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SUSTAINABLE DEVELOPMENT, NOOSPHERE AND SPATIAL ORGANIZATION OF SOCIETY IN THE SUBJECT FIELD OF SOCIATY GEOGRAPHY

The article is devoted to the noospherical evolution of the spatial organization of society. One of the main noospherical provisions of *HomoSapiens* ecology is the fact that this species is an equal participant in the natural material-energy cycle but it has expanded limits of its ecological niche by advancing in time natural processes ("traps for time") and the spatial transformation of its ecotope ("traps for space"). In addition, this space-time transformation significantly increased the level of planetary entropy ("trap for information").

Therefore, spatio-temporal inconsistency nature and society development is considered as one of the main causes of increasing global environmental problem. Correct statement and further solution of global environmental problem can be solved within the boundaries of spatial socio-natural systems which are regarded as a set of three interrelated ecosystems of a Man – agricultural ecosystems, urban ecosystems and infraecosystems.

Their contemporary interaction describes the modern scientific picture of the world within which scenarios of transition to sustainable development are possible. This approach is proposed to be carried by a system of criteria-indicators for the corresponding typology of countries in the world. Methodological approaches to the development of a new administrative-territorial structure of Ukraine based on sustainable development criteria are proposed. In particular, striving for noosphere (sustainable development) in the course of noospherogenesis process should be carried out by a Man in spatial boundaries of socio-natural systems which represent ecosystems and have a dual character of boundaries. That is, these are synergistic conjunctions of natural and social components with each other that have been developing by their own laws.

The new awareness of the ecological content of modern spatial organization of the society makes justifying special space and meaningful participation of human geography in studying noospherogenesis process that is embodied in the development of the most fundamental philosophical methodological approaches to studying the relationship of nature and society.

Key words: spatial organization, global ecological problem, noosphere, sustainable development.

Сергій Сонько. СТІЙКИЙ РОЗВИТОК, НООСФЕРА І ПРОСТОРОВА ОРГАНІЗАЦІЯ СУСПІЛЬСТВА У ПРЕДМЕТНІЙ ОБЛАСТІ СУСПІЛЬНОЇ ГЕОГРАФІЇ

Стаття присвячена ноосферній еволюції просторової організації суспільства. Як одна з головних причин загострення глобальної екологічної проблеми розглядається просторово-часова неузгодженість розвитку природи і суспільства. Її рішення можливе в межах просторових соціоприродних систем, які розглядаються як комплекс трьох взаємозв'язаних екосистем Людини – агроекосистем, урбоекосистем, інфраекосистем. Розроблена система критеріїв-показників для відповідної типології країн світу. Пропонуються методологічні підходи до розробки нового адміністративно-територіального устрою України, засновані на критеріях стійкого розвитку.

Ключові слова: просторова організація, глобальна екологічна проблема, ноосфера, стійкий розвиток.

Сергей Сонько. УСТОЙЧИВОЕ РАЗВИТИЕ, НООСФЕРА И ПРОСТРАНСТВЕННАЯ ОРГАНИЗАЦИЯ ОБЩЕСТВА В ПРЕДМЕТНОЙ ОБЛАСТИ ОБЩЕСТВЕННОЙ ГЕОГРАФИИ

Статья посвящена ноосферной эволюции пространственной организации общества. Как одна из главных причин обострения глобальной экологической проблемы рассматривается пространственно-временная несогласованность развития природы и общества. Ее решение возможно в границах пространственных социоприродных систем, которые рассматриваются как комплекс трех взаимосвязанных экосистем Человека – агроекосистем, урбоэкосистем, инфраэкосистем. Разработана система критериев-показателей для соответствующей типологии стран мира. Предлагаются методологические подходы к разработке нового административно-территориального устройства Украины, основанные на критериях устойчивого развития.

Ключевые слова: пространственная организация, глобальная экологическая проблема, ноосфера, устойчивое развитие.

Introduction. The steady worsening of global environmental problem makes scientists reconsider methodological guidelines for the development of subjects of their sciences. Human geography has certain advantages in comparison with other sciences in correct setting and further solving of global environmental problem. Justification of real solutions to global environmental problem is a unique opportunity for geography to strengthen its fundamental theoretical and methodological positions in sciences and strengthen their worldview status.

Modern Ukraine's progress toward "post-industrial", "information", "globalized" society under the banner of sustainable development, methodological guidelines of which have not fully defined yet and, therefore, are quite questionable, forces to reflect on more general basis of the human development which implies a gradual promoting of humanity to the noosphere [12].

In human geography the spatial paradigm dominates for a long time that in modern conditions requires further in-depth development. Connection of the correct formulation of many global problems, especially environmental one, using geographical space by a human is only beginning to be realized by the scientific community.

