



Urban Agriculture in New York State

A Study of New York's Urban Agriculture Landscape and
Recommendations for Administrative and Legislative Action, 2022

Cornell Cooperative Extension
Harvest New York

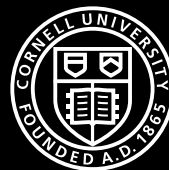




Photo: RJ Anderson, CCE

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Executive Summary

Urban agriculture across New York State includes many types of urban growing, from community gardens to commercial hydroponic greenhouses, and each type of growing requires unique conditions to maximize the benefits they provide. Urban growing creates economic, ecological, and social benefits, but challenges impose limits on the provision of these benefits. These challenges include regulatory hurdles and access to inputs like water, land, and technical expertise, among others. This report details these benefits and challenges.

This report presents findings from research seeking to understand the urban agriculture landscape across New York State, including the dynamics impacting urban farmers. These findings are included in an overview of urban agriculture in New York, including case studies from Albany, Buffalo, New York City, Rochester, and Syracuse. This research informed comprehensive recommendations that are intended to enable New York State administrative and legislative action to maximize the benefits provided by urban agriculture and to create a more equitable future for this important sector of the industry. These recommendations span 10 themes, outlined below, with further, actionable sub-recommendations included for each in the Recommendations section.

Outline of Recommendations

1. Advance equity in urban agriculture policy development and administration
2. Increase coordination and collaboration in support of urban agriculture systems
3. Provide better access to capital and funding available for urban agriculture
4. Promote the role of urban agriculture as a source of community, physical, and social wellbeing
5. Encourage the adoption of local land use laws that accommodate urban agriculture through the promotion of standardized regulation and zoning across the state
6. Reduce obstacles to land access and retention for urban agricultural producers
7. Acknowledge the distinction between community-focused and commercial urban agriculture, and support community development and business development, respectively, for urban growers
8. Increase investment in urban agriculture education to inspire and support the New York food sector workforce of the future
9. Expand financial assistance in support of urban agriculture that is grounded in sustaining ecosystem services while ensuring community, physical, and social wellbeing
10. Evaluate regional and local food systems supply chains to ensure greater access to markets for urban agricultural producers

This report was informed by an extensive synthesis of literature, including peer-reviewed academic reports, sector-specific reports, and local policy guides. Researchers also conducted stakeholder interviews and held a public comment session to capture input from urban agriculture practitioners and advocates from across the state. This report would not have been possible without their insight and participation.

Introduction

Motivation

The world's cities are experiencing a population boom: more than half (55%) of the global population lives in cities, and that number is projected to rise by over 2 billion additional urban dwellers by 2050 (UN DESA, 2018). New York is bearing witness to this trend. Results from the 2020 census show significant population growth (+4%) in the state's largest cities outside of New York City for the first time in decades (DiNapoli, 2021). New York City's population increased 7.7% (DiNapoli, 2021). Conversely, many of the state's rural towns experienced population declines (DiNapoli, 2021). Because of these population trends, policies and investments targeting urban populations can have an outsized impact (Clinton et al., 2018).

New York is also impacted by emissions-driven climate change, increasing wealth disparities, and issues of food security and food sovereignty. Agriculture and food systems are increasingly considered critical and effective mechanisms that can address the complex and interconnected problems of the 21st century. Urban agriculture, specifically, has been identified by academics, policymakers, and local communities as a specific solution (Alaimo et al., 2008, 2010; Clinton et al., 2018; Nogueira et al., 2018).

Interest in local food systems has endured throughout the United States' history (notably including the Victory Gardens of the early 1900s), becoming especially salient during the economic downturn of 2007-2008 and again as a result of the COVID-19 pandemic (Israel et al., n.d.; Nogueira et al., 2018; AGM & CALS, n.d.). Before the pandemic, food prices globally dropped to historic lows as a result of Green Revolution technologies and domestic agriculture policies of the late 20th century (Chavas, 2011). However, a lack of food access driven by disparities in income is becoming a growing concern in communities across the country.

At the same time, many of the negative externalities of the prevailing food system (including environmental harm, labor conditions, and health impacts) mean the "true cost of food" is likely three- to five-times higher than current prices suggest (The Rockefeller Foundation, 2021). The effects of climate change are also increasingly wreaking havoc on food production systems, threatening more uncertainty in the future (Nelson et al., 2009). Compounding these challenges are the historic and persistent inequities of the current food system in which communities of color are especially burdened with a lack of access, a lack of resources, a lack of information, and disproportionate exposure to risks (Department of Agriculture and Markets, 2021; The Rockefeller Foundation, 2021).

New York State government has acknowledged the role that urban agriculture plays as one of the many solutions to these food system challenges. In her 2022 State of the State address, Governor Kathy Hochul committed to making local food more accessible to all New Yorkers and to encourage more urban farming. In November 2022, the New York State Department of Agriculture and Markets (AGM) made available \$800,000 through its Urban Farms and Community Gardens Grant Program to support resiliency and food security for New Yorkers (Department of Agriculture and Markets, 2022a).

Following budget negotiations, the Governor and the New York State Legislature deepened the commitment to assisting in meeting food justice needs, adding a \$1 million Beginning Farmers Grant Program and a \$4 million grant program for socially and economically disadvantaged farmers. As part of this effort, the New York State Legislature authorized this study to better understand urban agriculture across the state and the potential of state-level policy to further its benefits.

Priorities and Objectives

The statutory priorities and objectives listed below are used as a framework to guide the research and development of this study of urban agriculture and support state agency and legislative work that achieves these priorities and objectives.

- To study all forms of urban agriculture, including but not limited to vertical farming, community gardens, and urban farming
- To examine the effects urban agriculture would have on access to locally grown food, job creation and educational opportunities, and impacts on the environment
- To present legislative and administrative recommendations to the joint houses of the New York State Legislature and Governor

This study will address this mandate as follows:

- By defining urban agriculture broadly, then expanding this definition by exploring various common methods used in urban agricultural production across New York
- By researching and reporting the benefits and limitations of urban agriculture, as well as challenges facing the expansion of urban agriculture
- By presenting recommendations, in addition to sub-recommendations, as informed by input from urban agriculture stakeholders across New York

Methodology

Urban agriculture is not comprehensively reported in the USDA Census of Agriculture; therefore, capturing a snapshot of urban agriculture across New York State required a multi-faceted research approach. This study was conducted in four phases: (I) the review of relevant literature; (II) definitions, taxonomy, and stakeholder analysis; (III) drafting of recommendations; (IV) stakeholder outreach, which consisted of individual interviews with AGM administrators, research of case studies, and an Urban Agriculture Stakeholder Meeting. In addition to this structured approach, the research team gained valuable insight by attending conferences and events, volunteering on urban farms (50+ hours), and visiting open urban farm days hosted in urban areas across the state in the summer and fall of 2022.

The study focused on the five largest urban centers in New York State: Albany/Troy (population: 150,625 combined), Buffalo (population: 278,349), New York City (population: 8.8 million), Rochester (population: 211,328), and Syracuse (population: 148,620). Cities in Westchester County and on Long Island were included as a proximate of New York City for this study. The metropolitan areas around these cities are also experiencing population growth, suggesting that urban agriculture approaches and policy in the urban centers have the potential to influence broader geographies and populations beyond city limits (DiNapoli, 2021).

The study team recognizes that urban agriculture can be and is practiced in smaller urban cores across the state. As urban populations in the state continue to rise, urban growing will serve an increasingly important and context-specific function in areas that were not specifically examined in this report. However, the themes around the benefits and limitations of urban agriculture and the challenges facing urban growers highlighted in this report are intended to reflect conditions across New York State and, therefore, can be used as a starting point for New York communities, growers, or policymakers interested in advancing urban agriculture in their area.

Review of Related Literature

The research team conducted a review of relevant literature to ground its investigation in the historical context of urban agriculture at the global, national, state, and local level. Background materials selected for this review were made by Cornell Cooperative Extension specialists in New York City; through the suggestions of local urban agriculture practitioners and advocates; and through independent research. The study team reviewed a diverse selection of materials, including 61 reports, 43 online news/blog pages, and 37 other online resources. Of the reports, nine were industry reports, 15 were policy reports, 15 were local reports, and 22 were academic reports. The team also attended three events related to the publications of new reports (for the release of *Neighborhood Fare: Tools for Connecting Local Food Systems*, *Farms Under Threat 2040: Choosing an Abundant Future*, and the United Nations' Food and Agriculture Organization's *FAO Urban and Peri-Urban Handbook*). The Principal Investigator on this report, Yolanda Gonzalez, participated in AGM's Community Gardens Task Force throughout

2022. Insights from this task force informed this report, and further results will be published in a separate, upcoming report.

Examples of the selected local food policy reports include:

- Capital Roots' *Greater Capital Region Food System Assessment* (2021)
- Greater Buffalo Urban Growers' *Urban Agriculture Barriers in Buffalo & Practices from Other US Cities* (2022)
- The Design Trust for Public Space's *Five Borough Farm: Seeding the Future of Urban Agriculture in New York City* (2012)
- The Rochester Urban Agriculture Working Group's *Recommendations from the Rochester Urban Agriculture Working Group for the First Hundred Days of the Malik Evans Administration* (2021)
- Syracuse Grows' *Syracuse Grows 2020 – 2021 Annual Report* (2022)

Examples of the selected academic publications include:

- *Increasing City Resilience through Urban Agriculture: Challenges and Solutions in the Global North* (2021)
- *Local Food Systems: Reviewing Two Decades of Research* (2021)
- *Making Urban Agriculture an Intentional, Equitable City Redevelopment Strategy* (2020)

Examples of the selected policy reports include:

- *The New York State Diversity and Racial Equality Working Group Report* (2020)
- AGM's *The New York State Resiliency Report* (2021)

Examples of the selected industry reports include:

- *The Economic Contributions of Agriculture to the New York State Economy: 2019* (2021)
- In collaboration with the USDA, Cornell Small Farms' *The Promise of Urban Agriculture* (2019)

A full list of the reviewed and cited literature can be found in the References section of this report.

