This report was compiled by Tobias Stuttars, Turing Scheme trainee at the Centre for European Volunteering (CEV) from the University of East Anglia (UEA). The report is based on information gathered from online research. This is a preliminary study to gather information about the impact of volunteer-led urban and community gardening initiatives in the EU on waste reduction, food security, and improving living standards.

How volunteer urban/community gardening within the EU can reduce waste, food miles, and improve food security and living standards

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Introduction

The importance of urban gardening cannot be understated, with the UN predicting that 68% of the world population will live in urbanised areas by 2050 (United Nations, 2018). Additionally, the use of aggressive pesticides in large-scale farming - which itself accounts for 20-30% of greenhouse gas emissions within the UK (Enviro, 2024) - has led to a degradation of soils and particularly biodiversity which has a huge impact on our natural environment (Centre for Biological Diversity, 2021). Urban gardening communities aim to tackle this, not only on the issue of food production, but also by setting up eco gardens within cities, with ecologically beneficial plants for natural wildlife. It is increasingly important to explore these alternatives to typical farming methods as we move to this more urbanised world.

This urban shift has led to: an uptake in urban farming collectives and individual small scale urban gardens within cities; a major increase in 'local food movements', promoting small scale local food production with farmers markets, and local investment into urban farms. Locally produced food, such as the produce of urban gardens, is potentially more cost-effective through cutting out the 'middleman' - removing extensive transport costs and the influence of major multinational corporations exercising price gouging - therefore highlighting how further investment into urban farming projects could help produce cheap, local food for communities, sustainably. Furthermore, the scale of local gardening initiatives has only increased, with there now being an estimated 67.4 million hectares of urban cropland globally, around 5.9% of all crop land (Thebo et al, 2014), and 90% of urban areas with a population greater than 50,000 having some form of urban gardening in the form of allotments or local urban gardening collectives. Furthermore, 40% of global agriculture already exists within 10 kilometres of 'peri-urban' (non-urban landscapes adjacent to or surrounding metropolitan settlements) (Nicholls, 2020). However, this agricultural land is under threat from city sprawl and degradation of soil due to city related pollution, further highlighting the need for solutions such as urban gardening initiatives within these peri-urban areas, focusing on ecological sustainability.

Benefits to urban/ community gardens

The human benefits stemming from this volunteer-based approach to urban gardening cannot be understated. Particularly in light of the COVID19 pandemic, which has adversely affected the mental and physical health of all, especially younger people, which has exacerbated increasingly sedentary lifestyles and poorer nutrition brought on in part by the supply chain and inflation issues caused by the pandemic (Harding, 2022). These volunteer urban gardening collectives can allow people to reconnect in an open and green environment. Various reports have concluded that community gardeners report higher levels of resilience and optimism than the non-gardening control groups. These results indicate some potential for mental health benefits in urban environments, specifically in terms of subjective well-being and resilience (Suto et al, 2021). Furthermore, volunteering as a method of delivering these urban gardens brings extensive benefits to the volunteers themselves, as

engagement in volunteering is often linked closely with improved mental well-being and physical health (O'Brien et al, 2010). This does not only help the individual, but the community more widely, who benefit from a greater sense of ownership in their local area, more chances to interact and form bonds with their neighbours, and directly from the products of the garden.

Particularly when considering areas identified as 'food deserts', defined by the Food Empowerment project (F.E.P, 2024) as communities where "residents' access to affordable, healthy food options (especially fresh fruits and vegetables) is restricted or non-existent", these small-scale urban gardening collectives can be extremely impactful in these areas, providing cheap, healthy food to areas that most need it, while also providing an effective community centre for these areas impacted by socioeconomic decline (Krishan et al, 2016). This issue of 'food deserts' has only increased with large scale supply chain disruption increasing the prices of basic goods, the closing of shops and the increased economic hardship felt during the COVID19 Pandemic, this combination of issues having a particularly negative impact on those more economically deprived urbanised areas.
Community gardens play a crucial role in waste reduction by encouraging composting and recycling organic waste. Studies show that urban gardening projects effectively reduce municipal waste through composting kitchen scraps and garden waste, diverting waste from landfills and creating nutrient-rich compost (Gasperi, 2017). These gardens also serve as educational centres where volunteers learn sustainable waste management practices through peer lead learning. Furthermore, these gardens also significantly lower food miles by localising food production. Produce grown in community gardens is consumed locally, eliminating the need for long-distance transportation, which reduces greenhouse gas emissions and energy consumption associated with food logistics, in comparison to large scale traditional farming from peri-urban areas. (Ghose and Pettygrove, 2014).

