INTEGRATING SENSORY PLANT COMPOSITIONS IN PUBLIC SPACES

INTEGRAREA COMPOZIȚIILOR VEGETALE SENZORIALE ÎN SPAȚIILE PUBLICE

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Abstract. Present study explores the basic concepts of sensory gardens design, highlighting their characteristics and qualities. It also presents the analysis of how sensory compositions can be integrated in different places, starting from case studies such as the sensory garden in the urban space, in special schools and in public institutions of daily care, addressed, for example, to the elderly. An essential part of the paper will be related to the theory of the five senses and how the therapeutic plantscape can influence these senses. This type of landscape is generally a plant-dominated environment intentionally designed to facilitate interaction with the healing elements of nature that promote human health and well-being. The research starts from the belief that every landscape has the ability to stimulate the five human senses, but landscapes with therapeutic plants in particular do so to a greater degree than others. The work will bring to the fore the importance of integrating sensory aspects in the design and arrangement of public spaces, offering a new perspective on how nature can be used for the benefit of health and leading to the creation of sustainable, inclusive communities for all social categories, in particular of the disadvantaged.
Key words: sensory gardens; urban spaces; sustainable communities.

Rezumat. Lucrarea exploraza conceptele de bază în amenajarea grădinilor senzoriale, evidențiind caracteristicile și calitățile acestora. De asemenea, prezintă analiza modului în care compozițiile senzoriale pot fi integrate în diferite locuri, plecand de la studii de caz precum grădina senzorială în spațiul urban, în școlile speciale și în instituțiile publice de îngrijire zilnică, adresate, de exemplu, seniorilor. O parte esențială a lucrării va fi legată de teoria celor cinci simțuri și modul în care peisajul vegetal terapeutic poate influența aceste simțuri. Acest tip de peisaj este, în general, un mediu dominat de plante conceput intenționat pentru a facilita interacțiunea cu elementele vindecătoare ale naturii care promovează sănătatea și bunăstarea umană. Cercetarea, pornește de la convingerea că fiecare peisaj are capacitatea de a stimula cele cinci simțuri umane, însă, în special, peisajele cu plante cu efecte terapeutice o fac într-un grad mai mare decât altele. Lucrarea va aduce în prim-plan importanța integrării aspectelor senzoriale în proiectarea și amenajarea spațiilor publice, oferind o perspectivă nouă asupra modului în care natura poate fi utilizată în beneficiul sănătății și conducând la creearea de comunități sustenabile, integratoare pentru toate categoriile sociale, în mod deoosebit a celor defavorizate.
Cuvinte cheie: grădini senzoriale, spații urbane, comunități sustenabile.

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INTRODUCTION

The paper *Integrating Sensory Plant Compositions in Public Spaces* explores the basic concepts in the design of sensory gardens, highlighting their characteristics and qualities. It also presents the analysis of how sensory compositions can be integrated in different places, starting from case studies such as the sensory garden in urban space, in special schools and in public day care institutions, addressed, for example, to seniors.

An essential part of the paper will be related to the theory of the five senses and how the therapeutic plant landscape can influence these senses. This type of landscape is, in general, a plant-dominated environment intentionally designed to facilitate interaction with the healing elements of nature that promote human health and well-being. I will explore how the sense of sight, touch, hearing, smell and taste can be stimulated and integrated in the design of green spaces, being the most direct ways in which people perceive external information and evaluate experiences, contributing to the creation of a more pleasant and therapeutic environment [Pallasmaa, 1994; Vítovská, 2015]. Plants with various health-enhancing functions are distributed and arranged in this environment in a manner that integrates science and art.

Therapeutic plant landscape designs are based on nature and ecology to promote human health and ensure the sustainability and resilience of larger ecosystems [Granö, 1929]. The research starts from the belief that every landscape has the capacity to stimulate the five human senses, but, in particular, landscapes with therapeutic plants do so to a greater degree than others.

This work will bring to the forefront the importance of integrating sensory aspects in the design and arrangement of public spaces, offering a new perspective on how nature can be used for the benefit of health and leading to the creation of sustainable, integrative communities for all social categories, especially the disadvantaged [Koura *et all.*, 2010; Spence, 2020].

Starting from Shoemaker's statement, quoted by [Hussein Hasreena, 2011], according to which "A sensory garden cannot be designed without taking into account the human element. Unlike traditional gardens that are meant to be observed from a distance, sensory gardens attract the visitor to touch, smell and actively experience the garden with all the senses", I can emphasize that these gardens are different from traditional gardens and are suitable primarily for education but also for recreation, having deeply comforting effects on the beneficiaries.

