

Sustainable Development- The Definition of the Concept and the Perspectives of Development

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Abstract

The issues related to the definition and development of the concept of "sustainable development" in the aspect of critical period in the development of modern architecture have been considered in the present work. These are the development of information technologies and the technological revolution, as well as a chain of global crises.

Goal: to define the concept of the "Sustainable development of the architecture" in the aspect of tendencies of its modern development.

Keywords: architecture, sustainable development, ecology, city, environment.

The extent of development of a problem.

The works of Abraamov E. [1], Iesaulov G. [2], Ursul A. [3], Kuvshinov M. [4], Bergun T. [5], Ponedelnikov V. [6], and some other scientists, the interests of which at a certain degree are connected to the problem of sustainable development of architecture, are causing certain interest for the author of present research.

FORMULATION OF THE PROBLEM

Billions of years of evolution have allowed forming the living world on our planet that would be resistant to disasters and constant changes. Changing continuously, it had not lost its shape, its integrity. And human, thinking of their wishes alone, subject to anthropocentrism, putting its essence in the cornerstone, naively suggested the possibility of making this world better as if human being can be compared to the Creator itself. This misconception leading to the need for accelerating sustained economic growth had jeopardized our very existence, the existence of future generations. Now that synergies, systematic approach, non-linear thinking, have entrenched in the minds of the researchers, it's time to plant their sprouts in the mass consciousness, and realize it in the economic and social spheres.

After a long, and almost non-conflict with nature development of humanity, in the XX century it reached a collision with the biosphere, which led to rapid global changes in all environments and practical cessation of recovery of renewable

natural resources - air, water, soil, flora and fauna. This has now become the question of the development of strategy of the development of civilization. [1]

To stop the rampant consumption growth, to review the barbaric attitude to natural resources, to reduce the production and everyday life waste to its possible minimum, to completely reorganize the educational system, to provide a new rational approach to the construction and arrangement of housing, to subdue the development, planning and management to precise mathematical models, to introduce a new control system, based on certification - these are tasks for the nearest future, the implementation of which makes the very possibility of existence of future and next generations.

THE RESULTS OF THE RESEARCH

Nowadays, great attention in the architectural community is being paid to the concept of an ecological city, also known as a "sustainable city" and a "green city". The variety and number of approaches to the design and construction of these cities urge to make certain generalizations that would be desirably developed to a system of concepts and techniques of innovative architecture, the architecture of sustainable development. At the present stage of development of the problems we can already see the basic criteria of the approach to the city; it is energetically, resource and ecological self-sufficiency. Ecological self-sufficiency means that a city will become the object of environmental regeneration rather than the object of environmental pressure as it is being now.

The main issue is the question of regional binding of innovations of sustainable development in each particular place. For example: the great-defined concept of the floating city in Haiti is absolutely not applicable to placing it, for example, in the Kakhovka reservoir (Ukraine). The city of sustainable development is being formed under the influence of hundreds of climatic and landscape factors of each specific region. Even the displacement of the project for 200-300 kilometers will already affect its formal and planning structure. Like any living system the sustainable city mutates and adapts to such factors as the availability and number of energy sources, the availability and accessibility of drinking water and fresh water, the annual temperature fluctuations,

biodiversity of the environment, the availability and accessibility of raw materials. These factors determine the layout of the blocks, the maximum number of population, the attractiveness for investors, and hence the perspectives of the growth of sustainably developing city. Unfortunately, the main problem in creating a project for the city of sustainable development is the impossibility to develop a map of long-term forecasts. There is such a term as a prediction horizon, beyond which any predictions lose clarity so that they lose any of their practical value.

Today, the great number of global crises such as the environmental, the demographic, the energetic, the economic one and the crisis of raw materials during relatively short period of time as well as the informational and technological revolution have shortened the distance of the horizon of predictions to 20-30 years, which is less than the life of the woodshed, not to mention such mega constructions as the "Burj Dubai", for example. It turns out that we almost blindly use the data for the formation of the concept of city of sustainable development. Will a complex of "Burj Dubai" with its highly complicated structure of communication still be used in case if Arab Emirates will stop selling oil and use fossil energy sources? How in these conditions they will solve the problem of fresh water? Will it not suffer the fate of hundreds of ghost cities of our planet.

