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The Impact of Territotial Bio-Economic Policy to the Environmental Economy of Russia.

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ABSTRACT

The problem of creating an effective system of control bio-economic policies at different economic levels (federal, regional, sectoral) in connection with the change of technological orders, as always parallel to the instability in the external environment and include in the world economy, has become even more relevant. The main purpose of the scientific work is conduct structural analysis of the impact of bio-economic policies at the federal and regional levels to national economic development of natural resources of Russia, by using abstract logical, economic and statistical, monographic, deductive-inductive and other economic research methods to analyze different aspects of the activity in the field of bio-economic policies at the federal level and the regions, determine the most effective management of this activity at the regional level and the federal center. There the generalized economic analysis of the development and growth prospects of the role of bio-economic policies in the national economy of nature based on a literature review and the authors' calculations have presented.

Keywords: environmental economics, bio-economic policy, bio-technology, bio-economy.

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INTRODUCTION

The bio-technology economic development issues mentioned as economic problematic in the last years become very important [1]. There a lot of scientific works are about these issues. The main interest in this field in the framework of the relationship with section of scientific knowledge - environmental economics are given [2, 3]. The issue of interest both in the analysis of the introduction in the educational sphere of higher education, the real economy (industry), as well as in the financial sector [4-13].

METHODS

There abstract logical, economic and statistical, monographic, deductive-inductive and other economic research methods are used to analyze different aspects of the activity in the field of bio-economic policies at the federal level and the regions, determine the most effective management of this activity at the regional level and the federal center.

RESULTS

Today, biotechnology is one of the most dynamic and investment-attractive sectors of the world economy. In accordance to the experts' assessment in 2030 biotechnology will provide 2.7% of GDP in developed countries. For developing countries, the contribution of biotechnology will be even greater. The biotechnology will provide 80% of medicines, 35% of the chemical industry and 50% of agricultural production in 2030 and in 2050 the world market of bio-energy will be 150 billion US dollars and 30% of the world's energy would be produced from renewable sources. The volume of biomass market by 2050 will be 150 billion US dollars. It is estimated that the global market of biotechnology in 2025 will reach 2 trillion US dollars. The volume of bio-economy in Europe is currently around 2,200 billion euros, which correspond to 17% of EU GDP. The European bio economy employs 21.5 million people.

The driver of technological development in the field of economy is bio-refining (creation of bio-factories). The bio-factories technology development allow to smooth transition from the chemical industry based on fossil hydrocarbon feed to the green industry, semi-finished and fine chemical technologies based on renewable raw materials (biomass). The term "green" against bio-economy has no conservation value and economic value, where the value added chain based on technology, knowledge-based life sciences. Modern OMIK: genomics, proteomics, metabolomics, synthetic biology make the seemingly traditional inefficient and highly profitable industry creates significant added value. One of the drivers of the development of green technologies is Germany.

The emergence of new economic and technological paradigm is a challenge for Russia and promise new opportunities. The Soviet Union possessed the power of the second (after the USA) in bio-industry sphere in the world; in 1990 it accounted for 5% of the world production.

As mentioned above, Russia consumed second place in biotechnology industry the world. More than 85% of consumption in the Russian Federation imported bio-technology products and volumes are negligible low.

However, at the present time in Russia there are very good opportunities for the development of industrial biotechnology (including bio-factories) and bioenergy. It - cheap renewable raw materials (grain, food, wood, waste wood, and of aquatic industries), the availability of research and technological base, the objective socio-economic necessity in the development of the country's regions.

The main problems of biotechnology market is a certain inertia of the existing chemical industry and the economy as a whole, based on the use of traditional raw materials and energy, a serious technological lag in technology biofactories second generation. A major obstacle is the imperfection of the existing legal framework, recommendations for change which will be one of the results of the project.

In November 2012, the government of Russian had formed a working group for the development of biotechnologies (the order of Prime Minister Dmitry Medvedev on November 19, 2012 DM-P8-6930). The main task of the working group (chaired by the Deputy Prime Minister Dvorkovich A.V.) were to define the strategic

directions of development of the bioeconomy in the country, to develop a set of measures aimed at the development of the biotechnology industry, and ensuring the coordinated work of the existing programs and the implementation of BIO 2020.

The Program Bio-2020 defined state policy in the field of biotechnology and bio-economy as a whole. It aims to create a globally competitive sector of bio-economy, implying a yield of Russia to the leading position in this field, including in certain areas of biomedicine, agri- bioenergy and industrial biotechnology. A special section is dedicated to the development of the Program bio-factories second generation in Russia as a driver of scientific and technological acceleration in the bio-economy.