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Main contents of research. To formalize the global environmental problem for some countries it is necessary to develop a specific indicator. It is very important in order to reduce energy efficiency of nature management [3]. Thus, in the developed world agriculture is characterized by a very high productivity of labor but for the soil fertility in production output from 1 hectare, for example, China has much higher figures than the United States. In this context the indicator of output per unit of agricultural lands is more important rather than output per one employed person. Thus, according to noosphere positions considering "sustainable development" achieved only due to the high GDP (that is, the number of convertible substance in consumer cost of the biosphere) is incorrect. GDP is not taking into account that this substance is obtained from areas of geographical space already incompatible with the territory of one country. This approach is methodologically incorrect since according to it spatially ecological hierarchy is formed that most approximates the population of *Homo Sapiens* not to environmental but to the financial pyramid [4].

We consider it is necessary to introduce actual noospher criteria – the depth of influence of individual countries (through the formation of certain information flows) to ecosystems of other territories. Based on the principles of ecosystem dynamics, one of these criteria can also be indicator of absolute and relative biomass consumption of carbon dioxide equivalent calculated as per one individual *Homo Sapiens* and for a total territory of the area (the area of the country plus the territory of other countries from which the biomass is supplied). Such indicators should be equated with the main constants of the biosphere, and their reference values require special calculations.

It is also advisable to use energy value indicator of weight unit of the biomass produced in agriculture. It should be remembered that naturalized (without external energy subsidies) farming has the best energy ratio. It is also necessary to take into account the most common indicator is the share of the rural population (as a variant – the population employed in agriculture). According to the author's concept it should be at least 35-40% [2]. This is obligatory condition for participation of this population directly in agricultural activities "closed" in a given territory by corresponding flows of matter and energy. That is, we are talking about establishing mandatory quotas for the proportion of natural economy in the GDP.

As a guarantee of the ecological reserve as well as the stability and diversity of the biosphere [1], considering such indicator as the proportion of unchanged economic territories of the total area of the country will be appropriate.

A spatial criterion of noospherical development confirms a direct link of occurrence of remaining so-called "global problems" of humanity from ecological one. In particular, it can be argued that the relevant spatial dynamics of species *Homo Sapiens*, involves considerable structuring of geographical space securing appropriate "environmental" specialization of certain countries and distorting natural ecosystems despite the preservation of diversity and spatial patchiness [9]. Particularly, to the approach of modern spatial organization of human society to the noospherical state the following steps will contribute to:

- limiting proportion of the surface of the globe occupied by territories of urban settlements which should not exceed 1% (it was at the beginning of the industrial era);
- limiting expansion of fields of influence of large cities on the immediate surroundings is larger than the average distance of the vectors to neighboring towns of the same rank [10];
- limiting density of hard surfaced communications per unit area the standard of which is best calculated by Kristaller's model k=4 [6];
- inability to increase by more than 15% proportion of forage arable land [2].

Environmental and spatial criteria should take into account trends in goods-producing economy which exists and develops thanks to the phenomenon of the growing consumption of nature substance. Thus, the total rejection of nature substance (both bone and living ones together with biogenic) in tons can be considered as a criterion-indicator of the depth of transforming natural ecosystems. At the same time reinforcement of consumer society strategy through advertising, media, involves a radical structuring of geographical space (and, accordingly, natural ecosystems). Such structuring initially gives incomparable benefits to developed countries prompting other countries to the distortion of natural ecosystems which are on their territories [10].

It is also important to establish the real "environmental friendliness" of certain industries. Thus, it is estimated that in developed countries "environmental friendliness" indicators are quite high due to low material- and energy consumption and high-tech unit of finished products. In fact, this is due to the virtual distortion of spatial relationships, in particular through transferring of environmentally hazardous facilities on the territory of third countries. The criterion-indicator of this virtual distortion may be the sum of investments made in such production on the territory of third countries.

The concept of eco-efficiency should contain the idea of a positive reproduction of the habitat of any species in the course of its life. In more "natural" ecological systems time flow happens in accordance with the cosmic rhythms. To harmonize this pace a man creates a "trap for the time" [5]. The same applies to the space distortion of which for the purpose of better use of resources is not taken into account when calculating economic efficiency. Namely this distortion fundamentally changes the real time and space in which natural ecosystems develop.

The new awareness of ecological maintenance of modern spatial organization of the society causes justification of the special space and meaningful participation of human geography in studying noospherogenesis process. Using known categories of space and time in studying this problem we can conclude that the main reason for the emergence and exacerbation of the global environmental problem lies in different rates of development of nature and society. Among states of nature and society

different in spatial and temporal nature or "dilution" in time and space there are searching and finding specific ecotope of a Man and studying his spatial evolution.

