

FORMALIZATION OF THE APPROACHES REGARDING ASSESSING THE LEVEL OF THE ECO-FRIENDLY REGIONAL INNOVATION SYSTEMS

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ABSTRACT

In this article the structural model of the eco-friendly regional innovation system (RIS) is suggested, which takes into account the interconnection of the RIS subsystems and macro components, and also has a number of common positions with the Triple Helix concept, the Quadruple Helix concept, which along with universities, industry and the state a key role in the innovation process gives to the society - the ultimate consumer of innovation, as well as with Quintuple Helix concept which generates knowledge and innovation in the context of the environment and which is interpreted as an approach in accordance with the principle of sustainable development and social environment. Typization of the regional innovation systems (RIS) is suggested for the purpose of comparative assessments in order to find ways to further development of the eco-friendly RIS. Proceeding from the synthesis of the most common techniques in assessing the level of the RIS innovative development, it is suggested to conduct an assessment taking into account, firstly, the development type of the eco-friendly RIS; and secondly, take into account the mutual influence of the socio-economic and the innovation environment and to allocate the block "green" economy. The authors indicate the stages of the assessment level of the RIS innovative development and suggest indicators according to which the level of eco-friendly regional systems development is calculated. The suggested approach will allow identifying priorities in the choice of the regional eco-friendly strategies.

Keywords: *the «green» economy, the regional innovation system, socio-economic environment, assessment of the regions innovative development level*

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1. INTRODUCTION

In the context of Ukraine's integration into the European Union and the reforming of the local self-government, which is called to resolve a number of obsolete problems in territorial management and provide real opportunities for the development, issues of the formation and development problems of the eco-friendly regional innovation systems (RIS) become. The main requirement for the countries intending to enter the European Union (EU) is to ensure the sustainable development of the territories on the basis of the innovation-oriented economy, the economy based on environmentally friendly technologies (including energy-saving ones), which are the basis of Ukraine's innovative transformations and will provide the "green growth" to which the whole world endeavors. In 1994 in Ukraine a course to implement the "innovative model of sustainable development" and to accelerate the integration of the state's economy into the world economy with a high level of competition was launched, but neither strategic nor tactical measures were fully implemented. The reason for this is the low efficiency and quality of the innovation development management, both at the country level and at the regional level. In connection with this, lately, questions arise regarding the management of the development of the eco-friendly regional innovation system, which ensures an increase in the quality of the population life through the innovative development of the economy.

2. GENERATION OF THE DATA

A significant contribution to the study of the "green" economy development in order to achieve sustainable development, management of the socio-economic and the innovative development, interdependence of the innovations and the economic growth, the theory of the evolution and the formation of the innovative economy, the development of the national and eco-friendly regional innovation systems have made such foreign and domestic scientists as V. Gusev, H. Kuznetsova, R. Coase, R. Lucas, S. Metcalf, L. Melnyk, D. North, R. Nelson, R. Solou, V. Tolkovanova, I. Chikarenko, K. Freeman, M. Filyak, B. Chizhevsky, F. Hayek, J. Schumpeter, Y. Sharov and others.

At the same time few scientific works cover the issue of managing the eco-friendly development of the innovation system in the region on the basis of the assessment of the mutual influence of the socio-economic and the innovation environment with studying the place of the "green" economy in the regional innovation systems.

2.1. Basic material statement

The objective of this study is to develop a theoretical and methodological approach regarding the evaluation of the eco-friendly regional innovation systems development level. Chikarenko I while studying the problems of the formation of the management system for innovation development indicates that regional innovation systems (RIS) presuppose the presence of the environment that affects the internal processes of the RIS, on parameters and results and also the RIS structure includes subsystem of knowledge generation and the subsystem of innovations distribution and using and has a number of common positions with the Triple Helix concept. (Chikarenko I., 2014).

In the study regarding the socio-economic potential of the sustainable development is indicated that the economic growth ensuring directly affects the environmental pollution and degradation, climate changes, loss of biodiversity, human health and other processes and, therefore, one of the promising directions for eliminating the environmental, economic and social threats is to ensure the sustainable development on the basis of the transition to a "green" economy (Libanova, E. M, et al., 2017).

To the issues that require detailed elaboration in this context it is possible to refer the development of a structural model of the eco-oriented regional innovation system (RIS) taking into account the interconnection of the RIS subsystems, macro components, as well as elements of Triple Helix, Quadruple Helix, Quintuple Helix for the development of innovation and methodological recommendations regarding the assessment of the eco-oriented RIS development taking into account the interaction of the socio-economic and innovative environment with allocation of the evaluation block of the "green" economy development.

2.2. Methods of research

The methods of the theoretical and empirical research are used in this study, namely: the methods of the analysis and synthesis are used in determining the euro integration landmarks and the formation of the eco-oriented regional innovation system development, the study of the world and domestic experience and the best practices of the innovative development of the territories on the basis of the concept of sustainable development, the substantiation of the mutual influence of the quality life and innovations. Methods of comparison and analogy are used while studying foreign assessing methods of the innovation development in the regions. Classification methods are used while studying the theoretical foundations of the innovation development.

In designing the structure of the eco-oriented RIS we proceeded from the fact that it has a number of common positions with the Triple Helix concept (Arnkil R., Järvensivu A., Koski P., Piirainen T., 2010), the Quadruple Helix concept, which along with universities, industry and the state, a key role in the innovation process presents to the society - the end user of the innovations (Carayannis, E.G, Campbell, D.F.J., 2012) and the Quintuple Helix concept, which forms knowledge and innovations in the context of the environment and which is interpreted as an approach consistent with the principles of the sustainability development and the social ecology (Carayannis, E. G., Barth, T.D., Campbell, D. F., 2012).

3. RESULTS

The conducted scientific analysis of the regional development in the EU countries shows that the main factor of the regional development is the management of the RIS development considering the ecologization of the region economy, and the research on the RIS development allowed to state that, *firstly*, the RIS has several representation forms: 1) the RIS as a set of regional public and private education, science and business institutions, which initiate, create and distribute innovations in the region and beyond; 2) the RIS as a functional subsystem of the regional economy, a set of interacting education, science and innovation business institutions integrated into the regional economy; 3) the RIS as a spatially organized subsystem of the national innovation system (NIS), which is aimed at forming the innovative type of economic development in the country; *secondly*, the regional innovation system is an open system, the process of the new knowledge (technologies) diffusion that is directed both beyond its boundaries and within its boundaries (this accelerates the circulation of knowledge

within the system and ensures the appearance of innovations), that is, other the RISs, NIS and international factors influence on the RIS ; *thirdly*, in the Ukrainian economic science there is no integral RIS concept, namely, there is no single approach to the RIS structure. The RIS in most cases is considered by scientists as a set of institutionalized territorial NIS subsystems; such conception of the RIS does not provide an idea of the interdependence between the innovation development level and the development of the socio-economic environment of the regions. Therefore,

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