CHOICES
The magazine of food, farm, and resource issues
A publication of AAEA Agricultural & Applied Economics Association
VOLUME 41 QUARTER 2

Community Gardens in Urban Agriculture: Site Selection and Cost Considerations

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JEL Classifications: O33, Q15, Q18
Keywords: Community gardens, Costs, Site-selection, Urban Agriculture
DOI: 10.22004/ag.econ.370420

Urban agriculture (UA) has seen a significant rise in demand across the United States in recent years. This trend is driven by multiple factors, including growing concerns about food security, increased interest in locally sourced fresh and organic produce, and a broader movement toward sustainable urban living (USDA, 2025a). As a core component of UA, community gardens serve as collaborative initiatives that utilize shared urban spaces.

Community gardens are considered impure public goods because they offer both private and public benefits. Gardeners gain food and recreation, while communities benefit from enhanced social ties, economic resilience, and healthier urban ecosystems (Dorr et al., 2021; Newell et al., 2022). These public gains are typically absent in commercial urban farming (Dorr et al., 2021; Newell et al., 2022). The COVID-19 pandemic further highlighted their value as accessible food sources and safe, socially engaging outdoor spaces (Clark, Conley, and Raja, 2021).

The success of community gardens in urban areas largely depends on optimal site selection (Drake and Lawson, 2015; Diaz et al., 2018; Smith, Meerow, and Turner, 2021; Lu, 2022). However, research on siting strategies remains limited and often addresses only specific aspects. Most existing studies focus on the sociopolitical dimensions of the siting process (Barron, 2017) or the social factors that support effective garden operations (Drake and Lawson, 2015; Diaz et al., 2018). Moreover, much of the literature examines urban agriculture more broadly, rather than community gardens specifically (e.g., Rogers and Hiner, 2016; Parece and Campbell, 2017).

A notable study by Smith, Meerow, and Turner (2021) addresses this gap by examining community garden site selection in Phoenix, Arizona, with a focus on reducing food insecurity. Their benefit-oriented framework identifies locations based on physical suitability and social demand. While understanding who benefits most is essential—given varying preferences across socioeconomic groups (Li and Long, 2024; Li and Livy, 2025)—a benefits-only approach overlooks a key element of optimal site evaluation: costs.

Few studies examine the costs of developing and managing community gardens, despite their importance for site selection. Ignoring capital and recurring expenses can misstate welfare estimates and threaten long-term viability. This article addresses that gap by focusing on cost-related factors. We adopt an environmental cost–benefit analysis framework (Atkinson and Mourato, 2008; Boardman et al., 2008) to evaluate net impacts. This approach defines net social benefits as the difference between the full stream of social benefits and costs, including external costs (externalities) such as water pollution and gentrification. While we do not directly estimate these external costs, they could be incorporated using approaches such as non-market valuation (e.g., hedonic pricing and stated preference methods, Haab and McConnell, 2002; Champ et al., 2003).

This article examines four key cost factors in community garden site selection: two direct—land and water—and two indirect—water pollution and gentrification-related social costs. As shown in Figure 1, direct costs, such as land and irrigation water, are borne by gardeners. Indirect costs are those borne by society rather than the garden itself, including subsidized water and externalities, such as water pollution and gentrification. We exclude routine operating costs (e.g., labor, compost, fertilizers, and tools), which are generally similar across sites. Unless locations have unusual soil conditions or labor constraints, unit costs for seeds, amendments, and labor vary little. These four factors are emphasized due to their documented impact on long-term sustainability.

Figure 1. Cost Considerations in Site Selection for Community Gardens

Background

Recognizing the value of community gardens, the USDA launched the People's Garden initiative in 2009. In 2022, the program expanded nationwide to increase access to fresh food, support wildlife habitats, and enhance urban green space. As part of the 2018 Farm Bill, the USDA also established the Office of Urban Agriculture and Innovative Production in 2020. This office now oversees 17 regional Urban Hubs that promote urban, small-scale, and innovative agricultural practices—including community gardens (USDA, 2025b).

While not all community gardens are officially registered, the People's Garden registry offers insight into their geographic distribution. Figure 2 displays 2,463 gardens with recorded geographic coordinates that have been voluntarily reported. Most gardens are in urban areas—69% in large and 23% in smaller metropolitan counties (Panel A). Regionally, 88% are in the eastern US, reflecting its higher urban concentration, while 12% are in western states, highlighting regional variation.

