SCIENCE AND TECHNOLOGY FORESIGHT 2030 IN RUSSIA: ENVIRONMENTAL MANAGEMENT

Science and Technology (S & T) foresight in Russia is quite a new phenomenon. If in the UK, for example, the first cycle of S & T foresight was held in 1994; in Russia it was initiated by the Ministry of Education and Science only in 2007. Now, the third cycle of S & T foresight that targets development in 2030 is being implemented. Stakeholders consider its results the basis for the forecast integration in strategic management of development of the Russian Federation. The third cycle of foresight focuses on six priority areas of scientific and technological development of Russia, i.e. energy efficiency, medicine, transport, new materials, information and communication technology, and environmental management. In 2011, a network of S & T Foresight Centers on these areas has been established at the leading Russian universities to provide expert support of forecast activities. A Foresight Center on environmental management is functioning at the Lomonosov Moscow State University (MSU). Its activities are connected with the platform "Technologies of Environmental Development."

The main directions of S & T forecasting in the area of environmental management are defined by three key critical technologies (the List of critical technologies was approved by the Presidential Decree of July 7, 2011):

- Monitoring and forecasting of the state of the environment, prevention and mitigation of its pollution;
- Exploration, mining, and development of mineral deposits;
- Prevention and mitigation of natural and technogenic emergencies.

The MSU Foresight Center is the coordinator of the network of the leading Russian universities that serve as the centers of competences in the key critical technologies. The network includes Tomsk State University, I. Kant Baltic Federal University, Belgorod State University, Russian State Hydrometeorological University, Kazanskiy Federal University, Perm State University, and some others, 13 universities in total. The network universities have close contacts with other higher educational institutions, scientific organizations, and enterprises of the real sector of the economy. The main activities within the MSU foresight network are shown in the Figure 1.

The major objectives of the system of national forecasting in the area of environmental management are:

- Analysis of global and national challenges and trends, and windows of opportunities for S & T;
- Description of the most perspective thematic areas and their technology components that may be the drivers for the emergence of new market segments;
- Identification and analysis of perspective markets and niches of products and services that will be most promising for development in the future, in Russia (alone or in cooperation);
- Identification of S & T areas where Russia has leading or equal positions with the

