

## HARNESSING URBAN AGRICULTURE TO TACKLE INEQUALITY: 10 LESSONS FROM THE EDIBLE CITIES NETWORK FOR ROMANIA

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### Abstract

*In recent decades, the pursuit of sustainable solutions to address the challenges of feeding a rapidly growing global population has been a central focus of international programs and mechanisms. Romania, in alignment with these global efforts, has been progressively advancing toward a self-sustainable economy, with significant investments in sustainable and green agriculture. This ongoing commitment to sustainability supports our decision to analyse the outcomes of the Edible Cities Network project, part of Horizon2020 initiative. Our objective is to explore how the principles and practices promoted by this initiative and the outcome of individual projects can be effectively implemented in Romania, contributing to the achievement of the nation's sustainability goals and enhancing food security, in a conscious effort to fight inequality in large urban centres.*

**Key words:** urban agriculture, EdiCitNet, sustainable food systems, inequality

### INTRODUCTION

As the world population continues to grow, the need to ensure food accessibility, affordability, security, and sustainability becomes more and more pressing. The Department of Economic and Social Affairs (DESA) from the United Nations predicts that by 2050, the world population will increase by 25% surpassing 10 billion people, with more than 68% living in urban areas (10% more than today) [36]. Romania's perspectives are no different than the ones we identified globally. Romania currently finds itself in an increasing urbanization process, like most of Europe [16]. The same UN-DESA data places the urban population in Romania at 54.49%, with the prospect of reaching 66.7% by 2050. This increased level of urban-living citizens results in numerous challenges related to food accessibility, availability and affordability.

It is safe to say that such a change in demographics and living conditions will significantly challenge traditional food chains, increasing the need to find innovative approaches to food production [30]. While traditional agriculture has long been the pillar of food supply chains everywhere, providing

the majority of the world's food and accounting for more than 80% of the world's food production, urban agriculture has emerged as a complementary solution that can help meet the growing demand for food in cities. The necessity to bring food production in an urban setting arose especially as urbanization accelerates, leading to the availability of labour resources in rural areas becoming scarce [15], and to a surge in consumption needs within densely populated urban centres due to rising populations. In response to the limitations of traditional agriculture and the challenges posed by increasing urbanization, urban and peri-urban agriculture gained momentum as viable solutions to improving food security and sustainability in cities [24]. According to the European Commission, Urban Agriculture, also shortened as UA in the current research paper, represents "the practice of cultivating, processing, and distributing food in or around urban areas" [13]. As an alternative to traditional agriculture, urban agriculture involves the cultivation of crops and rearing of animals within or around cities, utilizing available spaces such as vacant lots, rooftops, balconies, and community gardens, providing a complementary approach by bringing food

production closer to consumers, reducing the need for long-distance transportation, and lowering the carbon footprint associated with food distribution. It is estimated that UA can provide between 15-20% of the world's food necessary involving more than 800 million people in the sector [18], the sector being led by cities like Singapore which has become self-reliant on meat and could provide up to 35% of its fruits and vegetables, solely through urban agriculture, Berlin where more than 60,000 people are involved in UA projects [10] or Rotterdam which has fully integrated urban agriculture in its core [6].

Despite their complementary roles, both urban and traditional agriculture face challenges that must be addressed to ensure a sustainable food future. Traditional agriculture, while productive, often struggles with sustainability issues, and large-scale monoculture farming frequently depletes soil nutrients, requires significant water usage, and contributes to greenhouse gas emissions. Also, traditional farms are often located far from urban centres, making food supply chains vulnerable to disruptions, generating higher costs and a higher carbon footprint. On the other hand, UA challenges related to scalability, profitability, production resources access, and local policy support. Often, urban farms tend to be smaller in scale, which can limit their ability to produce large quantities of food, and due to their innovative nature, more often than not they are met with resistance in their respective communities.

