

GCPMED 2018
**International Scientific Conference "Global Challenges and
Prospects of the Modern Economic Development"**

**ENVIRONMENTAL MODERNIZATION - NEW SOLUTIONS IN
THE TRANSFORMATION OF THE WORLD ECONOMY**

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Abstract

High rates of economic growth, necessary with the existing growth of the population on the planet, can be achieved while maintaining the quality of the environment and improving its condition in order to meet the vital needs of present and future generations, that is, while implementing the principles of "sustainable development". The aim of the research is to consider eco-modernization as a new solution in the transformation of the world economy. Hypothesis of scientific research: the possibility of sustainable development in the transformation of the world economy is provided subject to the transition to environmental modernization. The main methodological principles of the study: systematic; unity of theory and practice; the principle from "abstract to specific"; activity in the full structure of a scientific subject - from problems to tasks, from empirical material to theoretical positions; configuration of various types of knowledge. The authors examine the historical discourse of the theoretical foundations of environmental modernization, consider the ways of the development of eco-modernization using the example of the basins of large rivers. Space zoning was carried out according to the parameters common to the Yangtze River and the Volga River: economic parameters (GDP per capita, production structure, and employment structure) and social factors (urbanization level, life expectancy, infant mortality rate, proportion of the population with higher education).

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Keywords: Environmental modernization, sustainable development, "green economy", anthropogenic load, large river basins.



1. Introduction

Issues of sustainable development and environmental modernization in the 80s of the twentieth century in Western European countries and the United States were the object of a small group of scientists who studied the social and economic aspects of nature conservation and environmental management. The concept of sustainable development recognized over the past 30–40 years by the UN and all countries, is the consensus official paradigm of the world economy in the 21st century (Bobylev, 2017). One may suppose that sustainability implies: «... a broad interpretation of ecological economics where environmental and ecological variables and issues are basic but part of a multidimensional perspective. Social, cultural, health-related and monetary/financial aspects have to be integrated into the analysis» (Söderbaum, 2008, p. 81-82). Costanza & Patten (1995) emphasized, taking the meaning of sustainability from biology, that: Biologically, sustainability means avoiding extinction and living to survive and reproduce. Economically, it means avoiding major disruptions and collapses, hedging against instabilities and discontinuities. Sustainability, at its base, always concerns temporality, and in particular, longevity. Nevertheless, in general, as Pearce (1989: 69) has commented: «defining sustainable development is not a difficult issue. The difficult issue is in determining what has to be done to achieve sustainable development, assuming it is a desirable goal».

Since issues of environmental modernization have become part of a wider public discussion (Luqmani, Leach, & Jesson, 2017; Hovardas, 2017; Shkarupa, Karintseva, & Shkarupa, 2016), and even entered into state plans.

In the Presidential Decree of May 13, 2017 No. 208 "On the Economic Security Strategy of the Russian Federation for the Period until 2030", the main directions of the state policy to ensure the economic security of the country are listed as following:

- development of public administration, forecasting and strategic planning;
- ensuring the growth of the real sector of the economy;
- creation of economic conditions for the development and implementation of modern technologies, stimulating innovative development;
- development of national financial system, etc.

The main results of the implementation of the Strategy are: ensuring the economic sovereignty of the country; the resilience of the national economy to external and internal challenges and threats; strengthening socio-political stability; dynamic socio-economic development; improvement of the quality of life of the population (Rossiyskaya Gazeta dated May 13, 2017).

To fulfill the tasks, it is necessary to increase the industrial potential of the country, develop agriculture and transport, and ensure the economic growth. However, at present, due to a quantitative increase in production factors (additional resources of labor, capital, fixed and current assets, natural resources are involved in production) there is extensive economic growth which in turn leads to a slowdown in economic growth and an increase in the human pressure on the environment. These processes are factors that adversely affect the sustainable development of the country as a whole, as well as individual regions and administrative units in particular. The model of development of the Russian economy should be based on a balance of economic, social and environmental components (Bobylev & Solovyeva, 2017).

