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ECOARCHITECTURE AND CHILD HEALTH CARE

Catherine FEDORENKO, Tetyana OLIINYK
Odesa State Academy of Civil Engineering and Architecture
Str. Diedrichson, 4, Odesa 65029, Ukraine
e-mail: pk@ogasa.org.ua

Relevance of the research. Air pollution is one of the most widespread and complex forms of urban environmental impact. People and everything around them suffer from polluted air: vegetation, wildlife, architectural monuments, metal, building materials, fabrics, etc. This is one of the main problems of today's cities. This has been countered by such a trend in architecture as green architecture. Eco-building helps to solve such an environmental problem of megacities as environmental pollution. The relevance of environmental friendliness in the planning of pre-schools in cities is particularly important. The task of landscape organization of such territories is to improve sanitary and hygienic conditions in terms of air and site cleanliness, good insolation and ventilation, protection from wind, noise and dust, creation of favorable conditions for recreation, enrichment of the architectural exterior and interior of buildings (Fig. 1) [1].

Fig. 1. Landscape of the territory of the kindergarten

The proper organisation of life and education for children in a preschool institution is reliant on the overall architectural and planning solution of children's spaces, the organisation of the building's interior space, and the provision of hygienic and rational equipment. To ensure favourable conditions for the harmonious physical and spiritual development of children, the interior should be designed accordingly. The organization of educational processes is intricately connected to the architectural and planning solutions of the premises, as well as their equipment, lighting, and decorative finishes. This necessitates a comprehensive examination of the problem of environmental sustainability of preschool institutions' interiors.

The design of children's institutions is complicated by the presence of diverse chemical compounds in the air of the premises, which are emitted by furniture, building, and finishing materials, and pose a health risk [2]. Hence, safeguarding the children's health calls for the use of only eco-friendly materials indoors while refraining from incorporating hazardous substances in building materials.

Based on literature analysis, the subject of eco-friendly interiors and design with natural materials is gaining more global attention. By utilizing the phytoncidal and gas-absorbing capabilities of plants, upper respiratory tract illnesses are reduced whilst indoor air is purified from hazardous chemical impurities aimed towards children, creating an advantageous psycho-emotional atmosphere. Green walls, vertical gardens, and indoor plant walls have the potential to recreate natural habitats for children within indoor spaces.

Today, in the realm of ecodesign, we consider the scientifically-based and targeted introduction of plants for various functional purposes in interior and exterior design. Phytodesign is perceived as a means to enhance human life quality in modern architecture. Interior design techniques involving plants are categorized into three main groups. These groups are complex landscaping, which includes large compositions of natural elements on relatively extensive spaces. The fragmentary group is composed of compositions containing single or group plant arrangements of one or more species. Lastly, temporary landscaping, which is typically used for decorating space during events [3].

Vertical gardening has gained popularity in recent times through the use of phytowalls and vertical gardens [4, 5]. Phytodesign refers to the decoration of building exteriors and interior areas with climbing plants. The arrangement of vertical gardens should comply with specific guidelines and requirements related to microclimatic features, which is particularly significant for the climate of Odesa. Generally, tropical and subtropical plants are ideal for indoor spaces and have been traditional indoor plants in our country. For the exterior vertical walls, we utilise mountain plants with strong root systems that have adapted to poor soils.

The significance of landscape arrangement in children's institutional areas is attributed to the prolonged exposure of children to the outdoors. Incorporating plants in childcare facilities leads to favourable microclimatic and aesthetic environments, which are crucial for children's walks. In addition to its decorative purposes, landscaping contributes significantly to enhancing the general and sanitary-hygienic conditions of the facility. When discussing the benefits of green spaces, it is crucial to acknowledge the phytoncidal properties of plants, which are utilised in creating landscape features for their targeted phytotherapeutic effects. Furthermore, the green space within a kindergarten serves as the initial connection between a child and the natural world, leading to the development of an ecological worldview [6, 7].

Purpose: to create an eco-interior and phytodesign for a kindergarten.