Urban gardening can also improve food security by providing reliable fresh produce to the community around these gardens or to the individual, this also makes fresh produce more accessible within more deprived areas and 'food deserts' (Krishan et al, 2016). Urban agriculture can also act as a buffer against market shocks to large scale common agriculture as it is largely disconnected from factors that impact traditional farming (Optiz et al, 2015).

The human benefits of community urban gardening are also significant, with participation in community gardens improving overall quality of life by fostering social cohesion, providing recreational opportunities, and enhancing mental and physical well-being. Studies show that these gardens create spaces for social interaction, reducing isolation and strengthening community bonds (Hoffman, 2018). Additionally, gardening activities promote mental health and reduce stress levels (Suto et al, 2021).

Although, despite their benefits, urban gardening projects face challenges such as access to land, funding, and resources, particularly in densely populated areas. Long-term sustainability requires community engagement and support from local governments (Pearson, 2011). Policy frameworks

that support urban agriculture and integrate these initiatives into urban planning are essential for impactful return from this practice (Bieri et al, 2024)

Case Studies

BIGH Farm, Brussels

The BIGH Farm, (Building Integrated GreenHouses) is a large-scale urban gardening project located on the rooftop of the Foodmet market building in Abattoir of Anderlecht, a historic meat market within the city. It operates approximately 4,000 square metres of plant growth, making it one of the largest rooftop urban gardens in Europe. The farm itself operates advanced hydroponic and aquaponic systems, in addition, with its waste management systems allowing for the recycling of bio waste into growing mediums for plants, which allows for the operation to operate on a net zero waste plan. Furthermore, the farm is designed to be energy efficient, using solar and other renewable energy sources while using captured rainwater for irrigation, further allowing it to operate on solely renewable sources.

With this urban garden being so large, it does have an impact on the local food supply, outsourcing fresh produce in local markets and shops, reducing food miles, and supporting local food security. This impact on the local area also extends to the farm's local outreach projects, operating workshops in urban gardening and environmental sustainability to allow people to start their own small scale urban garden (Sky Farms).

Although this example is not a volunteer organisation, it still works to illustrate how large-scale urban gardening can be impactfully used to benefit local communities surrounding it and can be profitable to an extent where they can offer local outreach projects. Furthermore, how these gardens can be carbon and waste neutral, reduce food miles and improve local food security illustrates how impactful these gardens can be for the environment, and the need for more of these projects in future which could engage volunteers at a local level to further strengthen their social impact.

EFUA – Le talus

The EFUA (Enabling the flourishing and unleashing of urban agriculture), is a European initiative aimed at promoting and supporting urban agriculture across Europe. The project focuses on creating a supportive environment for urban farming by addressing various challenges and leveraging opportunities within European cities. Some of the core objectives of this project include the facilitation of knowledge exchange and collaboration between existing urban gardening organisations, challenging existing barriers to urban gardens within cities such as zoning laws and regulations, and promoting the implementation of urban agriculture into city development and planning policy.
For example, this organisation supports smaller, local projects of urban gardening. Such as activities centred around supporting an Urban Garden within Marseille, France, which focuses on the

community aspect of urban gardening. In 2021 the project had over 2200 members, of which 500 were actively participating, with a 10-person employed team for organisation and coordination of activities while all other members were volunteers. With a significant non-profit turnover of 500,000€, from the sale of produce and private donations.

The organisation that coordinates this (Le talus) hosts gardening plots, rents garden boxes for small scale individual gardens, tools and carpentry for the creation of new, sustainably sourced growing locations and boxes. The project operates on a zero-waste protocol, focusing on recycling unused produce and materials.

Within this organisation, volunteers are wholly responsible for the maintenance and planting of crops within the garden, peer led learning is also encouraged between volunteers through workshops and volunteering with more experienced gardeners. Le Talus further supports its volunteers with an urban farm shop, to which only members have access, selling cheap, locally sourced produce from all participating in this project, reducing food miles of products and selling cheap, fresh produce. Furthermore, volunteers are encouraged to organise and participate in events at these urban gardens, such as live music events and dinners using produce grown, allowing for more social benefits of this garden to be felt by the community around it. This organisation illustrates how urban gardening can be impactful when done using volunteering, while also keeping the practice environmentally friendly and benefiting the community around it through impactful community engagement and raising general living standards.