One requires new solutions in the transformation of the economy allowing to ensure the transition to sustainable development.

2. Problem Statement

Nevertheless, we believe that the issues of ecological modernization as a new solution in the transformation of the world economy while ensuring sustainable development are not fully studied by the example of a large river basin region.

3. Research Questions

The aim of the research is to consider environmental modernization as a new solution in the transformation of the world economy while ensuring sustainable development.

4. Purpose of the Study

The hypothesis of scientific research is as follows: the possibility of sustainable development in the transformation of the world economy is provided subject to the transition of civilization development to the path of environmental modernization.

5. Research Methods

For the research the authors use some of the basic methods of the scientific research to obtain the information necessary to the complex systemic processing of the issue. The main methodological principles of the study: systematic; unity of theory and practice; the principle from "abstract to specific"; activity in the full structure of a scientific subject - from problems to tasks, from empirical material to theoretical positions; configuration of various types of knowledge.

6. Findings

The results and discussion. The transformation of the movement of the economic and environmental component in ensuring sustainable development and environmental modernization in a certain "historical sequence", starting with Vernadsky's (Kaznacheev, 2013) teachings on the noosphere, is presented in Figure 01. The diagram is based on the previously published works of the authors (Rozenberg, Kostina, Kudinova, & Rozenberg, 2014) and literary sources.

