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THE CITY CHALLENGES AND EXTERNAL AGENTS.
METHODS, TOOLS AND BEST PRACTICES

THE CITY CHALLENGES AND EXTERNAL AGENTS. METHODS, TOOLS AND BEST PRACTICES

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Editorial correspondence

Laboratory of Land Use Mobility and Environment
DICEA - Department of Civil, Architectural and Environmental Engineering
University of Naples "Federico II"
Piazzale Tecchio, 80
80125 Naples
web: www.tema.unina.it
e-mail: redazione.tema@unina.it

The cover image shows the Irpinia hills at sunset, highlighting the enhancement of two renewable energy sources: sun and wind.
The photo was taken by Giuseppe Mazzeo in August 2022, in S. Andrea di Conza, Avellino, Italy.

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Landscape and urban planning approach within regional spatial planning system. Case study of Moscow oblast'

Elina Krasilnikova ^a, Alesya Goncharik ^{b*}

^a Institute of Urban Development
Department of Architecture and Design
Sevastopol State University, Russia
e-mail: eekrasilnikova@sevsu.ru
ORCID: <https://orcid.org/0000-0002-9845-5374>

^b Institute of Urban Development
Department of Architecture Design,
Sevastopol State University, Russia
e-mail: alessia26@yandex.ru
ORCID: <https://orcid.org/0000-0002-3456-677X>
* Corresponding author

Abstract

This article is devoted to the landscape and urban planning system formation issues of the Moscow region, based on the integration of landscape and urban planning approaches. The current proposal considers the landscape both as a system and as an active part of the completely urban planning process. The article aims to present landscape and urban planning as systemic tools for transforming the spatial and planning structure of the macro-region - the Moscow region, offering opportunities for the physical and spatial restructuring of regional landscapes into a single green infrastructure of the region. The relevance of the study is related to the lack of documents in the Town Planning Code of Russia substantiating the need for the development of landscape planning projects, which are necessary for the landscape and urban planning system formation of cities, agglomerations, provinces, regions. In creating the landscape and urban planning system of the Moscow region, it is necessary to rely on the theory and practice of landscape urbanism, which shows the possibilities of its active use in the modern process of urban planning development. Furthermore, this article specifies modern research in the landscape and urban planning transformation field of spatial planning structures at the macro-regional level (macro-regional scale). The article will be useful for training researchers and specialists who could improve planning methodology and, consequently, existing landscape and urban planning practices.

Keywords

Moscow region; Landscape-urban planning system; Natural-ecological framework; Landscape urbanism; Green infrastructure.

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1. Introduction

Garrett Eckbo (1950) said that in any landscape we look for two features: one is an expression of landscape nature specifics; the other is the development of maximum landscape opportunities for adjustment to the human being's needs (Eckbo, 1950; Treib, & Imbert, 1997). Therefore, the purpose of this study is to substantiate the need for the integration of landscape and urban planning approaches, which is the main mechanism for creating the landscape and urban planning system of the Moscow region.

1.2 The path of transformation of the landscape and urban planning structure

One of the areas of landscape and urban planning transformation of the spatial and planning structure of the Moscow region is the creation of green infrastructure. Green infrastructure is a definition that originates from the Western scientific tradition. Green infrastructure is a unified system of facilities that ensures the preservation of the natural environment along with a system of measures for the construction and reconstruction of facilities (Gushchin, 2015).

In the Russian scientific tradition, Reimers (1990) gives the concept of ecological infrastructure: "a complex of structures, enterprises, institutions and technological systems that provides the conditions of the human life environment (the environment surrounding a person)" (Dushkova & Kirillov, 2016). This infrastructure should ensure the sustainable development of the urban planning system. Green infrastructure is a single continuous system of interacting and interconnected urban development objects, united by green spaces and green areas for special purposes.

The emergence of the priority project "Formation of a comfortable urban environment" in Russia (Pravitel'stvo Rossii, n.d.), focused on taking into account the interests and needs of citizens and individual urban residents, gave impetus to a new round of development of green infrastructure concept. Green infrastructure is currently being considered from the position of socio-ecological orientation for solving social, economic and environmental problems in modern society and its environment (Podoĭnitsyna, 2016).

The process of forming a green infrastructure will inevitably require its assessment, corresponding to modern ideas and qualities. Experts suggest using indicators and indices of biological and environmental sustainability to assess the quality of the infrastructure itself. Experts note that only the system interconnection can ensure its sustainable development (Divakova & Krasilnikova, 2019).

Green infrastructures of cities, which in the 90s in Russia, were destroyed by chaotic buildings, of various functional purposes, are becoming the main criterion for balanced urban development and the main element of the spatial planning structure of cities and regions. The understanding of the importance of creating green infrastructure for the adaptation of cities, villages, and settlements to climate change (Marić, Crnčević & Cvetić, 2015), especially in the context of COVID-19, is obvious. An urgent question is: "How to form an effective, environmentally safe, socially-oriented, healthy, and comfortable city environment?" the environment created by the green infrastructure of the city.

The answer to this question defines a new approach to managing the environmental qualities of the urbanized environment, reflected in the UN document "New Urban Development Program. Habitat III" which emphasizes of the importance of creating attractive and livable cities and towns, urban landscapes based on "evenly distributed networks of multipurpose, safe, open to all, accessible, environmentally friendly and quality public places" (New Urban Agenda, 2017; Krasilnikova et al., 2020).

