

Trends in the development of modern architecture and landscape-architectural environment of Rostov-on-Don and China, considering cultural traditions

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Abstract. The article deals with the features of the formation of the landscape and architectural environment due to the trends in social development in the 20s of the 21st century. The present time is characterized by the formation of an information society, the complexity of social transformations, the problems of epidemics, the environmental crisis, and other processes. In this sense, the cultural, ecological, and traditional components of the surrounding space are necessary to stabilize the negative impact of the risks of the specified period. Urbanization and urban population growth require special attention to the identified problems. The million-plus Rostov-on-Don city, known for its pace of construction, has faced the issue of the need to intensify the landscape activities, considering the possibilities of transport interchanges, the environmental friendliness of the city, and other problems raised in our article due to the active construction of high-rise buildings. Of particular interest are the studies of Chinese scientists on this problem and the methods of its solution. Our tasks echo their theoretical research and practice of recreating lost and historic urban landscapes.

1 Introduction

The beginning of the 21st century was marked by significant social, economic, and political changes. The problems of solving the environmental problem have come to the fore. In 2020, a coronavirus infection appeared unexpectedly and led to a pandemic that lasted for a third year. It is accompanied by the consequences of coronavirus infection associated with physical and psychological health problems and takes people's lives. During this period, we could observe the wearing of a mask and protective equipment for the face and hands, protective clothing such as a windbreaker in the heat, during the cancellation of the mask regime. Long periods of isolation of people in multistory buildings have made themselves felt. Therefore, the task of providing the population with ecofriendly and videoecological conditions, natural, comfortable ones, and harmonious with human physiology, ones that have developed since the appearance of people. Historically, the material and natural environment created by their creative activity has developed in society as an ethnically

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formed living environment for certain peoples. This component turned out to be of primary importance since in the picture of the world of people, it is laid down as responsible for the physiological, psychological, and mental harmony of the individual's stay in the natural (the world of nature) and artificial environment (material objects created by creativity and human hands). In the information society, with the use of modern technologies, artificial natural objects can be created, for example, in bioart and land art technologies. In our country, this direction is implemented as an exhibition sample or a manifestation of park design.

In urban space, within the framework of the designated topic, we are interested in a complex landscape environment including natural objects that are historically comfortable for human physiology and objects of small architecture for aesthetic and moral satisfaction, and to improve the perception of beauty and harmony of city residents. The aspects of the videoecology of the architectural space of the city that are directly related to human physiology and living conditions are especially important. In this context, the natural landscape environment with natural terrain, plants, reservoirs, and landscape architecture of small forms is the natural and artificial environment that allows a citizen to feel harmoniously in a big city, not only in the historical center, but also in neighborhoods with numerous high-rise buildings.

Scientists around the world are concerned about the risks of the 21st century. These circumstances have intensified the fight against the environmental crisis on all continents. Chinese scientists are also involved in the preservation and creation of a comfortable environment in their country. The problematics of their research at the beginning of the 21st century were formulated as the study of the current state, trends, and prospective development of such areas as the formation of the present and future landscape architecture and landscape development with the definition of the role of landscape architecture as the basis, along with urban design and architecture on a global scale. In their context, the natural part of the human living environment has risen to the same level as buildings and their planning in urban and rural areas.

2 Materials and methods

Russian scientists are investigating the state of modern urban architecture and landscape for a visually comfortable environment that is harmonious for a person to stay in the city. The new typical buildings in Rostov-on-Don do not always please the eye with a large amount of glass, tiles, gloomy shades of colors, and lack of decor. In the central part of the city, its historic buildings, there are fewer and fewer buildings that represent the cultural value of the capital of the Southern Federal District. The deserved glory of the “green capital” of the Don Region should be maintained despite the active construction of new residential complexes. The massive replenishment of the urban population is associated with the migration situation in the city. These two mutually complementary trends create conditions for the activation of specialists in the field of landscape and architectural design in the city.

New buildings do not always have green spaces in adjacent territories, both in the city center and in the microdistricts. The commissioned residential complexes do not contain a visually comfortable decor that could offset the negative impact of homogeneous and aggressive (repeated numerous elements (windows, tiles, etc.) fields of the new kind of city architecture.

A building made of glass and tiles built in the center of Rostov-on-Don does not yet have a landscape design. The tiled surrounding area does not contain a place to plant trees and shrubs, not to mention flower beds and flower beds.