For constructive solution of "global environmental problem" it is necessary to find areas of geographical space which reflect the difference in speed of nature and society in the future to bring them into the required ratio. Consequently, in order that the subsequent development of human society was going in the direction of noospherical and was really close to the sustainable one, it is necessary to reconsider fundamentally spatial existence of the human species *Homo Sapiens*.

From geographical positions striving for noosphere (sustainable development) in the course of noospherogenesis process should be carried out by a Man in spatial boundaries of socio-natural systems which represent ecosystems and have a dual character of boundaries. That is, these are synergistic conjunctions of natural and social components with each other that have been developing by their own laws.

For understanding socio-natural system noosphere content is taken deliberately based on the fact that the noosphere is the sphere of mind which has not formed yet and the process of spatial development of socio-natural systems is the noospherogenesis process. Approaching territorial organization of the society to "sustainability" is proposed to carry out in the form of possible scenarios at different spatial scales. The current strategy of creating ecological network should cover the meso- and macro level. At the micro level it is necessary to introduce strategy of combining boundaries of natural and agro-ecosystems harmonized with noosphere in the directions suggested by the author [8]. At the same time there is one of the main conditions of noospherical (sustainable) development – such a change in structure and functions of natural ecosystems by a man which leaves them able to reproduce themselves. One of the main noospherical provisions of *Homo Sapiens* ecology should consist in the fact that this species is an equal participant in the natural material-energy cycle but it has expanded limits of its ecological niche by advancing in time natural processes ("traps for time") and the spatial transformation of its ecotope ("traps for space"). In addition, this space-time transformation significantly increased the level of planetary entropy ("trap for information").

Homo Sapiens throughout its life in the biosphere of the Earth forms identical edaphic (spatial) units by environmental features with other species and also participates in food chains taking its trophic level in spatially rearranged but natural ecosystems. "Ecotope" of a human extends beyond the organismal level of species organization and covers populational and even ecosystem level. In this context, it is more logical to talk about the agro ecosystem as the ecological niche of *Homo Sapiens* with not clearly defined (movable) spatial boundaries. Therefore, there is no reason to consider agro ecosystem of *Homo Sapiens* unnatural ("semi", "combined", "artificial", "anthropogenic", "technogenic") based on the presence of "second nature" of a Man. All ecosystems including anthropoecosystems (or noospherical) are "primitive natural".

Uncertainty of the main landmarks of the concept of sustainable development providing unfair division of the globe by ecological functions by "civilized" countries in a contemporary manifestation, forces to seek own national "concepts of sustainable development". In particular, it is necessary to divide methodologically the idea of achieving noospherical state of socio-natural systems (sustainable development) and the idea of nature conservation (preserving anthropocentric attitude to it).

As an approximation to the sustainable development the priority development of agricultural ecosystems as socio-natural systems and need for "fitting" administrative-territorial division into their borders are proposed as at this time chorological content of interaction between nature and society will be approximately optimal [11].

Trying to find noospherical criteria of typology of countries in the world that reflect the depth of influence of individual countries (through the formation of certain information flows) on ecosystems of the planet leads to the conclusion that paying penalties by "developed" countries for violating ecosystems (for development purposes) in the territories of other countries. The size of these penalties can be assessed by comparing the "difference" of natural and economic borders of agricultural ecosystems in countries with natural economy and "developed" countries [8].

Conclusions. In the context of the theoretical geography the most common consequence of the above author's searches is an interpretation of modern spatial processes according to the concept of noospherical ecosystems. In particular, it is proposed to include their evolution into the general scheme of the paradigm of natural history. Given the fact that the information impact of world cities restructures the geographical area in the direction of greater crystallization of some of its foci there is logical consequence that the modern informatization does not only decrease but, on the contrary, it contributes to the compression of the geographical space. This changes the general direction of the process of territorial organization of the economy, as this process does not start from the micro-level and inherent real-energy components (mineral deposits, energy, etc.) but from meso or even macro level (the medium and highly developed country, region of the world) and subsequent involvement in the production of information properties of geographical space – environmental friendliness, ergonomics, valeological property, communication, and in the long term eniological property. In turn, this leads to a change in the priority of economy placement factors which goes through several stages [7].

The direct contribution to the affirmation of the fundamental status of geography may be variations of modern ecological and spatial paradigms in some applied and fundamental sciences, such as biology (ecological system science, ecology), information science (computer science, information dynamics), urban planning (regional planning, architecture).

Consideration of author's historiosophical provisions helps in developing realistic national concepts of "entering" "not gold billion" countries the new era of the globalized economy and post-industrialism – concepts close to the idea of sustainable development.

Correct statement of the environmental problem with the purpose of its further decision is in line with the

optimization of geographical space – optimization which can be realized only by examining trends in the spatial development of socio-natural systems – important objects of human geography and primary spatial units of noospherical development.

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