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SPATIAL IMBALANCE OF URBAN DEVELOPMENT OF SETTLEMENTS AND WAYS OF ITS SOLUTION IN MODERN CONDITIONS

Abstract: *The article discusses the issues of regulation of urban development as a part of resettlement systems in order to form a balanced socio-economic and territorial organization of resettlement in the country and its individual regions. The concept of overcoming significant differences in the conditions and way of life of urban and rural population, resolution of regional socio-economic imbalances, inconsistency and incompleteness of development of resettlement facilities, lagging social, transport and engineering infrastructure. The socio-spatial trends in the development of resettlement systems are conditioned by new principles of social planning based on the achievement of greater social equality for the population living in cities and rural settlements. The task of urban development is to find new ways to form dynamically stable spatial systems, to develop new approaches to architectural and spatial support of modern post-industrial social processes, and the continuous development of cultural heritage.*

Keywords: *spatial imbalance, urban development, settlement system, territorial organization of cities, regulation of social and spatial development*

For millennia, people have been experimenting with ways of spatial concentration of people and the resources they need in different forms. Cities appeared simultaneously with the advent of modern civilization and are closely related to the basic laws of civilizational development of society. These were cities, where at all times ideas, institutions, forms of social organization, inventions and achievements of culture were developed. As civilization developed, the number of cities grew, cities became larger and more complex in their layout and construction, united in territorial systems, which are now represented by agglomerations and conurbations. At the same time, in the process of development each city and its surroundings acquire their individual features, differing in size and configuration of territories, population structure, nature of planning and development, architecture and models of urban and rural behavior. The city, even being surrounded by walls, never lost its connections with its environment, receiving all the missing resources from the outside, providing protection, goods, and developed social institutions. Today, this external resource dependence of cities on the external environment has greatly increased and is expressed in the formation of complex relationships of all the components of urban systems.

Discussion of the development of urban systems under conditions of the current global changes in social development should be carried out taking into account the main modern problems faced by society today and the ones that do not have clear solutions, but which are connected with the fate of the future spatial structure of states. Such problems can be correlated with different conditions of life environment development and external influences on it.

The development of modern town-planning activity is determined by the emergence of new problems of social development, such as a significant increase in the scope and nature of the location of industries and services, the formation of new forms of settlement in the intensively urbanized areas, a significant complication of communication systems (transport, energy, information, migration, etc.), increasing consumption of non-renewable natural resources, exacerbating conflicts between anthropogenic and natural environments. These problems require

elaboration of special urban development strategies, taking into account the full range of social, economic, technological, environmental, architectural and other conditions.

The practice of theoretical description of the mechanisms of urban and agglomeration systems functioning began in the early 19th century with the appearance of the work of the German economist Johann Heinrich von *Thünen* called “The Isolated State in Relation to Agriculture and Political Economy” in 1826. Thus, from the very beginning, inter-universe spatial interactions were modeled exclusively in the economic category. The first von *Thünen*’s postulate determined that “... the price of each product at any point in space differs from its price in the city by the amount of transport costs, which are taken directly proportional to the weight of the cargo and the distance of transportation” [*Thünen* J.H., 1826]. I.G. *Thünen* was the first who proposed to introduce statistical analysis of the spatial equilibrium on the basis of calculations of economic indicators of resource allocation and the possibility of their achievement in space. This first model of spatial distribution of human resources was based on the fact that spatial irregularity in the settlement of people and the location of their economic activity will take place almost always.

Currently, in many studies descriptive models of mechanisms of urban systems formation have become more complicated and already extended groups of economic indicators related to population density, optimization of transport systems, land rent, spatial objects connectivity and many others are taken into account.

Modern urban development systems have grown to a large scale, and the processes of globalization of economic and spatial development are becoming supranational and transcontinental. Despite the fact that urban planning systems are of artificial origin and were formed by people exclusively to solve their own problems, their real spatial and functional development occurs in addition to the will of people, since the level of complexity and involvement of urban planning systems in natural systems is such that it is more correct to talk about the conditionality of the processes. In this sense, urban systems are rather a product of the natural development of the material and spatial environment and the regulation of its change is not so much the will and objectives of social development as natural laws that people have not discovered yet or learned how to use them. In this regard, the attempts of some urban planners-managers to determine the solution of problems of spatial optimization of cities and their interactions with each other on the basis of economic, demographic, legal and other regulators, are doomed to failure, as they are not supported by the necessary knowledge about the nature of the processes.