Recognizing the paramount importance of finding long-term sustainable solutions for feeding the world and seeing urban agriculture as a worthwhile pursuit, the EU developed several projects under the Horizon 2020 program and subsequently in Horizon Europe focused on UA initiatives, recognizing the potential they hold for addressing national challenges such as food inequality, urban sustainability, and social inclusion. Several projects directly focused on UA, such as:

- Edible Cities Network (EdiCitNet/ECN) [11] – which focuses on creating "edible cities" where food production is seamlessly integrated into urban spaces—ranging from community gardens and rooftop farms to

edible landscapes in public areas. The project aims not only to increase local food production but also to foster social inclusion by involving diverse community groups in urban farming activities.

- URBAN GreenUP [33] - a project designed to re-nature cities through innovative green infrastructure, including urban agriculture. The project focuses on integrating nature-based solutions into urban planning, with a strong emphasis on sustainability and climate resilience by transforming underutilized urban spaces into productive green areas.

- CITYFOOD and Aquaponic [5] - focuses on aquaponics—a sustainable system that combines aquaculture (raising fish) with hydroponics (growing plants in water) in urban settings.

- SUPURBFOOD [32] - focuses on short food supply chains and urban-rural linkages. It aims to strengthen local food systems by promoting urban agriculture and connecting urban consumers directly with local farmers.

- ReGreenation [29] – whose main purpose is to bring again green spaces in large cities and deliver greener communal spaces to communities.

While Romania's participation in this type of project is still emerging, the country has begun to leverage the opportunities provided by EU-funded initiatives to adapt and implement urban agriculture strategies suited to its unique context.

We have chosen to focus the current paper on the lessons provided by the Edible Cities Network because although Romania was not a primary partner in the project, Romanian cities and research institutions have shown interest in the best practices and innovations developed by EdiCitNet. These include initiatives related to community gardens, urban farms, and the transformation of public spaces into edible landscapes bringing valuable information on how they have succeeded and made viable long-term UA projects.

## **MATERIALS AND METHODS**

To explore our research topic, we've chosen to dissect case studies from cities that are part

of the Edible Cities Network, that have successfully implemented in the past years urban agriculture projects, offering a wide range of experiences that could be implemented in Romania's larger cities. Our research will focus on understanding how these initiatives were implemented and the subsequent results.

By analysing both the advantages and the challenges faced by these cities, we aim to extract practical insights for future Romanian projects providing insights that could be instrumental in developing local economies and strategies for modernizing Romania by considering the economic implications of sustainability, biophilia theory, built-environment cognitive processes, as well as of general urban growth. We are using publicly available data from both the EdiCitNet website and the cities' own reports.

## RESULTS AND DISCUSSIONS

While Romania's percentage of land used for agriculture (55%) is fairly above the European average of 39.1% (Fig.1), the country still imports more than half of its food products.

There is however a concerning trend regarding the decrease of the percentage of land destined for agricultural production in Romania, especially in the context of growing urbanization. Statistics from the World Bank show that in the past 34 years, the share of land used for agriculture in Romania dropped by almost 12% [35]. This massive shift occurred on the premises of large societal changes in land ownership, urbanization, or deforestation [26]. Shall this trend continue, Romanian food production will dramatically decrease, forcing the country to focus on different production technologies like smart farming technologies, controlled environment agriculture, aquaponics, or vertical farming, all options fit to urban and peri-urban agriculture [25].

