

Review

The Contribution of Urban Agriculture to the Sustainable Development of Cities

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Abstract: During the period of intensive urban development, urban agriculture can serve as a significant "tool" for achieving sustainable development. There are various forms of urban agriculture, one of which is community gardens. These gardens provide a range of economic, environmental, and social benefits that contribute to the sustainable development of cities. By applying methods of analysis and synthesis, as well as the descriptive research method, this paper systematizes the benefits of urban agriculture. Additionally, the paper highlights the most significant challenges that urban agriculture faces today.

Keywords: *Urban agriculture; community gardens, economic benefits, environmental benefits, social benefits.*

1. Introduction

Urban agriculture is defined as food production that takes place in spaces within or directly adjacent to cities [1,2]. The 21st century is the era of urbanization. In 2020, 54% of the global population lived in urban areas, and projections suggest that by 2030, urban populations will make up 60% of the total population [3]. On a global scale, as much as 79% of the total food production is intended for urban populations [4]. Urbanization is more dynamic in developing countries than in developed ones. United Nations projections indicate that by 2050, urban populations will account for 68% of the world's population, thus increasing the significance of urban agriculture [5]. Urban agriculture is promoted as a "tool" for achieving sustainable development in cities [6, 7, 8, 9] and food security [10]. Sustainable development is present in the ecological, economic, and social spheres of life [11]. In current conditions, urban agriculture can play a significant role in increasing the total amount of food needed to meet the needs of the growing global and particularly urban population. Research conducted worldwide confirms that intensive urban agriculture can produce up to 140 kg of vegetables per square meter annually [12].

Urban gardens are a concept related to growing plants in urban environments. Their goal is to improve the quality of life in urban areas through food production, aesthetic enhancement of space, and the increase of green areas. There are different types of urban gardens, depending on how they are organized and how agricultural practices are applied. Four forms of urban gardens are most common: rooftop gardens, which are located on the tops of buildings; vertical gardens, where plants

are grown on walls or in specially designed structures; community gardens, which involve larger areas where multiple community members can grow plants; and balcony gardens, or small gardens on terraces or balconies [13]. The focus of this research is on community urban gardens as a form of urban agriculture. The aim of the research is to highlight the benefits that community urban gardens provide in the ecological, economic, and social spheres. Additionally, the goal is to demonstrate, based on existing experiences and research, the contribution that urban agriculture and community urban gardens make to the sustainable development of cities.

2. History of urban agriculture

The emergence and development of community urban gardens can be divided into several phases [14]. The first phase, during which the first community urban gardens in Europe appeared, is associated with the period of intense industrialization, from 1700 to 1910. Due to industrial development, air quality and hygiene conditions deteriorated, leading to health risks and poverty, particularly among the working class. The attempt to overcome these poor conditions resulted in the establishment of the first community urban gardens in the United Kingdom, Germany, France, and Belgium.

The second phase in the development of urban gardens corresponds to the period of the two world wars and the Great Depression, spanning from 1911 to 1950. During wartime, the food crisis became evident in both rural and urban areas. To mitigate these challenges, citizens engaged in local gardening communities for food production. Abandoned urban areas, city outskirts, and any available open spaces were transformed into gardens where residents grew fruits and vegetables. This method of escaping poverty was particularly prevalent in the United States and the United Kingdom.

In Eastern European socialist countries, community urban gardens were also organized, not only for food production but also as a means of promoting ideology based on solidarity and increasing motivation for work. The model of urban gardening in these countries involved the allocation of available land to social enterprises, which then distributed smaller plots to workers for personal use.

A significant date for the second phase of urban agriculture development is October 3, 1926, when the International Office of Allotment Gardens was founded in Luxembourg. Today, this organization unites national associations from Austria, Belgium, Denmark, Finland, France, Germany, the United Kingdom, Japan, Luxembourg, the Netherlands, Norway, Sweden, and Switzerland. Since 2021, it has been accredited as an observer in the United Nations Environment Assembly.

