Cities in newly-developed regions: features of shaping a sustainable development

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Abstract. The main criterion for sustainable development in the world ultimately comes down to the ratio of disturbed and undisturbed areas within certain boundaries and compliance with particular conditions. These conditions can be met by considering the city area together with its suburbs. The presence of a suburban area and its characteristics depend on the stage of urbanization of the area. Newly-developed cities, being in the first stage of urbanization, have a sufficient amount of open space in both urban and suburban areas. This is an advantage in shaping sustainable development over the old-developed cities, which are in the second and third stages of urbanization. In these stages, urban agglomerations are formed, resulting in the shrinkage and sometimes complete disappearance of suburban areas. At the same time, industrial, transport and military facilities that have lost their functions in the process of de-industrialization, the downsizing of the urban kernel and the formation of a “secondary” free space, are being rehabilitated or completely eliminated. These activities are labour-intensive and costly, but they do help to increase some of the available space within the city and improve the environmental situation in the city.

1. Introduction.
The concept of sustainable development was first formulated in 1987 and is still relevant today. At the UN Sustainable Development Summit in September 2015, sustainability was addressed in the context of 17 goals, one of which was to ensure that cities and human settlements were inclusive, safe, resilient, and environmentally sustainable [1]. The importance of this goal is determined by the fact that more than half of the world’s population now lives in cities, the state of which, according to UN experts, is unsustainable. In this context, countries around the world are adopting national documents that set out the main pathways and milestones for the transition to sustainable development.

The Concept for the Transition of the Russian Federation to Sustainable Development emphasizes that sustainable development is an objective requirement of the times, the transition to which involves the gradual restoration of natural ecosystems to a level that guarantees the stability of the environment. It defines indicators, milestones, directions, tasks, and conditions for transition, with a special focus on the regional dimension. [2]. Two phases of Russia’s transition to sustainable development have been outlined, focusing on solutions to acute economic and social problems, compliance with environmental
constraints and the greening of socio-economic development processes. It is declared that in the future the harmonization of interactions with nature around the world should be gradually addressed.

The Urban Planning Code of the Russian Federation, based on the concept of the Russian Federation’s transition to sustainable development, emphasizes the state of the natural environment. It interprets the sustainable development of urban areas as ensuring safety and favorable living conditions for people during urban planning activities, limiting the negative impact of economic and other activities on the environment, ensuring protection and rational use of natural resources in the interests of present and future generations. This has been followed by the creation of programs to shape the sustainable development of individual cities, conducting rankings and scientific conferences.

However, it should be noted that these activities, while paying due attention to the state and preservation of the natural environment, do not take into account the main criterion of sustainability in the world – achieving a strategic balance between human activities and maintaining the reproductive capacity of the biosphere. This criterion ultimately boils down to the ratio of disturbed and undisturbed areas, which is different in newly- and old-developed regions and correlates with the stage of urbanization.

Aim of the paper was to identify the specifics of shaping sustainable development in the cities of the newly-developed regions.

2. Methodology.

The methodological basis of the work was the modern theory of differential urbanization, which describes the evolution of cities in space and time [3], as well as the concept of sustainable development of the territory, the basis of which is to achieve a strategic balance between human activities and maintaining the reproductive capacity of the biosphere [4, 5].

3. Results and Discussion.

A prerequisite for the sustainable development of an area is paying equal attention to the environmental, economic and social pillars, which are interlinked and interdependent. However, the traditional division of issues into economic, environmental and social ones has not by now been overcome, so the challenges and solutions to each are usually studied independently. One recent noteworthy example is the 5th Conference “Sustainable Development of Russian Cities: A New Strategic Vision” [6]. It discussed demography, education, health, welfare, transport and other issues. They all reflect the socio-economic dimension of sustainable development. The environmental component focused on the state of the natural environment (water, air and soil), landscaping and the creation of protected areas within the city limits.

It should be noted that indicators of the state of the natural environment and landscaping reflect sanitary and hygienic norms, which are designed to create optimal conditions for work, life and recreational activities [7]. They indicate the quality of the urban environment, its comfort level, and certainly contribute to shaping sustainable development, but do not address the basic criterion of sustainability at all.

The main criterion for sustainable development is achieving a strategic balance between human activities and maintaining the reproductive capacity of the biosphere, which ultimately boils down to the ratio of disturbed and undisturbed areas within certain boundaries [5] and compliance with certain prerequisites [8]. Conditions include the reproduction of the main components of the natural environment, ensuring their balance in the inter-district streams of substance and energy, correspondence of the degree of biochemical activity of landscapes to the scale of industrial and domestic pollution of the human environment, correspondence of the level of the physical stability of landscapes to the strength of the impact of transport, engineering, recreational, and other anthropogenic pressures.