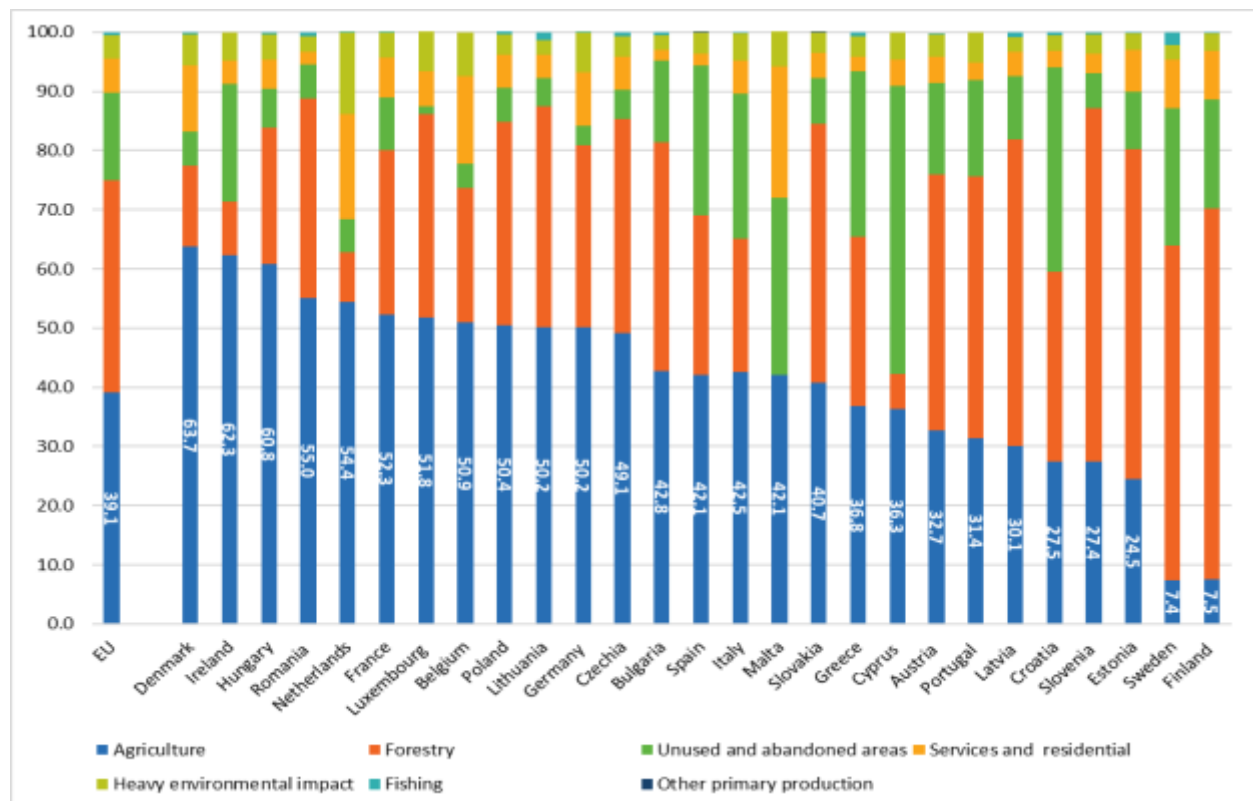


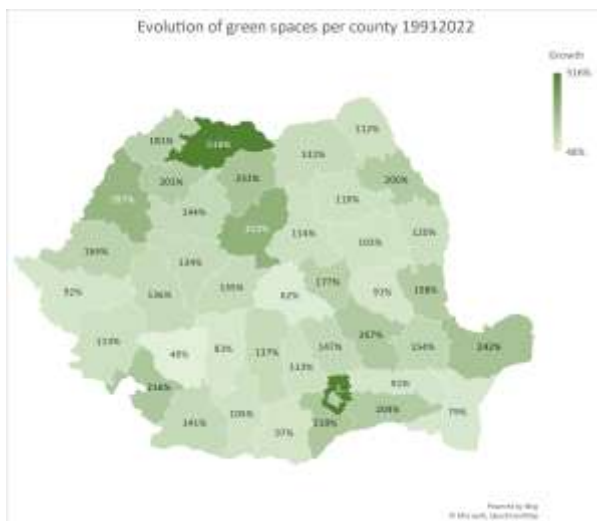
Fig. 1. Destination of land usage, percentages, 2018 (% of total area)  
 Source: Eurostat [12].