The third phase of community urban garden development spans from 1951 to 1972. After World War II, rapid urbanization led to a decline in available land for community gardens. Additionally, public interest in this type of gardening significantly decreased, primarily due to rising living standards. However, in the early 1970s, the focus shifted towards sustainable development and ecological standards, which indirectly revived interest in gardening. Unlike in wartime and crisis periods, during times of economic prosperity, urban gardening motivations transitioned from economic necessity to environmental concerns.

The fourth phase of urban garden development began in 1973 and continues today. In the current context, the benefits of community urban gardens are evident in multiple spheres: social, economic, ecological, and health-related. Wars, political instability, rising inflation, declining living standards, global health crises, human alienation from each other and from nature, as well as food crises caused by increasing climate change, have brought people back to urban gardening communities.

3. Benefits of urban agriculture and community gardens in the context of sustainable city development

The benefits of community gardens can be categorized into several segments: ecological benefits, economic benefits, impact on public health, and social cohesion within local communities [1, 15, 13, 16, 17, 18]. To fully understand these benefits, urban agriculture should be considered through its four primary functions in cities: subsistence, economy, recreation, and community building [19].

Some of the most significant benefits of community gardens identified by researchers include poverty reduction, biodiversity conservation, the production of safe and healthy food, and social sustainability [20]. Thus, the positive effects of community gardens, as an integral part of urban agriculture, can be observed in economic, ecological, and social spheres.

The exclusion of the ecological dimension from strategies aimed at achieving social development has led to the current global ecological crisis. Therefore, it is essential to highlight community gardens as a factor in achieving socially sustainable urban development without causing negative environmental consequences. Community gardens are a segment of urban agriculture that, in addition to positive production effects, provides numerous benefits on individual, community and environmental levels [21].

The ecological benefits of urban agriculture can be observed in several domains, including air, soil, water, biodiversity, temperature regulation, and energy consumption. When food production sites are significantly distant from consumption sites, food transportation contributes to air pollution through emissions of harmful gases. This fact has motivated the “localism” movement, which advocates for reducing air pollution through urban agriculture planning and development [22].

Reusing organic waste rich in nutrients from food processing and consumption as compost is another ecological advantage of urban agriculture. Compost obtained in this way can significantly improve soil quality in urban areas [1]. Given the increasing occurrence of water shortages in cities, urban agriculture can help mitigate this issue by utilizing wastewater suitable for agricultural production, thereby increasing water use efficiency [23]. The cultivation of various plant species in urban agriculture contributes to biodiversity conservation and enhancement.

Green spaces, which are becoming scarcer due to intensive urbanization, can significantly contribute to reducing temperatures during hot periods. Buildings and roads emit more heat than green spaces on hot days. Thus, promoting urban agriculture and increasing green spaces can reduce energy consumption for cooling.

A particular contribution of community gardens is the production of safe and healthy food, which benefits both the environment and public health. A survey conducted in 2015 in Santa Clara County, California, used the term „good food“ as a synonym for safe and organic food [20]. In this context, urban agriculture emerges as a strategy for improving access to safe food. Gardening enables low-income populations to access organic food. Participants in the case study described “good food” as fresh, tasty, organic, familiar, and trustworthy. They particularly emphasized that the vegetables they grow are fresher than store-bought ones. Special attention is given to pesticide-free practices, crops grown for taste and freshness rather than shelf life, as is the case in commercial production. The majority of respondents (94%) produce organic food, which is otherwise unavailable to them due to their low purchasing power [20].

In addition to ecological benefits, the economic benefits of urban agriculture, particularly community urban gardens, are highly significant. Economic benefits can be considered on individual, local, and broader economic levels. Organic agricultural production involves higher costs, leading to higher market prices for organic products [24]. This significantly limits low-income populations' ability to consume organic food. Urban gardening provides these populations with access to organic food [20]. This benefit belongs to both the ecological and economic spheres [25].

Besides reducing household expenses on fruits, vegetables, and herbs, an important economic benefit of urban agriculture is the potential for additional income sources [26, 27]. High-intensity production on small plots, characteristic of urban agriculture, can generate marketable surpluses and additional income for households selling their produce in local markets [1]. Research on community urban gardens in the United States indicates that cost savings are highest in the cultivation of peppers and tomatoes, with cost reductions depending on cultivation methods, gardeners' agricultural knowledge, and water availability [28].