A number of Russian scientists and architects (Vladimirov, 1982, 1986, and 1999; Zalesskaya & Mikulina, 1979; Yargina, 1986; Sosnovskiy, 1988; Vergunov, 1991; Kolbovsky, 2008; Krasilnikova, 2015; Reimers, 1994; Kavalyauskas, 1985, 1987 and 1988; Rodoman, 1974 and 2002; Sokhina, 1991; Zarkhina, 1978; Luntz, 1974; Nefĕdov, 2002 and 2012) were engaged in the problem of formation of the green infrastructure of the cities and complex scientific and practical approach to urban landscaping.

2. Case study

2.1 Influence of features of urban planning development: historical context

The Moscow Region is the largest region of Russia, a constituent entity of the Russian Federation with an area of about 46,000 km². The population of the region is approximately 8 million people. According to the administrative-territorial structure, the Moscow region is divided into districts, cities, and urban-type settlements of regional subordination and closed administrative-territorial units.

Due to the administrative division peculiarities and the presence of the federal capital in its composition, the Moscow region is deprived of its own center, which forms the specifics of the landscape and urban planning system development. In the course of its development, the Moscow region was an advanced region, in which many production processes were introduced earlier than in other regions of the country, as a result of which at the moment there are a significant number of degrading territories in the region formed in the process of urbanization. The process of forming a green infrastructure with the introduction of innovative technologies in the Moscow region will allow solving many existing environmental problems of the region under consideration. Methods that at this stage of the theoretical level of research include an existing structure analysis of the Moscow region, which is formed from the consideration of the historical component of the formation of this agglomeration, then the transport infrastructure is studied as one of the main influences on development. Based on the synthesis of the obtained data and taking into account the state of recreational and investment resources, proposals are formed for generating a landscape and urban planning system with the introduction of innovative technologies into its structure.

The landscape and urban planning system formation of the cities of the Moscow region were influenced by the historical development processes of the cities of the Moscow region, as a result of which the region boundaries were gradually formed and consolidated.

The settlement system of the Moscow region was formed under the influence of the Moscow transport infrastructure, which originated in ancient times. From the moment of its existence, the main Moscow territory and region routes were rivers, since most of the territory was occupied by impenetrable forests (Pravitel'stvo Moskovskoi oblasti, 2016).

The first land acquisitions of the Moscow princes are the Mozhaisk principality (1303, west, inheritance from Smolensk), now the Mozhaisky district of the Moscow region, Kolomensk land (1300, south, inheritance from Ryazan), now Kolomensk, Voskresensk, Stupinsk districts of the Moscow region, " Lopastensky places "(1300, south, volosts from Ryazan, located on the river of the same name), now the Yasnogorsk district of the Tula region, Chekhovsk, Stupinsk, Serpukhov districts of the Moscow region and" another Ryazan places "(between 1353 and 1359, west, volosts from Ryazan), now Naro-Istoricheskie Fominsk district of the Moscow region. Purchased by Moscow in the principalities of North-Eastern Russia - Rostov, Yuryevsk, Dmitrov, Pereyaslavsk, etc. The rest of the Moscow territory in the scientific literature is usually called "Moscow land", which entered a qualitatively new stage in its territorial development, affecting the scale of entire North-Eastern Russia.

2.2 Spatial planning context

In the process of urban development of the Moscow region, the integration of transport infrastructure and the construction industry expanded, namely, drivable dirt roads, highways, railways, and subsequently, airfields, highways were built at a rapid pace (between 2015 and today).

Subsequently, such elements of transport infrastructure as the Moscow Canal, airports, the Moscow ring road, the Big Moscow ring road, the main routes of the head radial sections, and the ring oil product pipeline were actively developing in the Moscow region.

At present, for the sustainable spatial development of the Moscow Region, further development of the existing transport system of the Moscow Region is envisaged on the basis of its integration into the backbone network of highways of the Russian Federation and improving the quality of transport services for the population and economy of the Moscow Region (Pravitel'stvo Moskovskoi oblasti, 2016).

One of the largest megacities in the world, Moscow, plays a vital role in the settlement system of the Moscow region. The Moscow agglomeration is constantly developing and transforming, at present, it is a monocentric agglomeration. The Moscow agglomeration includes Moscow with all its suburbs; is the largest macroeconomic region in Russia (territorial production unit) and an interregional center of socio-economic development and attraction of the central part and all of Russia; one of the largest urban agglomerations in the world. Moscow is the center of gravity of all world agglomerations, which is 10 times larger than the number of inhabitants of other cities included in the agglomeration (with an average distance between neighboring cities and towns not exceeding 10 km). The Moscow agglomeration ranks 15 in the world (Rosstat, 2022).

A feature of the spatial planning structure of the Moscow region at the moment of development is the functional and typological diversity of cities that form its urban planning structure (Fig.1):

- *historical cities* (Sergiev Posad, Kolomna, Dmitrov, Zaraysk, Volokolamsk, Serpukhov, Zvenigorod, Mozhaisk, Noginsk, etc.) that contain historical value, with a history of several centuries.
- *closed cities* (Krasnoznamensk, Vlasikha, Voskhod, Zvezdny City, Molodezhny) for which a special regime has been established for the safe functioning and protection of state secrets, including special living conditions for citizens.

The cities of the Moscow region can be classified according to the territorial distance from a large metropolis, which directly depends on the existing transport links "center-region", and, accordingly, on the development of the transport infrastructure of the agglomeration.

