

USING FRUIT GROWING SPECIES IN GREEN RESTORATION OF THE CITIES PUBLIC SPACES FOR IMPROVING URBAN RESILIENCE AND SUSTAINABILITY

FOLOSIREA SPECIILOR POMICOLE ÎN RESTAURAREA VERDE A SPAȚIILOR PUBLICE ALE ORĂȘELOR, PENTRU ÎMBUNĂȚĂȚAREA REZILIENTEI ȘI DURABILITĂȚII URBANE

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Abstract.

The present paper aims to provide a comprehensive overview of the sustainability of urban gardens, highlighting their numerous benefits while also acknowledging the challenges and proposing potential solutions to ensure their long-term success. The importance of revitalizing and renewing residential spaces is essential to create an urban environment that meets the aesthetic, but also functional needs of the inhabitants. By integrating plant elements, a closer connection with nature is promoted, contributing to the creation of a friendlier and more harmonious space for the community. The focus is on the modernization of old and neglected residential neighborhoods by introducing fruit tree species in the landscape design. The objective is the rehabilitation and revitalization of urban public spaces in Orăștie municipality.

Key words: urban gardens; sustainability; green spaces; environment; rehabilitation.

Rezumat.

Prezenta lucrare își propune să ofere o imagine de ansamblu cuprinzătoare asupra durabilității grădinilor urbane, subliniind numeroasele beneficii ale acestora, recunoscând totodată provocările și propunând soluții potențiale pentru a le asigura succesul pe termen lung. Importanța revitalizării și reînnoirii spațiilor rezidențiale este esențială pentru a crea un mediu urban care să răspundă nevoilor estetice, dar și funcționale ale locuitorilor. Prin integrarea elementelor vegetale se promovează o legătură mai strânsă cu natura, contribuind la crearea unui spațiu mai prietenos și mai armonios pentru comunitate. Accentul este pus pe modernizarea cartierelor rezidențiale vechi și neglijate prin introducerea speciilor pomicole. Obiectivul este reabilitarea și revitalizarea spațiilor publice urbane din municipiul Orăștie.

Cuvinte cheie: grădini urbane; sustenabilitate; spații verzi; mediu, reabilitare.

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INTRODUCTION

Urban gardening is a hot topic in sustainability. It's a necessity in today's rapidly urbanizing modern world. As urban areas expand beyond the cities, the need for green spaces becomes more and more critical. Sustainable gardening in urban areas offers numerous benefits, not only for the environment but also for the well-being of city dwellers, offer a wealth of benefits, from environmental to social to economic.

Urban gardens can involve many forms, from rooftop farms to community plots to vertical hydroponic systems, allotments and green walls. They involve cultivating, processing, and distributing food in or around urban areas, integrating innovative gardening techniques, tools and materials. Urban gardens together with urban residents have the potential to make our cities more sustainable, resilient, and equitable, creating relaxing environment, productive spaces even in the most limited areas [Schipa et al., 2018].

By addressing the challenges and implementing innovative solutions, there could be unlock the full potential of urban gardens and create a greener, healthier future for all. Building sustainable gardens in cities is crucial for several reasons. Firstly, where cities experience higher temperatures than the surrounding areas, due to extensive constructions and asphalt, it helps combat urban heat island effects [Thierry et al., 2023]. It can be seen as a plant based solution for this matter as greenery cool these areas, improving air quality and also reducing energy consumption for cooling [Alevizos et al., 2017].

Using fruit trees species for urban gardens promote biodiversity by providing habitats for pollinators like bees and butterflies, which are essential for a healthy ecosystem [Antić et al., 2021; Smyth, 2023]. It also promotes the use of native plants, well-adapted to local climates. These species require less water, are low maintenance and make gardens more sustainable.