Environmental and economic differences also vary across gardens. Panel B shows eastern gardens receive over 31 inches of growing-season rainfall annually, compared to just 11 inches in the West. Panel C illustrates that western gardens tend to be in wealthier counties, with median household incomes around $87,000, versus $77,000 in the east.

These patterns highlight the wide variation in natural and socioeconomic conditions across community garden sites. In the next section, we turn to a less-explored aspect of garden development: The costs that affect where and how gardens can be sustainably established.

Direct Costs

We begin by examining the direct costs associated with community gardens, focusing on land and water costs. Securing land is a critical factor in siting decisions, as it influences both the short-term and long-term viability of community gardens in urban areas. Similarly, water costs are an important consideration, particularly in arid regions where affordability and availability may be uncertain. The following section offers a more detailed discussion of these cost factors.

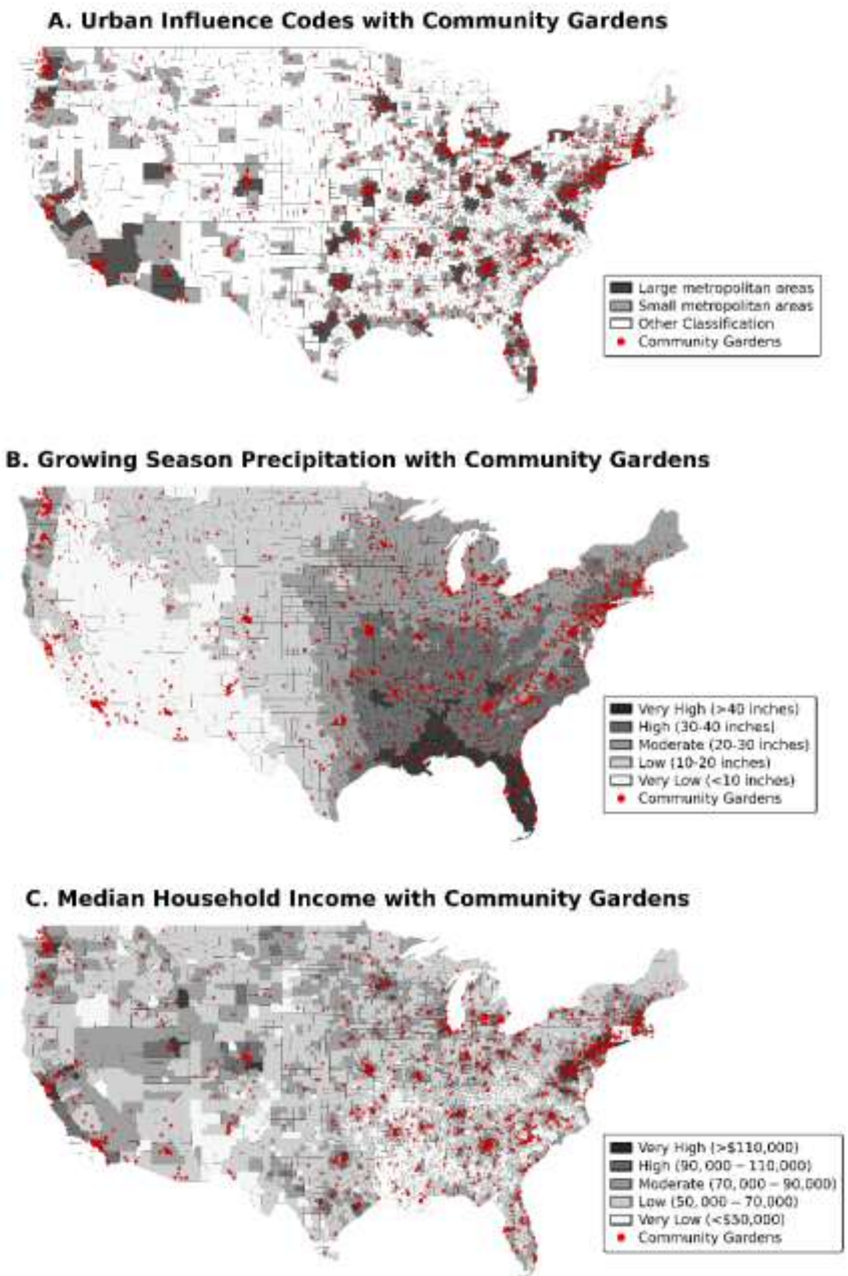
Costs to Secure Land: Short-Term vs. Long-Term

Securing land is a fundamental requirement for the establishment of community gardens, but high urban land costs often pose a significant barrier. One common solution is to use relatively low-cost parcels, such as underutilized or vacant lots, for garden development. Alternatively, gardeners may partner with nonprofit organizations—such as land banks or public land trusts—to access land for cultivation. For example, the Philadelphia Land Bank (Philadelphia City Council, 2024) acquires tax-delinquent or foreclosed properties and leases them for community garden use (Drake and Lawson, 2014).