Bio-2020 was developed with the active participation of the Technological Platform "Bioindustry and Bioresources (BioTeh2030)."

In 2012, Russia signed the Comprehensive program of development of biotechnologies to 2020 "Bio-2020". The strategic objective of the Programme of BIO - 2020 is the creation in Russia of a competitive high-tech sector of bio-economy based on the large-scale introduction of modern biotechnology in the key sectors of the economy. In addition, the vast reserves of renewable resources, freshwater, land, and are not lost scientific potential allows to predict the possibility of ensuring Russia corresponding to its potential place in the world bio-industry. The concept of the "Bio-2020" assumes active international cooperation in the fields of education, technology transfer, the creation of international projects.

To develop the bio-factory concept (Bio-refinery) in Russia necessary to ensure the development of sustainable cooperation ties between Russian and European research organizations and the definition of scientific and technological priorities that will ensure the harmonization of national and international strategies for the development of the concept bio-factories (Bio-refinery) within the framework of the program "Bio -2020. "

Since the bulk of resources for the bio-industry are not exported, and no long-distance traffic, the development of the industry can be a stimulus for agriculture primarily in subsidized regions. The seasonal shortage of labor are eliminated by low labor costs "green" technologies, on the other hand, the economic discrete biotechnology allows, depending on the regional situation, or to use large-scale production, or the network of small, possible mega cluster and local mini- clusters in the regions. A particular problem for Russia is distillery, with obsolete equipment and ecologically dirty, economically inefficient technology (example bio-factory first generation). However, these are often bio-factories of core enterprises. Therefore, the relevant mobile production on the basis of modular parts, "smart plants" (bio-factories second generation), the concept that is being developed in Germany, including the foreign partner of the project are needed.

Nowadays, technological backwardness of Russia has great scientific and technological potential. Since the development of the forest products demand scarification including Germany and it create opportunities for mutually beneficial cooperation.

The current stage of development of applied biotechnology allows us to look not only at the current assessment available in Russia but also in the future to the year 2030. Already, Russia has considerable overproduction of grain and sugar beet, which in the short term can be used as biological resources for the development of new biotechnological techniques.

As evidence of these realities, it is worth considering the analysis of graphs of production of sugar from domestic sugar beet in the past 10 years:

From the analysis of official statistics, we can see that the volume of production for the 2011-2013 year increased relative to 2005-2010 years. 25-30%. At the same time, the number of sown areas under beet grows not so much, including through the use of new agricultural biotechnologies.

The beef sugar marketing such as overproduction is made possible by the almost total abandonment of production of the product from imported sugar cane. In subsequent years, for the realization of the product is simple to grow from want will have to transfer the excess to the available biological resources for new

biotechnologies. A similar situation exists for the secondary products derived from sugars, such as pulp and molasses.

A similar situation occurs in cereals. Here, according to the newspaper Vedomosti, 12.28.2014 "The season of 2014/15 (lasts from 1 July to 30 June) finally promised farmers golden rain, which they are already tired of waiting. The last seven years, they always something prevented: the record harvest and lower grain prices, the drought and one-third of the burned crops, the low international prices and a strong ruble. In the same year, and farmers favored the nature and the environment. No abnormal heat after emergence of crops when they are still immature and fragile or heavy rains during the harvest - and Russia gathered in the history of the second crop of 104 million tonnes (an increase of 4.2 million tonnes was only in 2008) with its own needs at about 70 million tonnes. In addition, the grain turned out excellent quality, being able to give odds even the French wheat, with which the quality of Russia has never before competed. Adds joy to participants of the grain market weakening ruble: sell abroad was beneficial even when world prices slightly above $ 200 / t. In July Russia every month put another record on sending grain abroad: December 17 were exported 19.7 million tonnes. The grain balance of the country allows the season to export 30-32 million tons of grain, such predictions were given not only to the domestic industry experts ICAR and the Russian Grain Union, but the USDA. Russia is in the top 5 largest grain exporters in the world and domestic prices are directly dependent on the world's dollar. For the first time in many years, the time came when grain producers on what does not complain and could proudly say: we do not need subsidies, we have learned to make unaided. However, the high prices of steel producers complain of bread, pasta and meat. And when the ruble became quite fall, the government decided to act. First, in mid-December 2014 Rosselkhoznadzor virtually stopped issuing mandatory phytosanitary certificates for export, two days later Railways stopped grain shipments in the export direction. Finally, "reassured" the market participants get into a fuss Prime Minister Dmitry Medvedev on December 22, instructing supervising the AIC Deputy Prime Minister Arkady Dvorkovich study the issue "to introduce administrative restrictions on grain exports." Dvorkovich, mentioned that the government had not seen the point of banning exports, we were prepared proposals on the introduction of export duties during the day. The logic is this: it is necessary to leave plenty of grain in the country to bring down the price of bread and meat in a situation of rapid growth in food inflation. Inflation accelerated predictably after the other decisions of the government - a ban on imports of some products from Western countries. Exporters, again predictably, stopped buying grain from farmers, those - to sell grain, waiting for the export prices on the domestic market. Grain producers - do not like to trade with the declining price and have the ability to store long goods. So we'll have to come up with the government are still some restrictions for the victory over inflation "(Vedomosti, 2014).