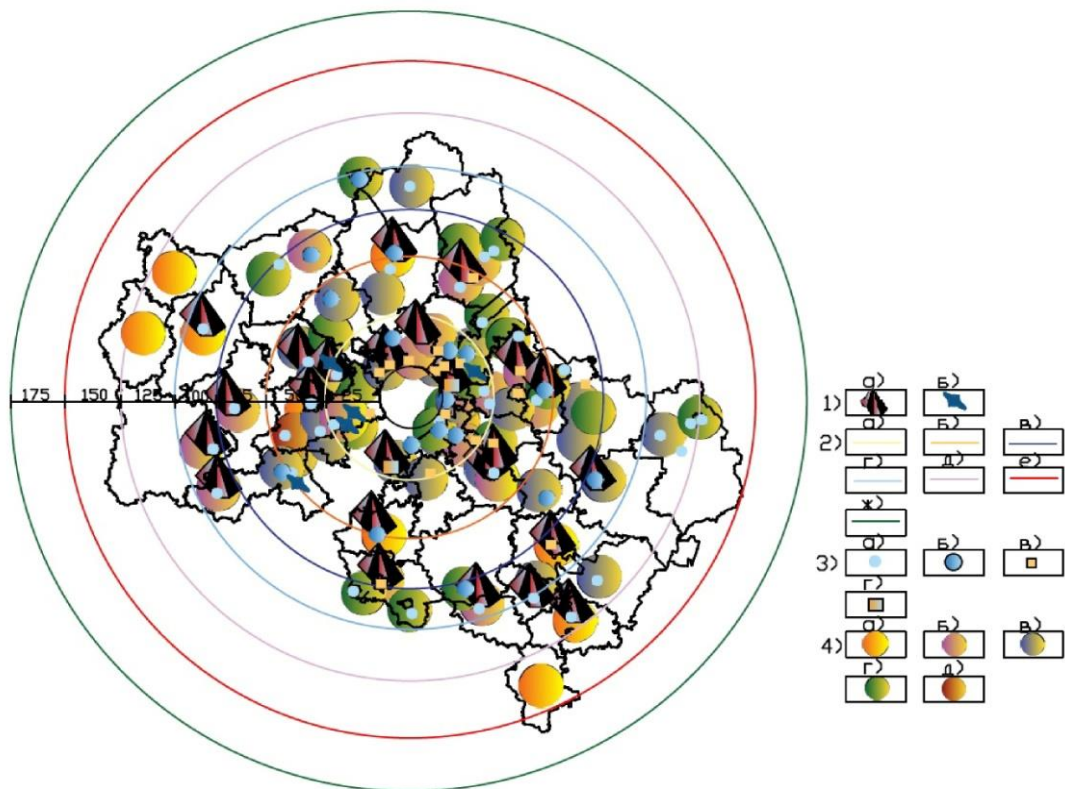


Fig.1 City features: 1) based on functional and typological features: a) historical, b) closed; 2) based on distance to metropolis: a) 25 km; b) 50 km; c) 75 km; d) 100 km; e) 125 km; f) 150 km; g) 175 km; 3) based on human geography: a) with a population of 50,000- small; b) from 50,000 to 100,000 - medium; c) from 100,000 to 250,000 - big; d) from 250,000 to 1,000 000 - massive; 4) based on periods of formation: a) during X-XII centuries; b) during XII-XV centuries; c) during XV-XIX centuries; d) during XIX-XX centuries; e) during XXI century. (Goncharik A.A., (2017)

The Moscow region has a variety of recreational resources for the inhabitants of the region: physical, biological, energy-informational resources form a single network of territorial-recreational complexes with individual, unique features and types with characteristics of a particular territory (direct, indirect, active, historical, evolutionary, ecological, therapeutic, etc.).

At present, in the cities of the Moscow region, in order to create a favorable investment climate, a decision has been made (Pravitel'stvo Moskovskoi oblasti, 2016) to improve the architectural and artistic appearance, to form a comfortable urban environment (Moskovskaya oblastnaya Duma, 2014), to create a comfortable, environmentally sustainable and socially-oriented urban environment, including on the Moscow region territory, which is to ensure safety and create favorable conditions for human life.

Thanks to the improvement of the architectural and artistic appearance of the Moscow region cities, the negative impact of economic and other activities on the environment will be limited, and the protection and rational use of natural resources in the interests of present and future generations will be ensured. An important aspect in the formation of a comfortable and safe environment in the Moscow region cities is the rebranding of cities. Each of the Moscow region cities is unique, as it has independent cultural and historical development, landscape, and planning features of the spatial and planning structure formation of cities in conjunction with the natural frame. Thus, each of the Moscow region cities has its own "urban legend" and its own unique, memorable image of the city.

The residents' perceptions of the city are formed by the surrounding reality - the urban environment nature. Over time, individual elements of visual and mental perception of the city are strengthened, passed on to future generations, become the accumulated collective memory, traditions, ideas, city essence (Vizgalov, 2011). At present, measures to shape the individual appearance of the Moscow region cities are carried out on the basis of the strategy of the Government of the Moscow Region "New Image of the Moscow Region Cities" (Glavnoe upravlenie arkhitektury i gradostroitelstva Moskovskoi oblasti, 2015). This strategy is aimed at creating a modern and comfortable urban environment, developing territories, creating recreational zones in the structure of Moscow region cities.

Consequently, it can be predicted that the Moscow region cities can be vectors for the development of an interconnected system of recreational territories of various functional purposes, which, when integrated with the regional transport infrastructure, form the landscape and urban planning system of the Moscow region.

In almost every country, enterprise and city, the approach to gardening is unique. At the same time, the problems of landscaping have a rich historical aspect and a powerful legal structure - the development of taste. In France, they follow the path of adaptation to the specific features of the territories (climate, regulatory framework, building practices, process organization system). Improvement projects are accepted by the City Hall and are aimed at recreating a unique environment both on the square and on the small street of the quarter (Haute Qualité Environnementale, HQE, 1992).