When land is obtained through these channels, acquisition costs are minimal. Yet the parcels are often low-productivity—vacant, underutilized, or environmentally degraded—and thus demand sizable up-front investments in soil testing, remediation or amendment, and basic infrastructure, particularly when the site's prior use was industrial or residential (Meuser and Meuser, 2010; Kim et al., 2014). Because remediation and soil-building can span several growing seasons, cultivation is delayed and the opportunity cost of holding the land rises. Consequently, the choice of land type should be weighed carefully: Parcels with very low purchase prices may, after accounting for prolonged preparation and forgone production, prove more costly over the garden's planning horizon than slightly higher-priced sites that require less renovation.

In addition, despite lower short-term land acquisition costs, securing long-term land tenure remains

Figure 2. Community Gardens in the US Shown with Three Regional Characteristics: Urban Influence Codes, Precipitation, and Median Household Incomes



Notes: Community gardens are overlaid with (A) county classifications based on Urban Influence Codes (Source: USDA, 2025c), (B) 5-year average (2019–2023) growing season precipitation by county (Source: PRISM), and (C) median household income by county (Source: 2019–2023 American Community Survey 5-Year Estimates).

challenging for community gardens, as these spaces are typically leased rather than owned, making them vulnerable to displacement by future urban redevelopment projects (Drake and Lawson, 2014). Tenure uncertainty can discourage gardeners from investing in soil improvements, irrigation systems, and other essential infrastructure, as they risk losing both access to the land and their invested capital (Suchá and Dušková, 2022; Kanosvamhira, 2023, 2024).

Several states, including California and Maryland, offer tax incentives to promote urban agriculture; for example, urban agricultural lands may be fully or partially exempt from property taxes if maintained for agricultural use for a certain number of years (National Conference of State

Legislatures, 2026). While such tax incentives may not fully resolve long-term land security concerns, they can help lower land costs, making purchasing land financially feasible. Alternatively, non-profit organizations can use private donations to lower land purchasing costs (Rauch, 2022).

Water Costs: Affordability and Availability

Irrigation is a common practice in community gardens, with municipal water being the most frequently used source (Segal et al., 2024). However, water affordability varies by region, largely due to water scarcity. Access to affordable water is especially challenging in arid urban areas (Arnold and Rogé, 2018). In such regions, high water costs can pose a significant threat to the economic viability of community gardens, as water bills may accumulate into substantial financial burdens over time. For example, they account for 34% of annual maintenance in California (Los Angeles Community Garden Council, 2017).

Even in water-rich areas, irrigation is commonly used, but water costs are generally low because irrigation is only applied when rainfall is insufficient. Regional policies can further reduce expenses: For instance, community gardens in New York are exempt from water bills (New York Legislature, 2023), and Baltimore offers reduced water rates (Hinds, 2020), resulting in minimal water costs.

As a result, community gardens in dry regions must carefully assess water costs when selecting optimal sites. In areas with high water costs, two main strategies can help reduce expenses: first, lowering water use through efficient technologies like drip irrigation (Diekmann, Gray, and Baker, 2017) and second, utilizing alternative sources such as rainwater, stormwater, or recycled wastewater (Dona, Fukushi, and Mohan, 2025).

Although stormwater and recycled wastewater are often low-cost or even free, access to these resources can limit site selection, as they require proximity to infrastructure such as retention ponds or treatment facilities. When feasible, prioritizing such sites can substantially reduce irrigation costs and provide a reliable water supply, particularly given the abundance of stormwater and wastewater generated in densely populated urban areas (Christou et al., 2024).

Therefore, optimal site selection for community gardens should consider the water affordability, especially in regions where water availability is uncertain. In this context, evaluating the economic feasibility of mitigation strategies—such as adopting efficient irrigation technologies or utilizing non-conventional water sources—is essential when assessing water costs for prospective garden sites.