On the basis of list of scientific and technical support to identify biological resources, it is worth noting that the Government of the Russian Federation and the European Union renewed the agreement of 16 November 2000 on cooperation in the field of scientific and technical activity, which determines the legal basis of the scientific-technical cooperation between Russia and the European Union, which It is acting in our days (Sharov & Balashov, 2012; Sharov, 2011). In connection with the relevant decisions adopted by the EU Council, the Government of the Russian Federation was introduced agreed with the Ministry of Foreign Affairs of the Russian documents required for renewal of the Agreement between the Government of the Russian Federation and the European Community on cooperation in science and technology. Renewal of the Agreement was implemented by an exchange of notes between the General Secretariat of the EU Council and acting on behalf of the Government of the Russian Federation Ministry of Foreign Affairs of Russia.

It was decided that for further extension of the Agreement would be also be effected by an exchange of notes.

Russia – EU collaboration goals:

1. Determine the scope of the coincidence of interests of Russia and the EU within the framework of Horizon 2020.
2. Develop mechanisms for joint decision of the Russian Federation and the EU and to identify ways of their implementation.
3. Promoting the integration of the Russian scientific community into the European Research Area. At the federal level, international cooperation in science in the "Biotechnology" concept is carried out in cooperation with international organizations (such as the CIS, the European Community, BRICS, the Organization for

Economic Cooperation and Development (OECD), the United Nations Industrial Development Organization (UNIDO), in framework of bilateral international cooperation between Russia and individual countries, as well as through multilateral cooperation in international projects and programs (for example, the project "Human Proteome", the establishment of the research center of ions and antiprotons (Facility for Antiproton and Ion Research, FAIR), the project of creation European XFEL, XFEL, and others. The participation of Russia in international organizations, projects and programs are governed by intergovernmental and interdepartmental agreements and other legal acts.

Implementation of regional development programs in biotechnology (Republic of Tatarstan, Chuvashia Republic). Nowadays, Russian Federation has begun to implement new regional development program based on the available raw material base for the biotechnology industry. In this regard, the main trend in the development of biotechnology in Russia is the development of the regions through the development of biotechnology and the biotechnology industry. In the study, the authors found it necessary a more detailed examination of the functioning of existing national technological platform for integration with the European program, including to strengthen the Russian-German biotechnological cooperation.

The analysis should start with TP "Food for Life":

Russian Technology Platform "Food for Life" is considered as a tool for the implementation of joint projects of the EU-Russia, which provides for the development of the principles of healthy nutrition in Russia, the EU and other countries, namely:

- Combine the leading Russian institutions and experts in the field of food production, food safety and healthy eating;
- Attention to science for the development and implementation of the latest collaborative technologies in practice;
- National resources and facilitates from the organization of European support through the new tools provided by the Horizon 2020 Programme attraction.

The main priorities of the Russian food industry:

- Food security
- The safety and biosecurity of food raw materials and food products
- Organize targeted food assistance to the needy population.
- Support for domestic production of specialized infant foods.
- Education and training of different groups of the population in matters of healthy diet.

The creation of Healthy diet Centre.

Before getting the analysis of TP "Forest management" is worth noting that the forest - the largest biome, occupying huge areas, and are of extremely large multi-purpose environmental and resource value. They have a key role in regulating the runoff and carbon emissions and the formation of the Earth's climate. Russian forest area according to forest account at 01.01.2003 amounts to 776 million hectares. They are concentrated 38% of the Euro-Asian and 22% of native forests on the planet.