Thus, the main objective in the design of the city of sustainable development should be not only the adherence to innovative technologies, but also the creation of the city that would be able to survive (without losing its functional properties) the most negative scenarios of global crisis. Under the term of "surviving" we don't mean solely the technical and functional operation, this concept includes the preservation and promotion of cultural and spiritual potential of the inhabitants of the city. Technically, at the present stage of development of human knowledge, this concept is quite implementable.

Nowadays, the architecture is experiencing the turning period associated with the emergence of several factors that are significantly altering the very idea of the architecture and its role in society. It is the development of information technologies and the technological revolution, as well as a chain of global crises, overlapping one another at a relatively short period of time. Now architecture is perceived as one of the main means of protection from an impending crisis, as a buffer between techno sphere and ecosphere.

A variety of challenges modern architecture is facing at the moment, brought the architects to a brand new level of creativity that relies not so much on the experience of previous generations, but mostly on the innovative technologies. Now this has led to chaos and the inability to predict the vectors of future development of the architecture.

SUSTAINABLE DEVELOPMENT

It is the "sustainable development" that reflects the reality of the required relationship of a human to the reality around him. The only way to be saved from extinction - is to accept the "rules of the game" of the world, not the one that has been invented by us, but the real one, the accuracy of which is mathematically understood by modern science.

UN Conference in 1992 in Rio-de-Janeiro on Environment and Development was one of the main events in the history of world civilization. It was in Rio-de-Janeiro where the worldwide recognition of the political problems associated with global warming and biodiversity conservation in the world has been gained. The Agenda 21 - a blueprint of civilization in the near future - has been adopted there.

At a symposium concerning the sustainable architecture, held in 2011, the definition: "Sustainable architecture" has been proposed. It stands for the architecture, with the program of consistent unity of aesthetic positions of the author, and time and socio-economic, engineering and technology, natural and environmental requirements based on the principles of sustainable development, which is determined by the fullness of realization accepted in international practice and requirements of the country's practice of rating systems assess the sustainability of the environment "[2].

The term (the concept) of "sustainable development" also has a large number of definitions (according to various sources, more than 50-100), and as it is rightly pointed by Ursul A., "there will be even more in future, because the process of realization of future development is taking place at the moment, and the future itself is indefinite and contingent" [3]. The lack of consensus in the definition and interpretation of this concept (term) can be explained due to the complexity of the concept of incorporating the social, economic and environmental aspects of human development and a mismatch of views of representatives of different sectors of society - the academic, the political, and the business one.

In the English language the concept of "sustainable development" can be explained in the following way: "Sustainable" literally means "maintaining life", "life-supporting". The term "development" apart from its main meaning, also stands for "manifestation". It was the term "Sustainable development" in the meaning of "The life-maintaining manifestations" that was entered into the use by the World Commission on Environment and Development(WCED) in 1987 to define the development in the process of which the "meeting the needs of the present will not compromise the ability of future generations to meet their own needs".

It should be noted that under the stability of a certain phenomenon or process, it is meant that this phenomenon is non-suspected to any fluctuations and changes; hardness, durability, reliability; persistence, staying in the same state;

the ability to maintain this state, in spite of the effect of various forces. The report "Our Common Future" explains the term «sustainability» as the ordering of technical, scientific, environmental, economic and social resources in such a way that the resulting system can be maintained in a state of equilibrium in space and time.

However, with regard to the socio-economic system the sustainability involves not the conservation of once reached levels of production but its increasing together with the growth of needs for these products. According to M.A. Kuvshinov: "The sustainable development has rather a dynamic character, it is not a state of harmony but rather a process of change in which the exploitation of resources, direction of investments, the orientation of technological development and institutional changes are consistent with the current and future needs," [4], [5] .

Afanasiev expresses the same views: "Sustainability does not necessarily mean a repetition of the same level from year to year. Such an understanding of sustainability equated him to a stagnation of production "[6]. For certain industries the sustainability can be characterized as a stability of even lower production volumes due to the decrease in demand or increase in production of substitutes of this type of products, the production of which seems to be more efficient.