Indirect Costs: Negative Externalities

Next, we consider the costs associated with negative externalities—impacts imposed on others rather than borne by garden participants. In community gardens, these externalities may include environmental harms like runoff and nutrient leaching from inadequate land management. Social costs can also arise, for example, through gentrification, where the establishment of community gardens increases property values and displaces low-income residents who can no longer afford to live in the area. The following sections discuss each of these externalities in detail.

Environmental Externality: Costs of Water Pollution

Nutrient leaching from community gardens can pose a risk of water pollution (Meftaul et al., 2020; Taylor, 2020; Buscaroli et al., 2021; Whittinghill et al., 2023). The extent of this impact varies based on the size of the garden and the agricultural practices used. While the direct costs of water pollution from community gardens have yet to be quantified, research indicates that urban community farms often manage nutrients inefficiently, leading to the accumulation of excess nitrogen and phosphorus in soils (Witzling, Wander, and Phillips, 2010), primarily due to overapplication of fertilizers (Taylor and Lovell, 2014; Small et al., 2019). These nutrient surpluses can contribute to groundwater contamination (Abdulkadir et al., 2013) and broader watershed degradation (Small et al., 2023).

Policy can play a key role in mitigating the environmental impacts of community gardens by regulating agricultural inputs. For instance, California's Assembly Bill 551 (AB-551) (California Legislature, 2013) limits pesticide and fertilizer use in Urban Agriculture Incentive Zones to substances approved by the USDA's National Organic Program. Such regulations help curb nutrient leaching and reduce environmental costs. However, the existence and enforcement of these policies vary across regions, and this variation should be factored into site selection to account for differing levels of environmental costs.

The management of nutrient runoff in urban areas also plays a critical role in determining its impact on water quality. Given that this runoff typically enters stormwater systems, the effectiveness of these urban stormwater systems in removing garden-derived nutrients remains uncertain (Deksissa et al., 2021; Rieck et al., 2022). For example, in many large US cities, stormwater is managed separately from sewage under the Municipal Separate Storm Sewer Systems (MS4s) program (US Environmental Protection Agency, 2017) and is often discharged directly into nearby waterways without advanced treatment. Consequently, runoff from community gardens may enter local waters untreated, potentially increasing the environmental costs associated with water use.

Environmental costs may be reduced by co-locating community gardens with stormwater quality management systems, such as green infrastructure like bioretention cells. When gardens are sited near these facilities, there is potential for nutrients to be filtered before runoff reaches waterways, which may help reduce water pollution. Coordinating garden placement with stormwater infrastructure planning could offer a promising strategy to help manage environmental costs.

Social Externality: Gentrification

Last, community gardens can have unintended social costs linked to gentrification, a process of neighborhood change that occurs when new investment alters a neighborhood's character and demographic composition, often leading to displacement of lower-income residents (Banzhaf and McCormick, 2012; Baik et al., 2025). Voicu and Been (2008) find that community gardens can cause to raise neighborhood property values because they are seen as desirable amenities. Using a difference-in-differences approach to isolate the effect of garden establishment from other neighborhood changes, they show that properties located immediately adjacent to a community garden experience price increases of approximately 3%–4% shortly after completion, with effects growing over time to roughly 7% within 5 years. While this may seem positive, it can also attract more younger, wealthier, and more educated residents and lead to displacement of low-income households, who may struggle to afford higher rents or property taxes. This effect disproportionately impacts lower-income residents, precisely those whom community gardens are intended to benefit. For instance, McClintock (2018) observed that community gardens are frequently located in neighborhoods undergoing gentrification in Portland, Oregon.

Moreover, once established, community gardens may not be the sole drivers of neighborhood change. Improvements from community gardens can also induce complementary investments in other local amenities—such as school quality, public safety, or retail access—which can further amplify housing price increases and gentrification pressures (Banzhaf, Ma, and Timmins, 2019). Therefore, while existing studies provide useful evidence on the magnitude of these capitalization effects, further empirical research is needed to evaluate their longer-run implications for housing affordability and displacement across different urban settings.