At the same time, in the Don State Technical University park in Gagarin Place 1, there is a composition with a tree, an insert in the center of the sidewalk with a recreation area

and benches, resembling a monument of gratitude to green spaces for their “work”. The functions of green spaces are unique: sanitary-hygienic, aesthetic and creating a comfortable visual environment. The color of greenery calms and soothes; the multicolored flowerbeds bring the harmony of the color space, in the variety of color effects on a person close to color therapy, where it is possible to perceive the color that is missing for inner harmony.

The bright color environment of the landscape and flower beds contribute to a surge of energy, positive emotions, good mood, and desire to create. Therefore, the perception of Rostov-on-Don until the beginning of the 21st century was always positive as a blooming, active, bright city with a beautiful historically established center of the city's development in different styles: classicism, eclecticism, modernism, and constructivism. It was attractive to tourists, which may have contributed to the participation of our Don capital in the international Games of 2018.

Doctor of Culturology, Associate Professor, and Professor of the Department of Design M. V. Pankina reveals “the possibilities and role of the subject-spatial environment in the formation of an ecological model of the behavior of citizens and ecological culture.” In her understanding, design is presented “as a mediator of urban space, architecture, man and nature and, at the same time, as one of the sources of environmental problems. “The main aspects of the description of the solution to the highlighted problem are “means and methods of design, qualities and functions of design objects that harmonize the urban environment and form the eco-consciousness and motivation of residents to an eco-friendly lifestyle.” [1]. All components, such as the creation of a design object and its artistic manifestation, according to the author, are responsible for the ecology of space, as are the designers themselves who develop and implement their works. Environmental issues are indicated in their professional training. The same aspects can be attributed to the creations of architects and their training.

Chinese researchers (School of Art and Design, Construction Institute of Shandong Jianzhu University) have defined the problem of people in the world in the 2nd century in terms of population, resources, and environmental issues. They consider urbanization and the ecological crisis to be the main reasons for the current situation. They suggest the possibility of solving it by computerizing the design of landscape architecture and space within the framework of the culture and customs of the Chinese people, their relationship with the landscape, natural forms, and images. In this article, the authors propose to consider the localization of the educational subject, landscape architecture, as a vertical basis, including urban planning and architectural construction on a global scale. Its connotation contained a traditional landscape subject, urban landscape afforestation, and three-level land landscape planning [2]. The Chinese people are so rightly serious about the problems of removing nature from the human habitat.

Universities in China conduct empirical research on specialties related to landscape design and study the visual and emotional reactions of visitors to various territories and historical and modern places of residence. There are studies on the emotional reactions of tourist motorbus passengers to the spaces of architectural and landscape environments in which they are interested. As a result of excursions, tourists express their preferences and have a negative impression of the visited areas. Conclusions based on their reviews show that the most attractive are the historical and cultural regional motifs of the streetscape, which cause positive emotions among passengers. Negative perception appears in a modern landscape with architecture and buildings that do not bring out positive emotions, so these are considered unattractive [3]. The authors of the following monumental study have done a lot of research on past and present problems in the urban environment of the three countries of Malaysia, Brunei, and Indonesia. They studied theoretical material, performed content analysis and conducted fieldwork on the study of traditional and modern trends in the main

cities of Borneo. The conclusions were quite severe regarding modern construction during globalization and changes in the social environment concerning landscapes and architectural developments. The results of the study were overshadowed by information about the loss of cultural traditions “for this unique region in Southeast Asia.” These documents have served as fundamentals for the leadership of these countries in preserving the cultural landscape. They are recommended as a priority for central authorities, city governments and local authorities, “guidelines for other urban conditions in fragile and sensitive tropical regions.”[4]. This publication of scientists represents a significant achievement in the work of specialists in restoring the cultural values of people in their places of residence, the victory of the video ecological principle in modern conditions and the restoration of eco-friendly landscape and architectural space associated with the traditional culture of local peoples.

In the Netherlands, the “Landscape” program was created. It is a concept of services, thanks to which cooperation between farmers and the state apparatus on landscape transformations of water lands, riverbanks and other reservoirs is developing. Before the creation of this program, there were many disagreements but now everything is being resolved quickly, at the state level, thanks to the emergence of several new mechanisms of influence. Farmers have gained confidence in the realizability of positive environmental transformations [5].

Part of the research on the landscape of the city environment is related to restrictions on territorial residence of people during the pandemic (COVID-19). In an article published in 2022, the authors suggested putting forward direct "ecological thinking to landscape design against the background of COVID-19." [6]. Many authors offer a solution to the problem of the pandemic consequences with an increase in landscape areas in the urban environment.