Sensory gardens have gradually evolved, starting from the traditional concept of a garden for the blind [Krzeptowska-Moszkowicz *et al.*, 2021]. The element that distinguishes sensory gardens from the rest of the gardens is that they aim to appeal to all the senses in such a way as to provide maximum sensory stimulation.

MATERIAL AND METHODS

The present work aims to design and lanscape a sensory garden within the courtyard of the "Prof. Dr. N. Oblu" Emergency Clinical Hospital in Iași, in the Tătărași

neighborhood, with a private character, open to the public, the role of which is to contribute to improving the quality of life of patients, medical staff and visitors. The sensory garden will provide a therapeutic and relaxing space, designed to stimulate the senses and promote mental and physical well-being.

The site that is the subject of the project is located in the Tătărași neighborhood, Ateneului Street 2, within the courtyard of the "Prof. Dr. N. Oblu" Emergency Clinical Hospital, more precisely behind it (fig.1). The area proposed for arrangement currently serves as an outdoor space for patients, visitors and hospital staff, the site not having a well-defined purpose (fig. 2). The total area of the site is 3400 sq m.

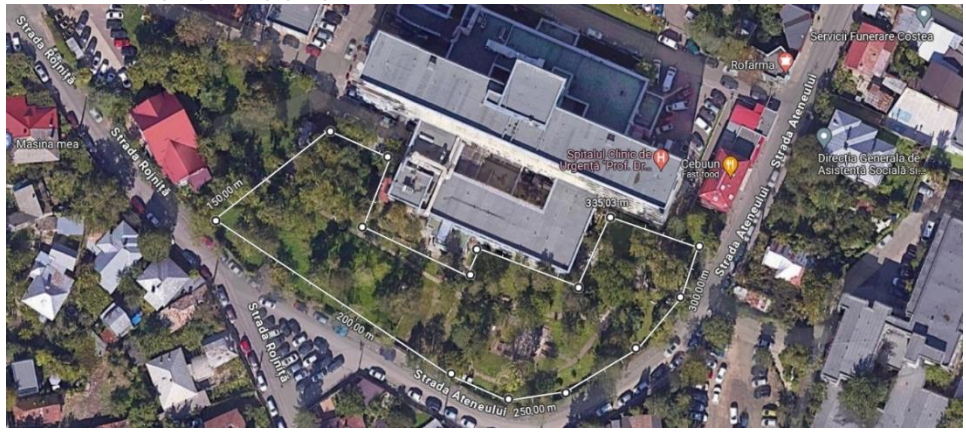

Fig 1. Sensory garden location, satellite view (maps.google.com)

Following detailed analysis processes, meticulously carried out on the project area of interest, it was possible to develop a list of strengths and weaknesses, both within the site and in the adjacent areas. These processes included precise measurements and in-depth studies of the structural elements and components of the area. Through this comprehensive approach, current needs were identified that will guide the development of the future sensory garden.

The studies carried out included the assessment of local biodiversity, the identification of existing plant and animal species, as well as the prevailing climatic conditions. This information is necessary to ensure that the sensory garden will be sustainable and beneficial for both the environment and the hospital community.

Fig 2. Current situation of the site

Next step was determining the necessary elements by identifying and selecting the essential elements for the sensory garden, such as plant types, materials for paths, water features, furniture and other necessary structures, respectively improving the existing situation by creating a functional zoning. Finalizing a judicious proposal for structuring and zoning the layout, materialized by developing a detailed structuring and zoning plan for the hospital garden, which provides a clear vision of the organization of the green space, establishing areas for relaxation, treatment and socialization, and the plant material is strategically placed to create a comforting environment. In addition to these methods listed above, another step consisted of executing the plan that is the basis for creating the sensory garden, which was created in RealTime.

RESULTS AND DISCUSSIONS

The proposal for the green space development aims to integrate sensory plant compositions into public spaces, focusing on capitalizing on the benefits brought by therapeutic plant landscapes for human health and well-being. It starts from the premise that every landscape has the ability to stimulate the five human senses – visual, tactile, auditory, olfactory and gustatory – but landscapes with plants with therapeutic effects do so to a higher degree. Through this project, we have integrated various areas dedicated to stimulating the human senses. The plan includes two entrances, large green spaces, a relaxation area, as well as various plant compositions, designed to create a therapeutic and pleasant environment for users.

Fig 3. General plan of the proposed sensory garden with zonning

Within the site, seven zones with distinct functions are identified (fig. 3 and 4). These zones are designed to fulfill various purposes, from relaxation and recreation to sensory stimulation and social interaction. Each zone is arranged taking into account its functional specificities, ensuring a diversified and pleasant experience for users. Also, around these main zones, various design elements are integrated that contribute to the coherence and harmony of the ensemble.