The principles demonstrate their relevance and success, then a decision is made to use it in other cities. In the United States of America, design codes and new principles for planting urban trees, restoring soil and vegetation are being developed (Time-Saver Standards for Landscape Architecture, 1997; Landscape architectural graphic standards, 2007; Street Design Manual, 2013). In Canada, the approach to greening is staged by thematic area and area-specific, detailing the results (Toronto Official Plan, 2006; Urban Design Guidelines, 2006).

2.3. Landscape and ecological context

Currently, for the further urban development of the Moscow region, the issues of the natural potential development of its cities are topical.

The natural potential of the Moscow region cities is represented by a wide range of landscape, recreational and natural areas, these are natural and national parks, large recreational complexes, historical and cultural

sites inscribed in picturesque natural landscapes, state nature reserves, natural monuments, specially protected water bodies, coastal recreational zones, natural-historical complexes, specially protected natural areas, ski resorts, old museum-estates, temples, kremlins, hunting grounds, lakes, caves, equestrian complexes, reserves, reservoirs.

These objects of the spatial and planning structure of the Moscow region create a unique image of the Moscow region and are the main structure-forming elements of the landscape and urban planning system.

The intensive growth of new construction in the cities of the Moscow Region contains risks that lead to environmental imbalances (changes in ecosystem connections, disruption of the ecological sustainability of the city). The reduction of natural areas is compensated for on the basis of disorderly (not defined by the project for the reconstruction of green spaces) compensatory landscaping.

It is also important for the Moscow region to pursue a policy of constraining the growth of urban sprawl, in which there are three types of urban containment policy – green belts, boundaries of urban growth, and boundaries of urban services (Vladimirov, 1982).

However, considering the containment process solely at the expense of the green belt, on the one hand, forms environmental sustainability, and on the other hand, creates economic difficulties in varying degrees of manifestation.

Therefore, in this situation, it is more correct to focus on a comprehensive solution to the planning of the region, cities, and individual districts based on the creation of a green infrastructure, which forms an evenly distributed space of the landscape and urban planning system at each territorial level, avoiding the creation of territories strictly delimited by a specific function.

At the moment, there is no such complex solution for the territory of the Moscow region, which forms the ecological degradation of the region.

Based on a consistent assessment of the ecological state of the Moscow region (see Fig.1-2) it is necessary to form the basic principles of ecological optimization of urban areas in the Moscow region (Goncharik, 2016).

The ecological problems of the Moscow region are in the contradiction between the intensive processes of urbanization, the combination of various heterogeneous urban planning objects, and the preservation of the natural environment. Urbanized territories need the preservation, reclamation of natural, inartificial landscapes, their protection through legal and urban planning regulation and strategic planning of the development of territories.

To improve the ecological situation of the region's territory in order to create an effective landscape and urban planning system based on the green infrastructure of the Moscow region (including green infrastructures and blue-green infrastructures of cities, urbanized and natural areas), an important element necessary for implementation into this system is innovative technologies.

Innovative technologies that are possible for implementation in the structure of the landscape and urban planning system can be divided into several levels:

- pre-design and design technologies, which include at the stage of analysis of the use of GIS-technologies, at the design stage - the use of BIM technologies;
- socio-ecological, which make it possible to form a friendly and conscious attitude to the landscape and urban planning system, due to the restoration of the ecosystem, the formation of a new structure, and its further maintenance;
- technological, within the framework of which it is possible to use different methods and elements - energy obtained from renewable sources, biological treatment of the environment, preservation and restoration of existing wetland ecosystems, a qualitative approach to processing and utilization.

When using this scenario, it is possible to clearly control the development of sustainable development of the landscape and urban planning system, and not just the maintenance of the existing natural resources of the Moscow Region.