Surveys of many recipients were conducted to come at the emotional reactions of a people and the physiological impact of a closed space, the lack of fresh air, natural elements of the landscape and the consequence of a prolonged stay in a confined space. Online surveys were used to study the possibilities of eliminating the consequences of the epidemic for the well-being of people. A conclusion is about the positive impact of open landscape spaces after freedom restriction and the compensatory effect of this environment in restoring the mental and psychological state of people trapped in the conditions of the enclosed location of apartments for a long time. Concrete components and characteristics of the restorative environment, comfortable in its configuration, color scheme, interdependence with neighboring territories, the comfort of stay, access and many other elements that allow people to relax, are applicable and useful for residents of New Zealand and other countries of the world, were studied [7].

Another aspect of the greening of a social space that is harmonious for a person and his environment turned out to be the problem of interaction at the level of “person-person”, “people-people”. Most publications on landscape architecture are devoted to the study of “man-nature”, which was realised by the risks of the 21st century: ecology, the costs of a technological information society, and other problems described by us in the article. This study is based on creating harmony in the living environment by combining the cultural traditions of the Chinese people and the theory of interpersonal relations. Furthermore, the development of a design project considers personal preferences on the effectiveness of buildings, the choice of comfortable territories of the built landscape and the demand and proposals for individual construction with the presence of a landscaped courtyard area [8].

In a study by North Carolina scientists devoted to the study of species zones as species landscapes related to the problem of landscape and urban planning, it is proposed to apply an interdisciplinary partnership to correct the reliability of the results. We are talking about terminology in intersubject communication, methods, typification, and the scale of visual

research of nature, territories, and various landscapes with the prospect of further development of visual observation [9].

In the work of Italian landscape architecture researchers, within the framework of the Green Deal program adopted in the European Union in 2019, research is being conducted to protect against the ecological crisis, solve the problems of landscape architecture and visual natural environment in cities and rural areas for 2030 and 2050. The long-term development objectives of actual planning and landscaping in urban management policy in its tangible and intangible components of architectural and landscape design are outlined. The results of fifteen years of experience of leading designers in the effective solution of social and environmental problems are presented. Promising positive plans of the “Green Course” have been built to combat the transformation of negative climate phenomena [10].

The next group of studies questions are the possibilities of using park areas and feedback analysis. The issue of landscape organization, and landscaping of recreational areas of Greenway: High Line (New York), and Atlanta Beltline (Atlanta), was described as part of the City Greenway. Specifically, the benefits of health improvement of the population were mentioned, considering economic and environmental conditions. The number of park users, sampling pattern, actions, age preferences (fewer adolescents were identified than other age groups), emotional state and activity by day of the week were identified based on information from Instagram. The analysis of all materials showed the positive result - a large number of visitors enjoying the services of the park's territories. The researchers made conclusions about the possibility of using artificial intelligence, as information from the Instagram network, in the study of topical issues, similar to this case [11]. Such studies of various aspects are being conducted in different countries.

In the next article, the researchers consider the structure of the priorities of landscape and architectural elements, including their use in the space of city parks. Visitors' assessments of the possibility of access to the park, pastime in the park space, and the results of perception of the design of the landscape environment of the park, were analyzed. The assessment was made of perception of harmonious comfortable rest in the parks. The fundamental aspects and components of a coherent systematic and organized park complex for visitors in Thailand are also highlighted [12].

We have reviewed the studies of scientists from different countries of the world community devoted to solving the problems of the global environmental crisis and the risks associated with the formation of the information society. Their proposals are related to the restoration of lost landscape areas, the development of existing ones, and the creation of new green areas. The conditions for the creation of modern parks, recreation areas, as well as conditions of stay in them, and the analysis of the assessment of visitors to the services offered and recreation areas, have been studied.

In response to large-block panel technologies in the architecture of large settlements, the Land Art direction in the landscape art of America arose in the second half of the 20th century. The direction is considered the modern trend, respectively. Moreover, the direction is an avant-garde, somewhat ironic, modernist movement as a protest against urbanism and strict limits in creative space and the urban social environment remote from nature. To create objects of small architectural forms harmoniously fitting into the natural landscape in this style, traditional natural materials known to mankind since ancient times were used.