As a rule, modern literature uses the concept of sustainable development, which is given in the book "Our Common Future": "The sustainable development is the development that meets the needs of the present, but does not compromise the ability of future generations to meet their own needs." A broader definition, suitable for all spheres of human activity, not only the socio-economic and environmental ones, is given in the same book: "Sustainable Development Strategy aims to achieve the harmony between human beings and their society and nature". Sustainable development must be directed in the same amount to the survival of humanity and the preservation of nature. The first one is the ability to constantly maintain a balanced development in which our descendants would have no less opportunity than the present generation to meet its needs for natural resources. The second one is the preservation of the biosphere as the natural basis of all life on earth, maintaining its stability and natural evolution. [7]

The new strategy of the civilization development comes not of priorities of our today's life, but makes an attempt to put them on one step, to equate those terms of their ability to meet vital needs. It is about shaping the future socio-natural system that can allow a set of contradictions that would be manifested in our time as a result of globalization. Among them - the contradiction between the restricted abilities of nature and the needs of the rapid growth of the human community, between developed and developing countries, the global requirements of the transition to the sustainable development and national interests.

The most important criterion for sustainable development in the world is the achievement of the strategic balance between human activities and the maintenance of reproducing features of the biosphere. In such case the human activity will not cause irreversible damage to the nature. However, discussing the content of the transition to sustainable development, it would be wrong to reduce all the questions only to the environmental issues, although it is clear that they are basic. The transition to sustainable development requires a radical transformation in the center of which - the ecologisation (greening) of the main activities of mankind, the man himself, changing his mind and the creation of a new "sustainable society" as the sphere of mind, first of all. Such changes shall occur not spontaneously but deliberately, consciously, and one of the main mechanisms for managing this process can become moral, humane mind united humanity, using all the possible socio-economic, political and technical means.

One of the brightest examples of attempts to create a new type of settlement is the city of Masdar. The uniqueness of this city lies in the fact that today it is the only city that conceived, designed and built as a unified ecological system that is functioning not in fragments, but according to the principle of integrated biological system. There have been hundreds of attempts to create a sustainable city of the future. In fact, in all the leading economies of the world there are schools of architecture working in this direction. However, there are several legitimate questions, emerging from the summation of the available data that make each new school that has been added into this process, to find their way to the development of concepts of sustainable city development.

Great influence on the formation of "green" constructions is being implemented by the systems of certification existing in many countries - these are the BREEAM in UK, the LEED in USA, German DGNB and so on. The main differences between rating systems LEED, BREEAM and DGNB are enclosed in determining the strategic objectives of the above systems.

The LEED focuses on the efficient use of existing energy sources;

The BREEAM is concentrated on the use of renewable energy sources, recycling and location of the object;

The strategic goal of the DGNB is the focus on maximizing the life cycle of the building; on the quality and thoroughness of project development.

The DGNB system offers a very balanced approach to achieve any given positions in the ranking systems of "green" certification. Low rates in one part of the rating system can be compensated by improving the ranking in other sections.

Systems of certification of eco-sustainability of constructions have a rating system. The building can obtain a certificate of different values, depending on quality indicators. The

certificate of a certain level defines the ultimate goal of building - certification system becomes a mechanism of formation of eco-sustainable architecture, where the purpose and the means to achieve it are discussed and agreed by designers, customers, investors, builders and management companies before the start of the project design work.

There are more than seven hundred systems of eco-certification of materials worldwide, and they have a significant impact on the market. In many countries, eco-labeling is a guarantee of demand for the material in the market. Eco-materials have two types of labeling: eco-certification and eco-declaration. In Europe in 2013 the eco-declaration EPD (Environmental Product Declaration) will become mandatory. The biggest number of certified materials belongs to China (more than 35 000), There are 20 000 in the European Union and about 17 000 in Canada, in Russia it is just 80. The most famous Russian brand for certification in eco-materials is the "Eco-Material". [8]

INDICATORS OF SUSTAINABLE DEVELOPMENT.

