

A black and white photograph of a tree canopy, showing the intricate patterns of leaves and branches. The image is centered on a dark background, with the tree's foliage appearing as a bright, textured area. A prominent blue rectangular border frames the central text.

**Landscaping as a factor
in creating a comfortable
urban environment**



LANDSCAPING AS A FACTOR IN CREATING A COMFORTABLE URBAN ENVIRONMENT

EL PAISAJISMO COMO FACTOR PARA CREAR UN AMBIENTE URBANO CONFORTABLE

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Abstract

This article deals with the issues of gardening as a factor in the improvement of children's, educational, sports facilities and its impact on the aesthetic and artistic value of the created landscapes. This is especially true due to the fact that landscaping is one of the most important aspects in the whole range of measures for arranging a comfortable environment along with security issues, the formation of urban spaces, etc.

The authors provide recommendations on the selection of the plant assortment under the influence of negative urban factors, such as the impact of vehicles, noise pollution. The individual features of the territories of various objects are noted, private landscape solutions are defined.

By the example of the territories of the studied objects, the authors conducted taxation of tree plantings, which showed the unsatisfactory condition of a significant part of them.

The possibility of expanding the range of expressive means through the use of traditional national ornaments in the structure of planar plant compositions is shown.

The authors emphasize that the applied ecological approach not only provides for the creation of decorative compositions fully viable in harsh urban conditions but also contributes to the development of elements of the ecological framework as the basis for the conservation of urban fauna.

Keywords: green construction, landscape design, urban gardening, sports facilities.

Este artículo aborda los temas de la jardinería como un factor en la mejora de las instalaciones infantiles, educativas, deportivas y su impacto en el valor estético y artístico de los paisajes creados. Esto es especialmente cierto debido al hecho de que el paisajismo es uno de los aspectos más importantes en toda la gama de medidas para organizar un ambiente confortable junto con problemas de seguridad, la formación de espacios urbanos, etc.

Los autores ofrecen recomendaciones sobre la selección del surtido de plantas bajo la influencia de factores urbanos negativos, como el impacto de los vehículos, la contaminación acústica. Se observan las características individuales de los territorios de varios objetos, se definen las soluciones de paisaje privado.

Con el ejemplo de los territorios de los objetos estudiados, los autores realizaron la tributación de las plantaciones de árboles, lo que mostró la condición insatisfactoria de una parte significativa de ellos.

Se muestra la posibilidad de ampliar la gama de medios expresivos mediante el uso de adornos nacionales tradicionales en la estructura de las composiciones de plantas planas.

Los autores enfatizan que el enfoque ecológico aplicado no solo prevé la creación de composiciones decorativas totalmente viables en condiciones urbanas adversas, sino que también contribuye al desarrollo de elementos del marco ecológico como base para la conservación de la fauna urbana.

Palabras clave: construcción verde, diseño del paisaje, jardinería urbana, instalaciones deportivas.



Introduction

Proper arrangement of urban areas (children's, sports, educational, etc.) is impossible without competent addressing of landscaping issues. This is one of the most important aspects in the entire range of measures to create a comfortable environment, along with security issues [1-4] and space arrangement [5-9]. In this sense, the challenges set for improvement are being solved from the perspective of urban planning ecology, or rather, urban ecology - a new direction, the object of study of which is a person in an urbanized environment, human settlements in a natural environment, and the diverse direct and inverse relations between the environment and humans as a biological and social being [10].

Professional, thoughtful, and competently arranged landscaping helps to increase the emotional state of a person, the decorativeness of green spaces, their silhouette, shape, aroma; the combination of plants with different colors are beneficial for the psyche of people.

Unfortunately, in an urban environment, people are forced to be content with a trivial approach to landscaping based on the observance of certain standards [11, 12]; and if in the 70s of the XX century the proportion of greenery, for example, in a nursery school, should have been "usually not less than 50% of the land area", the current resolution allows "reducing landscaping up to 20% in cities due to the dense urban development"; moreover, it goes about the territory "free from development". Thus, we observe a clear and very alarming tendency to reduce the area of green areas, when the percentage of vegetation is reduced to 5-10; in this regard, concern about the general condition of the landings, their quantitative and qualitative characteristics becomes clear.

Results and discussion

As a model objects for landscaping, we took a number of territories, and selected the most various plots: a children's preschool institution (ДДУ), a "sleeping" district in the city of 0.99 hectares; Olimpiiskii sports complex of PJSC TATNEFT in the central residential zone of the city of Almet'yevsk; the educational building of the Institute of Management, Economics, and Finances of KFU. The conducted taxation of plantings showed that trees and shrubs in the territory grow randomly; no well-thought-out and continuous gardening system is traced; and a significant (more than 30 years) age of the object will inevitably lead to serious vegetation loss in the near future, which will require anti-aging in the foreseeable future and wellness activities.