Studies also show a key difference between urban agriculture in developed and developing countries: the motivations for engaging in gardening. In developed countries, people are driven by social and health motives, while in developing countries, economic necessity is the primary factor [29]. In low-income countries, populations face an unfavorable consumption model, which is a reliable indicator of low living standards. In these countries, food costs represent a significant portion of household expenditures, and price fluctuations threaten food security [30]. Thus, urban agriculture and community gardening present an opportunity to ensure food security [31, 32].

The development of urban agriculture, particularly communal urban gardens, has positive economic effects on budgets at both local and national levels. National budget savings are reflected in lower healthcare expenditures, as a diet rich in fresh fruits and vegetables positively impacts public health. Additionally, undeveloped areas on the outskirts of cities are more efficiently utilized when communal urban gardens are established. In the absence of such gardens, additional budgetary funds are required for the maintenance of these areas.

Finally, community gardens can influence the attractiveness of certain urban neighborhoods, leading to an increase in real estate prices. According to urban planning research, the presence of green spaces can raise property values in their vicinity. Namely, neighborhoods with urban gardens become more desirable for both residents and investors. However, regarding the economic benefit, it is necessary to highlight the risks associated with so-called urban gentrification. Green gentrification represents a new or intensified form of urban socio-economic inequality resulting from “green” strategies and greening interventions, such as pathways, parks, urban gardens, ecological corridors, or elements of green infrastructure [33]. As a result of green gentrification, property values rise, leading to migration and displacement of lower-income population [34]. For this reason, it is essential to emphasize that urban gardens must be carefully planned and organized to ensure the realization of fundamental principles of social sustainability [13].

Motivations for engaging in urban agriculture, particularly within communal urban gardens, also include numerous social benefits provided by this model of agricultural production. The most significant social benefits of communal urban gardens include:

- Strengthening community and social inclusion,
- Education and raising public awareness of the importance of agriculture and environmental conservation,
- Improving physical and mental health,
- Connecting generations and people from different socio-economic backgrounds,
- Cultural exchange and acceptance of diversity,
- Greater community safety,
- Social justice and food accessibility, and
- Enhancement of urban space quality.

Greater and more meaningful interaction among local community residents is one of the most significant benefits of urban agriculture, especially when organized in the form of communal urban gardens [1]. Urban gardens vary according to several criteria: they are cultivated by different types of communities, located in various areas, and may involve both individual and shared plots with varying levels of participation. However, despite these differences, all communal urban gardens have a positive impact on fostering social connections within smaller communities. Communication and mutual assistance are the most common reasons people join urban gardens [35]. Connecting with others through time spent in urban gardens, mutual support, and the exchange of produce are particularly meaningful for participants. One of the key benefits highlighted by participants in communal urban gardens is the social relationships that are formed and strengthened through collective work [20, 17]. A particularly valuable social benefit of urban gardens is the sense of belonging to a community, which is important for every individual. This is best illustrated by the statement of a participant in a study on communal urban gardens in Melbourne, who said, “You feel like you are part of something bigger” [36].

One of the most common motivations for engaging in urban gardens is the connection with nature among people living in urban environments [37]. Another highly valued motivation among participants is the sense of belonging, socializing, and connecting with other community members. In essence, the common denominator of urban life is social and environmental alienation. Urban gardens serve as places where people can overcome this sense of detachment.

A survey-based study conducted on a sample of 150 respondents in Naples, Italy, emphasizes that the two most significant benefits of communal urban gardens are mitigating the effects of urbanization and improving community well-being [7]. According to this study, the benefits of urban gardens can be categorized into two groups: individual benefits and benefits for the entire local community (Table 1).

Table 1. Individual and community benefits of community gardens.