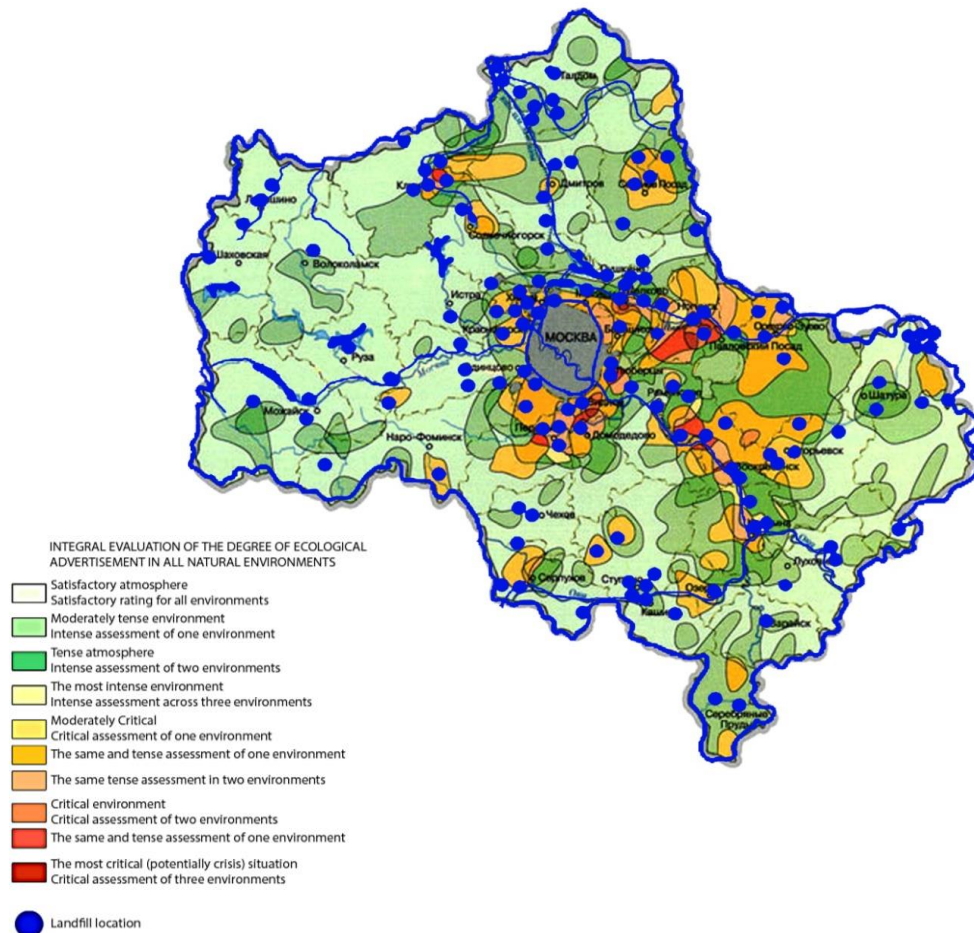


Fig.2 Explication to the scheme of the ecological situation on the Moscow region territory (Source: Authors)

3. Materials and methods

The relevance of the study is associated with the absence of legally approved landscape plans of cities and regions in the territorial planning documents in the Town Planning Code of Russia, and the insufficient number of scientific studies justifying the need to introduce the landscape and urban planning approach in the of regions spatial development strategy.

The aforementioned Russian scientists have considered various aspects of the formation of an interconnected system of landscape and urbanized territories, but research on the creation of a unified landscape and urban planning system of the Moscow region has not yet been carried out. Therefore, an important aspect for substantiating the research results is the study of the world experience of landscape and urban planning, in the context of its interdisciplinary focus. A modern direction in the scientific and practical concept development for the formation of green infrastructure of cities is the creation of a landscape and urban planning framework (Vargas-Hernández & Zdunek-Wielgołaska, 2021). This approach has been applied to the creation of the green infrastructure of Northwest England (Horwood, 2020). The green infrastructure of North West England interconnects the natural ecosystems of suburban areas between cities in the region and permeates the urban fabric of cities: Carlisle, Lancaster, Barrow-in-Furness, Preston, Blackpool, Manchester (Mell et al., 2013), Liverpool и Chester, through its integration with transport infrastructure in the landscape - urban development framework (Krasil'nikova, 2018).

Based on the fact that at the territorial level of regions and large agglomerations, the landscape and urban planning framework is part of the landscape and urban planning system, it can be concluded that its creation is a necessary condition for ensuring stability of the spatial planning structure of the regions. In spatial

planning, the natural and urban landscape properties are determined on the basis of cartographic, functional, historical-genetic, morphotype, geoecological, visual methods, and GIS research methods (Kochurov et al., 2018). Such an integrated approach based on the above research methods is revealed in the definition of landscape urbanism, which is an ecologically oriented direction in modern urban planning theory and practice, based on an interdisciplinary approach, in which the landscape plays one of the dominant roles in determining the main vectors of territorial development (Krasil'nikova, 2015). When compiling figures 3 and 4, historical data on the development of the territory, the existing transport infrastructure, historical references of cities were used. All these data are aimed at developing objective, system-organized and substantiated knowledge about nature, man and society.

3.1 Landscape urbanism in the formation of landscape and urban planning system

The introduction of new ecologically and socially oriented directions and theoretical concepts of modern urbanism is relevant for the formation of the landscape and urban planning system of the Moscow region. In our opinion, it is advisable to dwell on the application of the scientific and practical foundations of the theoretical concept of landscape urbanism in the creation of the landscape and urban planning system of the Moscow region.

The theory and practice of landscape urbanism reveal the real possibilities of its active application in the modern process of development of urbanized territories. Landscape urbanism is focused on the creation of ecologically sustainable territories with a unique and identical spatial planning structure.

Landscape urbanism, according to Weller (2008), allows one to move away from critical regionalism due to the absence of dogmatism in its theory, offering a broader view of urban spatial planning and design. According to Waldheim (2006), new urbanism is a serious drawback of modern urban planning, since the coding of territories proposed by this direction leads not only to a lack of variability in the possibilities for the development of a territory, but also to leveling and diminishing the importance of the creativity of architects, designers, and artists in shaping its individual image.

Examples of the creation of small cities in America, similar to one another, built based on space coding of new urbanism, leads to the depersonalization of cities, the loss of an individual architectural and artistic image. Therefore, for the landscape and urban planning transformation of regional systems, such as the Moscow region, theoretical and practical methods and approaches of landscape urbanism are the most effective. The rationale for the choice of the scientific basis for this study is the expansion of the scale of urban planning application of landscape urbanism at various territorial levels.

An example of the transition of the application of landscape urbanism from the regional level to the level of development of mega-territorial structures is the project of the West Coast Region in Australia, developed by Weller (2008), Ahern (1999). R. Weller's concept is based on the creation of a mega-region, the structure of which is formed in such a way as to improve difficult environmental conditions and conditions for socio-economic development. From the point of view of R. Weller, mega-regional planning presupposes a new concept of integration between landscape systems and urbanized structures, which will ensure the sustainable development of this territory in the future. The symbiosis of landscape, cities, and humans in the 21st century is one of the main directions of economic optimization based on the ecological vision of mega-regional development. Landscape urbanism was born at the University of Pennsylvania in the early 1980s.

This was obvious because the founder of the Department of Landscape Architecture at the University of Pennsylvania was Ian McHarg (1957), who first proposed the concept of ecological land planning in 1969 in his book «Design with Nature». The ideas of McHarg (1963, 1969) on the integration of man and the natural environment, as well as his scientific research on the interaction of urbanized and natural territories in the process of their evolution, became the scientific and theoretical basis of landscape urbanism and are still relevant for the development and transformation of urbanized territories (Krasilnikova, 2015).

