

Policies to promote low-carbon urban agriculture

Urban agriculture, or growing food in cities, is an increasingly popular response to climate change, both for providing an environmentally friendly alternative to conventional food supply chains and for expanding urban resilience to natural disasters. Extensive research has also found that urban agriculture has many local social and environmental benefits, including access to fresh food in underserved areas. But is urban food-growing *always* climate-friendly? [New research from the University of Michigan](#) finds that the carbon footprint of some urban agriculture sites can be higher than conventional vegetable farming if not designed with best practices in mind. However, a number of sites studied had a lower carbon footprint than conventional farms, offering ideas for how low-carbon urban agriculture might be promoted. According to the research, land use and material reuse policies in cities will be central to determining the long-term carbon impacts of urban agriculture. This policy brief (continued on reverse) clarifies how the insights garnered from assessments of gardens in New York City (USA), London (UK), Nantes and Paris (France), Dortmund (Germany), and Gorzów Wielkopolski (Poland) can offer guidance to policymakers in many cities.

Authors: Jason K. Hawes^{1*}, Dr. Nevin Cohen², Dr. Benjamin P. Goldstein¹, Dr. Joshua P. Newell¹

¹University of Michigan School for Environment and Sustainability

²City University of New York, Graduate School of Public Health and Health Policy

*Correspondence may be directed to Jason Hawes at jkhawes@umich.edu

Research Overview and Key Findings

Urban agriculture is expanding globally. In addition to providing access to fresh food, the practice provides mental and physical health benefits to farmers and gardeners, opportunities for environmental education, job training, and other community development, sources of free or low-cost produce, and even reduction in urban heat island and stormwater runoff. But little research has assessed the carbon footprint of food grown on these sites, or ways to reduce their carbon footprint. A [new study](#) published January 22, 2024 documents researchers working alongside urban farmers and gardeners to monitor the inputs and outputs of 73 urban agriculture spaces in Europe and the US. The team then calculated the carbon footprint of food produced on each site. The research shows that even though urban agriculture reduces the distance from farm to fork (“food miles”), it is not inherently an effective climate mitigation strategy. In other words, without strategic planning and access to resources, urban agriculture may increase the carbon footprint of urban food systems. However, urban farms that maximized material reuse, operated for longer, made strategic crop choices, and maximized social goods compared favorably with conventional farming carbon footprints. This study does not imply that urban agriculture should not continue to expand, given the numerous social, food access and environmental benefits. Rather, our findings suggest that urban agriculture must be strategically incentivized and supported to benefit both communities and climate.

Recommendations for Policy and Practice

Our study suggests that urban agriculture has the lowest carbon footprint when it takes advantage of urban waste streams, uses its infrastructure for long periods of time, and supports a wide array of social benefits. We identified five strategies to ensure that urban farms and gardens out-perform the impacts of conventional agriculture:

- **Allow access to safe building waste for garden construction.** Infrastructure, like raised beds, pathways, and sheds, was the largest contributor to carbon footprint on sites. Cities can facilitate a second life for materials that are otherwise headed for landfills, like scrap wood.
- **Promote low-carbon nutrient sources via composting.** By reducing food waste to landfills and reducing demand for potting soil and synthetic fertilizers, compost offers many climate benefits. But it must be managed well to reduce methane emissions, something local governments can accomplish by investing in the capacity, supplies and training needed to expand effective composting operations across the city.
- **Promote social benefits at farms and gardens.** Urban farms and gardens don’t just produce food, and carbon footprinting must account for this. By expanding programs that support the social goods produced on-site, cities can reduce the carbon impact of urban food production.
- **Secure land tenure for urban agriculture sites.** Long-lived sites have lower carbon impact, and sites embedded in cities for longer have greater social footprints. Urban policies that secure land tenure for urban farms and gardens are not just a community good, they’re a climate solution.
- **Identify high-carbon food imports and replace them with local production.** Findings show that not all conventionally farmed vegetables are low-carbon. In northern climates, vegetables are often grown in greenhouses or imported via air freight to avoid spoilage. By helping urban food growers make informed decisions about which crops are best to replace, cities may reduce the overall carbon footprint of their food supply. Furthermore, cities may be able to replace their own high-carbon vegetable supplies with urban sources by launching strategic local food procurement policies.

Read More

Central reading: Hawes, Goldstein, et al. 2024. [Comparing the Carbon Footprints of Urban and Conventional Agriculture.](#)

Social benefits: Ilieva, et al. 2022. [The Socio-Cultural Benefits of Urban Agriculture.](#)

Urban ag, food justice, and planning: Horst, et al. 2017. [The Intersection of Planning, Urban Agriculture, and Food Justice.](#)

Planning for local environmental benefits: Newell, et al. 2022. [Ecosystem services of urban agriculture and prospects for scaling up production: A study of Detroit](#)