This study followed an inductive research framework. Literature was reviewed without an established hypothesis or specific outcome in mind. Instead, the research team reviewed each piece with the intention to identify:

1. The benefits of urban agriculture
2. Challenges facing the development of urban agriculture
3. Examples of urban agriculture as practiced in New York State
4. Policy recommendations to advance urban agriculture

Throughout the literature review process, the team intentionally sought literature that would represent diverse voices and perspectives. This process was supported by the Cornell Cooperative Extension Harvest New York team in New York City, as well as contributors from Albany/Troy, Buffalo, New York City, Rochester, and Syracuse.

Definitions, Taxonomy, and Stakeholder Analysis

This inductive approach to the literature review gave the research team a wealth of information and perspectives on urban agriculture from which to pull themes and trends. These themes and trends were identified by conducting a taxonomy exercise designed to determine key definitions to be used throughout the study, as well as a stakeholder analysis.

In this taxonomy exercise, researchers charted the outputs, stakeholders, goals, and resources for different categories of urban agriculture. The categories of urban growing examined were: commercial, education-focused, community gardens, non-profit, and for-profit. Understanding the similarities and differences between these categories helped establish the main distinctions within types of urban agriculture. Other themes discussed included the role of urban agriculture types within the local community, the technological level of the inputs, the carbon generation intensity of the growing practices, and considerations for racial and social justice. Researchers then crafted profiles for non-profit, for-profit, soil-based, and controlled-environment agriculture (CEA). These profiles and distinctions informed the definitions and case studies used in this report.

The stakeholder analysis employed Bryson & Alston's Power and Interest Grid (2011) to identify subjects (high interest, low power), players (high interest, high power), context setters (low interest, high power), and crowd (low interest, low power) stakeholders. Understanding the current influence of and relationships between stakeholders was critical to determine before drafting recommendations. In many cases, this report's recommendations intend to move those interested parties with little influence to a position of higher power, or to move parties with high influence to a position of greater interest. Practically, this means encouraging an emphasis on the empowerment and inclusion of underserved, marginalized communities.

Recommendations Drafting

The review of relevant literature, networking and volunteer work conducted by the research team, and select interviews with Cornell Cooperative Extension specialists and contacts informed the first draft of policy recommendations developed. Challenges and opportunities for urban agriculture were grouped by theme. The final recommendations were drafted following stakeholder outreach.

Stakeholder Outreach

After the initial recommendations were drafted, the research evolved into a deductive methodology. The draft definitions, urban agriculture categories, and recommendations were shared with 166 members of the New York urban agriculture community to solicit feedback. Stakeholders were invited to contribute to the study by completing a survey and/or by participating in an Urban Agriculture Stakeholder Meeting hosted on November 2, 2022. This meeting was conducted virtually and in-person, concurrently, with options to respond to the survey following the meeting. Survey responses were due by November 15, 2022. Following feedback from meeting participants, the survey was made available in six languages (English, Spanish, French – African dialect, Bengali, Mandarin, and Cantonese).

Input from these stakeholders shed light on elements of the study and the draft recommendations that needed adjustment. These included but are not limited to: distinguishing between the types of urban agriculture; restructuring the recommendations to emphasize the most important considerations higher on the recommendations list; considering urban agriculture from a food systems level; and adjusting verbiage to more accurately reflect executive authorizations. Critically, while the study draft sought to prioritize equity considerations throughout each recommendation, feedback revealed that these considerations were not sufficient. Therefore, a tenth recommendation was added to ensure proper emphasis on racial and gender equity and justice. The final recommendations can be reviewed further in the Recommendations section of this report. 21 surveys were returned to the study team. Responses represented each of the five urban areas of focus for the study, as well as six responses from those representing interests at a broader, statewide level.

A full recording of the Urban Agriculture Stakeholder Meeting and copies of the survey can be found on the [New York State Department of Agriculture and Markets Community Gardens website](#).

During this time, select urban agriculture practitioners were also interviewed to contribute case studies of urban agriculture. These practitioners were selected based on their relative visibility and/or community impact as determined by Cornell Cooperative Extension Urban Agriculture specialists in New York City and Buffalo/Rochester.



Photo: Makela Elvy, CCE



Photo: RJ Anderson, CCE



Photo: Yolanda Gonzalez, CCE

Final Recommendations

1. Advance equity in urban agriculture policy development and administration
2. Increase coordination and collaboration in support of urban agriculture systems
3. Provide better access to capital and funding available for urban agriculture
4. Promote the role of urban agriculture as a source of community, physical, and social wellbeing
5. Encourage the adoption of local land use laws that accommodate urban agriculture through promotion of standardized regulation and zoning across the state
6. Reduce obstacles to land access and retention for urban agricultural producers
7. Acknowledge the distinction between community-focused and commercial urban agriculture, and support community development and business development, respectively, for urban growers
8. Increase investment in urban agriculture education to inspire and support the New York food sector workforce of the future
9. Expand financial assistance in support of urban agriculture that is grounded in sustaining ecosystem services while ensuring community, physical, and social wellbeing
10. Evaluate regional and local food systems supply chains to ensure greater access to markets for urban agricultural producers

Background

Definitions

Urban agriculture can take many forms. It can broadly be defined as growing food in cities. It is a way of growing food while considering the unique needs and constraints of communities, land, and resources in an urban setting. Urban agriculture generally plays a unique role in fostering community development, but the mechanisms of doing so may be commercial or non-commercial (emphasizing education or justice rather than produce sales) (Rangarajan & Riordan, 2019). Urban agriculture can also play a role in the larger food and social systems of cities “by improving food security and public health, building social capital, and promoting circular economies” (Gulyas & Edmondson, 2021). Urban agriculture is also often shortened to “UA” in industry, academic, and policy reports.

While it is necessary to define urban agriculture, it is important to remember that urban agriculture is not monolithic. Just as community culture and economic development look different between and even within cities, so, too, does urban agriculture take on unique forms depending on community need, business opportunity, and resource constraints. The following section provides further clarity on this subject.

Whether urban agriculture accomplishes its diverse goals is dependent on local and state government support. Urban agricultural production is often perceived as competing with other types of land use within cities (Rangarajan & Riordan, 2019). As a result, successful urban agriculture projects need protection to safeguard against development pressures. Government support can come in the form of legal protection, tax breaks, incentives, grant funding, procurement and delivery of inputs, public support campaigns, or purchasing and programming by public schools and institutions (Gatti, 2020).

For the purpose of this study, peri-urban agriculture may be included in our definitions of urban agriculture. Peri-urban agriculture is generally defined as growing food in the “fringes of growing cities” or the “transitional zones between urban and rural areas” (Gulyas & Edmondson, 2021). Whether or not a farm is considered urban is dependent on the size, scale, and nature of the city or neighborhood. Peri-urban agriculture can play a unique role in communities and may require distinct policy needs that are determined at the community level.

Urban agriculture is defined as growing food and raising animals in cities, accompanied by complementary activities such as processing and distributing food, collecting and reusing food waste and rainwater, and educating, organizing, and employing local residents. Some examples of urban agriculture include hydroponics, urban apiary, aquaponics, backyard chickens for egg production, and rooftop farming (Department of Agriculture and Markets, n.d.).

Typologies

Urban agriculture may be too broad a term to use when seeking to understand exactly how food production in urban areas takes place. Indeed, it may be too broad a term to use when drafting policy or when seeking to support urban growers because of the unique challenges and benefits offered by various types of urban growing operations. However, recognizing that growing food in urban areas does itself present specific challenges and opportunities, urban agriculture can still be a useful term so long as distinctions between the types of urban growing are considered. This section provides helpful and necessary comparisons and definitions, although it must be noted that even more refined distinctions exist even within these typologies. However, this approach should still be helpful for the purposes of this study.

Three typologies of urban agriculture were identified as a result of the research conducted: soil-based or non-soil-based; for profit or non-profit; and non-commercial or commercial.



Photo: Judson Reid, CCE

Soil-Based or Non-Soil-Based

Soil-based agriculture emphasizes growing food in soil. Soil in many cities may be found literally on the ground, either in gardens, parks, rooftops or vacant lots; or it may be sourced offsite and transferred to raised beds, grow bags, or containers/pots. Non-profit, community-based, and urban agriculture for personal consumption in New York State tends to be soil-based (but not always). Urban soils can pose unique challenges for urban growers, who must be diligent about soil testing for heavy metals and other particulate matter contaminants not typically found in the same concentrations in rural soils. Information for growers on soil management practices in urban areas can be found on the [Healthy Soils, Healthy Communities website](#). While soil-based activity can take place in “controlled environments,” ranging from semi-exposed high tunnels to fully enclosed greenhouses, they are largely open-air and exposed to the elements. Generally speaking, soil-based operations generate more ecosystem services and use fewer fossil fuel inputs for energy (because they rely on sunlight), a major contributor to greenhouse gas emissions related to agricultural production.



Soil-based agriculture at [Phoenix Community Garden](#) (Brooklyn, NY). Photo: RJ Anderson, CCE



Seedlings growing in soil in seed trays at [Brady Farm](#) (Syracuse, NY). Photo: RJ Anderson, CCE



Youth tend soil-based raised planting beds at [Southwest Community Learning Farm](#) (Syracuse, NY). Photo: RJ Anderson, CCE

Non-soil-based agriculture emphasizes growing food without soil. Hydroponics and aquaponics are the two most common types of non-soil-based agriculture. Hydroponics is the science of growing plants in a soil-less environment, usually using water to carry dissolved nutrients to plant roots; aquaponics is a mutually-symbiotic and energy-efficient system where the nutrient water from fish sustains plants and reduces need for additional fertilizer inputs, while the plants clean the water for the fish. Non-soil-based agriculture is typically practiced as controlled environment agriculture, or CEA.



Hydroponics at [Wheatfield Gardens](#) (Buffalo, NY). Photo: Jeffrey Landau, Agritecture



Hydroponics at the [Kenneth Post Greenhouses](#) (Ithaca, NY). Photo: RJ Anderson, CCE

Vertical farming may be soil-based or non-soil-based, but typically is associated with non-soil-based CEA. Vertical farming emphasizes using as little space as possible, growing vertically rather than growing horizontally where possible. Vertical farming can be practiced in nonconventional spaces such as in buildings and shipping containers.