Individual (personal) benefits	Community-level benefits
Socialization	Strengthening community ties
Sense of belonging to a community	Development and rational use of abandoned areas
Physical, mental, and social well-being	Mitigating the effects of urbanization
Improvement of agricultural knowledge	Enhancement of community-level agricultural production

Urban gardens act as a link between urban living models and so-called rural culture, fostering greater connectivity between cities and rural areas. Additionally, by engaging in gardening, urban populations increase their awareness of the importance of agriculture, the preservation of natural resources, and biodiversity.

Social motivations for engaging in urban agriculture include education, a sense of independence, and food security. Furthermore, urban gardens counteract excessive and often uncontrolled urbanization, which brings numerous negative consequences. The sense of independence experienced by gardeners has a positive impact and can be socially empowering.

When discussing food security as a motivation for urban agriculture, it is more relevant to developing countries than to economically developed regions. However, in cases such as war, drought, or pandemics, urban populations in economically developed countries may be driven by the same motivation [15]. Moreover, in countries dependent on agricultural imports, urban agriculture can significantly contribute to national food security in times of economic and/or political instability or market fluctuations [16]. The key food security question to ask is not "Can urban agriculture feed the city?" but rather "How should the city be fed?" [38].

The first research on urban agriculture dates back to the 1980s. Studies conducted during the 1990s and 2000s were criticized by some authors [39, 40] for lacking quantitative indicators of urban agriculture's contribution to food security.

4. Challenges faced by urban agriculture and community gardens

Despite the numerous advantages that community gardens provide to both individuals and local communities, their promotion and organization may encounter certain challenges and limitations. However, previous research has paid little attention to the challenges facing urban agriculture, particularly in terms of constraints on its development [29, 19]. Therefore, recommendations emphasize the need for a holistic and multidisciplinary approach in future research on this topic [41].

Key barriers or limitations to urban agriculture include negative attitudes toward gardening from certain members of society, the dominance of large producers, processors, and retail chains in the market, as well as government support that is often insufficiently motivating [1]. Additionally, there are significant challenges related to the promotion and development of community gardens as a part of urban agriculture. These challenges can be categorized into three main areas:

1. Availability of land,
2. Impact on soil quality, and
3. Financial and institutional support at the local and national levels.

First and foremost, the establishment of community gardens requires available land. Such land is usually located on the outskirts of cities and remains unused for specific purposes. However, if, according to urban development plans, the area is designated for the construction of infrastructure or other facilities, the availability of land for urban gardens may be limited [42].

The degradation of soil quality in urban areas due to heavy metals, antibiotics, and other pollutants can be a significant constraint on using such land for urban agriculture. To produce safe and healthy food, it is necessary to reduce soil contamination. This can be achieved, among other methods, by using compost, mulch, or biomass recycling [15].

Furthermore, as demonstrated by the experiences of numerous cities worldwide, the operation of community gardens is unimaginable without adequate logistical and financial support from local governments. If this support is lacking, urban gardens cannot be established, and even existing ones cannot function properly. The opinion of the local population on the organization of urban gardens is also very important. For this form of urban agriculture to succeed, there must be a positive perception among the broader public. Finally, a significant limitation to urban gardens and the distribution of their products on the local market can be large retail chains that act as market monopolists.

Findings from studies on international experiences regarding the impact of urban agriculture on food security indicate that the benefits of urban agriculture and its influence on food security cannot be achieved without adequate support from the state (national level) and local authorities, particularly regarding [43]: access to land, co-financing of input procurement, and collaboration with relevant institutions to improve citizens' knowledge of agricultural production.

According to reports from the United Nations World Food Programme, global food security has deteriorated due to armed conflicts, economic crises, and climate change [44]. The same source states that in 2023, 2.3 billion people lacked physical and economic access to sufficient quantities of safe and nutritious food. Food security is defined as: "a situation in which all people, at all times, have physical, social, and economic access to sufficient, safe, and nutritious food that meets their dietary needs and food preferences for an active and healthy life" [45].

The inability to access safe and nutritious food leads to numerous health risks, such as diabetes, cardiovascular diseases, obesity, anxiety, and depression. Therefore, the fight for food security can be characterized as a fight for public health, both globally and within individual countries. For all these reasons, financial and institutional support for the development of community gardens is one of the mechanisms for achieving better food security [46].