The greening concept was based on two basic principles.

The first is the creation of compositions of "continuous decorativeness" using a bright palette of plants, from the early flowering *Forsythia europaea* to the late autumn maples *Acer tataricum* and *Acer ginnala*.

The second, usually used in the creation of rock gardens and generally stony gardens, is the principle of minimal care, which, if possible, reduces all agricultural activities: weeding, top dressing, trimming, etc.

Given the above limitations, the plant assortment was selected for the maximum implementation of all the functions of properly organized landscaping - environment-forming, protective, decorative, and, finally, educational.



For landscaping of a sports facility, the authors followed the norms and recommendations given in [13, 14]. Initially, it was planned to carry out geoplastic transformations of the relief to create artificial hills. Such a vertical layout would not only solve the problem of giving the site originality and artistic expression but also protect the territory from the influence of adverse factors passing along the highway. But subsequently, preference was given to the planar nature of the arrangement of landscape elements, as the most suitable for creating smooth and broad perspectives in the style of a regular park.

The greening of the territory of sports facilities can vary greatly both in the assortment of plants and in their location in terms of the complex. The use of certain landings depended on the size of the territory and was determined by the general architectural design of the composition, as well as the indisputable circumstance that approximately 30% of the front area in front of the complex was originally allocated for car parking.

The selection of the plant assortment was based on the general and specific properties of plants that meet the entire range of requirements, most effectively affect the microclimate and contribute to the hygienic, physiological, and psychological comfort of the environment. Since no sporting events are directly held on the landscaped territory, it allowed using tree species and shrubs with shiny leaves and also placing plants so that the shadow from their crowns fell on paths and platforms.

Special plants were planned to reduce the noise level, improve air composition, thermal and humidity conditions in the territory of the sports complex. Thus, when forming external protection against pollution was provided along the perimeter of the land plot by planting a strip of shrubs *Cotoneaster lucidus* 1.5–2 m wide from the main road and 1 m from the local access roads.

The landscaping of the structures of the scenes, strips, and other elements of green space considered the resistance of plants to mechanical damage and recreational loads, as well as the phases of their vegetative development and, therefore, the manifestation of ionization and phytoncide activity. The choice of tree species ensured the continuous release of volatile production during the entire season of sports and suggested the abandonment of early falling species.

Insolation schemes for individual areas were elaborated with the selection of the necessary assortment, which allowed creating comfortable conditions at an early stage of vegetation formation and gave an economic effect - a significant reduction in planting material due to its most rational placement.

The immediate task of the landscape designer was to use the decorative qualities of plants. To decorate the ceremonial flower garden just before the entrance to the building, two-color schemes using national ornaments were proposed, one of which is shown in Fig. 1.

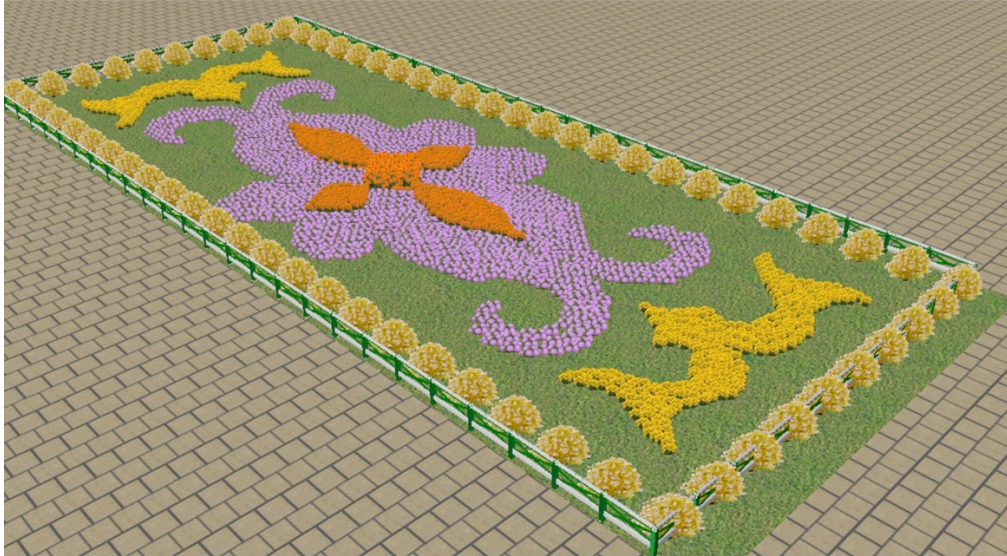


Fig.1 Vegetable composition in the form of a national ornament

Another model object in the work was the educational building of the IMEF KFU, located on a high hill, which makes it a high-rise architectural dominant with a leading urban development influence on the organization of development of the entire adjacent region. The space-planning composition is based on a combination of two equally sized wings located at an acute angle with respect to each other and forming, in conjunction, a common outer wall concave in an arc.