[Masonic Care Community Greenhouse](#) (Utica, NY) grows herbs in a vertical farming system. Photo: RJ Anderson, CCE



Basil growing at [Square Roots](#) (Brooklyn, NY). Photo: RJ Anderson, CCE

For Profit or Non-Profit

For profit operations sell produce, other farm output (like honey or processed goods), and/or services (like workshops, urban landscaping, or greenhouse construction on private property) that fully or primarily fund farm operations and staffing. Few urban farming operations follow a for-profit model, largely due to the relatively low cost of food at retail coupled with increased costs of land, inputs, and regulation relative to urban or peri-urban agriculture. Those for-profit organizations that also seek to provide food at especially low (and, therefore, more accessible) costs struggle specifically with this issue, and may need to offer additional services like event space and consulting to be financially viable.



For profit farming at [Brooklyn Grange](http://www.BrooklynGrangeFarm.com) (Brooklyn, NY). Photos used with permission.

Non-profit operations depend on donations and grants to fund their operations. These operations often rely heavily on volunteer support and may give produce in-kind to volunteers for their work. Volunteers may also experience a multitude of social, physical, and mental benefits from this work. However, non-profit growing faces several challenges. A dependence on donations and grants means these organizations must dedicate time and energy finding and applying to funding opportunities that are not guaranteed instead of spending those resources on growing activities. They may also experience mission drift, in which primary missions like improving food access may be compromised in favor of pursuing projects that fund education and innovation, which may open the door to more lucrative grant funding. Grants are often conditional and may demand outcomes that are incompatible with producers' goals, discouraging some growers from applying. Most urban agriculture organizations in New York operate as non-profits, with missions like community development, youth education, or health, which may supersede production goals.



[Randall's Island Urban Farm](#) (New York, NY) is a non-profit operation. Photo: Ciara Sidell



[490 Farmers](#) (Rochester, NY). Photo: Marci Muller, CCE

While the distinctions between for profit and non-profit may be clear in other industries, the delineation is not often as clear for urban agriculture. In many cases, a non-profit growing operation may still sell produce or services and may seek to pay wages to their employees. This financial investment in human capital can impact a farm's competitiveness, either necessitating higher prices or shrinking the profit margins so low that a non-profit model is the only model that works. Additionally, some urban agriculture operations, like many community gardens and private spaces, may not technically operate as either for or non-profit entities; rather, they may be solely private or communal, leveraging private or collective funds for operation and generating no revenue; or they could be solely funded by government subsidies and grants.

Non-Commercial or Commercial

Non-commercial assumes that product sales are not a significant priority of the growing operation. Non-commercial urban agriculture may look like a window garden, a home garden, or a community garden. It may also look like a larger farming operation intended to feed the volunteers or members of the farm. While difficult to quantify, most urban agriculture practiced in New York may be non-commercial, relying on volunteers and focusing on food access, education, community development, and/or physical and mental health of local populations. School gardens and gardens connected to houses of worship are classic examples of this type of urban growing.



Hands and Hearts Community Garden (Brooklyn, NY). Photo: RJ Anderson, CCE

Commercial assumes that the sale of products and services is a priority of the growing operation, at least to some extent. The United States Department of Agriculture (USDA) defines a farm as an operation with \$1,000 or more in annual revenue but defines a commercial farm as making \$350,000 in gross cash farm income (GCFI) and is distinct from an intermediate farm or a residence farm (Subedi et al., 2021). This study uses the Cornell Cooperative Extension definition, which considers operations making \$1,000 or more annually as commercial, indicating that farm sales are a consideration even if they are not the sole consideration. Many urban agriculture operations in New York seek to be commercial operations but are hampered by local regulation (for example, growers in Rochester cited regulatory limits on sales and fundraising; Teens for Food Justice cited an inability to sell their produce grown in school gardens back to school cafeterias due to minimum food purchasing thresholds that exceed production [NY General Municipal Law §103 (1)]) that limits farm sales. The most notable urban, commercial operations are either heavily service-driven or would be considered controlled environment agriculture (CEA) that leverage venture capital, business investments, and sales from growing high-value, quick growing crops like microgreens and lettuces.



Healthy eating lessons at the [East New York Farmer's Market](#) (Brooklyn, NY). Photo: Yolanda Gonzalez, CCE



Vegetable for sale from [La Familia Verde](#) (Bronx, NY). Photo: Yolanda Gonzalez, CCE



[Radix Ecological Sustainability Center](#) (Albany, NY). Photo used with permission.

Benefits of Urban Agriculture and Challenges Facing Urban Growers

Benefits of Urban Agriculture	Challenges Facing Urban Growers
<ul style="list-style-type: none">• Expanded food access• Increased food sovereignty• Community development• Youth education and engagement• Physical and mental wellbeing• Ecosystem services• Job creation and economic multiplier effects	<ul style="list-style-type: none">• Racial and gender equity, especially for communities of color• Lack of policy prioritization and coordination• Lack of access to land• Lack of access to capital• Zoning and regulation• Lack of technical expertise• Declining workforce• Market imperfections

Benefits of Urban Agriculture

Urban agriculture can have economic, ecological, or social benefits, and the scale of this impact ranges based on the type of urban agriculture practice. Literature reviewed for this study regularly cites a “multi-functionality of urban agriculture” that could allow for greater sustainability and resilience in urban centers (Langemeyer et al., 2021).

Economically, urban agriculture can create new jobs within communities and create new supplies for food within city centers (Adams, 2021). Agriculture generally has a relatively strong multiplier effect, meaning that every \$1 of output in New York State agriculture creates \$0.49 in non-agricultural profits. Additionally, every \$1 in Gross Domestic Product (GDP) from agriculture creates an additional \$1.14 in GDP outside of agriculture (Schmit, 2019). Therefore, as an investment, agriculture creates revenue and grows GDP outside of the industry, creating compounding benefits for New Yorkers. Urban growing can even “complement food access strategies in urban food deserts” (Palmer, 2018). These new sources can increase local community food sovereignty and the power that community members have over their diets and groceries (Adams, 2021). However, while studies have shown that urban agriculture engagement can have beneficial impacts on children’s diets, true nutritional security needs support from other interventions (Raj et al., 2017). These positive economic/dietary impacts can also fail to impact surrounding communities if the farm isn’t located in or accessible to marginalized communities (Raja et al., 2017). In addition to the location of the farm, food prices, volunteering/work opportunities, and community space must be accessible.

Ecologically, urban agriculture's impact on carbon emissions and the local environment vary according to the form of growing. Soil-based farms can help regenerate soil, improve biodiversity, and even sequester carbon. Some counties in New York State pay for these environmental improvements, as in the case of Tompkins County, where the Payment for Ecosystem Services program rewards and incentivizes farmers who have positive environmental impacts (Cornell Cooperative Extension, n.d.). Creating "permanent and protected sites...that are tied to keep soil in production" can also help with mitigating stormwater runoff, the heat island effect, and carbon emissions (Kosby et al., 2022). Healthy soil can "absorb more water during heavy rains [and] hold more water during droughts", making local ecosystems more resilient to climate shocks (Kosby et al., 2022). These impacts are especially strong in comparison to the normal buildings or concrete that covers space in urban centers. However, these ecological impacts are less relevant with vertical farming that doesn't utilize soil and may have a negative impact on carbon emissions dependent on energy use and sourcing.

Finally, the social role that urban agriculture can have in neighborhoods is one of engagement, new activities, and meeting space. According to the NYS Food Resiliency Report, community farms in urban areas "can help encourage youth development, aid in nutrition education, provide culturally appropriate, hyper local foods" (New York State Food Resiliency Report, 2021). By providing green spaces and engaging events and activities, urban agriculture can create natural spaces for community members to meet, engage, and learn new skills (especially for local youth). These spaces can promote positive physical and mental wellbeing (Feda et al., 2014) (Rosan, 2020). Urban growing can have myriad benefits dependent on the local community and nature of growing, but there are also challenges unique to growing food in an urban center as discussed in the following section.

Challenges Facing Urban Growers

Urban growers face environmental, institutional, and social challenges. Environmentally, soil health or contamination present serious risks to growers. Soil contamination is a reported issue in Buffalo, NYC, Rochester, Albany, and Syracuse (The Greater Buffalo Urban Growers Network, 2022) (Cohen & Reynolds, 2012) (Rochester Urban Agriculture Working Group, 2021) (Stanforth, 2022) (Syracuse Grows, 2022). Fixing these issues can be a major expense for urban farms that may need to shift their production set up, or which can prevent them from growing all together. If a farm or garden plot lies in the shade of tall buildings, access to light may also be an issue. This is especially challenging when new developments are built next to established farms or gardens. For rooftop growing, there are additional structural demands. Generally, rooftops need to have at least 10,000 square feet and to be built between 1900 and 1970. During that period, they were built with greater roof live load requirements(required to withstand 50 pounds/square foot (Meier et al., 2013). Landscape complexity presents another challenge: urban areas are generally simple landscapes dominated by concrete, and growers often plant the same few types of crop species (Gregory et al., 2016). This lack of landscape

complexity can exacerbate pest and disease issues on urban plots (Chaplin-Kramer et al., 2011; Gregory et al., 2016). As mentioned above, there can also be issues around high energy use especially within CEA, indoor, and/or vertical growing, which presents financial challenges and may result in carbon-intensive production (Palmer, 2018). These issues are present throughout New York State and are conditions of growing in urban areas generally.

When engaging with city, state, and local institutions, urban growers may have issues accessing land, water, financing, and coping with regulatory burdens. On the topic of land, there is often an inherent competition for space in urban areas because land is at a premium price. Land in cities has many possible uses, some of which create more profit than all types of urban farming. This can make farming and gardening in cities even more difficult because there's external pressure to use the land for other purposes. Expanding access to information on affordable, vacant lots can help empower urban farmers and help them find land with more secure tenure (Palmer, 2018). Historically, gardens have also been labelled as vacant lots within the tax lot system, making it easier for developers to build over a community garden. Creating a new community garden label can help prevent this (Vutrapongvatana, 2020). Within the regional reports that have been integrated into this study, access to and financing for land is an issue for urban growers across New York State (in Buffalo, Albany, Rochester, Syracuse, and NYC). In Rochester, there's specific emphasis on the need for more secure, long-term leases for urban farming land (Rochester Urban Agriculture Working Group, 2021).