Limitations of Urban/ Community Gardens

The most impactful and efficient method of urban gardening is, as previously analysed, large scale high tech urban farming, as shown within the BIGH farm in Brussels. However, within these farming settings, it is more difficult to make effective use of volunteering due to the more complex nature of it and would require specialists in hydro and aquaponics systems for it to run effectively, most likely this being paid work. This is however only for the most efficient use of urban garden space, with gardens still being able to operate without these advanced technologies.

Although not impossible to run large scale operations through volunteering it can be more difficult and not nearly as efficient. These spaces would run the most efficiently with the use of a small group of paid staff, maybe mixing with groups of volunteers and volunteer organisers.

Finding free urban spaces to set up large scale urban gardens is increasingly difficult, as prices of housing are increasing, this coupled with difficult zoning laws in many cities is making it increasingly difficult to set these projects up in areas where it would make a difference, furthermore, the inherent lack of profitability of these operations require funding that can also be difficult to acquire, even when there is an obvious social benefit for these ideas.

Studies show that urban gardening (when not operating on a carbon neutral model) does produce more CO_2 than traditional farming methods, with urban gardens on average producing 0.42 kilograms of CO_2 per serving, while traditional farming produces 0.07 kilograms of CO_2 per serving (Morrison, 2024). This illustrates the need for these farms to operate on a net zero basis as urban gardens are an inevitable future of farming.

Recommendations & Conclusions

Investment into large scale urban gardening volunteering projects within urbanised areas in cities can create wide scale improvement for local areas, through increases in social cohesion, personal well-being, and environmental protection. With this large-scale investment, these farms can become profitable and self-sustaining. Furthermore, most of this investment should go to more deprived urban areas/ 'food deserts' to allow for an increase in food security and living standards through the production of fresh produce. Although, the scale of investment would most likely be difficult to undertake at this current time.

Investment into smaller scale and individual urban gardening initiatives, such as creating a framework, education and awareness campaign, can further expand the reach and potential impact of urban gardening for the community and the individual, bringing the benefits to various aspects of society. Individuals could begin to get involved through the use of small-scale individual growing boxes on balconies and roofs, or smaller community gardens, allowing for people to grow their own healthy food. This would require a significantly smaller investment than large scale urban gardens and would be significantly easier to organise, with the setting up of workshops and spaces in which people can come together and conglomerate ideas. This would also be less staff-intensive and could easily become a self-sustaining group of self-organised citizens, some of which already exist.

The most effective implementation of volunteer Urban Gardening would require a small group of paid staff who are 'experts' within urban horticulture and gardening, supported by others organising on a voluntary basis, this would allow them to be fully dedicated to the upkeep and organisation of volunteers within a large-scale urban garden. In an ideal setting these organisers would be paid with donations from individuals and grants given to urban gardening initiatives due to the benefits of the urban garden on the surrounding area.

In theory they could also be paid with profits made from the garden, however this would not be ideal as the garden would be able to operate more efficiently if all profits were reinvested into the project, as the typical profit margin is not so large to sustainably maintain both a large staff and investment in infrastructure. With these experts you can also draw from their wide knowledge base and provide workshops on small-scale individual urban gardening for people who may not be able to partake in the main large scale urban garden, allowing for more inclusivity within the community. By drawing from aspects of both the for-profit urban gardens and volunteer-run urban gardens you can find a healthy middle ground in which an urban garden can exist to benefit the community and also be

self-sustaining with little funding. This would require significant community integrations - which volunteering can help to foster - with connections to local markets, schools and community centres, allowing for impactful cohesion within the community. A connection with local schools would allow for children to be taught from a young age the importance of sustainable practices within farming and pushing for greener methods.

To conclude, urban gardening is increasingly becoming a more viable method of ensuring food security and increasing environmental protections within cities. Through volunteering this idea can be turned into a reality, transforming underutilised spaces into productive gardens. These initiatives cut municipal waste through composting and localised food production, reducing greenhouse gas emissions. They improve food security by providing fresh, local produce, especially in “food deserts”, and create a buffer against market fluctuations. Additionally, urban gardening fosters community cohesion and enhances mental and physical well-being especially with the involvement of volunteers. Despite challenges like land access and funding, the benefits of urban gardening justify continued investment and supportive policies. By integrating urban agriculture into city planning and supporting both large-scale and small-scale projects, volunteer-led and involving urban gardening can undoubtedly significantly contribute to a more sustainable, resilient urban future.

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