The best thing is that the benefits are not only environmental. Urban gardens enhance mental and physical health as well. Studies show [Carney et al., 2012] that interacting with plants can significantly reduce stress, anxiety, and depression. Gardening also provides a moderate-intensity physical activity, contributing to overall fitness especially for seniors and children. Through well-planned and integrated interventions, such neighborhoods can be transformed into vibrant communities, offering a healthy and comfortable living environment [Ippolito et al., 2018]. Nevertheless, growing your own food ensures access to fresh, organic produce, hch is healthier and reduces the carbon footprint associated with food transportation.

MATERIAL AND METHODS

The aim of this proposal was the integrated rehabilitation and revitalization of urban public spaces in Orăștie municipality, Hunedoara County.

Opportunities for these kinds of approaches are multiple, both for environment and community, from improving the quality of infrastructure, creating modern public spaces, promoting social cohesion and increasing real estate values, to the increasing the quality of life, access to recreational areas, reducing pollution and improving safety. Such projects contribute to the social and economic revitalization of the city.

The location of the site is Pricazului street, identified by nr. CF 68678, 68679, 68680, 68681, 68682 and 60636, nr. Cad. 68678, 68679, 68680, 68681, 68682 and 60636, municipality of Orăștie, county of Hunedoara (Figure 1). In Figure 2 can be seen the existing situation at the site level and the need for intervention is indisputable.

Modernizing the old and neglected residential neighborhoods is a key priority in the process of integrated rehabilitation and revitalization of urban public spaces. These areas, often marked by deteriorated infrastructure, undeveloped green spaces and lack of modern amenities, have immense potential to become attractive, functional and friendly spaces for residents.

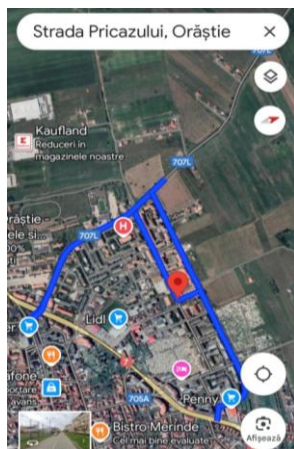


Fig 1. Site location, satellite view (maps.google.com)



Fig. 2. Current situation of the site

The focus was using fruit trees species for urban gardens. This promotes biodiversity by providing habitats for pollinators like bees and butterflies, which are essential for a healthy ecosystem. Plant composition proposed in the project is varied and lively, offering an attractive landscape the year long. The carefully chosen species complement the existing vegetation, bringing color and texture accents that beautify the spaces.

RESULTS AND DISCUSSIONS

Green restoration of the cities public spaces by using fruit growing species is a sustainable and gratifying way to introduce these species in urban gardens design wich will improve the quality of life in cities, bringing urban resilience and sustainability.

The sustainability of this approach lies in combining economic, aesthetic and functional aspects, especially of such areas, making them the primary aspects anchored in determining the choice of the most suitable crop systems.

Fruit trees with ornamental value are well represented by a great diversity of species and varieties that find, in our country, favorable climatic conditions for growth and prosperity, while ensuring decor spread throughout the year.

Fruit trees and shrubs add contrast to the landscape, becoming a central decorative element. In addition, the white-pinkish flowers, which appear in the flowering season, create an elegant contrast with the dark foliage, amplifying its visual decorative effects. In full bloom branches are slightly arched, adding a touch of elegance to the landscape composition.

General plan of the proposed solution can be seen in Figure 3.



Fig. 3. General plan of the proposed solution

In Table 1 there is the list of proposed tree, shrub and annual species. The fruit trees species as *Malus*, *Mespilus*, *Sorbus*, *Cornus* and *Corilus* were used to complete the plant compositions. Species are varied, offering an attractive interest the year long, from impressing flowering in early spring till colored or contortuos branches during winter time.