Accessing water can also be an issue for growers who are purchasing water from their local municipality. Local regulations, high costs, and fees on water can limit growers' capacity and cause a financial strain. This has been noted as a specific issue in Buffalo, NYC, and Syracuse (The Greater Buffalo Urban Growers Network, 2022) (Cohen & Reynolds, 2012) (Syracuse Grows, 2022). Financing urban gardens and farms is also a burden for growers in cities across the state, especially when these gardens work to serve marginalized communities. High upfront costs, "insufficient access to working capital..., and lack of financing for startup costs" can mean that those farming in urban centers are those who already have financial resources or access to capital (State of Indoor Farming, 2017). Limited access to capital impacts farmers' ability to buy/rent land and purchase farming inputs (machinery, seeds, tools, irrigation equipment, etc.). The high costs of urban growing don't integrate the positive externalities that urban growing brings to communities (including the benefits discussed above). Subsidizing more market support for urban agriculture with distribution, inputs, and land can help integrate these.

Farmers also face issues accessing technical expertise and recruiting trained workers. Growing expertise may include growing knowledge, skills, and experience. This expertise will be different in urban areas and finding advice on specific urban agriculture issues can be difficult both for business and community development-focused farms. This need for technical expertise in growing farming and gardening

enterprises has specifically been reported in Rochester and NYC (Rochester Urban Agriculture Working Group, 2021) (Cohen & Reynolds, 2012). CCE's Master Gardener (MG) program can help provide information to growers, and currently has 2,262 active MG volunteers. However, this program requires a time commitment that many growers may not be able to make, especially those working other jobs in addition to urban growing (Potteiger et al., 2021). Establishing a Master Gardener program specifically for urban growing (Master Urban Gardeners, perhaps) would also allow for educational opportunities to specialize in the needs, constraints, and opportunities of urban agriculture. Declining agricultural workforce is an issue across the state, and specifically noted in reports about Albany's agri-food system in farming, processing, and distribution (Klein et al., 2021). Within urban agriculture, there may also be specialized issues with workers trained in CEA methods and infrastructure (Abraham et al., 2022). Many urban farms operate apprenticeship programs, both to create opportunities for local workers and train people in the methods specific to urban agriculture.

On a local level there are also zoning and regulatory limits that curtail farming options, economic activities, and food access. These regulations may include what type of animals a farmer is able to raise in the cities and how many, including bees, chickens, fish, and other small ruminants, an issue noted in Buffalo (The Greater Buffalo Urban Growers Network, 2022). These laws attempt to provide public health protections, but occasionally they create arbitrary limits on farmers' activities and prevent them from making the right choices for their business, operation, and community (Butler, 2012). Finally, given the current dynamics and requirements for resources and capital to begin farming, urban agriculture can effectively leave out historically marginalized communities, something seen in urban areas across New York State. Gentrification and development can make some community land totally unfeasible for urban growing, and push farmers out of their plots (London et al., 2020). Some of these challenges are innate to trying to grow in cities, but others can shift based on intentional action on the state and local level. New measures to promote urban growing must intentionally involve and promote marginalized folks and communities to remedy the access components of these challenges.

An Overview of Urban Agriculture in New York State

New York State Urban Agriculture at a Glance

Table 1. A Snapshot of the Diverse Scale and Types of Urban Agriculture in New York State in 2022

City	Number Commercial Urban Farms	Number Community Gardens	CEA	Official Urban Agricultural or Garden Network	Urban Agricultural Governance	Urban Agricultural Public School Education or Programming
Albany/Troy	5	55 <i>40 operated as part of Capital Roots</i>	Developing <i>Examples: Microgreens Urban Farm; Radix</i>	Capital Roots	Urban Agriculture Subcommittee <i>Within the Mayor's Office of Sustainability</i>	Some school gardens managed by the Vegetable Project
Buffalo	13	83 <i>Supported by Grassroots Gardens</i>	Developing	Grassroots Gardens; Greater Buffalo Urban Growers (GBUG)	Buffalo Green Code Project <i>Managed by the Mayor's Office of Strategic Planning</i>	27 school gardens managed by Grassroots Gardens
New York City	27+	600+ <i>555+ through GreenThumb (NYCHA: 25)</i>	Established <i>Examples: Oko Farms, Gotham Greens, Square Roots</i>	GreenThumb <i>Managed by NYC Parks</i>	NYC Office of Urban Agriculture	150 operated by Grow NYC Programs with Edible Schoolyard, NY Sun Works, and Randall's Island Urban Farm
Rochester	0	102 <i>14 through Taproot Collective; 82 garden permits and 6 teaching gardens through the City of Rochester</i>	Developing <i>Example: Clearwater Organic Farms</i>	490 Farmers Network	ROC City Home Grown; Office of Community Wealth Building (community garden program on city-owned vacant lots)	Some school farms funded via Cornell Cooperative Extension or local grants like the Master Gardener School Grant
Syracuse	1+	28 <i>Supported by Syracuse Grows</i>	Nascent	Syracuse Grows	Within the city's Planning Division (i.e. ReZone)	Some schools with gardens

Case Studies

To further illustrate urban agriculture as it is practiced in New York, select producers provided a peek behind the curtain of their growing operations. The following case studies highlight:

- Radix Ecological Sustainability Center in Albany, NY
- Massachusetts Avenue Project (MAP) in Buffalo, NY
- Oko Farms in New York, NY
- Aerial Springs Community Garden in Rochester, NY
- Brady Farm in Syracuse, NY

The time and input of the urban growers representing each operation was instrumental to the development of this study, and these contributions are much appreciated.

Taken as a whole, these case studies illustrate the great diversity inherent to urban agriculture in New York State. Each featured operation reinforces the idea that, although urban agriculture is not monolithic, they share the ability to generate a multitude of direct and indirect benefits. This diversity challenges attempts to define urban agriculture as an aggregate, which may complicate the development of policy seeking to expand urban agriculture. However, diversity also creates more resilient food systems that can respond nimbly to local situations, contexts, and even crises. For this reason, policymakers and administrators should embrace the complexity of urban agriculture and build flexibility into policy and executive frameworks.

Case Study A: Radix Ecological Sustainability Center Albany, NY

Achieving just urban transitions through an emphasis on education, environmental stewardship, and food sovereignty

- Founded in 2009
- Growing on 2.0 acres (1.0 acre on Radix property)
- Non-profit, soil-based and aquaponics, bees and small livestock, educational center
- Priorities, themes, and differentiators:
 - Center ecology, environmental stewardship, and justice around agriculture
 - A training center envisioning how cities can grow equitably
 - Investing in innovative growing projects and season-extension with the dual goals of local food justice and education

About Radix Ecological Sustainability Center

The mission of the Radix Ecological Sustainability Center (Radix) is to promote ecological literacy and just sustainability through educational programs based around demonstrations of sustainable agricultural technologies. Radix seeks to create a model for environmental- and urban transition- justice education from the perspective of urban agriculture, a model that Radix leadership believes could be applied in cities around the world. Radix also runs an afterschool youth employment and agricultural training program.



On the Farm

Radix is an education center first and foremost and has invested in a variety of growing technologies designed to educate groups about these systems. While Albany's growing season is relatively predictable, it is short; season extension technologies, like a solar greenhouse and a hoop house, are meaningful investments that allow production to continue, sustainably, for more of the year. Radix has also built a sustainable rainwater harvesting system, organizes a community compost initiative, and is pioneering a food forest project that will plant fruit trees across Albany to increase food access while mitigating pollution and urban heat island effect. Produce, mushrooms, fruit, and eggs harvested from the center are sold throughout the neighborhood, including through a sliding-scale CSA farm-share model.

Education, Innovation, and Community

Justice for both people and planet is at the heart of everything Radix does. As an incorporated non-profit, Radix is empowered by a board and funding to support a small staff. These resources have given Radix the capacity to identify barriers to urban agriculture in Albany and to advocate for change. In part because of this work, urban agriculture now has permitted zoning and use categories in Albany's zoning code. Scott Kellogg, Radix's Educational Director, chairs Albany's urban agriculture subcommittee (a part of the city's Sustainability Advisory Committee), and will continue to lobby for improved and affordable access to water, land, and funding for urban growers in the region.



Photos courtesy of [Radix Ecological Sustainability Center](#), used with permission.

Case Study B: Massachusetts Avenue Project Buffalo, NY

Farming, processing infrastructure, and food access

- Began in 1992
- Growing on 1.5 acres
- Non-profit, soil-based community farm
- Priorities, themes, and differentiators:
 - Access to affordable produce
 - Training young farmers
 - Investments in processing, refrigeration, and preservation infrastructure and facilities for farmers and community members

About the Massachusetts Avenue Project

Beginning as a community project in the 90's, Massachusetts Avenue Project (MAP) was a small farm focused on growing food and a handful of youth programs. When the neighborhood's final grocery store closed in 2002, MAP partnered with the University of Buffalo's Food Lab to conduct a community food assessment. In order to respond to community needs, MAP expanded their youth employment programming and started a mobile food market. Eventually, they started a micro-enterprise program, teaching their apprentices how to craft different value-added products from teas to honey and naturally-dyed products. In 2018, MAP finished its current farmhouse and community training center, which has growing plots, a commercial kitchen, and a massive amount of refrigeration/food storage. This center acts as a community center, training space, local advocacy hub, and a farm.



On the Farm

MAP grows a variety of fruits, herbs (culinary and medicinal), flowers, and vegetables, with a focus on culturally appropriate crops like peppers and a variety of eggplants. They also raise their own bees and chickens. Food sold at their Mobile Food Market is sourced both from MAP and other local farms across Erie, Niagara, and Cattaraugus Counties. This breadth of local food coming into their market allows MAP farmers to focus some of their growing efforts on culturally relevant foods that community members have trouble sourcing elsewhere.

Community Involvement & Support

This organization grows food, but also sees itself as a part of a larger food system and that focus is evident with their investment in processing, preservation, and storage facilities. Training programs teach young people to farm and are focused on creating a new generation of food systems leaders. MAP offers growing apprenticeships as well as a college prep program and community classes to learn how to raise chickens, start seedlings, preserve food, and more.