The discussion of modern urban systems involves the use of such concepts as agglomeration, conurbation, metropolis, cluster, group of settlements, urban area, etc. that reflect the different nature of inter-human interaction. The disadvantage of using these concepts to describe the state of urban systems is that they are associated with the models of interaction that are too different in nature of cities and small settlements and are not able to fully reflect the geographical, climatic, biosphere and other conditions of these systems organization.

The economy is more productive in places where population, finance, resources, technology, culture and science are concentrated. According to the American urbanist E. Glaeser (E. Glaeser, 2009), the main tool for solving modern urban problems is the search for a certain spatial balance, i.e. a balanced alignment of the level of comfortable stay of people in urban space. The model of such spatial equilibrium is designed to provide understanding of the reasons for the spatial concentration of people and their activity in certain places.

In most publications devoted to the problems of urban development and their agglomerations, explanatory theories are based on economic categories (Batten D.F., 2000, Shubenkov M., 2015). However, the practice of historical formation of cities proves that their foundation is not necessarily determined by economic reasons. Cities can emerge, revive and develop for different reasons. In some cases, the formation of cities and agglomerations is

determined by the circumstances of the protection of the boundaries of territories or special conditions of natural comfort of the environment, which predispose to living in a particular place.

In the process of developing spatial equilibrium models in the framework of urban planning and development projects, it is necessary to take into account the entire range of consumer qualities of the urban environment, including the assessment of the level of comfort of the population, which becomes the leading factor in the regulation of urban concentration of all other resources. Building this kind of priorities defines a new approach in urban planning and design, called “human development” (A. Piorr, J. Ravetz, 2011).

The current approaches to the measurement of real estate capitalization do not take into account the rate and extent of depletion and degradation of natural resources, which are still considered to be unlimited. Today, the need to radically change the traditional paradigm of the formation and development of cities is obvious. On the one hand, modern cities can no longer exist within the closed systems with their environment and are built into complex group systems (agglomerations, conurbations), involving the economic turnover of large areas, and, on the other hand, the dictate of urban areas over natural can not continue indefinitely, because it threatens the existence of cities themselves as consumers of natural resources depend on them. It is necessary to search for symbiosis, and co-evolution of the artificial and natural environment.

What is the resource that can help to overcome the transition to sustainable development? Many scientists argue that this is determined by to the need for a number of reforms that should change the existing society in terms of interaction with the natural environment. The most significant reforms include the reform of changing public consciousness associated with the transition from the policy of stimulating the growth of consumption to the policy of symbiotic coexistence of artificial and natural biosphere, and the information society reform.

The first reform provides for significant changes in the legislation, state programs of priorities for economic, scientific, technical and social development. It is about developing a new code of ethics, proclaiming the principle of intergenerational and intergenerational justice, defining the forms of a viable way of life of both the individual and the global community, common moral and ethical foundations, respect and care for all living beings.

The second reform of information society is based on the dematerialization of economic activity, a new type of economy of intangible flows of finance, information and intellectual property. The real economy is increasingly shifting to the growth and dissemination of information resources and knowledge, which open up new opportunities for reformatting the economy as a whole. Specific energy intensity in some branches of modern economic activity is reduced.

At present, we are witnessing another socio-economic revolution, which is associated with a fundamental change in the culture of consumption, namely, not goods and their production become an economic priority, but services of all kinds, provided by people and aimed at people. Klaus Schwab, Swiss economist, the founder and President of the world economic forum in Davos, in his book “The Fourth Industrial Revolution” argues that such Internet platforms as Airbnb, Uber, Alibaba, WhatsApp, Instagram, and Telegram have covered the whole world today. The role of capital and the scale of business required for their successful development are changing. They are already less related to the nature of business and the size of the investment, and are more focused on the quality of work, knowledge and skills, knowledge intensity, environmental friendliness, innovation and complexity. At the same time, Klaus Schwab warns about the opposite effects of the ongoing changes in social development, about the negative effects of the development of modern IT technologies, such as violation of private life through anonymous tracking, theft of personal data through the Internet and hacking, various illegal actions in online environments (cyberterrorism, flash mobs, virus attacks, etc.), artificial polarization of opinions in society (media propaganda), distribution of false information in the Internet environment, etc. (Gutnov A., 1984).