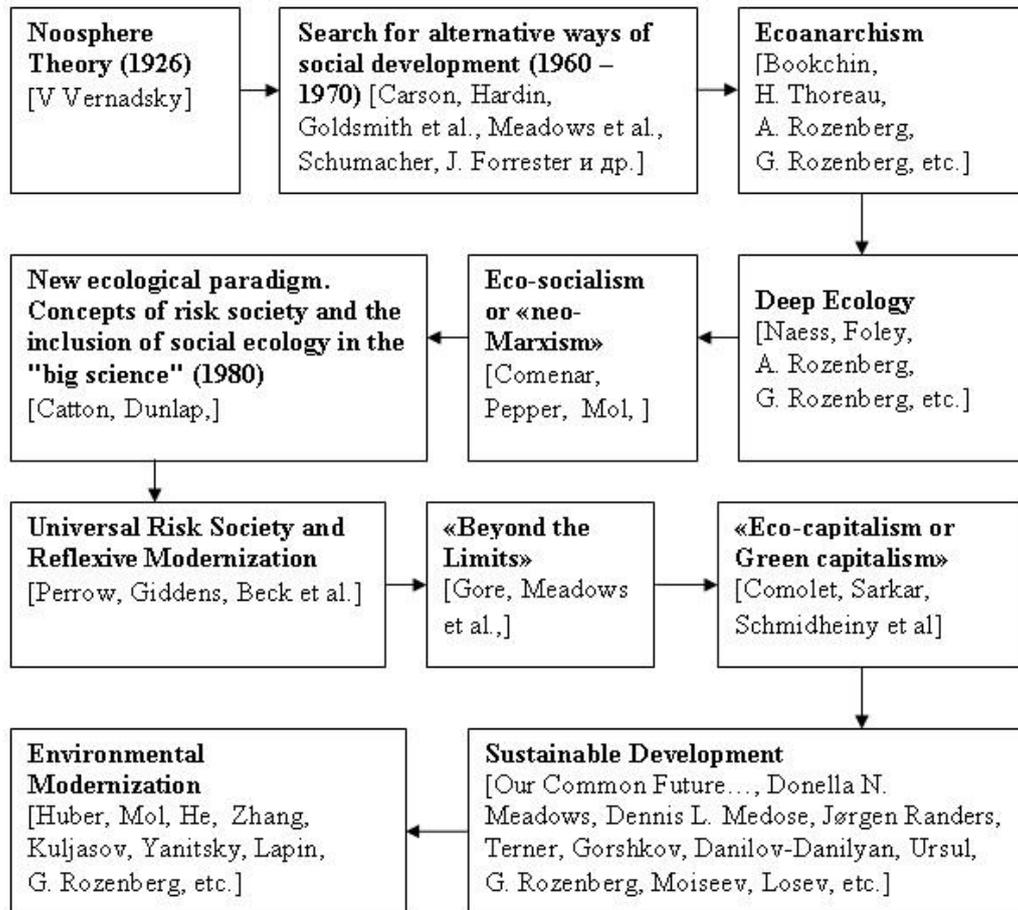


Figure 01. Scheme of the subordination of the theoretical foundations of eco-modernization

As follows from the above scheme, environmental modernization is a fundamental trend in the transformation of social development and the world economy while ensuring sustainable development.

In some articles that there is currently no single definition of “ecological modernization”, with four “semantic layers” identified:

- environmental modernization is the theoretical basis of eco-sociology (sociological interpretation of environmental reforms);
- environmental modernization is a new model for understanding and analyzing technologically intensive environmental policies;
- environmental modernization is a qualitative model of reflecting the progress of developed countries in environmental and economic reforms (since the 1980s);
- environmental modernization is a theory of social changes that describe economic and social changes, which are based on the “environmental signal” (a theory aimed at development without hostility to nature).

Consequently, the processes of environmental modernization, occurring in different countries, regions, deserve consideration, analysis and study of experience. At the same time the ideology and strategy of socio-economic development can be based on the paradigm of sustainable development (Komarov, 2015). Moreover, in the works (Greenwood & Holt, 2016), it is noted that sustainable

development is a process in which all countries are in constant change, with countries facing challenges to improving the quality of life, achieving environmental sustainability (Mella & Gazzola, 2015).

For further analysis of environmental modernization we have selected the basins of the largest rivers in Europe and Asia: the Yangtze River (People's Republic of China) and the Volga River (Russia, Kazakhstan).

We present some data on the considered river basins. The length of the Yangtze River is 6,300 km, with an area of 1.81 million km². There are 12 provinces located in this territory, in which 517.2 million people live. For comparison, the length of the Volga River is 3,530 km, where 39 regions (regions and republics of the Russian Federation) and 2 regions of the Republic of Kazakhstan are located on the area of 1.36 million km². The population of the Volga basin is 56 million people.

In the Review Report four stages of the evolution of society “against the background” of the Yangtze River are considered:

- the upper course - traces of primitive society, matriarchy; slash-and-burn agriculture - the first stage;
- the middle course - agrarian society - the second stage;
- the lower course - industrial society - the third stage;
- estuary - the nascent knowledge society - the fourth stage.

We have carried out the zoning of the provinces of the Yangtze river basin and the Volga basin in the space of “modernization indicators” - economic (GDP per capita; production structure: agriculture, industry, services and employment structure [agriculture, industry, services]) and social factors (level of urbanization; expected life duration, child mortality rate, proportion of population with higher education).

The result of the regionalization of the provinces of the Yangtze River basin in the space of the specified “modernization indicators” actually coincides with the result of the division of the Yangtze River basin according to the evolutionary stages of the development of society. Thus, the Yangtze River (flow west → east) acts as a model for the modernization of civilized communities of people at different stages of development: “primitive society - knowledge society” (Rozenberg, Kostina, Kudinova, & Rozenberg, 2014).

The zoning for the Volga basin carried out according to the same “modernization indicators” did not give the very same visual picture as for the Yangtze basin (Figure 02.).

It is obvious that the provinces of the Yangtze river basin demonstrate the division into four types of modernization societies, practically located along a straight line. The regions of the Volga basin (regions and republics) are grouped and belong to the second and third (Moscow region, Tatarstan, Samara, Saratov and Yaroslavl regions) types of societies. However, if we add the city of Moscow as a separate territory, then, perhaps, Moscow together with Moscow region will be allocated to the fourth group of territories - the knowledge society. In fact, in fig. 02 one observes an uneven development of the socio-economic space of any territorial objects (Skufina & Baranov, 2017).