Photos courtesy of [Massachusetts Avenue Project](#), used with permission.

Case Study C: Oko Urban Farms

New York, NY

Urban farming, aquaponics, education, and environmental stewardship

- First farm built in 2013, second farm built in 2021
- Growing on 0.25 acre
- For-profit, soil-based and aquaponics
- Priorities, themes, and differentiators:
 - Innovative growing, from crop production to pest management
 - Economic and environmental sustainability
 - Community access

About Oko Urban Farms

Oko Urban Farms started in 2013 when the company converted an abandoned lot in East Williamsburg into the Oko Farms Aquaponics Education center. At the time, this was New York City's first outdoor, and only publicly accessible, aquaponics farm. The methods chosen by Oko Farms aim to provide affordable, culturally appropriate foods for the city. Having seen success towards achieving this goal, the growers at Oko Farms offer aquaponics training and consultations for other farmers interested in integrating this system into their own.

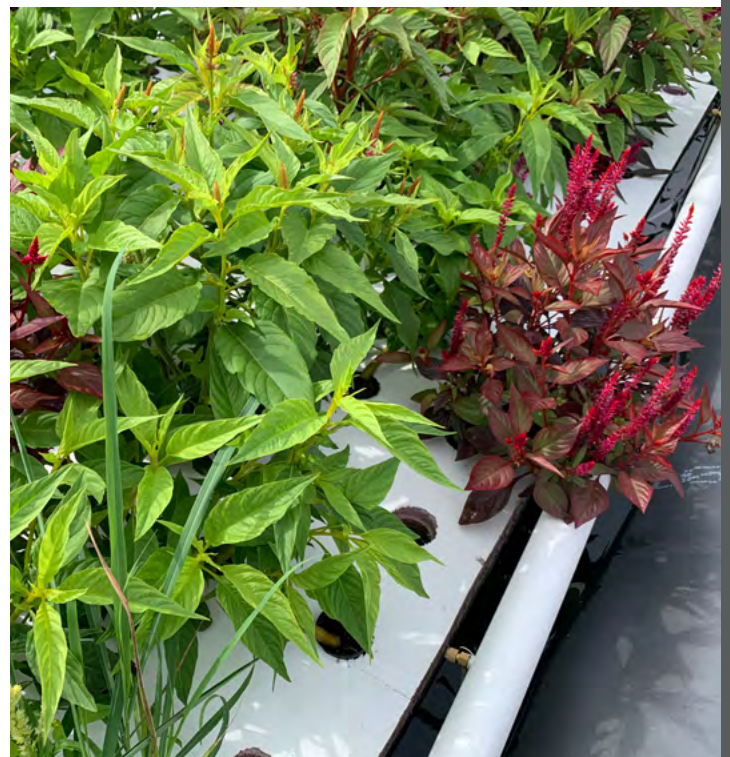


On the Farm

Oko Farms combine indoor and outdoor aquaponics and soil-based growing. Aquaponics is a recirculating, closed loop system that allows the farm to both cultivate and sell vegetables and freshwater fish while minimizing off-farm fertilizer inputs and saving water. A wide variety of produce is grown on the farm, demonstrating the possibilities of aquaponic systems. Some of the crops grown on the farm include cabbage, onion, sweet potatoes, lemongrass, okra, millet sorghum, and flowers like marigolds. Fish species include mirror carp, koi, and crawfish. Experimentation is central to the ethos at Oko Farms; for example, the team has been growing indigo for use as a dye.

Tradition, Innovation, and Sustainability

The growers at Oko Farms take seriously the method of growing, not just the output. The farming practice at Oko Farms is rooted in Traditional Ecological Knowledge, emphasizing low-tech and accessible growing techniques that employ symbiosis. Growing fish and leveraging an aquaponics system allows the farm to rely primarily on fish waste to fertilize the crops. Pests and disease are an inevitable part of any farm, and closed loop systems face unique challenges when either are introduced to the system. However, Oko Farms has succeeded in managing their pest issues using Integrated Pest Management (IPM), an “environmentally sensitive” approach to pest management (Environmental Protection Agency, 2022). While Oko Farms offers courses to other growers, the team is also constantly innovating and testing the limits of urban growing.



Photos courtesy of [Oko Urban Farms](#) and Island Bee Project, used with permission.

Case Study D: Aerial Springs Community Garden Rochester, NY

Art, community space, and accessible produce/cut-flowers

- Began growing at this garden in early 2022
- Growing on 1,500 square feet
- Soil-based
- Priorities, themes, and differentiators:
 - Providing an accessible community space
 - Integrating art throughout the garden
 - Creating a source of food and joy through open access to produce and flowers

About Aerial Springs Community Garden

Aerial Springs is a recent project by arts and special education teacher Janelle, fueled by her desire to build an inclusive green space in her neighborhood. She began with a community garden permit from the City of Rochester and has built a thriving garden that functions as a community space and food source for her neighbors. She credits other Rochester urban farms, community gardens, and CCE staff for their support and advice as her garden continues to grow.



On the Farm

Aerial Springs grows produce and flowers in raised beds using organic methods. Some of the crops she grows include cucumbers, chives, beans, lettuce, watermelon, tomatoes, herbs, onions, and garlic. In building the community garden, Janelle has been able to recycle and reuse pallets, tires, and a variety of other materials. This, combined with her work saving seeds, demonstrates her commitment to circular methods in the garden. She has taken advantage of CCE master gardener classes and many of the subsidized resources offered by the city, including trees, plants, seeds, mulch, and tools.

Art and Community

Aerial Springs works to invite community members in by providing seating and including kids in the art projects found throughout the garden. At the school where she teaches, Janelle incorporates her garden into the arts curriculum, and her students are able to contribute to the garden too. Produce and flowers from the garden are distributed to the community through baskets at the perimeter, and many neighboring families volunteer in the garden planting, weeding, and harvesting.



Photos courtesy of [Aerial Springs Community Garden](#), used with permission.

Case Study E: Brady Farm Syracuse, NY

Community focused-farming with roots in faith-based vision of social justice

- Began in 2016
- Growing on 5.8 acres
- Non-profit, soil-based community farm
- Priorities, themes, and differentiators:
 - Organic
 - Community engagement
 - Local educational and employment opportunities
 - Food access

About Brady Farm

Brady Farm is rooted in the Brady Faith Center, focused on engaging community members, training the next generation of young people, and providing a source of healthy, local food for community members. It is open to the public and seeks to normalize growing food and providing green space for their community. They run a successful apprenticeship program and collaborate with local schools and community centers to provide interactive, nature-based programming.



On the Farm

Brady Farm organically grows a variety of vegetables, some fruit, and a variety of culturally relevant food for community members in Syracuse. Given their farmers' relationships with local schools, they also integrate fruits and veggies in spaces that are fun for children to be in and explore, like a popular raspberry patch and cucamelon tunnel that are used as sensory, learning labs.

Community Involvement and Support

Food is sold to the community below market price and the farm does not generate a profit for these sales. This model is used to improve access to healthy food and provide community members with an affordable source of produce. The farmers see food justice and access as a core part of their farming and sales, and a way to combat the food apartheid, poverty, and racial injustice in Syracuse.

Brady Farm has been able to continue its work using foundation grants, individual donations, and some support from the county and federal government. Sales revenue from their affordable markets also go directly to funding operations. Increased funding opportunities for both urban farming and educational opportunities are seen as pathways for continuing and expanding community programming at the Brady Farm. Due to its location in a residential neighborhood, the farm also required a zoning use variance from the city to farm. This variance was allowed because all other use- cases for the neighborhood (schools, churches, stores) were satisfied, and there wasn't interest in new development on the plot. The Brady Farm was able to navigate institutional and environmental challenges due to staff expertise and its connection with the Brady Faith Center, but many urban farmers are curtailed by zoning restrictions, environmental degradation, and opaque regulatory systems.



Photos courtesy of [Brady Farm](#), used with permission.

Recommendations

Urban agriculture provides a host of benefits, including food access, ecosystem services and environmental regulation, community and business development, and general wellbeing. Urban agriculture has played a historical role in urban development and will continue to serve critical development functions as urban populations across New York grow. National agriculture policy reflects the growing importance of urban agriculture; in response to the 2018 Farm Bill, the USDA established an Office of Urban Agriculture and Innovative Production.

Similarly, integration of urban agriculture across New York State government will be critical to expanding the benefits of urban agriculture. These recommendations respond to needs identified both in the literature and via input from urban agriculture stakeholders across New York. There is no one type of urban agriculture, and therefore the challenges and commensurate needs associated with each type will differ. These recommendations serve as a guide based on this research and community feedback, and careful attention should be paid to which type of urban agricultural operation each recommendation serves.

Recommendation 1: Advance equity in urban agriculture policy development and administration

Systemic bias, policies, and the resulting lack of access has significantly impacted the demographics of who benefits the most from urban agriculture. This is evidenced both in the history of agriculture policy in the US and in the stories gathered from New Yorkers as part of the research for this study. Historically, the USDA engaged in systemic discrimination against Black, Indigenous, Latino, and women farmers, as proven and decided in a series of landmark court rulings (Pigford v. Glickman, or Pigford I and In re Black Farmers Discrimination Litigation, or Pigford II; Keepseagle v. Vilsack; Garcia v. Vilsack, and Love v. Vilsack, respectively) (Congressional Research Service, 2013; Jett, 2020; NASC, 2013). These rulings illustrate examples of discriminatory lending practices that further disadvantaged already marginalized groups, subverting their ability to compete fairly for resources and market access.

This legacy of discrimination persists, ranging from biased policies to a systemic lack of access to knowledge and resources. While New York State has pursued policies, like the development of the Minority- and Women-Owned Business (MWBE) Development and Lending Program, those interviewed for this study insist that not enough has yet been done. The Diversity and Racial Equity Working Group, authorized by New York State, reported that BIPOC (Black, Indigenous, People of Color) farmers comprise only 1.94% of all producers in the state and own or operate just 0.5% of the farms (Department of Agriculture and Markets, 2021). Black Farmers United NYS, a group of over 100 Black farmers and advocates from New York, maintain that the work of Black farmers in New York remains “undercounted, overlooked, and undervalued” (About Us, n.d.). New York must also reckon with the history of land theft from Indigenous peoples, a history that continues to threaten the wellbeing of Indigenous communities.