The design elements are selected and placed so as to complement and amplify the characteristics of each zone, while also providing visual and thematic continuity.

The first area, the entrance, was designed as a waiting space, offering visitors a pleasant and relaxing first contact. This area is marked by a central round, around which comfortable benches are arranged, which offer places to relax and rest for those entering the site. In the middle of the round is a diversified floral composition, meant to delight the eye and create a welcoming atmosphere, using species as *Viola wittrockiana*, *Alyssum* and *Campanula carpatica*, which add an explosion of color and texture, animating the entire space. Behind the benches, the plant compositions are made up of a variety of species, each contributing to a rich and diverse landscape (*Aster novi-belgii*, *Hydrangea sp.*, *Taxus baccata 'Repandens'* and *Picea glauca 'Conica')*. These plants are chosen not only for their beauty, but also for their ability to provide structure and visual depth, while ensuring a lush green backdrop throughout the year. This area serves not only as a place to relax, but also as an exciting introduction to the full experience of the site.

Zone 2, intended for the therapeutic plant landscape of the Rose Garden, based on the stimulation of the visual sense. This zone is specially designed to provide an intense and pleasant visual experience, using the beauty and diversity of roses. This zone is characterized by a series of pergolas, which are covered and fenced with species of *Rosa rampicante* and *Rosa floribunda*. The pergolas covered with climbing roses create spectacular flower arches, providing a picturesque setting and delicate shade for visitors.

Zone 3 is intended for the therapeutic plant landscape based on the stimulation of the auditory sense, having at its center a fountain and various pieces of flowing water. This area is designed to offer visitors a soothing auditory experience, through the relaxing sounds of water. The layout of this area is organized around a roundabout, divided into four distinct sections. Two of these sections are dedicated to aquatic elements, where species of water lilies can be found that add visual charm and contribute to creating a peaceful environment through the gentle movement of the water. The other two sections are lawned and decorated with arabesques formed by the species *Cineraria maritima* and *Iris cristata*, bringing a pleasant contrast between the green of the lawn and the colors of these plants. Groups of benches are placed around the roundabout, providing seating for visitors who want to enjoy the sounds of water.

Area 4 is designed as a space for outdoor relaxation and dining and offers visitors the opportunity to retreat and enjoy a moment of rest in the middle of nature. The layout of the area includes three groups of modular benches, each accompanied by tables, thus providing comfortable seating, harmonized with white stone inside, creating a pleasant contrast and giving an elegant and modern look to the entire space. In the center of the area there is a specimen of the *Acer macrophyllum* species, which adds a natural and decorative element to the landscape. With its rich foliage and vibrant colors during autumn, this tree offers a touch of charm and beauty around which visitors can gather and relax.

Zone 5 is designed to stimulate the sense of touch, offering visitors the opportunity to explore and interact with various textures and surfaces. This open space is designed to encourage sensory exploration through thoughtful and varied landscape design. Key elements of the zone include gravel surfaces, wooden edges, balance beams, and rocks of various sizes and shapes. These elements are strategically placed to create a diverse and engaging tactile experience. Visitors are invited to walk barefoot or touch the different surfaces to feel the varied textures and enjoy full sensory stimulation. The zone leads to a specially designed therapeutic walkway, built from ten distinct parts. Each part of the walkway offers a different texture, so people can experience a variety of tactile sensations. Materials used for this walkway include: medium gravel, clover, dried pine needles, sand, fine gravel, turf, tactile carpet, mulch, large gravel, and bark. This diversity of materials allows visitors to explore and appreciate tactile differences, contributing to a greater awareness of the sense of touch and a deeply therapeutic experience.

Fig 4. Details of the seven landscaped areas

Zone 6 is dedicated to the sense of smell, offering visitors a unique experience through a winding alley where they encounter various species of plants with distinct

and attractive scents.

The entrance to this olfactory space is through a series of arches adorned with species of *Clematis* and *Wisteria sinensis*, which, in addition to their visual beauty, also exude delicate aromas that welcome visitors in a charming way. Along the winding alley, various species of plants known for their special scents are strategically placed as *Gardenia jasminoides*, *Osmanthus heterophyllus 'Variegatus*' and *Rosa* sp., which offer a variety of delightful floral aromas. These are complemented by species such as *Rosmarinus officinalis* and *Lavandula angustifolia*, which add fresh and aromatic notes, creating a diverse olfactory palette. Around this alley other plants are strategically placed to enrich the olfactory experience and form a complete landscape (*Picea orientalis*, *Magnolia stellata*, *Lonicera*, *Pinus ponderosa*, *Pseudotsuga menziesii*, *Tilia tomentosa*, *Syringa reticulata* and *Corylus avellana*, *Viburnum plicatum)*. These plants not only add variety and texture to the landscape, but also contribute to the creation of a complex and captivating olfactory environment.