3 Results

Russian cities with a population of one million, like Rostov-on-Don, require a particularly careful study of the landscape and architectural environment, which is basically the lungs of the city. We found that in the 20th century there was no such issue in our city. It was a fairly landscaped historical center that attracted tourists. The construction of new

microdistricts was conducted according to the general plan for construction of the city along the outskirts adjacent to the central part of the city. There were gardens, which, were preserved according to the possibility. New trees were planted, including fruit trees. Therefore, Rostov-on-Don was called the garden city. In recent years, very active construction has taken place. The construction was conducted mostly infill, and building of skyscrapers was a prime focus. There is also the question of providing new residents with transport. That is, a high-rise block or a complex of houses appears on an unprepared territory for such a large number of people and private cars. It fits into the existing landscape or, at best, there is a place for landscaping the surrounding area. With this approach, the GOST (Russian National Standard) system developed in Russia and approved for green roofs in Russia is suitable for buildings. Here, technical and environmental standards for creation of projects with the installation of green roofs of residential buildings, technical and auxiliary buildings, including roofs of underground garages, are mentioned. The use of this possibility of greening the roofs of infill buildings would greatly help the city, at least partially compensate for the lack of greenery.



Fig. 1. The Galeria Shopping and Entertainment Center “Park”, Rostov-on-Don, Northern residential area.

The Galeria Shopping and Entertainment Center “Park” is located in the center of the Voroshilovsky district of Rostov-on-Don, which has the largest population. Geographically, it is adjacent to the Druzhba park of the same microdistrict. At first glance, it may seem that the new shopping center is competing for the number of visitors. Architects from Rostov-on-Don created this center with passion and professionalism. They filled this object with elements of a green garden: phytowalls, trees and plants in flowerpots and flower boxes. The authors of the project of The Shopping and Entertainment Center “GALERIA PARK” in Rostov are AB «PROJECT», a team of architects from the city of Rostov-on-Don.

Dozens of trees, hundreds of bushes, a beautiful lawn and flower beds along the road are planted on the adjacent territory. Small recreation areas are organized. The one of them is a illuminated pedestrian fountain - a favorite place for children to relax. Materials for the interior design of the premises are natural. The proximity of the real park “Druzhba” inspired a trend to create an interior space on the principle of similar planning, like a city park. The naturalness and convenience of an ordinary park became the basis for creating a layout with diverging paths with benches, a large amount of greenery and an entertainment

area with a cinema. The Galeria Shopping and Entertainment Center “Park” has become a truly favorite place of rest for the residents of Rostov-on-Don, as expected by the employers. Residents of different districts of the city come here to have a successful shopping in conveniently located shopping galleries, relax in specially organized sports and cultural areas for children and youth. For this, almost a whole floor is provided.

This center with a highlight makes an especially great impression. Facades clad with structures of biomorphic form, reminiscent of trees, covered with perforated film with illumination along the contour. From the science of videoecology point of view, this object fully meets the requirements for a comfortable stay of population from children to adults.

There were only positive reviews and gratitude for the comfort among the population that passed the survey, visiting this center.

We have compiled a survey table of the opinions of city residents about the objects presented in this article.

Table 1. Evaluations of objects of urban architecture and objects of the architectural and landscape environment.

Objects of urban architecture				Objects in landscape environment	
Name	Materials	Color of facades, decoration	Evaluations	Landscape	Reviews
Buildings of the second half of the 20th and 21st centuries.					
Modern buildings	Concrete, insulation, brick	Ochreish, brown, light colors	-	Green spaces, lawns	+
Standard housing	Concrete, insulation, brick	Light, colored, ocher-brown. Mosaics, paintings.	+	Green spaces, lawns	+
The Shopping and Entertainment Center “Park”	Concrete, insulation, perforated surface.	Grey, green, yellow. Biomorphic pattern	+	Greenery and natural materials (interior), green spaces, lawns (exterior)	+
Historical buildings of the city of Rostov-on-Don					
Classicism	Stone, wood, coloring	Ocher, light green, blue, white. White, stucco molding	+	Green spaces, lawns	+
Eclecticism	Brick, ceramic tiles, painting	Red, red-brown, light. White window frames.	+	Green spaces, lawns	+
Art Nouveau	Reinforced concrete, tiles	Greenish, brownish. Window bindings, etc.	+	Green spaces, lawns	+
Constructivism	Panels, painting	Light background, pastel colors. Mosaic fries relief	+	Green spaces, lawns	+

Photographs of city objects, characteristic and typical for the analysis of structures, were prepared. They are presented in the table in two large sections:

- Historical buildings of the city of Rostov-on-Don: classicism, eclecticism, art nouveau, constructivism;

- Buildings of the second half of the 20th and 21st centuries: modern buildings, standard buildings, The Shopping and Entertainment Center “Park”. They were divided into two groups in the rows of the table.