While limited research has focused directly on mitigating gentrification driven by community gardens, the broader literature on "green gentrification" provides useful guidance (Baik et al., 2025). One approach is to predict gentrification risk during the community garden project design phase, using commonly applied indicators such as rising rents or housing prices, shifts in the local income distribution, increasing educational attainment, and demographic turnover (e.g., changes in race, age, or tenure status) (Bates, 2013; Chapple et al., 2017; Bengtsson and Kopsch, 2019). When these indicators point to elevated gentrification risk, community garden siting decisions can explicitly incorporate social cost considerations alongside environmental and health benefits. In addition, because community gardens often emerge in neighborhoods already prone to gentrification, proactive mitigation strategies become crucial. One effective approach is to enhance community capacity and involve multiple stakeholders during the planning process to ensure that local residents benefit and to help limit displacement (Curran and Hamilton, 2012; Derickson, Klein, and Keeler, 2021). Additional policy tools—such as rent control, zoning policies, and the provision of affordable housing near new green spaces—have also been recommended to protect vulnerable residents in high-risk areas (Rigolon and Christensen, 2019; Arogundade, 2021). However, it is important to note that these mitigation strategies are not costless and may involve tradeoffs that require careful consideration before implementation.

Site Selection and Cost Examples

As an example, consider two hypothetical community garden sites. Site A rents the parcel from the city at a

Table 1. Example of Cost Comparison

	Site A	Site B
Direct cost (private)		
Land	Low	Medium
Water	Low	Medium
Indirect cost (social)		
Water pollution costs	High	Low
Gentrification costs	High	Low
Overall	Higher total cost	Lower total cost

low rate with a relatively low municipal water price, while Site B rents land from the city at a medium rate and pays a higher municipal water prices as Site B is located in a different water district. Therefore, Site A may have lower direct costs compared to Site B. However, Site A has higher indirect costs due to water pollution (the municipal drainage infrastructure at Site A discharges directly into water bodies without treatment) and potential gentrification costs (the establishment of community gardens may contribute to increasing housing prices and neighborhood changes), whereas Site B's drainage is treated before discharge and is located in a neighborhood with proactive mitigation strategies to reduce the likelihood of gentrification. Under these conditions, the higher environmental and social costs at Site A outweigh its direct cost advantages.

In addition, other policy instruments may also influence site selection decisions. For example, land tax exemptions or water bill subsidies can reduce the direct costs faced by community gardeners. Although these policies primarily represent a transfer of costs to other parties (e.g., taxpayers), they can affect the private gardeners' cost considerations. Therefore, such policies should be carefully considered when evaluating the relative costs of alternative sites.

Conclusion and Discussion

Direct and indirect cost dimensions provide a valuable framework for assessing the overall costs of community garden sites. This framework can guide non-profit organizations in selecting community garden sites that minimize direct costs, such as land and water. City planners can use the framework to screen and prioritize parcels for community gardens by jointly considering the direct and indirect costs of garden establishment and permitting decisions that limit gardens near sensitive areas to reduce pollution or offer tax incentives for management. In practice, this can support zoning and parcels that can be developed in areas where water pollution can be mitigated. Moreover, pairing the framework with complementary anti-displacement tools (e.g., housing affordability protections) can help ensure that the benefits of new gardens accrue to existing residents.

Further research is needed to rigorously quantify these costs using this framework. Such estimates are crucial for informed site-selection decisions, enabling planners to move beyond correlation, accurately evaluate trade-offs across locations, and allocate limited resources to projects with the greatest net benefits.

Progress toward this goal is currently constrained by a fundamental data gap—specifically, the lack of a comprehensive, geo-referenced inventory of community gardens. While the USDA's People's Garden initiative has compiled a dataset of over 2,000 registered gardens, and Chen et al. (2025) recently assembled a list of community gardens in 24 US metropolitan areas, these datasets include only location information and do not provide a comprehensive picture of community garden distribution and status nationwide. A more complete dataset—including information on establishment year, land tenure, precise location, and management practices—would enable researchers to better understand the spatial distribution of community gardens, systematically link site attributes to garden performance, and track potential externalities over time. Therefore, future work can prioritize creating publicly accessible datasets that map existing gardens alongside their key characteristics. These data would enable rigorous causal analyses of costs, equity impacts, and long-term sustainability, thereby supporting more robust, evidence-based site-selection decisions.

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Acknowledgments: This work is supported by the Agriculture and Food Research Initiative (AFRI) Foundational - Social Implications of Emerging Technologies, project award no. 2025-67024-44288, from the US Department of Agriculture's National Institute of Food and Agriculture. Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the author(s) and should not be construed to represent any official USDA or US government determination or policy.

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