The share of forests in Russia is about 50% of the boreal and temperate, and 26% of the virgin forests of the world. Timber reserves in the Russian forests exceed 82 billion. M3 (106 m3 / ha) (vapor recovery units, 2003). The Russian forests are a giant factory of oxygen, a huge reservoir of organic matter, a powerful regulator of the exchange of energy and water, and biogeochemical cycles. It is impossible to overestimate the importance of forests as a source of goods is vital for the human, its habitat and the habitat of wild animals.
In the long term development of the Russian forest sector should be aimed at ensuring sustainable forest management in order to increase their biosphere, environment protection, social and resource functions and to obtain products with high added value. The solution of the issue without the scientific and innovative development is impossible.
The Platform activities:

- June 2006, 1 meeting of the Russian and European platforms, St. Petersburg - the beginning of the activity;
- Organization of the National Support Groups - completed in 2008;
- Preparation of State Research Program - completed in 2008;
- Database (organizations, experts, project proposals.) (From 2006-present) creation
- Date of European and Russian Platform10 October 2006, St. Petersburg; February 23, 2007;, Moscow May 15, 2007 Hannover, December 13, 2007 Moscow, May 21, 2008 Kranska Gora (Kranjska Gora) Slovenia

There goals of State Research Program are:

- To promote sustainable forest management and development of the Russian forest sector in key areas: forestry, pulp and paper industry and wood industry, specialty chemicals and bioenergy.
- To promote more effective scientific research, education, and professional development in the forestry sector, as well as the promotion of their funding, the possibility of using national and international funds and programs, and classification technologies for complex processing of forest resources to the critical technologies.
- Innovation improvement.

Priority research areas

Strategic Research Program (Agenda) European Forestry Technology Platform contains 26 research areas. 19 research areas of European and Russian programs overlap:

Russian technology platform "Animal Health" organized by the Russian Society of Biotechnology and institutions of similar profile, companies and organizations involved in the task of improving the health of agricultural (s / s) of animals. The consortium operates Gorizont associated with the program in 2020 and focuses on issues of reproduction, feeding and veterinary medicine.The main program chapters:

- Molecular biology and genetics of livestock;
- Diagnosis, monitoring, prevention and treatment of animal diseases;
- Improving the quality of veterinary drugs;
- Animal feeding
- Disposal of animal waste.

SUMMARY

The main idea of the platform is integration of Russian specialists to participate in animal health providing and collaboration with a program Gorizont 2020.

The aim of the project is implementation of the high priority, favorite projects to archive results on health livestock breeding. The following issues are solving:

- Improve animal health, productivity in various sectors of the livestock;
- In collaboration on methodological approaches to diagnosis, prevention and treatment of animal diseases of infectious and noninfectious etiologies;
- Development and production of new vaccines, diagnostics and drugs for veterinary use;
- improving control and standardization of veterinary drugs;
- new trends in the prevention and treatment of diseases;
- searching environmentally friendly means of treatment of animal diseases;
- Upgrading technology of feed production for livestock and poultry;
- The new biotech lines for disposal of animal waste.

Russian Technology Platform "Industrial Biotechnology" is formed as a research consortium to join the national projects in the field of industrial biotechnology and leading Russian research institutions who could potentially participate in the program Horizon 2020. The basis of the consortium: Moscow State University.

MV Lomonosov Moscow State University; GosNIIgenetika; Institute of Biochemistry. AN Bach, Russian Academy of Sciences; Center "Bioengineering", Russian Academy of Sciences; Institute of Microbiology, Russian Academy of Sciences; Pushchino Scientific Center, Russian Academy of Sciences; Institute of Biochemical Physics. NM Emmanuel, Russian Academy of Sciences; Russian Research Center "Kurchatov Institute"; GosNIISintezbelok; Institute of Environmental Engineering; Russian State University of Oil and Gas. IM Gubkin Institute of plastics; Group of companies "Bioprocess"; small and medium-sized businesses; JSC "Rosalko"; Business Association in the field of advanced integrated technologies "ASPECT"; JSC "Biotechnology Corporation";

Project description

The new generation of industrial enzymes

The project with a budget of 4.2 million dollars, for up to 2 years of implementation, brings together 5 research teams, led by partners with the Faculty of Chemistry of the Moscow State University. MV Lomonosov. The purpose of the project is to develop a new generation of industrial biocatalysts with improved properties for use in the paper, food and textile industries and in agriculture.Plastics and Biofeedback

The project with a budget of 4.2 million. dollars, for up to 2 years of implementation, brings together 15 research teams, headed by partners from Institute of Biochemistry. Bach Academy of Sciences. The purpose of the project - the development of a wide range of biomedical equipment based on biocompatible plastics technologies for the production of composite materials used for the production of environmentally friendly binders and the use of enzymes in polymer chemistry.