The followers of McHarg, who study the issues of effective integration of landscape and urban planning in the context of preserving and increasing natural components in urbanized areas, are currently well-known scientists: Corner J. (2014), Mostafavi M. (2010), Waldheim C. (2002), Weller R. (2008), Spirn A.W. (1984), Burns K. (2008), Forman R. (2008), Allen S. (1999), Kahn E. (2008), Ahern J.F. (2002).

Understanding the space from the perspective of "landscape as an ecosystem" in landscape urbanism is the priority of the ecosystem approach in building a sustainable, flexible model for the development and transformation of territory capable of self-healing. Each of the theorists of landscape urbanism in their own way interprets the role, place, and range of applications of landscape urbanism in the modern practice of urban development. Analyzing the theoretical works Corner (2014), Mostafavi (2010), Waldheim (2003, 2006), Weller (2008), Allen (2008) and other theorists of landscape urbanism, it is possible to formulate more specific definitions of the principles of landscape urbanism, the application of which can be traced in practice and shows the possibilities of applying this direction in a wider territorial range.

Openness, democracy, flexibility, and the ability to temporarily transform landscape urbanism make it possible to creatively develop and substantiate its theoretical principles for specific territorial levels. In this regard, it should be noted the importance of scientific methods and approaches to the formation of strategic landscape plans at the regional level, based on the integration of landscape ecology and landscape planning in the studies of Ahern (2002) and Forman (2008). The infrastructure approach, according to Allen (1999), can be defined as the basis or foundation for any concept that determines the direction of aesthetic and symbolic nature development. Allen's definition is important for understanding current trends in the infrastructural development of cities and agglomerations. The scenario approach of Ahern (2002), Weller (2008), Burns (2008) and the concept of "scenario city" (Kahn, Thomsen, & Golan, 2008) is currently one of the modern approaches to the selection of the most effective concepts for the development of landscape and urban planning systems at various territorial levels from a small town to an agglomeration. The priority of preserving the cultural and historical environment, based on its integration into the landscape-planning framework of urban areas, is considered in the studies of Spirn (1984), Burns (1991). Thus, the study of modern research related to the transformation of the spatial and planning structure of cities and regions in order to form the landscape and urban planning systems, allows us to determine foregrounded approaches for their creation: landscape and urban planning approach, infrastructure approach, ecosystem, scenario approach. The methodology of the above-mentioned approaches should be based on the identification of regional features of territorial development: landscape, spatial planning, natural-ecological, socio-cultural, socio-economic, and demographic, and others (Krasilnikova, 2014) (Fig.3).

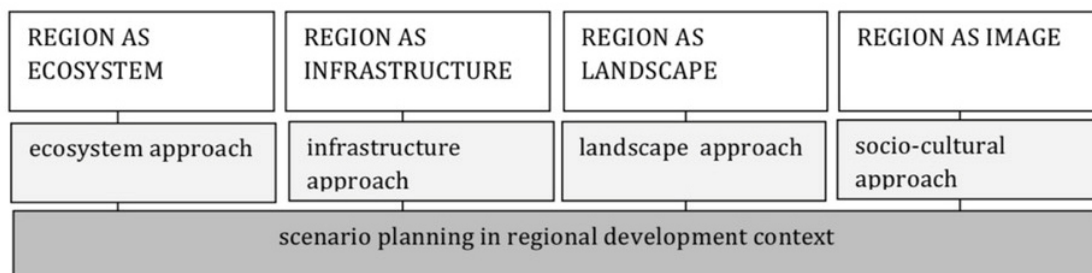


Fig.3 Landscape and urban planning transformation (Krasilnikova E., 2014)

Based on the foregoing, it is possible to propose the main directions of the formation of a conceptual model of the landscape and urban planning system (on the example of the Moscow region), based on the theory and practice of landscape urbanism. Namely, the landscape and urban planning system will determine the development of the region as a balanced ecosystem, as a multifunctional infrastructure, as a single landscape system, and as a region, that has an identity, a territorial brand, and a memorable visual and mental image of the territory (Fig. 4).