The absence of any significant horizontal platform did not allow arranging a court of honor or entrance stalls, widely used in the gardening of such monumental objects.

In addition, during landscaping, the authors faced a number of difficult circumstances, both of a purely technological and aesthetic nature. The first includes the following:

- extremely unfavorable insolation regime of the territory (on hot days, the soil surface temperature reaches 50-55°C);

- both slopes of the hill are windward, which contributes to deep winter freezing of the soil;

- significant slope steepness (25-45°) greatly reduces the irrigation efficiency; slopes lose most of the precipitation due to surface runoff and poorly maintain snow cover;

- the solid age of the building explains a large number of diverse underground utilities, data about which are ambiguous and often contradictory; this makes it very difficult, for example, to land large-sized plants or

 - to carry out trench plantings;

- the bottom of the slope does not have a pronounced horizontal platform and the flowing irrigation water, as well as rain and melt water washes off the soil layer and pollute the adjacent sidewalk.



However, the listed adverse factors are quite surmountable at the current level of development of landscape technologies.

The taxation of trees located on both sides of the main staircase showed that almost half of them are in an unsatisfactory condition (rickety, hollow, curved) and require radical trimming, treatment, or replacement. In the latter case, if the plants are completely replaced, the staircase is framed with *Artropurpurea* of the contrasting color.

A special issue was the use of large-sized plants for landscaping the front of the building, while there was a need to consider yet another important factor - the reaction of public opinion to both the biodiversity of urban planting and the landscaping process as a whole [15,16]. As a result, a variant was proposed that visually brought out the beauty of the facade in a row planting of *Pópulus álba*. The fact was taken into account that the selection and placement of tree-shrub vegetation, which is part of the compositional solution, should be approached from an ecological point of view, i.e., subject to the requirements of plants to environmental conditions. The assortment of plants for green construction is determined on the basis of a complex set of requirements that take into account the climatic conditions of the area, the intended purpose of the object, the natural features of the green area (soil, relief, hydrology, insolation, etc.), and architectural and planning situation. Each plant, especially a separate one, has its own individual characteristics. At the same time, in group plantings, trees and shrubs have the ability to “grind” to each other, forming not a set of separate plants but a single interconnected group that has a certain ability to form a balanced volume [17]. This shows, for example, a decorative-shrub group laid near the side stairs of the left wing (Fig. 2).



Fig.2 Ladder of the left wing and entrance group

Columna and *Sankist*, *Blue Arrow* and *Variegata* form the basis of decorative coniferous groups; the border consists of *Artropurpurea*, a plant that performs both protective and barrier functions in the presence of intense pedestrian traffic. One of the plants, which is almost ideal for urban landscaping, but, unfortunately, is not often used, is *Elaeagnus angustifolia* L. The contrasting silver-burgundy combination of Russian olive and barberry will serve as a bright decorative frame for the front staircase and the closed slopes and will be a worthy replacement dense thickets of American maple along the right side wing.



The composition of the frontal and lateral groups is similar, i.e. stylistically, they have something in common. At the same time, along with the architectonics of planting, when at long viewing distances the main role is played by the height and silhouette of the considered plantings (size, branching nature, crown shape, etc.) with close view (within the same height), decorative shades acquire the main significance, for example, the texture and color of the needles, the texture of the bark, the pattern of branches [18].

The authors tried to diversify the noted details as much as possible, not forgetting, of course, the decisive factor in the selection of plants, such as viability in urban settings.

The grassing of the slopes was decided to perform with the use of "dry lawn" using biomass intended for arranging vegetation on dry sandy soils not subject to mechanical stress. A specially selected mixture of grass mixtures is designed to provide high decorative lawn cover.

Thus, by the example of a number of model objects, the authors showed that the landscaping of urban objects of various purposes allows achieving environmental goals: improving the quality of the urban landscape and providing a more stable and comfortable environment.

Summary

1. The results of taxation showed that the plantations on the territory of the objects of study grow in random order; no elaborated and continuous landscaping system is traced.

2. Special plantings are proposed for facilities located in the area of the negative, including man-made factors.

3. Difficult aspects were identified during the design of landscaping of individual objects - from the unfavorable insolation regime of the territory to the significant steepness of the slopes.

Conclusions

The example of the studied territories, taken by the authors as a model, showed that the solution to the greening of urban objects of different profiles is an integral factor in creating a comfortable urban environment, increasing the aesthetic and artistic value of the created landscapes.

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