Community gardens are living spaces that play a crucial role in reconnecting people with nature in urban areas. Recognizing the advantages of urban gardens and, consequently, raising awareness of this concept within cities, along with the adoption of appropriate regulations, would be of great importance for urban gardening and landscape quality [47]. Despite their significant contribution to social, economic, and environmental benefits, urban gardens cannot develop spontaneously. Proper strategic planning of community gardens is essential for them fully realize their benefits for urban population [48].

The second most significant type of direct payments, in terms of their share in total funds, are subsidies for crop production. With an average participation rate of 25%, this type of subsidy absorbed a quarter of the budgetary funds allocated for direct support to agriculture. Of course, similar to livestock subsidies, subsidies for crop production also experience fluctuations in their share of the structure of direct payments from year to year. However, what remains consistent

throughout the observed period is the fact that these two types of directive incentives are consistently present, consuming approximately 70% of the budgetary funds.

Premiums, as a form of direct payments to agricultural producers, have been continuously disbursed throughout the observed period from 2015 to 2022. During this time, the highest amount of funds has been allocated and realized as milk premiums. Their share of the total direct support funds ranges from 17% in 2015 to 27% in 2021. Although they are consistently present in the agrarian budget structure, and their share of total direct support funds to agricultural production over the observed eight-year period amounts to 23%, milk premiums do not appear to provide sufficient stimulation for production. The limitation of budgetary funds in general, and consequently funds allocated to agriculture, adversely affects the economic motivation of agricultural production in the Republic of Serbia. In order to overcome the existing unfavorable situation, particularly pronounced in the livestock sector, it seems necessary to increase budgetary direct support through all types of measures, including milk premiums.

In addition to direct payments, which are the subject of analysis in this study, funds from the agrarian budget are allocated for other forms of incentives in agriculture and rural development. These include: incentives for rural development measures, special incentives, credit support, and IPARD incentives. Specifically, during the year 2020, special funds were allocated from the agrarian budget to support farmers who suffered income losses due to the Covid-19 pandemic. For this purpose, around 2.5 billion dinars were allocated in 2020 [20]. Also, in 2022, funds from the Ministry of Agriculture, Forestry and Water Management were allocated for Covid-19 interventions, including 312,000,000 dinars for the emergency purchase of cattle, 353,558,000 dinars to support flour producers, and 2,600,000,000 dinars to support sunflower producers [20].

The authors should discuss the results and how they can be interpreted from the perspective of previous studies and the working hypotheses. The findings and their implications should be discussed in the broadest context possible. Future research directions may also be highlighted.

5. Conclusions

The process of urbanization is extremely intense, as confirmed by the United Nations projections on the dynamics of urban population growth. Overcrowding, alienation from nature and people, and the destruction of biodiversity are just some of the negative effects of urbanization. For this reason, all "tools" available to ensure sustainable development in cities are welcome. Urban agriculture represents one of the mechanisms that influence the sustainable development of cities. There are various forms of urban agriculture, and one of them is community gardens. These gardens offer a wide range of ecological, economic, and social benefits, contributing to the sustainable development of urban areas. Community gardens, through interaction and teamwork, improve psycho-physical health, thus enhancing the quality of life for urban residents.

The benefits of community gardens in the domains of ecology, economy, and social life are interdependent and complementary. Nature conservation, the creation of green oases in cities, social inclusion, positive effects on nutrition quality, and access to fresh produce are just some of the benefits provided by community gardens. Indirectly, these gardens also have a positive impact on strengthening local communities. However, the development of community gardens should not be left to chance or the goodwill of individuals. The first step in developing this form of agricultural production is recognizing the need to raise awareness among the urban population about the importance of agriculture and the preservation of a healthy environment. It is essential to invest in public education and then ensure adequate financial and institutional support for this multifunctional green infrastructure at both the local and national levels.