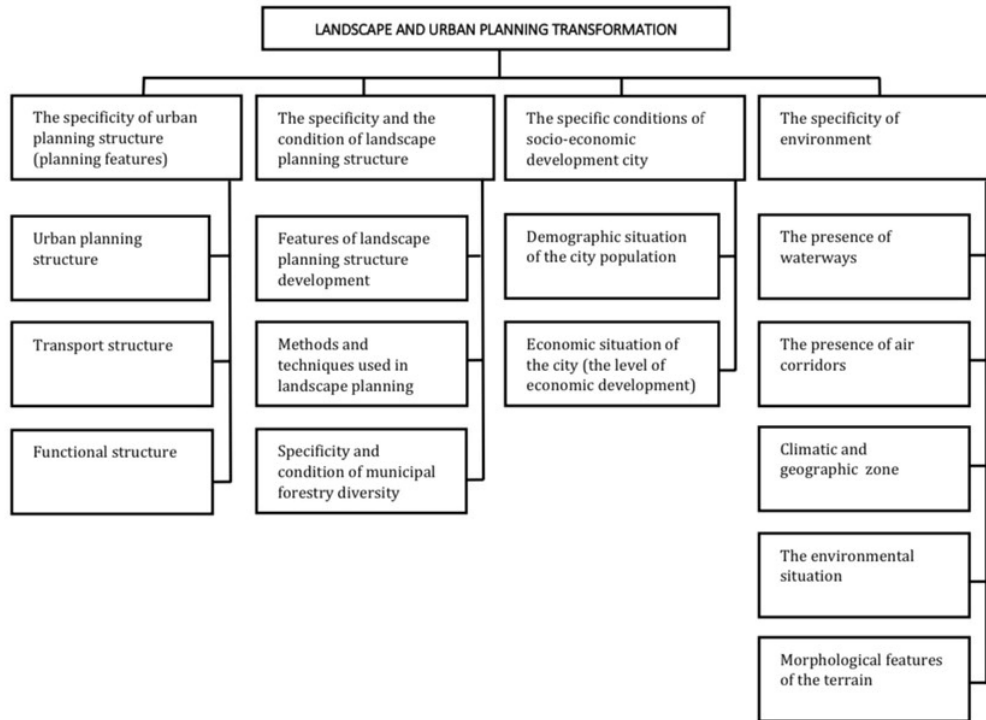


Fig. 4 The concept of the spatial planning structure transformation in the context of landscape urbanism at the regional level

The landscape and urban planning transformation of the Moscow region territory is one of the most ecologically oriented directions for the further development of the spatial planning structure of the region.

The symbiosis of urban planning transformations and the formation of a sustainable landscape system will create a viable, flexible, and sustainable landscape and urban planning infrastructure of the region (infrastructural approach).

The interrelationship between the landscape and urbanized Moscow region territories should be at each hierarchical level of the spatial planning structure. Globally, the urban space transformation is aimed at creating an urban-ecological balance of the urban environment. These transformations are based on the multifunctional use of the ecological capabilities of the existing landscape-planning framework and its diffusion into the spatial-planning framework of the Moscow region at each hierarchical level. Thus, we can create a dispersed multifunctional and socially oriented infrastructure that permeates all elements of the spatial planning framework of the Moscow region and affects the development of border areas (Tab.1).

Region	Development of a regional system of recreational spaces of natural areas, such as river valleys, sea areas, mountain forests, historical landscapes in the zone of agglomerations and metropolises influence
City	Formation of the landscape and urban planning scenario of the city on the basis of its integration with the natural frame of the city and adjacent territories for the effective territorial development of the city. Priority in the creation of contact zones between the elements of the natural framework of the city and territories with a high degree of urbanization. Formation of an interconnected system of embankments as a vector for the development of adjacent territories
District	Creation of multifunctional socially oriented public and recreational spaces that provide environmental, visual comfort, and accessibility for all categories of residents. Formation of the landscape and urban planning scenario of the district.
City Centre	Urban regeneration of central public and recreational spaces based on the formation of an interconnected system of green public pedestrian spaces (green routes) and multifunctional objects in the context of the surrounding socio-cultural environment
Post-industrial violations of the territory	Comprehensive landscape and urban planning regeneration of industrial, post-industrial, and disturbing territories, based on an urban-ecological approach to the restoration of a comfortable and safe socially oriented environment. Formation of new markers of city public spaces in conjunction with the development of adjacent territories

Tab. 1 Landscape urbanism in the development of urbanized territories (proposed use)

The formation of a comfortable, balanced, "open nature" urbanized environment in the context of landscape urbanism is considered at the level of a) region, b) city, c) district, d) city center, and e) post-industrial disturbed territories (Krasilnikova, 2015).

3.2 Proposed approach

The proposed case s experimental trials in Berlin and Seoul, which demonstrate that the cities are similar in size but with vast differences in landscape. As a method, maps are parsed according to types, each of which represents a template. Overlapping patterns indicate systematic relationships between different disciplines. The arts and humanities approach can be linked to the natural sciences approach by overlaying historical layers on geoscience layers. This provides the key to planning for sustainability in a social and environmental sense.

The geo-historical map overlay is a platform that can bring practitioners from different disciplines together to work in an urban environment. For the analysis and mapping of the European countryside, the landscape is defined as a functional, hierarchical layer of abiotic, biotic and anthropogenic processes (Mücher 2003; Mücher, Klijn, Wascher & Schaminée 2010). Landscape architecture holds this favorable position between nature - sciences and sciences of the humanities, between engineering and admin. Landscape architects offer design solutions to manage urban form more in line with topography (Condon, 1996; Mostafavi & Doherty, 2010; Waldheim, 2006, *Journal of Landscape Architecture* / spring 2013).

4. Results

For the purpose of defining the main directions for the formation of the landscape and urban planning system of the Moscow region, it is necessary at the level of strategic territorial planning to develop several scenarios for the development of the landscape and urban planning system of the Moscow region, taking into account a number of urban planning problems that currently require new approaches to solve them:

Ecosystem approach (Moscow region as a single ecosystem):

- creation of a unified ecosystem of the Moscow region based on the preservation of existing and new natural recreational facilities and the re-functionalization of landscaping facilities;
- development of a strategy for urban development of natural areas of the Moscow region.

Infrastructure approach (Moscow region as a sustainable landscape and urban planning infrastructure):

- development of a model of legal regulation of the landscape and urban planning system of the Moscow region in conditions of intensive urbanization;
- development of a clear functional purpose of each landscaping object and the mode of its use;
- development of a unified greening system for the Moscow region (region - city - adjacent territories);
- green infrastructure - green infrastructure - blue-green infrastructure;
- creation of a unified system of landscaping and water resources - blue-green infrastructure;
- formation of a set of measures for the introduction of innovative technologies into the structure of the landscape and urban planning system of the Moscow region.