Their visual characteristics were grouped by columns. Evaluations were made for the objects indicated in the first column.

1. The entire appearance of the building was assessed by the perception of the exterior of a building, materials, color of its facades and decorations (if there are any).

2. The same building was evaluated with the adjacent landscape solution of the given territory. We were interested in the positive or negative assessment of each building as a self-sufficient object and its own in the environment.

The survey showed that the presence of green spaces creates a positive attitude among the population, even if the building contains homogeneous or aggressive elements in the facades.

Therefore, the task of all those who can help the city is to restore the former glory of the “green city”, to show a desire for this, and to use professional opportunities in the fight against the environmental crisis.

4 Discussion

The state of the historical centers of modern cities, the presence of modern architecture, landscape architecture, urban greening, require close attention of specialists. The famous historian and theorist of architecture A. V. Ikonnikov wrote about the need to balance the natural and the artificial in the space surrounding people, especially in the environment of a modern city. Attention should be paid to the approach of Chinese scientists - the preservation of the cultural traditions of the people.

In teaching students in the specialties: urban planning, construction, architectural design, reconstruction and restoration of architectural heritage, design, including landscape design and interior design, it is necessary to issues the environmental problems of modern cities. The article of our colleagues, scientific teachers of Don State Technical University, lays the foundations for teaching fine arts, the beauty of natural forms, plein air painting, necessary for the further use of professional competencies, project development, and activities in landscape design [13].

The important innovative technology in art education in the process of online and offline learning based on digital technologies is mastering the skills of working in e-systems. This contributes to the formation of the new type of personality: a creative personality capable of innovation. A creative person is characterized by great mental mobility, adaptation to constantly changing conditions of the educational process, the ability to master digital technologies. Such person realizes new opportunities in visual communications, forms new competencies in accordance with modernization of education [14]. Personalities of the younger generation, especially students, designers, who have such properties, are able to implement creative tasks both in the educational process and in professional activities. At the same time, they are able to solve current social issues. The influence of digital technologies on the formation of the public consciousness of students is of great importance in the learning process [15].

The common name of Rostov-on-Don until the end of the 20th century was “garden city”. In the new century, architectural transformations in the city have changed its appearance. In addition, after the expiration of the 50-year planting period, high sprawling trees were cut down on the central streets of the city, giving shade in the heat and cleansing the atmosphere of the city. Since 2018, trees and bushes in tubs have been planted in the direction of Mondeal on Bolshaya Sadovaya st., Voroshilovsky pr. and other crowded places in the center of Rostov-on-Don. For our southern city, called the “gates of the Caucasus” and the capital of the Southern Federal District, it was not a very good decision to plant trees in tubs. However, the bushes withstood this experiment: in some places they still grow.

The good news is that the country has adopted laws since 2016 on the implementation of the green building system. In Russia, objects are certified according to the BREEAM system. The Technical Committee for Standardization TC 366 “Green” technologies of the living environment and “green innovative products” in the State Standardization System was created.

5 Conclusions

The works we studied on the problems of the development of modern architecture and the landscape-architectural environment in the world, Rostov-on-Don and China, allowed us to draw conclusions about current trends in solving the global environmental crisis, overcoming the consequences of the pandemic and urbanizing the living environment of people. The methods and technologies developed in the works cited by us are focused on:

- ensuring the study of this process by digital technologies;
- using artificial intelligence in collecting information and analyzing it using programs;
- application of software with the study of demand in the design of landscape and architectural environment;
- increasing in the volume of landscape and architectural environment in urban and non-urban areas;
- reduction of height in architecture;
- adjustment of the following aspects of the landscape environment: ethnic traditions of different peoples in landscape and architecture; considering cultural traditions; with the preservation, reconstruction and restoration of not only cultural monuments, but also architectural objects of the historical center.

All the aspects we have identified must be conveyed to minds of students during the period of study, and in creative practice. This is of great importance, so that in the process of learning during the period of acquiring qualifications and in their further professional activities, all the main positions in the design of urban space from architecture to the landscape and architectural environment of the city do not lose their significance. Here we are talking about both new global development sites and infill developments, especially in the historical city limits. That is, the preservation of the individual image of our city, which attracts so many tourists, will also be achieved.

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