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References

- Pearson, D., Hodgkin, K. The role of community gardens in urban agriculture. In: *Community Gardens Conference – Promoting sustainability, health and inclusion in the city*, University of Cambera 7-8 October 2010, 2010, Proceedings, 99-105
- Wagstaff, R.K., Wortman, S.E. Crop physiological response across the Chicago metropolitan region: farmers in the north central US. *Renewable Agriculture and Food Systems*, 30(1), 2015, 8-14, <https://doi.org/10.1017/S174217051300046X>
- Knorr, D., Khoo, C.S.H., Augustin, M.A. Food for an urban planet: Challenges and research opportunities. *Frontiers in Nutrition*, 4, 2018, 73, <https://doi.org/10.3389/fnut.2017.00073>
- FAO. FAO Framework for the Urban Food Agenda. In: *FAO Framework for the Urban Food Agenda*, 2019, <https://doi.org/10.4060/ca315en>
- United Nations. World Urbanization Prospects – The 2018 Revision. United Nations, 2018, New York
- Zasada, I., Weltin, M., Zoll, F. Home gardening practice in Pune (India), the role of communities, urban environment and the contribution to urban sustainability. *Urban Ecosystems*, 23(2), 2020, 403–417, <https://doi.org/10.1007/s11252-019-00921-2>
- Tapia, C., Randall, L., Wang, S., Borges, L.A. Monitoring the contribution of urban agriculture to urban sustainability: an indicator-based framework. *Sustainable Cities and Society*, 74(2021), 2021, 103130, <https://doi.org/10.1016/j.scs.2021.103130>
- Smith, J.P., Meerow, S., Turner, B.L. Planning urban community gardens strategically through multicriteria decision analysis. *Urban Forestry & Urban Greening*, 58(2):126897, 2020, DOI: 10.1016/j.ufug.2020.126897
- Fors, H., Ambrose-Oji, B., Konijnendik van den Bosch, C., Mellqvist, H., Jansson, M. Participation in urban open space governance and management. In: *Marit Jansson & T.B. Randrup (Eds.), Urban Open Space Governance and Management*, p. 112-128, <https://doi.org/10.4324/9780429056109>
- Caputo, P., Zagarella, F., Cusenza, M.A. Energy-environmental assessment of the UIA-OpenAgri case study as urban regeneration project through agriculture. *Science of the Total Environment*, 729, 2020, <https://doi.org/10.1016/j.scitotenv.2020.138819>
- Duletić, R., Đurić, K., Tomaš-Simin, M. Ecotourism as a factor of Sustainable Rural Development. *Journal of Agronomy, Technology and Engineering Management*, 7(6), 2024, 1271-1275, DOI: 10.55817/QHOV7865
- Armanda, D.T., Guinee, J.B., Tukker, A. The second green revolution: Innovative urban agriculture's contribution to food security and sustainability – A review. *Global Food Security*, 22, 2019, 13-24, <https://doi.org/10.1016/j.gfs.2019.08.002>
- Tapia, C., Randall, L., Wang, S., Borges, L.A. Monitoring the contribution of urban agriculture to urban sustainability: an indicator-based framework. *Sustainable Cities and Society*, 74, 2021, 103130, <https://doi.org/10.1016/j.scs.2021.103130>
- Keshavarz, N., Bell, S. A History of Urban Gardens in Europe. In S. Bell, R. Fox-Kaemper, N. Keshavarz, M. Benson, S. Caputo, S. Noori, A. Voigt (Eds.), *Urban Allotment Gardens in Europe*, 2016, 8-32, New York
- Lal, R. Home gardening and urban agriculture for advancing food and nutritional security in response to the COVID-19 pandemic. *Food Security*, 2020, 12, 871-876, DOI: <https://doi.org/10.1007/s12571-020-01058-3>
- Millstone, E. The atlas of food: Who eats what, where and why, 2013, London: Eartscan
- Ilieva, R.T., Cohen, N., Israel, M., Specht, K., Fox-Kamper, R., Fargue-Lelievre, A., Ponizy, L., Schoen, V., Caputo, S., Kirby, C.K., Goldstein, B., Newell, J.P., Blythe, C. The Socio-Cultural Benefits of Urban Agriculture: A Review of the Literature. *Land*, 11, 2022, 622, <https://doi.org/10.3390/land11050622>
- Filipović, V., Ugrenović, V., Rogoznica, N., Šuštrešić, L., Ilchev, A., Samardžić, D. Urban Farming for Beginners – Urban farming education for sustainable future. *Forum CSRD*, 2023, Skopje
- Hallegatte, S., Green, C., Nicholls, R.J., Cofree-Morlot, J. Future flood losses in major coastal cities. *Nature Climate Change*, 3(9), 2013, 802-806, <https://doi.org/10.1038/nclimate1979>
- Diekmann, L.O., Gray, L.C., Baker, G.A. Growing “good food”: urban gardens, culturally acceptable produce and food security. *Renewable Agriculture and Food Systems*, 35(2), 2020, 169-181, DOI: <https://doi.org/10.1017/S1742170518000388>
- Okvat, H.A., Zautra, A.J. Community Gardening: A Parsimonious Path to Individual, Community, and Environmental Resilience. *American Journal of Community Psychology*, 47(3–4), 2011, 374–387, <https://doi.org/10.1007/s10464-010-9404-z>