Object of research: kindergarten project in Odesa.

Results and discussion. The kindergarten project is located near the Black Sea on the site of a former health complex (Fig. 2).

Fig. 2. Situation plan of a kindergarten

The significance of devising a plan for the phytodesign of a kindergarten in Odesa lies in promoting environmental consciousness, which serves as a significant architectural and interior element in modern times, thereby garnering attention.

The landscape of the area comprises of high trees that provide essential shading, decorative shrubs, vines, blossoming perennial, and annual plants (refer to Fig. 3). The play area has a hard-wearing lawn and the trees and shrubs emit a significant amount of oxygen, producing a unique microclimate.

Fig. 3. Elements of landscape design for a kindergarten

In order to establish hygienic and sanitary conditions, botanical elements such as plants and flowers must be integrated in rooms allocated for children. The kindergarten's design adopts contemporary approaches to interior landscaping, inclusive of vertical gardening, a phytowall, and fresh flowers contained in flowerpots (see Fig. 4). A phytowall denotes a vertical plant structure that integrates a mechanism for automatic watering, and is intended for the indoor enhancement of greenery.

Fig. 4. Phytowall in the interior of a kindergarten

Plants and flowers are used to adorn the interior and provide a beneficial microclimate. They also offer a way for children to learn about the world around them. Gazing at plant foliage alleviates eye strain and mental stress, enhances self-esteem, and bolsters self-confidence. In addition, secure vegetation has been incorporated in the exterior of the nursery to cultivate children's motor skills and overall development (Fig. 5).

Fig. 5. Plants in the interior of a kindergarten

Using large specimens of plants that are not proportionate to a child's size is not advisable in kindergarten landscaping. Instead, they should be utilised as a background. For easy maintenance,

the plants should be kept in separate pots. By doing so, any plant can be removed during composition classes for closer examination and then returned to its original location.

Plants ought to be positioned in areas that children cannot unintentionally knock them over, and it is advisable to allocate a designated area for plant care. When situating plants within a child's grasp, ensure that the containers and planters are exceedingly robust and fastened securely in place.

Placing plants on window sills is not advisable, as they may obstruct the light. Climbing and trailing plants can be situated in flower lamps, on shelves, while larger plants or groupings of several low-maintenance plants can be positioned in floor vases.

Plants that emit phytoncides are suitable for kindergartens. These substances are known as natural antibiotics since they eliminate harmful bacteria and viruses. As a result, the air quality in the room is enhanced. Essential oils comprising phytoncides soothe the nervous system, thus improving the child's sleep and positively influencing their immunity and mood. Additionally, phytoncides provide beneficial impacts on the respiratory system. Certain indoor plants can neutralise toxins emitted by interior elements such as chipboard, MDF, fibreboard, and plywood [8]. Chlorophytum, aloe, spathiphyllum, and dracaena plants are particularly adept at absorbing formaldehyde.

Several different indoor plants are highly effective at regulating humidity. It has been observed that the indoor rooms' humidity drops to a mere 35% during the heating season, which is inadequate for comfortable human breathing. Employing indoor plants helps to sustain a constant humidity level of 50%, which greatly enhances breathing comfort.

Considering the hygiene requirements, the design for the nursery utilised decorative foliage plants, dried flowers, canned moss and stabilised plants.

Conclusions. The selective use of plant environmental characteristics to enhance the environment in children's institutions is a preventive measure for improving health. This approach also addresses the concerns of aesthetic, ecological, and environmental education and upbringing for children.

A kindergarten project (Odesa) utilizing phytodesign elements with eco-architecture consideration was developed. The planned area of the kindergarten property has been properly planted with decorative plants that retain aesthetic value throughout the year. This contributes to the creation of a favourable microclimate by reducing air pollution, controlling dust accumulation, regulating humidity, and decreasing noise. To establish an indoor safe nature corner, a contemporary interior with a green wall was implemented. All plants, including indoor and outdoor ones, must be completely safe for children.

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