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# Landscape planning of preschool yards

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**Abstract.** Creating a safe and favorable environment for child development is the key principle of a preschool yard landscape arrangement. Green spaces, plants for which should be selected with use area separation taken into account, play an essential part in the process. Enduring ornamental plants well-suited to the local climate conditions and causing positive emotions in children are preferred. Using wildlife flora species and arranging landscape compositions may contribute to children's early familiarization with their native nature as well as realization of their cognitive potential.

## 1. Introduction

Nowadays, many new preschool institutions are being built and a great number of old ones are being renovated in Russia. The landscape arrangement of preschool yards plays an essential part in preschoolers' physical development, their cognitive ability, educating process and forming a positive attitude towards the world around them. It should be noted that the problems of these areas landscape arrangement are not always placed an emphasis on in this country. In this paper, we would like to draw attention to basic solutions to these problems and primarily to creating green spaces since they are an important factor in establishing a favorable environment.

A generalization of literature on restricted-use area equipment and greening presented in the papers (Khrapko O., Kopeva A., Ivanova O. (eds) [1-3]) as well as schoolyards (Khrapko O., Kopeva A., Ivanova O. (eds) [4-6]), playgrounds (Golovan E. [7]), and preschool institutions was performed before determining the basic approaches to preschool yards landscape arrangement.

The survey of modern literature (Penkova K. (eds) [8]; Kurapina N. (eds) [9]) has shown that not only the system of education but also a high-quality environment plays an essential part in child development. Herrington and Studtmann [10] argue that arranging greenery and other landscape elements in playgrounds contributes to children's social, emotional and cognitive development. Czalczyńska-Podolska M. [11] reveals that playgrounds possess considerable potential for child development. Wai K. and Sui M. (eds) [12] determine the inclusive issues in playgrounds of a densely populated city. According to Dewi S. P. [13], playgrounds are essential in fulfilling the idea of creating a child-friendly city environment. Mrđan S. and Ljubjević M. (eds) [14] determines the extent to which preschool and school-age children are exposed to harmful plant species and also gains insight



whether the present landscaping takes into account the appropriateness in the use of certain ornamental species in arranging preschool and school greenery.

## 2. Methods

A number of private and municipal kindergartens in Vladivostok, Russia had been surveyed as to the landscape arrangement of their yards before the basic approaches to preschool yards landscape arrangement were determined. While surveying, a number of unfavorable external factors were revealed, which are to be taken into account when solving the issues planned. Using the results of examining ornamental plants in Russia's Academy of Science Far Eastern Branch Botanical Garden – Institute collections (A unique scientific collection of living open soil plants) obtained both from our own observations and from literature (Karpisonova P [15], Denisov N. and Petukhova (eds) [16]), types of green spaces as well as plant assortments for them have been proposed.

## 3. Results

Not only the system of education but also a high- quality environment plays an essential part in child development. Today, a kindergarten is not only a building designed for children to spend time in, but also an environment adapted to their perception, in which children spend most of their time, play and develop. Preschool yard landscape arrangement methods should be aimed at creating safe and comfortable conditions for child development; at forming an environment which could serve as an apt illustration while environment-friendly attitudes are being developed in children.

Greening is a key element of area landscape arrangement; it contributes to forming a favorable environment and serves a number of functions. One of these is habitat creating which is concerned with forming favorable microclimatic conditions, such as noise and wind speed reducing; air cleaning and oxygen enrichment, etc. Another function is an educational one, as plants serve as a visual aid of a sort, which makes it possible to show fauna variety to children and to develop love for the plant kingdom in them. The aesthetic function of green spaces helps foster a sense of beauty in children, affecting their mood positively.

Selecting a plant assortment for these green spaces presents a number of peculiarities related, on the one hand, to the necessity of creating a diverse, attractive and age-appropriate kid habitat, and, on the other hand, to safety which suggests excluding any poisonous or allergenic plants; thorny trees or bushes; those ones with inedible or conditionally edible fruit and so on.

## 4. Discussion

The basic principles of landscape arrangement for preschool yards as well of school yards [4-6] are as follows: forming a favorable microclimate; child safety; aesthetic and educational child habitat. However, it should be noted that preschoolers spend more time in the yard than schoolchildren do. In this connection, preschool area landscaping and greening present some peculiarities; it should be more designed for outdoor activities.