Table 1

List of proposed tree and shrub species

Nr. crt.	Specie name	Quantity
1	<i>Abies concolor Compacta</i>	17
2	<i>Acer palmatum Trompenburg</i>	24
3	<i>Acer platanoides Crimson King</i>	5
4	<i>Acer platanoides Drumondii</i>	16
5	<i>Betula pendula</i>	16
6	<i>Larix decidua Pendula</i>	8
7	<i>Picea omorika</i>	13
8	<i>Berberis thunbergii Harlequin</i>	39
9	<i>Buxus sempervirens "bila"</i>	37
10	<i>Chamaecyparis lawsoniana Ivonne</i>	53
11	<i>Cupressocyparis leylandii Gold rider "Spiral"</i>	16
12	<i>Hosta sp.</i>	76
13	<i>Hybiscus syriacus</i>	26
14	<i>Hydrangea arborensceus Annabelle</i>	25
15	<i>Juniperus Old Gold</i>	115
16	<i>Juniperus sabina</i>	67
17	<i>Juniperus scopulorum</i>	14
18	<i>Juniperus scopulorum Skyrocket</i>	38
19	<i>Juniperus squamata Blue Carpet</i>	66
20	<i>Nephrolepis exaltata</i>	98
21	<i>Physocarpus opulifolius Diablo</i>	28
22	<i>Picea pungens glauca Globosa</i>	38
23	<i>Pinus mugo var. pumilio</i>	51
24	<i>Pinus mugo Winder Gold</i>	27
25	<i>Salix integra Hakuro - Nishiki</i>	20
26	<i>Spiraea japonica Goldflame</i>	104
27	<i>Syringa vulgaris</i>	18
28	<i>Thuja plicata Fluffy</i>	11
29	<i>Cotoneaster horizontalis</i>	82
30	<i>Euonymus fortunei Emerald Gold</i>	26
31	<i>Malus floribunda</i>	12
32	<i>Mespilus germanica</i>	20
33	<i>Prunus cerasifera Nigra</i>	20
34	<i>Cornus alba Sibirica Variegata</i>	36
35	<i>Corylus avellana Contorta</i>	10
36	<i>Sorbus aucuparia</i>	15
37	<i>Lonicera kamtschatika var aedulis</i>	25



Fig. 4. Proposal for landscaping – plant compositions details



Fig. 5. Health benefits of using fruit growing species in urban gardens

The benefits of green restauration of urban spaces extend far beyond the aesthetic pleasure of outdoor activities. They are involved in crucial aspects of human life and linking in social structures, such as physical and mental health, community building, and environmental sustainability and resilience (figure 5). As urban areas continue to extend, facing tremendous challenges, the value of these urban oases will only become increasingly significant. Therefore, urban gardens with all activities they involve are not just for leisure, it's a multifaceted solution to some of the most pressing issues of the present global situation.

The importance of revitalizing and renewing residential spaces is essential to create an urban environment that meets the aesthetic, but also functional needs of the inhabitants. By integrating fruit growing species, a closer connection with nature is promoted, contributing to the creation of a friendlier and more harmonious space for the community.

CONCLUSIONS

Revitalizing and renewing residential spaces are of essential importance for create a sustainable urban environment that meets the aesthetic, but also functional needs of the inhabitants. By integrating fruit growing species is promoted a closer connection with nature, creating a friendlier and more harmonious space for the entire community and nevertheless new sources of food while assuring biodiversity.

Research on the sustainability of urban gardens typically arrives at several important conclusion linked to environmental benefits. One of the positive aspects is the improved quality of air and water. Urban gardens influence the air quality by

absorbing pollutants and reducing urban heat island effects. They also help improve water quality by reducing stormwater runoff and increasing infiltration. Climate change mitigation by sequestering carbon dioxide is another positive aspect.

Not in the end, the social and economic benefits derive from community building aspect. Green urban spaces foster a sense of community by bringing people together at different events and share knowledge. Nevertheless, it is well known the aspects linked to improvement of population health and well-being.

Activities that involves working outdoors with plants provides physical and mental health benefits, such as increased physical activity, stress reduction, and improved mental well-being. This could also bring opportunities and create jobs in areas like gardening, landscape, food processing, distribution etc.

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