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SPATIAL ORGANIZATION MANAGEMENT: MODELING THE FUNCTIONING OF ECO-CLUSTERS IN THE CONTEXT OF GLOBALIZATION

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Abstract

The issue of spatial organization of eco-clusters has always been under the close attention of scientists. Greening of production, resource conservation, economical use of natural resources, increasing the greenhouse effect and industrial emissions are forcing market stakeholders to plan cluster associations aimed at minimizing the negative impact of human activities on the environment. At the same time, this issue is extremely complex and needs careful study. In particular, the concept of formation and location of eco-clusters in the context of globalization should be based on the institutional environment, legislative field, labor market and other territorial conditions where the eco-cluster is planned to be located. It is important to form a cluster core, which will be the administrative center of eco-cluster management. In this regard, the purpose of the article is to model the activity of eco-clusters based on a neural network approach to the management of their spatial organization.

In this research, on the basis of training a neural network using regional indicators of institutional support and development of the labor market, the solution to the problem of the spatial organization of eco-clusters on the territory of Ukraine is described. The authors used the tools of artificial intelligence to model the spatial location and organization of eco-clusters. They proceeded from the premise that in each territory there is a certain set of labor, institutional, production, technological, managerial and information resources, the successful use of which will allow to effectively modeling cluster associations, and propose to recombine eco-clusters using the method of neural modeling. The input data for modeling eco-clusters is the use of 3,102 units of indicators by the neural network, which characterize the institutional and resource provision of a particular region of Ukraine. Given the wide range of input digital data, their various definitions (absolute or relative) neural network makes it possible

to automatically summarize and organize them. After completing the training of the neural network, analysis of errors and deviations, we obtain spatial graphical images of the optimal location of eco-clusters in Ukraine. The proposed neural network approach makes it possible to optimize the process of economic and statistical modeling of a significant array of data characterizing the main parameters of the environment in which ecological cluster associations operate.

The trained neural network allowed obtaining a map of the optimal location of eco-clusters, taking into account the available in a particular area of institutional, informational, innovative, technological and other types of resources. Based on the theory of synergetic systems, such a spatial arrangement of the eco-cluster will allow in the best ways to use available resources for their accumulation and multiplication in the cluster. The proposed neural network approach makes it possible to optimize the process of economic and statistical modeling of a significant array of data characterizing the main parameters of the environment in which ecological cluster associations operate.

The method of spatial modeling of eco-clusters proposed by the authors using the tools of artificial intelligence allows determining the best administrative centers of cluster development that can strengthen the territorial socio-economic development based on innovation and economical production. The step-by-step process of eco-cluster modeling presented by the authors will allow all stakeholders interested in the market to use artificial networks in the process of planning progressive spatial development. In addition, the proposed method of modeling eco-clusters, neural network activation and training do not require significant financial, technical and labor resources, which is a positive phenomenon in the context of ensuring resource-saving development of any area.

Key words: *Environmental management, Spatial organization, Labor Market, Institutional Development, Neural Network, Model.*