According to long-term strategies developed by Romanian authorities [21, 22] there is a high interest in transitioning the Romanian cities towards more sustainable and green

communities. We have noticed that even if the urbanization degree of Romania has increased, so have the green spaces for each county. Overall, there was a growth of over

more than 45%, the counties with the largest developments being Bihor, Bistrița-Năsăud, Buzău, Călărași, Giurgiu, Iași, Ilfov, Mehedinți, Mureș, Sălaj or Tulcea who doubled, tripled or more the entire urban green area. On the opposite spectrum, Brașov, Constanța, Gorj, and Vâlcea dramatically decreased the urban green area in the county with more than 20% decrease (Map 1).

Developing urban agriculture spaces within the cities would simultaneously hit two goals in the long-term development of Romania because they would both positively impact food security and accessibility, and they would help reduce pollution and decrease the temperature in large urban concentrations.



Map 1. Evolution of green spaces per county 1991-2022.

Source: INSSE [23].

Currently, Romania has several attempts at urban gardening and implementing UA projects, but most of them are local, small initiatives that are not translated into communal initiatives applicable on a larger scale. Our country is not an official partner of the EdiCitNet project and does not have any candidate cities. However, there are some UA projects currently running, mostly in the largest urban centres in the country.

A local initiative has been acknowledged by the EdiCitNet program, being rewarded for the “Most Innovative Individual Action”. CUIB from Iași County won this award at the Edible Cities Network Awards in 2023, for holistically including in its business model

sustainable-produced ingredients [28]. They focus on providing meat-free meals to reduce the businesses’ overall carbon footprint, they reduce the plastic waste they produce by using glass recipients for drinks, not having one-time use cutlery and choosing en-gros ingredients with minimal packaging, they choose locally sourced ingredients and when not possible they select Fair Trade suppliers [8]. Also, they try to spread their philosophy to their entire community by involving them in charity projects aimed at increasing food access to underprivileged individuals and they reward using non-polluting means of transport such as bikes.

Other local UA initiatives include projects like UrbanCultor [34] which is working towards developing and implementing UA solutions for both private and public companies, AcademiadeCompost focuses on finding ways to redirect organic waste toward composting [1], ClimatoSfera focuses on using UA and waste management to improve the living environment [3], Ultragreens [20] who started implementing micro greenhouses in large hypermarkets and recently launched the first Vertical Agriculture Green Hub in Romania, and Gradinescu project [14] that started 9 urban gardens by partnering with the local authorities and involving the local community.

However, while all these small projects are gaining traction in their respective communities, it is still insufficient, and it is important to look towards other successful projects and try to learn from their experience. The EdiCitNet program aims to tackle inequality by creating the necessary framework for introducing green, edible landscapes into current urban environments. By aligning these initiatives with city planning projects, the program promotes community-led agriculture, creating opportunities for local food production, enhancing access to nutritious food, and fostering social cohesion improving urban sustainability, empowering marginalized communities by offering them both economic opportunities and a stake in their urban spaces, and subsequently resulting in the reduction of socio-economic inequalities [11].

Several scientific papers map the results for the Edible Cities Network, providing insight into the viability and the benefits provided by integrating such projects in our current urban setting. The full ECN consists of 53 solutions, 66 initiatives, and 5 communities spread all around the world (Map 2).

The Edible Cities defined in the project are Andernach and Berlin in Germany, Oslo in Norway, and Rotterdam in the Netherlands. These cities act as sources of inspiration and serve as "Living Labs" where nature-based solutions are put into practice, offering a model for other cities to adopt and adapt within their own communities.



Map 2. Map of The European Edible Cities Network  
(Locations not shown on map: USA, Ecuador, Jordan, and Somalia)

Source: Source: Edible Cities Network [11].

