

Information Space for Sustainable Development and its Modern Transformation

Svetlana Mudrova^{1,*}, *Ekaterina Lisitsyna*¹, *Victoria Rudenko*², and *Gagik Galstyan*³

¹ Plekhanov Russian University of Economics, Department of Political Economy and History of Economic Science, 117997 Moscow, 36 Stremyanny lane, Russia

² Central Economics and Mathematics Institute RAS, 117418, 47 Nakhimovskiy av., Moscow, Russia

³ Yerevan State University, Faculty of Economy and Management, 1 Alek Manukyan St, Yerevan 0025, Armenia

Abstract. The article analyzes the backbone concepts of the spatial theory of sustainable development of modern countries – information space. The aim of the study is to substantiate the author's interpretation of the conceptual apparatus of spatial analysis, taking into account the principles of methodological institutionalism (comparative studies). In accordance with the purpose of the research, the following tasks are set and solved in the article: the essence of the information space in the system of sustainable development as a set of interactions of economic agents affecting the environment is disclosed; the attributive properties of the information space are formulated; the directions of its transformation under the influence of sustainable development processes are determined; the hypothesis about the transformation of the information space into information and communication under the influence of digitalization processes is formulated. It is concluded that the enrichment of the conceptual apparatus of the theory of spatial economics is a necessary prerequisite for the development of tools for implementing the sustainable development strategy in the digital and spatial dimensions.

1 Introduction

The formation of the post-industrial technical and economic structure has led to a change in the composition of sources of sustainable development and the allocation of spatial factors among them. It should be noted that the recognition of the significance of the spatial aspect of the country's sustainable development is the adoption of the Strategy for the Spatial Development of the Russian Federation for the period up to 2025 (approved by the order of the Government of the Russian Federation dated February 13, 2019 No. 207-r) [5]. In accordance with this document, spatial development is defined as “improving the settlement system and the territorial organization of the economy, including through the implementation of an effective state policy of regional development” [1]. The inclusion of this terminological construction in the scientific circulation and in the program documents of the state [2] was

* Corresponding author: Mudrova.SV@rea.ru

preceded by a long evolution of socio-economic conditions and environmental ideas. However, at present, the concepts of "space" and "spatial development" do not have a single interpretation in the system of scientific analysis of sustainable development.

The transformation of information-rich resources into a significant factor of sustainable growth of national and regional economy has led to the need for studying the attributive properties of the information space, the polarization of which is becoming a key factor in interregional and intraregional inequality. At the same time, changing the configuration of the information space based on the systemic digital transformation of regions is becoming a mechanism that ensures sustainable regional development. Strategic development of the information space should be one of the subject areas of the spatial economy. The need to clarify the conceptual apparatus of spatial economics as a field of scientific research determines the relevance and practical significance of this research.

2 Materials and Methods

Analysis of alternative methodological approaches to the interpretation of the category of "space" in economic science allowed us to recognize the advantages of methodological (comparative) institutionalism as a research program of spatial development. The use of the principles of methodological institutionalism, which uses the epistemological potential of methodological individualism and methodological holism in terms of the complementary provisions of neoclassical synthesis and neo-institutionalism, made it possible to present the author's interpretation of the information space and spatial development.

In accordance with the relativistic methodological approach, the information space is considered as a set of multi-level communications about information flows, the differences in density, intensity, frequency, volume and degree of ordering of which, as well as differences in their configuration, determine the differentiation of the spatial organization of the economy and the variability of directions and dynamics of spatial development.

As signs of the information space, the following are identified: emergence, fractality, heterogeneity (heterogeneity), dissipativity, cohesion (integrity), the ability to self-organization, the ability to self-regulate and purposeful development, stability, adaptability, localization within permeable boundaries, openness. Thus, emergence is realized through the fractal dynamics of the information space, which is dominated by horizontal connections. Fractality in relation to the subject of research is considered as a large-scale invariance and fractional dimension of the national, regional and municipal information space, the study of which makes it possible to determine the degree of dependence of the development trajectory of higher-level spaces on the development of its subsystems. Heterogeneity under the influence of institutions of communication takes the form of contracts (complete and incomplete; classical, relational and neoclassical). The dissipativity of the information space is expressed in the distributed nature of the placement of data banks organized on the basis of integrated formations (special economic zones, territories of advanced development, industrial parks, etc.), educational and research organizations, public authorities and local governments, public organizations and foundations, created to stimulate entrepreneurial and innovative activities, etc. Connectivity (unity) [3] of space is expressed in the unification of the interactions of its participants; the level of space connectivity increases under the influence of globalization and decreases due to localization processes.