The Indicators of sustainable development are the criteria and indicators used to measure the level of development of a particular geographical area (town, country, region, continent and the entire world community), to predict its future state (the economic, political, environmental, demographic one, etc.), and to draw conclusions about the stability of this state. The indicators serve as a basis for planning activities aimed at formation of sustainable development, development of policy in this area.

The scientific works concerning the sustainable development issues use a systematic approach, which takes into consideration the complex structure, which includes social and ecological systems, social, economic, and environmental interaction. Given the orientation of the target (the terminology of control theory) the abovementioned indicators are divided into three categories - the input-influence parameters, the status indicators and the management indicators. The first one is characterized by human activities, processes and characteristics that affect the sustainable development. The latter characterize the current state of the various aspects of sustainable development. Third ones are the indicators of the response, allowing making the choice of changes in the current state. There is the list of indicators, recommended by the UN Commission on Sustainable Development. With the help of such indicators it is possible to characterize the viability of the system and its stability, ability to change and evolve.

Among the indicators of sustainable development at the national level (the level of a separate country) 3 groups of indicators can be distinguished: the economic, the social and the environmental one. In a simplified version these categories can be interpreted as: the needs of (the society), the means to

meet them (the economy), and the impact of meeting the needs (environment).

The models of eco-sustainable development of cities and territories are based on the principles of harmonious existence of the biosphere, on the development of the territories without prejudice to the nature, flora and fauna, without the damaging effects of the subsoil and the climate of the planet. The man who is aware of himself as part of nature, must find solutions to meet their needs without harming the environment and, therefore, without harming himself.

The Russian Academy of Architecture and Construction Sciences (RAACS) and its First Vice-President V.A.Ilichev have developed a model of urban development, called "the transformation matrix of the town to the biosphere-friendly and human-developing one". It addresses the issue of unity of the city and surrounding countryside. The external and internal development of the city is compared in this work. The balance of the biosphere from a humanitarian point of view is considered as well. It is proposed to convert the pathological factors in the resources of development, based on the knowledge about the city management. It is proposed to legislate the humanitarian balance of the techno sphere. The work tells about the need to develop the functions of the city, that meet human needs, not only livelihoods, but also entertainment, charity, education, creativity, connection with nature, not forgetting about the functions of power inherent in any society. Knowledge, on the proposal of the academician, is the basis of politics, security agencies, internal communication, and the style of the city.

Not without interest is the program "Healthy Cities" - a long-term program that considers all aspects of health in the urban context, developed by the World Health Organization (WHO).

Healthy urban planning is intended to improve the environment and quality of life of individuals and communities. Now the relationship between urban planning and health are seriously underestimated. The current planning system (when it goes about efficient and rational city) has a narrow and limited approach to this problem; focuses mostly on the technical and financial side of the issue, and it is forgotten that such benefits are just short-term ones and run counter to the expectations and needs of the residents. Health and quality of life should be planned along with sustainable economic growth. Only in this case the interests of the people will be really placed at the center of planning and urban development. The practice of planning and urban environment can affect the health of the people positively or negatively. Such connections are complex and varied, and include social, environmental and economic aspects. Healthy urban planning is based on the positive prerequisites, aims at setting goals of health at the forefront of decision-making. With this approach, the interests of the people become the center of the planning process. This approach helps to develop a healthy economy, a healthy environment and a healthy community.

CONCLUSION

The SMARTCITY, "The City of Sustainable Development", the eco-city – all of these concepts, in the long run, cannot and do not change the city itself, as a fact established by history. The structure of communication be changed, the share of private cars in favor of bicycles and public transport will be dramatically reduced. The area of gardening will be definitely increased, but the city itself, its soul and the people will always remain the same.

Changes in the city can come only in the case of a radical change in public consciousness. It is the rejection of excessive consumption, de-globalization and de-urbanization, the natural decrease of the population to the environmentally-safe level, regionally divided usage of natural resources and use of renewable energy sources and materials. In fact, one should speak of a new type of ideology with its own imperatives and ideas about the role of man in the environment.

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