The EdiCitNet is an integrated ecosystem of its own, providing through its platform a meeting place for experts and interested parties to share knowledge, best practices, and resources among cities, researchers, practitioners, and policymakers, fostering collaboration on edible city solutions, allowing cities to learn from each other and co-create urban agriculture strategies tailored to their local contexts.

For us to be able to adopt lessons from the ECN into Romania's long-term strategy for tackling inequality by developing urban

agriculture systems, it is essential to consider Romania's specific socio-economic, political, and environmental contexts, and figure out which approach is the best. Urban agriculture can be a tool playing a significant role in addressing socio-economic inequalities by enabling access to affordable, healthy food, creating new job opportunities, and fostering community cohesion.

### **Lesson 1 – The power of multistakeholder partnerships**

Developing a sustainable UA project is not feasible for only one entity because creating a circular economy approach for this type of endeavour requires expertise and input from multiple stakeholders. Obtaining the support and engagement of key players like local authorities, experts on different levels for each part of the project, and ultimately the destination community who will directly benefit from the produce is essential for the success of the project. The city of Andernach [31] (Germany) is the best example for this lesson, demonstrating that involving collaboration between local government, community groups, and private stakeholders helped transform public spaces into edible landscapes accessible to all citizens, regardless of socio-economic status. From kindergarten to young teens to adults, all members of the community from all social contexts are involved in sustaining the 11 projects from Andernach. By using a similar approach, Romania could involve representatives from marginalized communities, such as low-income neighbourhoods, minorities, and unemployed youth to help directly plan and implement urban agriculture initiatives that are inclusive and address the needs of those most affected by socio-economic inequalities. By focusing on public spaces in underdeveloped areas of the large cities, Romania can create inclusive urban gardens that provide both food and social cohesion creating a sense of responsibility and belonging.

### **Lesson 2 – Relevance within context**

Not every neighbourhood is suitable for such a project, not every part of the city will ultimately be involved in UA developments. It is imperative to correctly assess the suitability



of the physical locations and to identify the areas with the highest levels of socioeconomic disadvantage to provide accessible, affordable food options and foster economic opportunities through local food production. The Urban Gardens in Tempelhof [2] are a fit example for this lesson, because through fostering the local garden they have created a space for learning, socializing and multicultural exchanges while simultaneously helping residents of the poorer district of Neukölln to participate in the project and benefit from the results of the garden. Similarly, Romania can conduct local assessments to identify unused urban spaces, like abandoned lots or rooftops, in disadvantaged neighbourhoods and convert them into community gardens where engaging residents in planning and managing these gardens ensures that the initiatives meet the community's specific needs and help the less fortunate members of the community.

### **Lesson 3 – Building policies for growth**

Implementing measures that help start and sustain urban agriculture projects that are community-oriented can help the inquisitive minds that have the ideas but do not have the proper support for them. For example, creating subsidies or financial incentives for urban agriculture projects in targeted areas, or implementing policies that prioritize the allocation of urban farming plots could help those interested in developing such UA projects. Also, ensuring that urban agriculture is incorporated into city planning in a way that prioritizes access for all residents, no matter their social status can help the citizens get more involved with the urban gardens and have more awareness of their benefits. The best example in this case is the city of Rotterdam, which is one of the first cities to create a complex food strategy [6, 7] and has created the Food Council, a body consisting of representatives from various sectors, including local government, NGOs, and businesses, who help promote sustainable food policies and urban agriculture focusing on creating inclusive, participatory governance structures. By encouraging and developing similar councils or governance frameworks, Romania can ensure that urban

agriculture policies are inclusive and promote equitable access to resources and opportunities, particularly, but not exclusively, for marginalized communities.