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Google technical Director Raymond Kurzweil (2015) made a forecast in 2009 for 10 years ahead and today we are approaching this date. Much of what seemed improbable then, really has come true today or is close to it. In particular, he predicted that computers will be built in everywhere and into anything – into clothes, furniture, household appliances, communication with the computer will be without a keyboard, the computer will perceive not only the human voice, but also gestures, there will be computers implanted in people, computer interpreters, unmanned aircraft and cars. R. Kurzweil sees the future of mankind in the symbiosis of man and artificial intelligence. Nanorobots and artificial intelligence systems will be incorporated into the human body at the molecular level. Human and machine consciousness will become common.

Planet Earth will become a supercomputer and by the end of the 21st century the colonization of space will begin. Not material values, but creative ideas become important for society.

We need a new model of social and economic development of the state and society, which is dictated by the global introduction of digital technologies. In this case, we are not talking about “digitalization” of processes, but about setting fundamentally new tasks for the society, the solution of which is possible only on the basis of new technologies of collection, accumulation, processing and exchange of large amounts of structured and unstructured data in order to develop more reasonable and effective solutions.

All of the above is directly related to the development of our environment. The nature and quality of the environment itself is expected to change inevitably, what will require the formation of new settlement systems and new urban components. Already today, new technologies are actively introduced into our lives, ranging from industry BIM, cybernetic systems of industrial robotics CPS, construction of Smart-city, IT-city, Digital-city, Big Data and Blockchain technologies, smart-system intelligent systems and completing the Internet of things IoT.

An example of mass modern informatization of society in relation to the space of life is the spread of geospatial platforms on the Internet. Free online traffic of geospatial platforms Microsoft Bing Maps, Oracle Spatial, Bentley Map, QGIS, gvSIG, Google Earth/Maps, MicroStation Geographics is widespread. In conjunction with GPS resources and other on-premises technologies, mobile devices are becoming easier, faster and cheaper to provide and manipulate data on maps and in space. Today, interactive maps are the most powerful means of visualization and local access to assets, resources, service in urban communities and neighborhoods. These new opportunities are becoming an invaluable tool for engaging citizens in planning dialogues with authorities and professionals.

Modern cities are losing their traditional role as technological centers of industrial production. Their development is increasingly associated with science, education, production of a variety of information of innovation, service, expert, managerial and organizational nature. The main place in the economy of cities today is the transfer of knowledge, the development of decisions and recommendations.

Knowledge, as a basic economic product, changes the structure of urban employment and ultimately the way of life, as there is an inextricable link between the nature of knowledge accumulation and transfer, and the communities where it is developed. The production and distribution of knowledge, where information technologies play a key role, starts functioning within local urban communities and to take specific forms. Today, there are conditions for the formation of a new generation of cities and their systems focused on the integrated maintenance of information processes, i.e. a kind of “information” urban systems of different levels of organization.

At the same time, new forms of urban identity in modern conditions are determined by the nature of socio-cultural space, which is associated with social heterogeneity, socio-cultural dynamics, social and cultural segregation and stochastic nature of urban events. At the same time, it is still unclear what properties of urban space determine its quality. Information and computer technologies occupy a major position in solving the problems of optimization of urban development processes related to planning, design, construction and management of cities.

In connection with the above, it is possible to identify two main directions in solving the problems of urban development systems based on information technology.

The first relates to the development of new types of strategies that take into account the active participation of society, administration, investors and designers in the development of the most effective urban infrastructure and services. The new strategies will be based on modern network infrastructure resources (Internet protocols), e-government programmes, digitalization of processes and systems of planning, transport, public services and construction. In conjunction with GPS and other local technologies, mobile devices are becoming easier, faster and cheaper to provide and manipulate data on maps and in space. Interactive maps are the most powerful means

of visualization and local access to assets, resources, service in local communities and neighborhoods. They are an invaluable tool for engaging citizens in planning dialogues.

The second area is related to the strengthening of the role of social initiatives, the development of civil society, with the increase of social capital by urban communities. Today, in developed countries, these innovations have already become widespread. Today, various urban forums, services and social support funds, social networking platforms such as Viber, WhatsApp, Pinterest, Telegram, Facebook, Twitter, Google, LinkedIn have been created and are successfully working, contributing to the formation of urban communities on various grounds and mobilizing them for active civil action.

Modern urban development owes its development to the complex interrelations of processes that take place in culture, society, environment and economy. New social models constantly appear and are implemented in society, and they encourage spatial structures to change. This is the evolutionary nature of urban systems. In this sense, each society forms its own spatial practice, develops its own recognizable architectural and spatial patterns, through which it manages the feedback of social changes. In a sense, modern information and communication technologies open up new opportunities for managing the development of artificial environments and opens up prospects for the beginning of a new era of urban Renaissance.

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