New York State responded to the Department of Agriculture and Market's Diversity and Racial Equity Report with the following policies:

- The appointment of an executive-level staff member dedicated to raising and addressing issues and opportunities related to diversity and racial equity to be addressed in cooperation with the rest of the agency
- The development of a newsletter of resources (Information & Opportunities) with content specific to informing members of historically underserved and underrepresented groups in agriculture
- The promotion of a newsletter and an email address for the public to have a means of direct communication with the Department (outreach@agriculture.ny.gov)
- The creation of the Diversity and Racial Equity Network to provide a platform for distinct input and ideas to address priority opportunities, challenges, and concerns identified by the Department while members develop relationships and connect with fellow agriculture practitioners, advocates, and leaders
- Increased awareness within state government of the distinct challenges faced by New York's BIPOC agriculture community, while also narrowing the focus to propose actionable steps to feed future conversations

The following funding has been allocated in the State's FY2023 budget (Department of Agriculture and Markets, 2022b):

- \$1 million for the development of a beginning farmers program
- \$4 million for a program supporting economically and socially disadvantaged farmers
- \$200,000 for Black Farmers United – New York State
- \$50,000 for Minorities in Agriculture, Natural Resources, and Related Sciences (MANRRS)
- \$700,000 for the Farmers' Market Resiliency grant program
- \$800,000 for the Urban Farms and Community Gardens grant programs

However, there is more work to be done to ensure equity in the urban agriculture space and beyond. Marginalized groups have been historically denied equal access to funding and support and remain vulnerable to shocks; as such, they are less likely to be able to accept unpaid work, apply for reimbursement or matching grants, or potentially less likely to have the time at all for grant applications or to participate in calls for feedback that are unpaid or inconvenient. Urban growing in the United States largely exists thanks to the labor of minority communities and women who reclaimed abandoned urban lots throughout the second half of the 20th century as a means of revitalizing neighborhoods that government and business chose to disinvest from (Amato, 2021; Cohen & Reynolds, 2012). Many marginalized groups still manage and maintain community-focused urban growing operations throughout the state but their work remains undervalued.

What follows are further recommendations, based largely on the recommendations already proposed by the State's Diversity and Racial Equity Report and Black Farmers United NYS as well as on the feedback obtained from stakeholders interviewed for this study. Note, additionally, that Recommendations 2 through 10 of this report seek to address opportunities and inequalities that stymie urban agricultural production; knowing that many urban growers, especially non-profit and non-commercial growers, are women and minorities, a commitment to implementing Recommendations 2 through 10 will also address issues of equity more broadly.

Specific recommendations that can be executed by AGM include:

- a. Continue to evaluate recommendations and implement changes related to the issues outlined by the Diversity and Racial Equity Working Group and Black Farmers United NYS¹
- b. Encourage the Strategic Interagency Task Force Lessening Obstacles to Agriculture (SILO) Working Group—a group convened by the Commissioner of Agriculture and Markets made up of farmers, representatives of agricultural organizations, and representatives of state agencies that engage in agriculture and food issues—to discuss the evaluation and mitigation of bias, both implicit and explicit, across State institutions working together on agricultural challenges. This can be approached through developing an action plan for minimizing the impact of systemic bias²
- c. Continue to interface regularly with minority and marginalized groups that are impacted by the agency's work
- d. Develop a framework for assessing policy and agency actions to ensure equity is a priority consideration
- e. Actively recruit and seek input from growers representing and working with communities of color, Indigenous peoples, women, LGBTQ+ communities, differently abled people, and economically disadvantaged people
- f. Develop policies and procedures to limit the impact of participation costs for producers and community stakeholders who consult and advise the Department through committees and workgroups, including but not limited to virtual participation options and travel reimbursement. (Stakeholders who contributed to the research for this report recommended compensation for all stakeholders that advise the Department, which should be investigated further in terms of legal and fiscal constraints of the State)
- g. Collaborate and build partnerships with engaged and emerging groups involved in urban agriculture, particularly those serving underrepresented

1 The Diversity and Racial Equity Working Group [Report](#) and Black Farmers United NYS [recommendations](#) emphasize access to inputs and land, education, and a commitment to inclusion and equity.

2 The USDA's NRCS recently released its own Equity Action Plan which could be referenced as an example: <https://www.nrcs.usda.gov/resources/guides-and-instructions/nrcs-equity-action-plan>

communities in agriculture, including but not limited to existing groups facilitating agricultural leadership and skill building with, for, and by farmers of color³

- h. Within available funds, create grants to support existing land trusts and the development of new land trusts to guarantee long-term land tenure for growing in historically under-resourced communities
- i. Close the gap on awareness of MWBE certifications with historically under-resourced agricultural groups and businesses through more proactive outreach and by connecting them to the appropriate support resources throughout the application process

Recommendation 2: Increase coordination and collaboration in support of urban agriculture systems

There is a need to centralize strategic planning, increase representation, and create better access to existing resources for urban agriculture in New York State. Currently, a multitude of diverse organizations across the state are involved in urban agriculture development and advocacy. Many of these groups have similar goals but are competing with each other for resources. Isolated activity prevents the sharing of best practices, the development of collaborative strategies, and the efficiencies that come with partnership and economies of scale across the food system and value chain.

Creating a new, state-level body to facilitate coordination and collaboration between existing urban agriculture practitioners and advocates will close knowledge gaps and lead to more strategic urban food systems planning. By encouraging and facilitating collaboration between relevant state and city government agencies (i.e., planning, transportation, labor, food policy, small business, economic development, and urban agriculture like the newly established office of NYC) and committees, food policy councils, grassroots organizations, producers, and non-profits, this new urban agriculture office or department would encourage cross-functional, systems-level problem solving. Given the expansive nature of urban agriculture, a broad coalition should be formed to ensure policy changes focus on the desired outcomes rather than symptoms.

Specific recommendations include:

- a. Create a central, state-level office or department to coordinate urban agriculture activities and fill in the gaps, including but not limited to: identifying and facilitating collaboration and networking between key stakeholders; determining priorities for the advancement of urban agriculture across the state; making recommendations to key stakeholders

³ Groups doing this work include (but are not limited to) current farm and garden managers, the Federally-Recognized Tribes Extension Program, school groups and non-profits serving these communities, and groups like [Black Farmers United](#), [MANNRS](#), [the Black Feminist Project](#), [Northeast Farmers of Color \(NEFOC\)](#), and [From Farms to Incubators](#) (among others).

and the state legislature; streamlining the dissemination of information (for example, grant deadlines), and promoting urban agriculture to state-level decision-makers⁴

- Should comprise state and local agencies (for example, municipal offices like the NYC Office of Urban Agriculture), local food policy councils, non- profits, academics, and producers from CEA, school gardens, community gardens, and urban farms; as well as the next generation of urban farmers (i.e., students) as well as rural farmers and rural farm organizations to foster collaboration along the urban-rural pipeline
 - Would collaborate with relevant USDA (NRCS, FSA) representatives to identify which federal and state programs are underutilized by urban farmers and to develop a plan to promote existing funding, programming, and opportunities equitably to urban farmers⁵
 - Would incentivize its members to stay connected to the realities of urban agriculture through professional development, urban agriculture field days, and networking opportunities⁶
 - Should initiate the development of an urban agriculture task force to determine relevant stakeholders and initial priorities for this new coordinating office or department
 - Should be responsible for creating and maintaining accurate records of urban growing across the state, including promoting participation in the USDA Census of Agriculture and conducting new surveys and models to inform policy⁷
- b. Create grants, within available funding, to develop local or regional food policy councils to streamline the transfer of information from local urban agriculture communities to the state, and the transfer of funds from the state to local urban agriculture communities⁸
 - c. Coordinate an annual gathering of urban agriculture stakeholders to encourage networking, information-sharing, and to establish a regular touchpoint with the state urban agriculture community to capture feedback
 - d. Position grants to encourage collaboration between existing groups

4 New York City recently created an [Office of Urban Agriculture](#)

5 As part of its County Committees program, USDA's Farm Service Agency (FSA) is opening an office in New York City

6 The Cornell Cooperative Extension and Cornell Small Farms materials, like the recently released urban agriculture curriculum, and events can help legislators and agency actors stay up to date on the state of urban agriculture

7 The AGM Farm Directory does not yet represent urban growing, showing only one farm each in New York City and Albany, for example: <https://farmdirectory.agriculture.ny.gov>

8 The Food Policy Council of Buffalo and Erie County streamlines prioritization of issues and helps growers to access grants and resources

- e. Create funds, within those available, specifically for the development of food hubs and cooperative models⁹

Recommendation 3: Provide better access to capital and funding available for urban agriculture

While the benefits of urban agriculture are clear, including the provision of many public services, current financing and funding structures do not meet the needs of urban growers in New York. Urban growers are often volunteers or are paid through grants. With limited revenue earned from production, community-focused growers are especially dependent on external funding sources but must juggle grant application and delivery processes that compete with their production priorities. In Rochester, for example, starting a new, single-house-lot sized urban garden with raised beds, water connection, irrigation, a toolshed, soil, and other necessities can cost \$15,000 to \$20,000 before considering land prices (figures calculated by Liz Henderson, Dr. William Bayer, and Iletha Clifton). Additionally, urban growers may not have the same access as rural growers to federal financial protection support due to the nature or scale of their enterprises.¹⁰ While many urban growing operations currently leverage private partnerships and funding, some stakeholders seek more streamlined access to government funds. Community-focused and non-profit operations face different needs for capital than commercial entities. Commercial projects face the most funding challenges in the start-up phase and need secure financing options that meet them where they are.