### **Lesson 4 – Cultivating minds not only the land**

What vulnerable groups suffer the most from, especially in large cities, is a lack of access to education and tools to elevate their status quo. Developing educational programs that focus on teaching urban agriculture skills to low-income residents, particularly in areas with high unemployment could mean a step forward toward building their independence, their self-confidence and self-worth. These programs can empower individuals by providing them with new skills, fostering self-sufficiency, and opening up new economic opportunities, therefore creating opportunities for a better life. Launching community-based initiatives that encourage collective action and community building through urban agriculture can also raise awareness in the area about the social inequities in the community and help different social groups better co-exist by understanding the challenges and difficulties the less fortunate experience. Such programs can help bridge social divides, build social capital, and strengthen community resilience against socio-economic challenges. The Linderud Community Garden in Oslo [17] is designed to engage the local community in sustainable food practices and environmental stewardship by offering workshops, training sessions, and educational programs for all age groups, particularly targeting schools, families, and marginalized communities to foster a hands-on learning environment. Romania can draw inspiration from Linderud by developing community gardens that serve as educational hubs, offering practical training in urban farming techniques and sustainability practices, making these gardens centres for community events, fostering social cohesion while teaching valuable skills that can improve food security and environmental awareness among local residents, especially in underprivileged areas.

### **Lesson 5 – Food for all**

Direct actions towards measures that enhance food security in low-income neighbourhoods

by supporting community gardens, urban farms, and food cooperatives can provide affordable, healthy food options and reduce dependence on expensive, processed foods, thereby addressing food insecurity and improving public health. Encouraging sustainable farming practices that are accessible and affordable for low-income communities by promoting methods such as composting, rainwater harvesting, and permaculture as parts of urban agriculture can help communities reduce costs and build resilience against economic and environmental shocks. Losæter Urban Farm from Oslo, Norway [19] for example, integrates sustainable practices like composting and permaculture and serves as a community hub for learning and food production, particularly supporting local low-income residents. Locally, in Romania the authorities could help develop urban farms in disadvantaged neighbourhoods, focusing on sustainable practices that reduce costs and build resilience, thereby enhancing food security for vulnerable groups.

#### **Lesson 6 – Overcoming challenges in urban farming**

Creating financial mechanisms such as microloans, grants, and subsidies to support low-income individuals and community groups in starting and maintaining urban agriculture projects combined with simplifying regulatory processes to make it easier for disadvantaged groups to access land and resources for urban farming can help sustain UA projects long term. Additionally, by offering targeted training and technical support to low-income communities to help them overcome barriers to entry into urban agriculture (this could include skills training, access to farming equipment, and ongoing mentorship to ensure long-term success) the chances of UA projects to succeed increase. DakAkker rooftop farm [9] portrays this attitude by becoming an example in using alternative spaces for urban agriculture. The farm was the first of its kind, and the largest rooftop farm in Europe. Over 1,000 m<sup>2</sup> of rooftop is used to grow vegetables, raise bees and chickens, providing local products to restaurants and stores. The farm is also a

learning hub for children of all ages and has become a sought-after tourist spot. Romania could introduce a similar program to ease land access for urban agriculture in underserved areas, offering microloans or grants to community groups and simplifying bureaucratic processes of obtaining proper paperwork, to encourage participation in the urban agriculture projects.

#### **Lesson 7 – Plan, Do, Monitor, Evaluate, Adapt, Repeat**

Just starting an urban agriculture hub is not enough. By creating frameworks to monitor and evaluate the impact of these projects on reducing socio-economic inequalities and using data to assess whether initiatives are effectively reaching and benefiting disadvantaged groups, stakeholders can adapt their strategies as needed to ensure equity and sustainability are achieved long-term. Brighton & Hove Food Partnership [4] in Brighton, UK closely monitors all its urban agriculture initiatives to assess their impact on food security and social cohesion, using this data to refine and adapt strategies. Romania can use this example to develop monitoring frameworks for evaluating the impact of urban agriculture on reducing socio-economic inequalities, using data-driven approaches to adapt and improve programs over time.