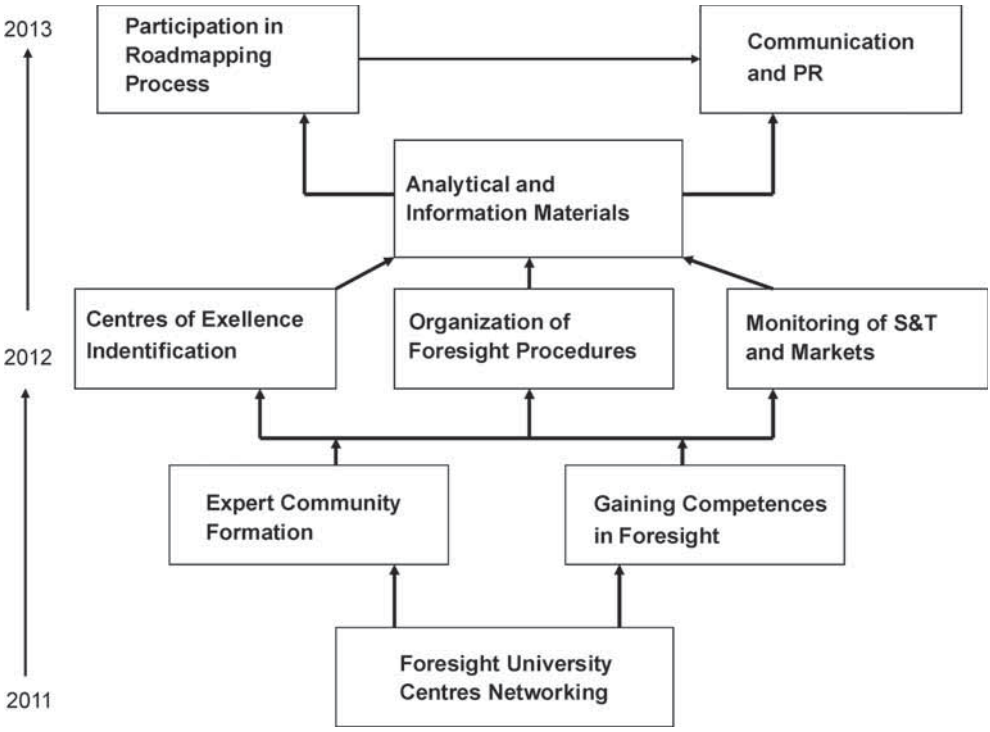

Fig. 1. The main activities of the MSU Foresight Center on environmental management

developed countries, as well as of "white spots" or lags in some areas;

– Recommendations on the prospects for cooperation in the S & T area.

Because the Foresight methodology requires the involvement of experts and the stakeholders in the foresight process, the issues of the expert community formation are among the most important positions for the MSU Center. Now, the national expert network includes more than 250 institutions and companies and more than 350 leading experts. During 2011–2012, the expert community has participated in different foresight procedures, including expert panels, brainstorming, surveys, workshops, etc. Approximately 300 experts were invited to participate in research activities.

One of the outcomes of the above-mentioned activities was the identification and ranking of global challenges and the most important, emerging trends related to the environment in Russia. They have to be identified from the policymakers' perspective in order to support development of relevant strategies. Russia's ability to manage challenges and emerging trends will shape the future of scientific and technological development in the area of environmental management. The list of 38 most urgent economic, social, technological, and environmental challenges was developed based on analysis of various Russian Strategies and State Programs. Numerous international forecasts and foresight studies done by UNEP, OECD, and European Environmental Agency were also analyzed. Most crucial trends for Russia that open windows of opportunities are as follows: greening of the economy, accelerated development of the Arctic, oil and natural gas production growth, development of environmentally safe waste disposal technologies, and

development of supercomputing technologies and information storage systems for modeling and prediction of climate and ecosystems. At the same time, a number of trends, according to the experts, create significant threats to Russia in the near future, including: increased morbidity and mortality from air pollution, increase of the urban population, climate change, biodiversity losses, etc. Climate change is a threat to Russia in the short term; however in the medium term, it can be either a threat or present new opportunities. Despite the fact that threats and windows of opportunities may appear close to 2020, a package of response measures must be undertaken now. This is an important challenge for science, technology, and innovation policies implemented by the Ministry of Science and Education of the Russian Federation.

The MSU Foresight Center, together with the network of the leading universities, will serve as the foundation for the emerging system of national forecasting in the area of sustainable environmental management.

Nina N. Alekseeva

INSTRUCTIONS FOR AUTHORS CONTRIBUTING TO "GEOGRAPHY, ENVIRONMENT, SUSTAINABILITY"

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The scientific English language journal "GEOGRAPHY, ENVIRONMENT, SUSTAINABILITY" aims at informing and covering the results of research and global achievements in the sphere of geography, environmental conservation and sustainable development in the changing world. Publications of the journal are aimed at foreign and Russian scientists – geographers, ecologists, specialists in environmental conservation, natural resource use, education for sustainable development, GIS technology, cartography, social and political geography etc. Publications that are interdisciplinary, theoretical and methodological are particularly welcome, as well as those dealing with field studies in the sphere of environmental science.

Among the main thematic sections of the journal there are basics of geography and environmental science; fundamentals of sustainable development; environmental management; environment and natural resources; human (economic and social) geography; global and regional environmental and climate change; environmental regional planning; sustainable regional development; applied geographical and environmental studies; geo-informatics and environmental mapping; oil and gas exploration and environmental problems; nature conservation and biodiversity; environment and health; education for sustainable development.

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