Specific recommendations include:

- a. Adapt the grant application and delivery structure to better match the capacities of urban growers
 - Be mindful of opening and processing grant applications during the growing off season
 - Examine thresholds for matching requirements with an eye to reducing the economic burden on applicants
 - Shift from a reimbursement to an upfront delivery model if and when permissible for state contracts (currently, this is not possible as the State provides payments on a reimbursement basis, according to state finance law)
 - As appropriate, allow for more funding to cover operational, administrative, and reporting costs for limited-resource organizations addressing equity needs
 - Expand on regional grant support and training at the state level to assist growers and urban agriculture organizations with grant applications and RFP processes

⁹ East Brooklyn Mutual Aid, the Park Slope Cooperative, Bronx Community Farm Hubs, CRAFT, and the Iridescent Earth Collective are examples

¹⁰ [USDA FSA Guaranteed Farm Loans](#)

- Evaluate the current grant framework, within the availability of funds, to offer grants that support urban agriculture long term, i.e., funding for longer projects and internal capacity building (like salaries, infrastructure), not just short-term startup costs
 - Remove land ownership requirements from funding conditions in favor of evidence of site control such as multi-year leases or use agreements
- b. Create a grant, within available funds, to support garden managers at community-focused urban gardens (full-time or part-time, based on scale of production); prioritize hiring managers from current garden membership
 - c. Increase investment in grants, within available funds, for new urban farmers, including for those from underrepresented groups and those promoting the production and processing of culturally relevant foods
 - d. Encourage development and availability of targeted investments and insurance (risk management) for early-stage commercial urban farms, or encourage the USDA's Risk Management Office (RMA) or other agencies to explore crop insurancemodels that may work for urban growers¹¹

Farm and garden inputs are a unique form of necessary capital beyond financial capital and are, therefore, considered separately within this recommendation.

Specific recommendations include:

- a. Create a grant, within available funds, to support municipal-level urban agriculture service providers, similar to the Green Thumb model currently operating in New York City, to provide inputs to community-focused growers¹²
- b. Increase awareness of and access to existing grants for growing-season extension, like those offered through NRCS, and increase investments in grants for food processing and added value-added activities
- c. Increase investment in grants, incentives, and loans for the provision of agricultural inputs (i.e., compost, wood chips, hay, raised beds) as funding allows at the state level and encourage this through local funding mechanisms¹³
- d. Provide funding for soil testing, including soil testing for heavy metals, free for community-based and non-profit operations
- e. Encourage the SILO Working Group to evaluate the process for updating the list of approved items for purchase under government contracts to

11 The recently announced \$1M investment in a beginning farmers grant program, but sustained and diverse financing options are needed; see Farm Credit East's FarmSmart program for an example

12 For example, New York City's [GreenThumb](#) community garden program delivers inputs like compost and woodchips to community gardens and provides some legal protection through the NYC Parks network

13 New York City's Office of Environmental Remediation's [PUREsoil program](#) offers soil to community- based organizations to improve the quality of degraded soil in NYC

streamline the establishment and maintenance of school gardens and hydroponics systems (especially as part of STEM curriculum)

Recommendation 4: Promote the role of urban agriculture as a source of community, physical, and social wellbeing

As illustrated in detail elsewhere in this report, the benefits of urban agriculture are numerous, diverse, and extend far beyond economic benefits tied to food production. This is especially true for community-based and non-profit operations. However, these benefits, and the interplay of these benefits, are not well understood despite the breadth of literature on this topic. New York State policy and communication should clearly promote the role of urban agriculture as a source of community, physical, and social wellbeing. The benefits of urban agriculture, spanning food access, mental and physical health, and community development, are clearly determined in the literature reviewed and were reiterated by stakeholders.

Specific recommendations include:

- a. Promote the benefits of urban agriculture across state-level legislative and administrative entities to foster the integration of urban agriculture solutions at a systems-level, from policy ideation to street-level administration
- b. Resolve the problem of “impermanence” by promoting the value of long-term land leases and creating grants to fund land banks and long-term land leases
- c. As suggested in [Recommendation 2](#), support local, urban agricultural stakeholders to establish quotas for open space, green space, and green infrastructure per capita that recognizes urban agriculture
- d. Authorize AGM to encourage cities to create agricultural districts to allow for the passing of right to farm legislation in urban areas¹⁴
- e. Increase consumption of fresh fruits and vegetables by establishing more funding for farmers markets, the incorporation of edible landscaping like fruit tree planting, and CSA/food box schemes¹⁵
- f. Expand access to necessary food safety training and Good Agricultural Practices (GAP) certification for urban growers to enable full participation in state procurement programs like Nourish NY, Farm to School, and facilitate more farm- to-institution sales for urban farms through direct connection to community green markets and emergency food providers
- g. Incorporate horticultural therapy in urban spaces into the Office of Mental Health’s strategy and continue to develop programs to assist community members and growers who are stressed¹⁶
- h. Provide resources and grants to ensure adequate public hours and access

¹⁴ See “Healthy Food for All” in Ithaca, NY

¹⁵ For example, continuing work with the Cornell Cooperative Extension’s FarmNet Program

¹⁶ The ADA National Network’s [Universal Garden](#) concept may serve as inspiration

at all community-focused operations (i.e., funding for staff to maintain the space during public hours, funding for physical accessibility)¹⁷

Recommendation 5: Encourage the adoption of local land use laws that accommodate urban agriculture through promotion of standardized regulation and zoning across the state

Currently, urban growers across New York either experience excessive regulation that limits their ability to produce or encounter a lack of information regarding what is allowed and how to seek funding, permitting, and support. Land use and zoning are regulated and determined at the local level, and vary by city; for example, growers in Rochester specifically cited restrictions on structures like toolsheds and high hoops on certain plots, while New York City growers cite relatively supportive zoning. State entities are encouraged to advocate for a standardization of urban agriculture-friendly policy at the city-level but should not supersede city governance. State entities can do this through education, technical assistance, and by adapting and promoting state-level policy tools. Many of these recommendations imply a collaboration between legislators, AGM, and the New York State Department of Environmental Conservation (DEC).

Specific recommendations include:

- a. In addition to responding to [Recommendation 4](#), promote urban agriculture as a permanent use case and as a part of redevelopment and green space protection efforts
- b. Seek authorization for AGM to specifically promote the development of agricultural overlay districts in cities, allowing cities to determine urban agriculture policy outcomes with support from the state that protects agricultural production practices (for example, protections for year-round structures and controlled environment agriculture infrastructure)
 - Promote the inclusion of raising chickens and keeping bees in all zones, allowing each city to determine which agency is best suited for day-to-day regulation¹⁸
 - Promote allowances for structures necessary for agricultural production (i.e., tool sheds, season extension structures like high tunnels and greenhouses)¹⁹
 - Consider authorizing a new district designation like a “food systems

¹⁷ [New York City zoning](#) allows agriculture in all residential and manufacturing, and most commercial zones (excepted commercial zone C7: “C7 districts are specifically designated for large open amusement parks.”)

¹⁸ Chickens and bees are permitted according to [NYC Health Code Article 161](#)

¹⁹ New York City specifically [allows greenhouses of specific parameters](#), while some cities like Rochester do not allow even basic structures like toolsheds and high tunnels; New York City’s [“Zone Green”](#) incentivizes the establishment of greenhouses and rooftop gardens

overlay district” to specifically aid municipalities with distinguishing types of agriculture in cities and to promote the protection of the entire local, urban food value chain

- c. Support expansion of the definition of green infrastructure to explicitly include agricultural practices to ensure urban producers are eligible for grants related to green infrastructure services. Urban agriculture should be considered as a form of green infrastructure, but is not included in New York State’s definition²⁰
- d. Encourage city and regional planners, like the Regional Planning Association (RAP), to develop a vision for urban agriculture, with targets set for green and open space per capita and a goal percent of a city’s food to be grown locally; such a vision will be critical to prioritize funding for urban agriculture and to guide architects, developers, producers, non-profits, and entrepreneurs
- e. Provide funding for all cities over 95,000 people to create and maintain webpages outlining all urban agriculture definitions, regulation, and zoning specifications²¹
- f. Expand language of urban-focused policies on the state level, such as green roof tax abatement proposals, to include cities with populations of 95,000 or more persons

Recommendation 6: Reduce obstacles to land access and retention for urban agricultural producers

Land access and securing long-term land tenure are some of the biggest challenges faced by urban growers of all kinds across the state. While specific land access challenges vary by city – for example, land is more affordable and available in urban areas like Albany than New York City – securing long-term tenure through leases and city partnerships is a challenge everywhere. Many urban growers identify and revitalize vacant spaces that may not formally be available for sale and most community-focused operations cannot afford to purchase land outright. Growers in Rochester and New York City reported struggling with temporary leases and arrangements on city-owned land that they felt left them vulnerable to development. Without a sense of security in long-term tenure, growers do not have the incentive to invest in long-term strategies like building season-extension infrastructure (necessary for year-round food access) or planting perennials (vegetation like trees and shrubs that help prevent erosion, mitigate urban heat island effect, and create habitat for pest predators). The State can support by

20 The [New York State definition](#) of green infrastructure makes no reference to agriculture, farms, nor gardens; NYS DEC [definition of green infrastructure](#): “At the city or county scale, green infrastructure is a patchwork of natural areas that provides habitat, flood protection, cleaner air, and cleaner water.”

21 New York City is the only large New York city with a [webpage](#) dedicated to outlining urban agriculture definitions and regulatory and zoning considerations; [Boston, MA’s Urban Agriculture website](#) is another example

addressing [Recommendation 5](#), creating specific land-access grants, and providing resources to close information gaps for urban growers.