Currently, information and communication technologies (ICT) are becoming an integral part of reproduction processes integrated on the basis of information platforms, which optimizes the choice from a growing number of alternatives at bifurcation points of space, determines the content of intelligent management tools in economic systems of all levels,

interacting online with environmental factors. On the one hand, in the modern economy, the role of communications is being transformed, which turns from a mechanism for transmitting information into one of its sources, and the nature of the relationship between information and knowledge is changing, which is expressed in the exponential growth of the amount of information that is not accompanied by the production of knowledge. On the other hand, modern knowledge is a necessary prerequisite for the integration of economic agents into the interaction system (the communication process about economic or non-economic assets), in which they act as switches and recipients of information in a transactive mode (simultaneously). Under these conditions, differences in the volume and efficiency of the implementation of human capital determine the height of the barriers to entry into the information space, become a key source of differentiation of the latter, i.e. by influencing the efficiency of communications, the quality of human capital determines the dynamics of macro- and meso-economic indicators. Thus, the formation of the information space has led to the following:

- to multidirectional dynamics of transaction costs;
- to social stratification of society, due to the difference in access,
- to ICT and in the scope of relevant competencies;
- to the activation of centrifugal and centripetal tendencies, which makes it necessary to take into account the peculiarities of communication processes when developing strategies for spatial development.

The transformation of communications from the operation of transferring information, providing an increment of knowledge, into a system-forming link in the process of producing information due to the avalanche-like growth of their volume causes the transformation of the information space into information and communication. The latter does not necessarily lead to the formation of knowledge as a result of the production of information, but presupposes that the communication participants have a certain level of information and communication competencies.

3 Results and Discussion

Spatial development is realized as an increase in the level of structured space, an expansion of the composition and an increase in the number of subjects, objects and transactions between them, a change in the density, frequency and intensity of the latter. The transition from a homogeneous type of space to a weakly structured one and its subsequent transformation into a heterogeneous one is an objective prerequisite for the development of scientific knowledge, the stages of which are the economy of the region, the regional economy and the spatial economy.

Globalization and the emergence of the global information space is accompanied by a further blurring of the boundaries of subspaces [4], which is due to the high role of transnational corporations, for which the criterion of territorial location does not play a significant role. Nationality is conditionally determined by the country where the headquarters is located, by unification of the institutional environment, by introduction of ICT, ensuring the globalization of information flows, by formation of common information threats and risks, etc.

The form of the implementation of the contradictory unity of the processes of globalization (convergence) and localization (fragmentation, “territorialization”) is the model of “regionalization”, or the integration of complementary elements of global and national (subnational) systems, which forms the basis of the theory of glocalization (R. Robertson [5], Z. Bauman [6] and others). The regionalization model can be considered as one of their forms

of resolving the contradictions between the processes of globalization and the localization of information and economic spaces on the basis of reformatting production and information systems, which implies a recurrent regionalization of fragments (stages) of global value chains. The regionalization of the information space is accompanied by the reforming of global value chains and the duplication of certain fragments of distributed systems within the borders of the single European economic space, which makes it possible to increase the level of national and macro-regional (the European Union as a macro-region) economic security. The relevance of this model is confirmed by the crisis phenomena caused by the COVID-19 coronavirus pandemic, which revealed threats to national economic security due to the dependence of European states on imports of personal protective equipment, certain medicines, etc. to the European Union. Thus, glocalization can be considered as a hybridization of global and local infocommunications, which leads to their mutual enrichment, an increase in the number of alternatives (and, consequently, bifurcation points in the development of space) and the number of attractors.

The study showed that the implementation of the principles of methodological comparative studies to the analysis of information processes made it possible to determine the content, functions and phases of development of the information space. The allocation of the category "information and communication space" is due to a number of circumstances, among which are the following:

- the transformation of communications into an independent element of space, transmitting and simultaneously producing information;
- accumulation of information that is not used for the production of knowledge;
- imputation of functions of switches and addressees of information to all economic agents;
- the introduction of ICT not only in innovative, but also in traditional spheres of activity;
- institutional design of communications as a key factor in the economic and social development of society [7-8] ;
- transformation of communications into an essential factor in the polarization of the economic and information space of the state and subnational entities [9], etc. regions.

The digitalization of sustainable development is viewed as a process of transformation of ICT into the main source of economic and social benefits of economic agents, which determines the growing role of communications in ensuring the progressive environmental dynamics of the state and its regions.

4 Conclusion

The author's interpretation of the information space in the sustainable development system is based on the principles of the relativistic paradigm, combining the provisions of the neoclassical general equilibrium model and the Keynesian stochastic model, supplemented by the methodological provisions of the neoinstitutional theory [10-11] and behavioral economics. Environmental specificity of sustainable growth [12-13] also must be taken into account. The research is based on the principle of methodological institutionalism, according to which regional development in the spatial dimension is explained using the tools of the institutional theory of behavior and the principle of institutional rationality, aimed at obtaining benefits from the spatial allocation of assets (spatial rent in the form of factor income) in conditions of imperfect competition, which is associated with a certain amount of costs, including transaction costs. Information space and spatial effects are studied through the prism of individual actions, which are understood as actions of individual and collective economic agents.

The study of the evolution of the information space under the influence of contradictory processes of sustainable development made it possible to give an expansive interpretation of glocalization as the formation and development of subspaces that perform the functions of initiation and propagation of spatial effects [14]. This provision is the starting point for rethinking the processes of integration and regionalization of the Russian economic and information space, as well as the processes of its differentiation. Thus, the development of a methodological platform and the conceptual apparatus of spatial theory serve as prerequisites for substantiating the normative attitudes of economic agents vested with the authority to design institutions and develop strategies for spatial development.

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