Zone 7 is designed to stimulate the sense of taste through a small fruit area. Here, various species of fruit trees are found, each contributing unique aromas and tastes. Plant species include: *Malus floribunda* - produces small, usually inedible fruits, but with high ornamental value; *Malus sylvestris* - whose small, sour fruits are edible and can be used in various preparations; Sorbus acuparia - the mountain ash, with edible red fruits used in jams and liqueurs; *Mespilus germanica* - the medlar, a tree with edible fruits that are eaten when they are well ripe or even fermented; *Amelanchier alnifolia* - a productive fruit shrub with vigorous growth; Prunus cerasifera nigra with small, sweet fruits, ideal for fresh consumption; *Ginkgo biloba* - whose seeds are edible after proper processing, although the tree is better known for its medicinal uses. In addition, the area dedicated to the sense of taste also includes an interactive alley. The goal of this area is not only to educate about biodiversity and horticulture, but also to provide a rich sensory experience, encouraging visitors to appreciate and enjoy the diversity of natural tastes.

Fig 5. Perspectives of the educational area in the field of horticulture

The area features educational containers for hands-on horticulture learning, focusing on planting, watering, care, and harvesting techniques. These containers are grouped and surrounded by vibrant Veronica species, along with *Acer circinatum* and *Clematis*. It also includes mini greenhouses that allow for observing plant life cycles, testing cultivation methods, and creating microclimates for different plants. Nearby, a plant composition of *Juniperus communis* and *Picea abies* enhances the learning environment, encouraging users to deepen their horticultural knowledge.

CONCLUSIONS

The theme of this research proposes the creation of a therapeutic and relaxing environment by stimulating the senses. Zoning involves dividing into areas dedicated to each sense, using sensory plant species to reach all the senses.

Plants were included that stimulate the visual sense through various colors and shapes, the olfactory sense through pleasant aromas, the tactile sense through various textures, the auditory sense through the delicate sounds of leaves and flowing water, and the gustatory sense through edible plants. This holistic approach transformed the garden into a space for recreation and sensory therapy, contributing to the physical and mental well-being of patients, visitors and medical staff.

The integration of sensory plant compositions and light horticultural activities in the design of the hospital garden highlights how landscaping can support the health and well-being of the community. The idea of this project can serve as a model for other medical institutions and public spaces, emphasizing the importance of the interaction between nature and the human experience.

REFERENCES

1. **Granö J.G., 1929 -** *Pure geography. The Johns Hopkins University Press.* ISBN 978-0801855917.
2. **Koura, S., Oshikawa, T., Ogawa, N., Snyder, S.M., Nagatomo, M. and Nishikawa, C. 2010 -** *Utilization of horticultural therapy for elderly persons in the urban environment*. Acta Hortic. 881, 865-868 DOI: 10.17660/ActaHortic.2010.881.145 https://doi.org/10.17660/ActaHortic.2010.881.145.
3. **Krzeptowska-Moszkowicz Izabela, Moszkowicz Ł., Porada Karolina, 2021 -** *Evolution of the concept of sensory gardens in the generally accessible space of a large city: analysis of multiple cases from Kraków (Poland) using the therapeutic space attribute rating method*, Sustainability 2021, 13, 5904. https://doi.org/10.3390/su13115904.
4. **Pallasmaa J., 1994** - *An architecture of the seven senses*. Q*uestions of perception: phenomenology of architecture,* July 1994 ed., pp. 27-37.
5. **Hussein Hasreena, 2011 -** *The Influence of Sensory Gardens on the Behavior of Children with Special Educational Needs*, Asian Journal of Environment-Behaviour Studies, Volume 2, No.4, January 2011, pp 77-93.
6. **Spence C., 2020** - *Senses of place: architectural design for the multisensory mind*. Spence Cognitive Research: Principles and Implications (2020) 5:46 https://doi.org/10.1186/s41235-020-00243-4.
7. **Vítovská, D., 2015** - *How to improve landscape and environment in Czech Republic with assistance of participatory planning*. Acta Hortic. 1099, 977-983 DOI: 10.17660/ActaHortic.2015.1099.125 https://doi.org/10.17660/ActaHortic.2015.1099.125.
8. www.maps.google.com