure, etc.).

Conclusion

Vitality and effectiveness of innovation systems have always depended on the efficiency of the flow of information among the participants. Access to relevant information is thus one of the vital elements for successful operation of the innovation system at local, national or European level. One of the most effective tools for supporting and encouraging innovations is an information campaign, addressed to businessmen, though it is often kept for a trivial waste of tax bearers’ funds.

The accessibility of information becomes useful only when the ability to absorb and integrate the knowledge diffused for the production process. This proves once again, that in an innovation system, responsibilities for knowledge diffusion should be coherently and consistently among decision-makers – universities, research institutes, enterprises, and all intermediate links, as spin-off firms and innovation infrastructure institutions.

Ignoring these features of an innovation process, we risk achieving innovatively cut-off

advantages because the country, being not able to deal with advanced environmentally friendly and socially compatible technologies; having no idea of how to improve the situation. It is, therefore, of utmost importance to realise that innovation system needs are somewhat different from just promoting innovations in the industry and development of science-intensive technologies – the background of its success is rather on the innovativeness of the mind of society, involvement of society into innovation process, and society's openness to innovations.

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