22. Edwards, F., Mercer, D. Meals in metropolis: Mapping the urban foodscape in Melbourne, Australia. *Local Environment*, 15(2), **2010**, 153-168
23. Barker-Reid, F., Harper, G.A., Hamilton, A.J. Affluent effluent: Growing vegetables with wastewater in Melbourne, Australia, a wealthy but bone-dry city. *Irrigation & Drainage Systems*, 24(1/2), **2010**, 79-94
24. Milić, D., Tomaš Simin, M. Economics of Organic Carrot Production through Case Study Report. *Journal of Agronomy, Technology and Engineering Management*, 6(1), **2023**, 73-884, <https://doi.org/10.55817/uqrf7578>
25. Bell, S., Fox-Kaemper, R., Keshavarz, N., Benson, M., Caputo, S., Noori, S., Voigt, A. Urban Allotment Gardens in Europe, **2016**, 1-7, New York, Routledge.
26. Glavan, M., Čerňič Istenič, M., Cvejić, R., Pinter, M. Urban Gardening: From Cost Avoidance to Profit Making – Example from Ljubljana, Slovenia. In: M. Samer (Ed), *Urban Agriculture*, **2016**, 23-42, <https://doi.org/10.5772/6231>
27. Glavan, M., Schmutz, U., Williams, S., Corsi, S., Monaco, F., Kneafsey, M., Pinter, M. The economic of urban gardening in three European cities – examples from Ljubljana, Milan and London. *Urban Forestry and Urban Greening*, 36(September), **2018**, 100-122, <https://doi.org/10.1016/j.ufug.2019.10.09>
28. Algert, S.J., Baameur, A., Renvall, M.J. Vegetable output and cost savings of community gardens in San Jose, California. *Journal of the Academy of Nutrition and Dietetics*, 114(7), **2014**, 1072-1076, <https://doi.org/10.1016/j.jand.2014.02.030>
29. Wadumestridge Dona, C.G., Monah, G., Fukushi, K. Promoting Urban Agriculture and Its Opportunities and Challenges – A Global Review. *Sustainability* 13, **2021**, 9609, <https://doi.org/10.3390/su13179609>
30. Tamirat, N. Adoption of Chemical Fertilizer Technology and Household Food Security , in Southern Ethiopia, in Case of Soro District in Hadiya Zone. *Journal of Agronomy, Technology and Engineering Management*, 4(1), **2012**, 558-576
31. Poulsen, M.N., McNab, P.R., Clayton, M.L., Neff, R.A. A systematic review of urban agriculture and food security impacts in low-income countries. *Food Policy*, Vol. 55, **2015**, 131-146, <https://doi.org/10.1016/j.foodpol.2015.07.002>
32. Korth, M., Stewart, R., Langer, L., Madinga, N., Rebelo Da Silva, N., Zaranyika, H., Van Rooyen, C., De Wet, T. What are the impacts of urban agriculture programs on food security in low and middle-income countries: a systematic review. *Environmental Evidence*, 3(21), **2014**
33. Anguelovski, I., Connolly, J.J., Garcia-Lamarca, M., Cole, H., Pearsall, H. New scholarly pathways on green gentrification: What does the urban “green turn” mean and where is it going? *Progress in Human Geography*, 43(6), **2018**, <https://doi.org/10.1177/0309132518803799>
34. Checker, M. The Sustainability Myth: Environmental Gentrification and the Politics of Justice. **2020**, <https://doi.org/10.18574/nyu9781479835089.001.0001>