#### **Lesson 8 – Going digital**

In a digital era, any urban agriculture initiative must remain connected to virtual communities, taking advantage of its easy reach and possibilities of growth. An inclusive digital hub that provides resources and tools specifically tailored for vulnerable communities and marginalized groups interested in urban agriculture could offer free training materials, access to micro-loans, and a directory of easily accessible support services. By using digital tools to connect low-income urban farmers and community groups with potential mentors, funders, and technical experts the hub could provide the support and resources needed to sustain and grow urban agriculture initiatives. In this case, the EdiCitNet Platform [11] is the best example, because it serves as a digital hub for sharing resources, best practices, and connecting urban agriculture practitioners

globally, fostering collaboration and knowledge exchange. Romania has the advantage of being an IT-friendly country, and could easily find partners to develop a similar digital hub specifically focused on local specificities, providing resources and tools tailored to local needs, particularly those of vulnerable communities, encouraging widespread participation and innovation.

### **Lesson 9 – Access to funding**

The most common problem when developing a project, no matter how large or small, is the funding aspect. When planning for funding urban agriculture initiatives the authorities should prioritize grants and investments that target underserved communities, while being well aware of the fact that the monetary return of investment might be negative. Accessing EU funding opportunities and finding private sector partners to secure resources that specifically support urban agriculture projects aimed at reducing socio-economic inequalities is the best option to reduce the burden of financing the projects on private investors or local authorities. By fostering partnerships with private companies that have a strong commitment to social impact and corporate social responsibility the projects can find funding, resources, and expertise to support urban agriculture initiatives that benefit vulnerable communities. Prinzessinnengarten, in Berlin, Germany [27] is a community garden that has successfully secured diverse funding sources to support its operations and growth by utilizing a mix of public funding, private sponsorships, crowdfunding campaigns, and revenue from selling produce and hosting events. Romania can explore diverse funding avenues, prioritizing grants and investments targeting underserved communities, and establishing public-private partnerships to support initiatives aimed at reducing socio-economic disparities, having the added benefit of being part of the EU and having access to funds through initiatives like Horizon Europe.

### **Lesson 10 – Integrating urban agriculture with national and European goals.**

Romania needs to ensure that its urban agriculture strategy is on the same wavelength with broader national and EU goals for social

equity, food security, and sustainability, by taking advantage of more complex frameworks like the European Green Deal and the Farm to Fork Strategy to support initiatives that aim to reduce socio-economic disparities. By accessing the EU's social funding mechanisms that support projects addressing poverty and social inclusion, Romania's cities could obtain resources to develop and scale urban agriculture initiatives that empower disadvantaged communities.

The Edible Cities Network has been a European-funded initiative, successfully reaching 18 countries and receiving an overwhelmingly positive response in every city it touched. This success is evident in the ongoing operation of these urban farms, which continue to thrive even after the project's completion, largely maintained by the local communities and the local authorities.

## **CONCLUSIONS**

Romania's long-term strategy on environment and climate sustainability has as a focal point increasing food and nutrition security. A goal, achievable through integrating various methods but including urban agriculture and peri-urban agriculture. While this topic is not currently properly developed, the local government with help and support from the EU is planning on increasing access to food and reasonable pricing by supporting urban agriculture endeavours.

The current paper underlines the transformative potential of urban agriculture as a key strategy for reducing inequality, enhancing sustainability, food security, and community well-being in urban environments by fostering collaboration across sectors and communities. Cities can develop adaptive, sustainable urban agriculture solutions that effectively address local needs and contexts, and strengthening policy support, education, and innovation is essential to building resilient, inclusive, and sustainable urban food systems that can adapt to future challenges. As Romania's cities continue to explore, understand, and implement the lessons learned from the Edible Cities Network, they pave the



way for a more sustainable and equitable urban future, where nature-based solutions play a central role in reducing inequalities and shaping urban resilience and sustainability. To meet the challenges of feeding a growing urban population, both traditional and urban agriculture must continue to innovate, to enhance productivity and reduce environmental impacts while maximizing food production by navigating the limited availability of resources.

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