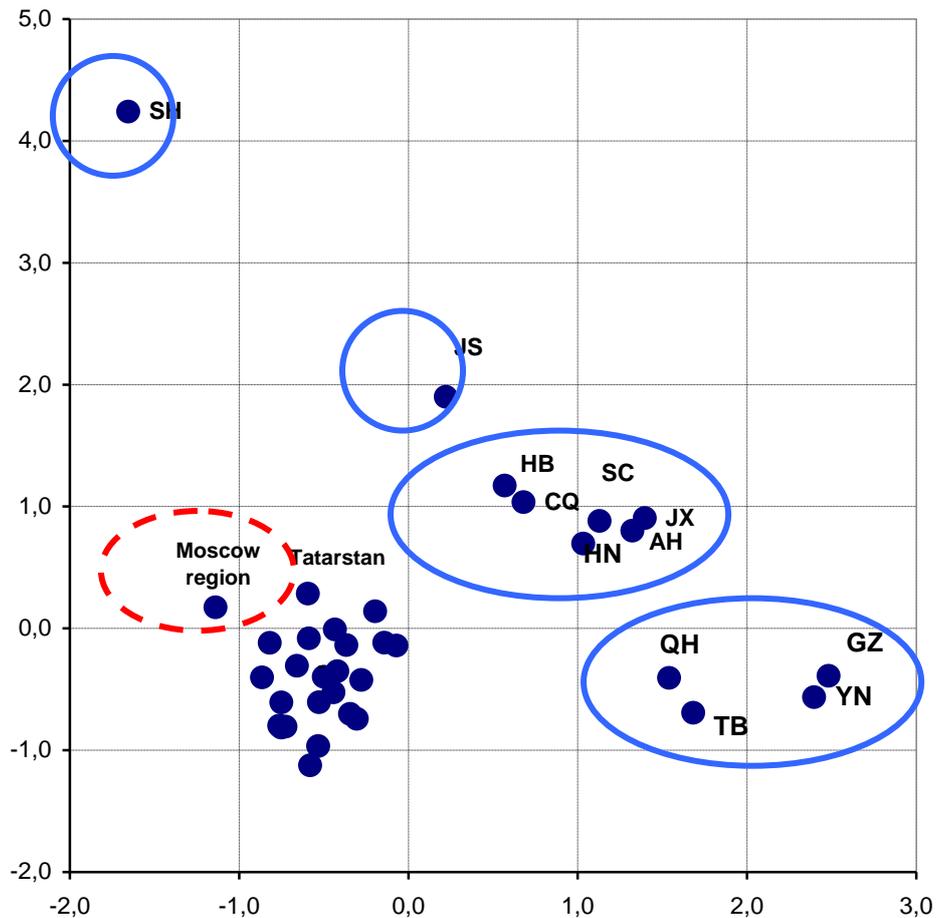


Figure 02. The ordination of the territories of the Yangtze and Volga river basins in the factor space

7. Conclusion

We suppose that in order to ensure the sustainable development of the Volga basin region, comprehensive measures are needed, including strategic, tactical and ongoing measures based on the principles of eco-modernization, advanced technologies of the green economy and the transition to the fourth type of modernization society - the knowledge society. Both the modernization in general and the environmental modernization of the country should be considered comprehensively developing various scenarios for the future of Russia. According to the concept of eco-modernization, economic and environmental interests have become inseparable from each other. However, in many countries, including Russia, economic interests are often put on priority positions, not always taking into account the preservation of the natural environment. According to supporters of eco-modernization, this is a temporary phenomenon and in the future problems will still be solved by spreading eco-modernization through the greening of the economy both in Russia and in other countries.

Acknowledgments

This research is conducted in the framework of the state assignment on the topic: AAAA –A17-117112040040-3 “Assessments of modern biodiversity and forecast of its change for the systems of the Volga basin in terms of their natural and anthropogenic transformation”.

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