35. Veen, E.J., Bock, B.B., Van den Berg, W., Visser, A.J., Wiskerke, S.C. Community gardening and social cohesion: different designs, different motivations. *The International Journal of Justice and Sustainability*, 21(10), **2016**, 1271-1287, <https://doi.org/10.1080/13549839.2015.1101433>
36. Kingley, J., Foenander, E., Bailey, A. „You feel like you are part of something bigger“: exploring motivations for community garden participation in Melbourne, Australia. *BMC Public Health*, 19, **2019**, 745, <https://doi.org/10.1186/s12889-019-7108-3>
37. Cumbers, A., Shaw, D., Crossan, J., McMaster, R. The work of community gardens: reclaiming place for Community in the City. *Work Employ Soc.*, 32(1), **2018**, 133-149
38. Valley, W., Wittman, H. Beyond feeding the city: The multifunctionality of urban farming in Vancouver. *BC. City Culture and Society*, Vol. 16, **2019**, 36-44, <https://doi.org/10.1016/j.ccs.2018.03.004>
39. Ellis, F., Sumberg, J. Food production, urban areas and policy responses. *World Departement*, 26(2), **1998**, 213-224, [https://doi.org/10.1016/S0305-750X\(97\)10042-0](https://doi.org/10.1016/S0305-750X(97)10042-0)
40. Battersby, J. Hungry Cities: A Critical Review of Urban Food Security Research in Sub-Saharan African Cities. *Geography Compas*, 7(7), <https://doi.org/10.1111/gec.3.12053>
41. Pearson, C.J. Regenerative, semiclosed Systems: A priority for twenty-first-century agriculture, *BioScience*, 57(5), **2007**, 409-409
42. Filkobski, I., Rofo, Y., Tal, A.. Community gardens in Israel: Characteristics and perceived functions. *Urban Forestry and Urban Greening*, 17, **2016**, 148-157, <https://doi.org/10.1016/j.ufug.2016.03.014>
43. Mead, B.R., Duncombe, T., Gillespie, R., Pugh, N., Hardman, C.A. Does urban agriculture contribute to food security, and how might this be achieved? *Proceedings of the Nutrition Society*, **2024**, 1-9, doi: 10.1017/S0029665124002209
44. World Food Program. A Global Food Crisis, **2023**, available at <https://www.wfp.org/global-hunger-crisis>

45. FAO. Trade Reforms and Food Security: Conceptualizing the Linkages, Food and Agricultural Organization UN, **2005**, Rome
46. Bitti, O., Blagaić Bergman, M. Urbani vrtovi u Zagrebu – ulaganja i izloženost, inicijative i perspective. *Sociologija i Prostor*, 52(3), **2014**, 261-277, <https://doi.org/10.5673/sip.52.3.2>
47. Đokić, V, Ristić Trajković, J., Furundžić, D., Krstić, V., Stojiljković, D. Urban gardens as lived space: Informal gardening practices and dwelling culture in socialist and post-socialist Belgrade. *Urban Forestry & Urban Greening*, Vol. 30, **2018**, 247-259, <https://doi.org/10.1016/j.ufug.2017.05.014>
48. Costa, S., Fox-Kamper, R., Good, R., Sentić, I. The position of urban allotment gardens within the urban fabric. In book: *Urban Allotment Gardens in Europe*, Edition 1, **2016**, <https://doi.org/10.4324/9781315686608-9>



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