According to a number of researchers, fulfilling these conditions and thus shaping sustainable development within the boundaries of a large industrial city is impossible. A large city and its suburbs is the territorial unit where these conditions can be implemented [8]. This is where green space, both within the city and in the suburbs, becomes crucial. It is very important to understand, however, that for
the purposes of sustainable development, green spaces must fulfil an ecological role and be classified as environmentally stabilizing and habitat-forming ones. It has been found that green spaces of less than two hectares (boulevards, squares, gardens, lawns, flower beds, etc.) while performing a number of functions aimed at forming a comfortable environment in the city, do not produce an ecological effect [9]. Such an effect is possible if there are fairly large green areas of at least 500 hectares. They preserve the natural core with the necessary ecological links and enhance the vitality of the entire plant community. Such urban or suburban sprawl should be an indispensable element in shaping sustainable development.

According to differential urbanization theory, which describes the evolution of cities in space and time, urbanization processes include three stages [3]. The first, which is the longest one, is characterized by the dominance of the large city, an increase in its size and share of the urban kernel, and a decrease in the population of medium and small towns. This process is underway in the newly-developed regions. The second stage is the growth of medium-sized cities and the third stage is the growth of small towns. This is typical of territories that have been developed for a long time. In these circumstances urban kernels are shrinking and urban agglomerations are formed, resulting in the shrinkage and sometimes complete disappearance of suburban areas.

The Far East is a newly-developed area. It has a number of peculiarities in its development compared to the regions of old or pioneering development. One of them is the polarization of the territorial structure of the economy, which manifests itself in the fact that undeveloped or underdeveloped areas exist between the main compactly localized types of production facilities [10]. These zones cover large areas and have the most valuable attribute, currently not being taken into account – a high proportion of preservation of the natural environment, which makes them a resource for shaping sustainable development.

The settlement system in the Far East, with a more detailed analysis of the evolution of the cities of Khabarovsk Krai, was studied by E.O. Kolbina and S.N. Naiden [11]. The authors have shown that with some deviations from the general pattern, the cities located there are currently developing within the framework of the first stage with the dominance of a large city (Khabarovsk) and a declining population, both in the medium (Komsomolsk-on-Amur) and small towns (Nikolaevsk-on-Amur, Sovetskaya Gavan, Bikin and Amursk). Due to their formation and development, the cities have a fair amount of open space, which in Khabarovsk reaches 42.4% of the total city area, in Komsomolsk-on-Amur – 69.5%, in Amursk – 48.6%, in Bikin – 49.8%, Vyazemsky – 46.2%, Nikolaevsk-on-Amur – 51.6%, and in Sovetskaya Gavan – 70.8% [12]. At the same time, the proportion of land not used for urban construction within cities is as high as 50%, and within built-up areas it reaches an average of 20%. Open space can be used for urban development, recreation, infrastructure development, etc. The demand for a comfortable urban environment is increasing. In this aspect, urban open space is a critical component as well as an environmental resource for shaping sustainable development [13].

It should be noted that an increase in the population of a large city (Khabarovsk) is gradually leading to an increase in the proportion of urban kernel, and therefore to a reduction in available space, a reduction in green space and, consequently, worsening of the overall ecological situation in the city. Knowing the general trend of urban development, which leads to a succession of individual stages, this process can and should be halted by reserving areas with ecological potential. According to V.V. Vladimirov [8] in regulated urbanization there are enormous opportunities of purposeful change and transformation of the natural environment, capable of being highly sustainable.

In the old-developed towns, the ecological component in the urban area can only be strengthened by redistributing land that had already been used. Simultaneously with the sprawl of urban agglomerations, industrial, transport, and military facilities, which have lost their functions in the process of deindustrialization, are being refurbished or completely dismantled. These activities are labour-intensive and costly, but they do help to increase some of the available space within the city. This so-called “secondary” open space is now generally used to achieve the ecological stability of an urban area, increasing its comfort and attractiveness and creating conditions for the formation of sustainable development.
development. Most modern parks in Western European cities, as well as in the cities of old-developed regions in our country, have been or are being created on the basis of previously used areas [14].

4. Conclusion.
The main criterion for sustainable development in the world is achieving a strategic balance between human activities and maintaining the reproductive capacity of the biosphere, which ultimately boils down to the ratio of disturbed and undisturbed areas within certain boundaries and compliance with certain prerequisites. These conditions can be met by considering the city area together with its suburbs. The presence of a suburban area and its characteristics depend on the stage of urbanization. In the cities of newly-developed regions that are in the first stage of urbanization, there is open space both within the city and in the suburban area. This is a great advantage over cities in old-developed regions. In the cities of long-developed regions that are in the second and third stages of urbanization, urban agglomerations are growing, resulting in the shrinkage and sometimes complete disappearance of suburban areas. A partial increase of free space within the city limits there is possible through the conversion or complete elimination of industrial, transport, and military facilities, which have lost their functions in the process of deindustrialization.

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