Landscape approach (Moscow region - Russian landscape):

- preservation of unique landscape parks, nature reserves, forest resources, which form the "postcard view of the territory" and the landscape identity of the Moscow region;
- creation of the landscape code of the Moscow region at the legislative level;
- an increase in bio-diversion in the Moscow region cities;
- an increase in urban forests in the structure of the Moscow region cities;

- development of the Urban Forest Program.

Sociocultural approach (visual and mental image of the Moscow region, delirium of the territory):

- cultural and historical development, landscape and planning features of the spatial and planning structure formation of cities in conjunction with the natural frame;
- involvement of residents in the process of creating the landscape and urban planning system of the Moscow region;
- integration of tourist routes into the green infrastructure of the Moscow region.

Currently, the most favorable conditions for the formation of the landscape and urban planning system arise in the Moscow region cities as a result of their constant development. The current trend in the development of land planning projects in the Moscow region cities is to increase the living space and the formation of an affordable and favorable life for the population. In this regard, the migration of people from areas with a low level of landscaping to another area with a more favorable and comfortable living environment is possible. Therefore, in connection with the possible migration of the population in the Moscow region and the increase as a result of this process the area of disappeared from the city-forming elements of the planning structure of cities and villages. Thus, there is an ineffective and unbalanced use of natural territories, the unity of nature with man disappears, and the number of green areas decreases, the ecological situation in the region deteriorates.

In the structure of the Moscow region, at present, the processes of development of territories for housing, civil and industrial construction are actively taking place. As a result of such an intensive investment development of territories, the resource of natural landscapes was practically not used in the urban planning concept for the development of these territories, i.e. inclusion of natural landscapes in the building structure. Thus, as a result of this, the existing urban planning composition of plans for historical cities can change, collapse, deform.

The next aspect justifying the creation of the landscape and urban planning system of the Moscow region is the need for strengthening state control over the state and use of natural areas, excluding unplanned (chaotic or unsystematic) urban land development.

Municipalities establish individual requirements and land planning restrictions on their territory. As a result, the risk of social and environmental tension in the Moscow region may increase. Consequently, the relevance of this study is due, on the one hand, to the current absence in Russia of a legal basis in the field of landscape and urban planning, on the other hand, to the need to create an ecologically sustainable and socially-oriented landscape and urban planning system of the Moscow region and other regional systems of Russia.

Thus, the landscape and urban planning organization of territories, which combines urban planning and nature conservation functions, is aimed at creating an urban ecological framework for the Moscow region, focused on ensuring the bio-diversion of the natural environment for further sustainable development. In the Moscow region, there are favorable conditions for the formation of an integrated system for the preservation of existing and creation of new natural objects and on its basis.

The landscape and urban planning organization of territories, which combines urban planning and environmental functions of architectural objects, is aimed at creating an urban ecological framework of spatial elements of the Moscow region, focused on ensuring the natural environment viability for their further sustainable development.

5. Conclusion and discussion

As a result of the study, it can be concluded that at different stages of the historical development of urban planning structures of the Moscow region cities, natural factors have always been the most stable elements of their spatial and planning structure, which have great potential and opportunities for transformation and

evolution, since they obey more dynamic infrastructural elements such as the transportation system, social, industrial and recreational connections.

Based on the fact that the landscape and urban planning system is based on the system integration of green areas of limited and special purposes, specially protected natural areas, urban forests, urban green public spaces with transport infrastructure, public spaces, residential and industrial areas of the region, it is necessary to clearly define the main directions ("Roadmap") of its spatial and planning transformation.

This approach to the future continuation of this study, namely, the transition from a theoretical to a practical level, will be a scientific and practical justification for the creation of a landscape and urban planning system of the Moscow region.

Therefore, as part of the next stage of these studies, it is necessary:

- to assess the current state of the landscape and urban planning system at all territorial levels;
- to reveal the regularity in the formation of the landscape and urban planning framework of the Moscow region cities;
- determine the strategy for the region development of the landscape and urban planning system based on green infrastructure;
- to determine the most optimal ways of sustainable urban development of the territories of the Moscow region cities, in the context of the theory and practice of landscape urbanism and considering the introduction of innovative technologies.

Thus, the research results presented in the article and promising proposals for further research, related to the formation of the landscape and urban planning system of the Moscow region, show the relevance, prospects, and the need for its creation. The article presents a hypothetical theoretical model of the concept of transformation of the spatial planning structure in the context of landscape urbanism (Fig.3, 4), which substantiates the landscape and urban planning approach integration to the formation of the landscape and urban planning system of the Moscow region and will be focused on creating a safe, environmentally stable and socio-oriented living environment of people in the Moscow region cities (Goncharik, 2018).

In conclusion, our study notes that a landscape-urban system, coupled with an efficient administrative system, is critical to the conservation of the natural environment. The analysis for each municipality can provide more accurate data, especially if data at the neighborhood level are provided. This is a complex and labor-intensive task. For this reason, the main contribution of the article lies in the preservation of existing ties and the development of new territories. To the best of our knowledge, our study is the first attempt to form a landscape infrastructure at the subject level.

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Image Sources

All figures from 1 to 4 have been elaborated by authors.

Author's profile

Elina Krasilnikova

Full professor, Head of Department of Architecture and Design at the Institute of Urban Development of Sevastopol State University. She is interested in urban design and planning from the position of sustainable cooperation between anthropogenic and natural aspect, eco-city reconstruction on the basis of sustainable development, Landscape urbanism and Landscape and urban planning approach within regional spatial planning system.

Alesya Goncharik

Engineer of landscape gardening and landscape construction, Associate Professor of Department of Architecture and Design at the Institute of Urban Development of Sevastopol State University. Her research concerns historical, environmental, social, and economic actions in order to define regional models for sustainable territorial regeneration based on a landscape and urban planning approach.