The catalysts for the synthesis of very pure inorganic substances

This project brings together research teams specializing in the synthesis of especially pure organic compounds and use for the preparation of chiral compounds. The project has a budget of 350 thousand. Dollars, carried out under the leadership of partners from the Moscow State University, Lomonosov Moscow State University, Institute of Physical and Chemical Biology. White Lake.

Organized research consortium set up to bring together national projects in the field of industrial biotechnology and leading Russian research institutions who could potentially participate in the program Horizon 2020 the European Union.

As a priority for the new biomaterials are:

- New classes of biodegradable composite materials created from renewable sources
- biocompatible materials for biomedical applications and health
- Eco Biofeedback for safe composite materials from wood
- The production of unique materials based on fibrous proteins
- Development of alternative approaches for the production of monomers by biocatalysis and fermentation of renewable raw material sources
- Development of technologies for producing PLA from renewable raw materials

New enzymes and microorganisms

- Rational design of biocatalysts with the desired properties
- Screening and directed modification enzyme with unusual properties (specificity, pH dependence, stability, etc.)
- Methods of predicting enzymatic stereo specificity and substrate specificity
- Extremophiles new enzymes based metagenomics
- Proteomics to optimize metabolic pathways
- bioinformatics tools for discovering new enzymes and to improve their catalytic activity

Managing the process of biocatalysis

- Mathematical modeling of biocatalytic processes from the microscopic to the macroscopic level
- New methods of immobilization of individual enzymes and whole cells
- Bioremediation
- Bioremediation of contaminated groundwater, soils, waters and marine waters with oil products
- bioremediation techniques to remove heavy metals and radionucleotides

In the framework of development regional program of bio-technology, have to be mentioned the Development Program of Bio-technology in Tatarstan. Decree of the Cabinet of Ministers the Republic of Tatarstan from 24.03.2010 №180 approved target program "Development of Biotechnology in the Republic of Tatarstan for 2010 - 2020". The total amount of the program is 30 bln. rubles, Общий объем финансирования программы составляет 30 млрд. рублей, including the expense of the federal budget - 3 billion rubles (10%), at the expense of the consolidated budget of the Republic of 6 billion rubles (20%) and at the expense of extra-budgetary sources 21 billion. rubles (70%). The main bioeconomy in agriculture in the Republic is the project "Biotechnological complex on deep processing of grain." The project involves the construction of a plant (modernization of the existing capacities of the branches of "Tatspirtprom") on the territory of the Republic of Tatarstan capacity of 400 thousand. Tons / year of raw materials - grain and demanded a number of import-substituting production of bioproducts (maltose syrup, sugar and fodder etc.). Work on projects: "Industrial production of organic products on the basis of Pervomaisky and Shumbutskogo distilleries." The project provides for the reorganization of the unprofitable branches of "Tatspirtprom" to create biotechnopark, as well as the issue of commercial products.

The main actuality is given to the project of lysine production under the program implementation. As follow up to the press relations services the OJSC “Tatneftekhiminvest- holding” negotiation with German company EPC Engineering consulting GmbH и EVONIK Degussa GmbH to lysine production with modern bio-technology using in Tatarstan republic.

The project provides to setup lysine-content product “Biolis” (BIOLYS) production. It content fibrins and feed additives with high level of value added chain.

The pilot project offer creation of bio-gas station in the based on pig-breeding complex Altyn-Saba LLC (raycentr Wealth Saba).

“Recycling of semi-subsistence wood and waste of timber industry complex of the Republic of Tatarstan”

The project offer recycling of semi-subsistence wood by thermochemical method and liquid products.

In other regions of Russia the works for program development of bio-technology are implemented.

The next step in the analyses framework is bio-region creation. Bio-region –is the region where development programs for biotechnology elaborated, as well as issues to improvement of them addressed. There are: Belgorodskaya oblast, Voronezskaya oblast, Kaliningradskaya oblast, Republic of Kareliya, Kirovskaya oblast, Novosibirskaya oblast, Tomskaya oblast.

There regions to implement development program of bio-technology in future are: Arhangelskaya oblast, Kalujskaya oblast, Krasnodarskiy kray, Moscow and Moskovskaya oblast, Primorskiy kray, Saratovskaya oblast, Stavrapolskiy kray, Tuymenskaya oblast.

CONCLUSION

The policy of bio-economy allow risk sharing between different participants of state economic and also state guarantees in terms volatility of external environment as well as world economy is viable pattern to fundraising VI bio-technology oriented technological mode transition.

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