As has been stated above, green spaces play an essential part in putting these principles into life. Selecting types of greenery and plant assortments, the following rules must be observed: plants which can do harm to child health are to be excluded; plants should be ornamental for a long period of time; they should also be weather enduring and they should not require special care; preference should be given to local plants making it possible to familiarize children with their regional flora

Three types of use areas can be defined in a preschool yard: public or entrance area; activity area, and utility or service area. As the entrance area draws immediate attention, it would be appropriate to use bright colors in its arrangement. The entrance pathway can be decorated with a green border of medium shrubs or with rectangular flower beds while the entrance hall can be set off with containerized flower compositions. Their number should not be large (1-2); the area size permitting, a composition may be arranged with the containers. The entrance area arrangement should raise spirits, so plants with bright blossoms, such as the nasturtium *Tropaeolum cultorum*, the French marigold *Tagetes patula*, the scarlet sage *Salvia splendens* and the like are appropriate here).

The main use area in a preschool yard is activity area, or various playgrounds designed for active play in the open. They are often isolated from each other with the help of medium (up to one meter/3.3) hedges of the Japanese meadowsweet *Spiraea japonica*, the shiny cotoneaster *Cotoneaster lucidus*, etc. A wall-to-wall ground cover made of trampling-resistant grasses is appropriate on playgrounds for small children. An area for quiet games should be made within each playground with sandboxes and benches to sit on. Here, solitary trees can be used, preferably those with beautiful tree crowns and originally shaped foliage, such as the Korean maple *Acer pseudosieboldianum*, the Amur lime *Tilia amurensis*, etc. as well as conifers (*Larix*, *Picea* and others), which can make the area look ornamental in the winter. Mixed tree and shrub ornamental groups comprising tall perennials (Khrapko O., Savin Cand Kotzar T. [7]) will enhance the aesthetic expressiveness of the area.

A portion of the playground is allocated for active physical play; it is equipped with various facilities, such as jungle gyms, sets of swings, etc. geoplastics techniques can be used to create artificial hills, slides and terraces.

Modern gardens are mostly located within the city limits, so their area needs to be protected from harmful surroundings, such as highways, residential areas, etc. Besides, in cities and towns with atypical wind regimes, of which Vladivostok can serve as an example, wind protection is also needed. Linear tree planting patterns of the hornbeam *Carpinus cordata*, the Manchurian ash *Fraxinus mandshurica*, etc. used along the perimeter of the territory complemented with group or linear bush plantings (the Easter tree *Forsythia ovate*, the common ninebark *Physocarpus opulifolius*, etc.). Dense rows of trees and bushes present a kind of protecting screen, which separates the preschool area from the surroundings. To make the hedge look more ornamental, some vertical greening systems can be used, with lianas like the honeysuckle, the Italian woodbine *Lonicera caprifolium*, the Amur pepper vine *Ampelopsis brevipedunculata*, etc. planted.

The size of the preschool area permitting, a small ecological trail or a special plot can be created on the periphery, where children may familiarize themselves with the typical regional plants. To this end, various deciduous and coniferous plant species endemic to the region should be planted here. For Primorye, these are such trees as the Amur cork tree *Phellodendron amurense*, the Manchurian fir *Abies holopylla* and others.

Landscape-style planting which imitates natural local landscapes are appropriate here (Khrapko O. and Kopeva A. (eds) [18]; Khrapko O., Kopeva A. and Ivanova O. [19]). This plot will make it possible to provide the necessary conditions for children's cognitive potential fulfillment; to organize the education process on a better level; to enable child personality development in harmony with nature. (Volobueva N. [20]).

## 5. Conclusions

Creating a safe and favorable environment for child development is the key principle of a preschool yard landscape arrangement. Green spaces, plants for which should be selected with use area separation taken into account, play a special part in the process. Enduring ornamental plants with beautiful blossoms, well-suited to the local climate conditions and causing positive emotions in children are preferred. Using wildlife flora species in plant assortments and arranging landscape compositions may contribute to children's early familiarization with their native nature as well as realization of their cognitive potential.

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