Specific recommendations include:

- a. As suggested in [Recommendation 5](#), authorize AGM to specifically promote the development of agricultural overlay districts in cities, thereby facilitating long- term and strategic planning that may create more stable land tenure and generate more long-term ecosystem benefits from urban agriculture
 - Advocate for urban agricultural planning strategies that deprioritize deference to highest financial bidder when public land with agricultural, food access, or community-development value becomes available
 - Transition from an interim to permanent mindset by advocating for long- term (at least 10 years) contracts for urban agriculture (both soil-based and indoor or controlled – environment agriculture)²²
- b. Designate soil-based, outdoor community gardens and urban farms as Critical Environmental Areas (CEAs) under SEQRA that meet the regulatory criteria for CEA designation based on city or state assessments – land cannot just be held in license and lease from a city to be sold off for other developments²³
 - Note: CEA can refer to either Critical Environmental Areas (as it does here), or controlled-environment agriculture (used elsewhere in the report)
- c. Create a centralized mechanism or database to track vacant/underutilized public land suitable for urban farming (including lots, rooftops, gardens, interior space, parking lots, and easements)²⁴
 - This could be managed by the central, state-level coordinating office or department suggested in [Recommendation 2](#)
- d. Designate funds and create grants to support existing urban land banks or to fund new ones where needed, especially those serving historically marginalized communities²⁵
 - Conditions codifying a percentage of this land that should be devoted

22 New York City's GreenThumb is transitioning from 4-year to 10-year license agreements beginning early 2023

23 Earth Justice and the New York City Community Garden Coalition (NYCCGC) have been advocating for this designation since 2020, publishing two extensive [reports](#) on the issue, and is requesting a six- month timeline in NYC

24 [596 Acres](#) acts as a grassroots resource and database on free or affordable vacant lots for sale in New York City. Expanding this type of service to urban areas across the state could provide many more future urban growers with the resources to purchase and revitalize city land

25 [Rochester's Land Bank Corporation](#) obtains and holds property across the city to manage and facilitate "community development projects". A similar version could function specifically for facilitate urban agriculture

to permanent green space, urban agricultural use, and/or public and community use may be necessary

- e. Update the AGM website to include information and resources regarding securing land in urban areas for new farmers, including resources to connect growers to opportunities to buy and lease available or vacant public land at discounted and affordable rates
- f. Protect the urban-to-rural pipeline and supply chain by establishing priority zones for peri-urban agriculture (conserving existing agricultural land near metropolitan areas, keeping this land in agricultural production rather than development)²⁶
- g. Promote access to and responsible use of inputs once land is secured
 - Many soil-based plots in urban areas lack high-quality and uncontaminated soil for growing. The central coordinating office or department suggested in [Recommendation 2](#) should assist in making sure available state funding is offered to promote the use of raised beds, controlled-environment agriculture infrastructure like greenhouses, and hydroponics
 - Access to soil testing for both pH levels and heavy-metal contamination should be easily accessible and free for urban, soil-based growers²⁷
 - Access to water is cited as a significant issue for most urban growers; a state-level coordinating office or department could advocate to municipalities for greater access to water for local growers (including via grants for rainwater capture infrastructure), while supporting education programs through CCE and others to ensure sustainable and responsible water use and run-off mitigation strategies

Recommendation 7: Acknowledge the distinction between community-focused and commercial urban agriculture, and support community development and business development, respectively, for urban growers

As many urban growers are concerned with both community-engagement and commercial sales, the distinction between these goals is not always clear. However, the mechanisms required to achieve community development are largely much different from those required to achieve business development, and urban growers need support with both. Growers may be limited by a system that does not see urban growing as a tool for development. In addition to technical agricultural support, community-focused growers need resources that build community development capacity. Urban commercial and for-profit growers may be excluded

²⁶ This is a specific issue identified by the [American Farmland Trust](#) as an immediate priority

²⁷ The Urban Soils Institute in NYC offers [free soil testing days](#) at the Governors Island Urban Farm

from programs available for rural, but not urban, production. Training, incentives, and investment in urban extension will be critical to maximizing the benefits of urban agriculture in New York.

Specific recommendations include:

- a. Increase investment in grants funding training programs for urban growers.²⁸ Programs should include:
 - Community engagement, mobilization, and development strategies
 - Business development for urban agriculture, including business planning, financing and accounting, marketing, and food safety
 - Starting community food projects (i.e., CSAs, food boxes, farmers markets, grocery co-ops)
 - Accepting SNAP/EBT
 - Technical training, including opportunities for urban farmers to learn from rural farmers and vice versa
 - Sustainability (IPM, composting, soil rehabilitation, crop rotation)
- b. Collaborate with Cornell Cooperative Extension to build its capacity to address urban technical assistance needs in all upstate and downstate urban areas and expand this capacity in New York City
 - Support Master Gardener programming in New York City and “Master Urban Gardener” programming throughout the state
- c. As suggested in [Recommendation 2](#), coordinate or provide funding for professional networking for urban growers across the state (i.e., statewide or regional conference(s))²⁹
- d. As suggested in [Recommendation 3](#), create funding guidelines that encourage collaboration between groups and fund the development of urban agricultural cooperatives and food hubs
- e. Cornell Cooperative Extension currently has four specialists to support urban agriculture and community gardens in New York City, and one specialist in Upstate New York. Ensuring there’s at least one urban agriculture specialist in each of New York’s major cities will assist in addressing technical assistance and education needs of urban growers.

²⁸ Urban agriculture focused Cornell Cooperative Extension agents, city government programs like NYC’s Green Thumb, and other non-profit groups offer some technical support, sustainability trainings, and networking opportunities, but these offerings should be increased and streamlined either through funding to CCE or state grants

²⁹ [CRAFT](#) (Collaborative Regional Alliance for Farmer Training) connects farmer apprentices to foster networking and deep learning; this model has been adapted elsewhere in New York, including in New York City

- f. Invest, through grants or funding to public universities, in incubators that would test new urban-focused, regenerative, and high-efficiency production techniques, including testing new business models³⁰
- g. Initiate and distribute the results of state-wide data projects to better inform policy and organization or business decisions based on up-to-date, representative metrics
 - Specifically encourage urban farmers or all kinds to participate in the USDA Census of Agriculture; in partnership with the USDA, suggest more robust information sharing and networking between all federal, state, and extension programs working with urban growers to intentionally establish a community-wide effort to compel urban growers to complete the census
 - Initiate an economic input/output modeling project to better understand the multiplier effects of urban agriculture

Recommendation 8: Increase investment in urban agriculture education to inspire and support the New York food sector workforce of the future

An informed and enthusiastic pipeline of talent is required to maximize and sustain the benefits and potential of urban agriculture. Many urban, youth- and education-focused organizations are already at work inspiring students around the state to connect with their food, to appreciate agriculture, and even to consider careers in this space. However, these efforts are limited by funding, regulation, and by the fact that there is not enough money in agricultural careers to fully close the gap between education and the pursuit of employment or entrepreneurship. This is especially true of urban agricultural careers, but also applies to rural agricultural careers, limiting the potential of the urban-to-rural pipeline through which education in urban areas drives future agriculture operation and innovation in rural New York. Increasing state investment in specific agriculture-focused education strategies will not only strengthen the economic pathways initiated by urban agriculture it will also support STEM-based learning and contribute to the nutrition education that is vital for long-term student health. Importantly, inspiring and educating young growers will support the continuation of community gardens in urban areas where older gardeners are seeking to transition management duties to younger generations.

30 In 2017, New York City Council Member Rafael L. Espinal and then Brooklyn Borough President Eric Adams earmarked \$2 million to create an urban agriculture incubator in Brooklyn, which would “facilitate the adaptation of a dedicated space for emerging businesses engaged in sustainable food innovation;” the status of the project is unknown. Programs like [Farm School NYC](#) in New York City and [Groundswell](#) in Ithaca, NY provide training for future farmers; there could also be an opportunity to reimagine urban agricultural innovation through the [Grow NY](#) competition

Specific recommendations include:

- a. Ensure urban agriculture and agriculture generally are included as career paths in State Education Department plans and programs (as part of core curriculum); emphasize the variety of career types associated with agriculture, including law, accounting, events, processing, and distribution³¹
- b. Create funding for school garden programs, including funds to improve student access to season-extension technologies, hydroponics, and soil-based operations
 - Additional, high-quality educators and operators is necessary; public schools do not have the capacity to maintain school gardens year-round with current resources (especially considering timing: the growing and harvest season typically occur in the summer when students and staff are not in school)³²
 - Funding can and should encourage partnerships between schools (in both zoned and BOCES), and existing organizations like nearby community gardens, local urban farms,³³ and programs like 4-H, FFA, Edible Schoolyard, New York Sun Works, and MANRRS;³⁴ this strategy can reduce the labor required by individual schools
 - Create funding for educational experiences that bring urban students to peri-urban or rural production sites to experience commercial agriculture at a different scale, and, vice versa, bring rural students to urban sites
 - Update procurement and vendor contracting guidelines and processes to ensure the availability and purchase of necessary materials, equipment, and expertise needed to bring a growing operation and accompanying education and food distribution programs to life
- c. Increase funding for paid youth-employment and entrepreneurship programs for urban agriculture non-profits, potentially through Department of Labor grants to supplement municipal and county summer youth employment programs³⁵

31 [The New York City School of Urban Agriculture](#) (funded by the USDA) acts as a community training resource for practitioners; the New York City Department of Education has approved a variety of agriculture programs as part of Career Technical Education, or CTE, including aquaculture, veterinary science, and urban agriculture

32 In Buffalo, [USDA Farm to School grants](#) offer funding for schools to develop school garden programs

33 The Randall's Island Park Alliance funds an [Urban Farm](#) that offers supplementary educational programming to local schools to complement school garden experiences

34 More information about [Edible Schoolyard NYC](#), [New York Sun Works](#), and [MANRRS](#)

35 Monroe County CCE currently leverages summer youth employment dollars successfully, but access and absolute amount of dollars available for community- or education-focused urban growers continues to be limited

- d. Expand loan forgiveness for those working for five plus years after graduation to include food processors, distributors, or retailers focused on the New York food and agriculture sector³⁶

Recommendation 9: Expand financial assistance in support of urban agriculture that is grounded in sustaining ecosystem services while ensuring community, physical, and social wellbeing

The provision of ecosystem services, like stormwater sequestration and urban cooling, is one of the strongest benefits of urban agriculture. Ecosystem services contribute positively to overall human wellbeing by keeping groundwater and surrounding waterways cleaner; keeping cities cooler; and building resilience to climate and weather shocks. Many soil-based urban agriculture operations already provide these ecosystem services, but subsidies and grants would make it possible to invest in specific, but cost-prohibitive, tactics to maximize this provision. Non-soil-based operations, like indoor hydroponics or vertical farming, may generate ecosystem benefits in the form of water and energy savings, though energy use is often currently still a net-emitter for these operations (innovation in this space is working on optimization and efficiency). While soil-based operations, whether on rooftops or windowsills or raised beds in vacant lots, offer many direct ecosystem benefits, education around the use of inputs (like fertilizer and pesticides) is necessary to maximize these benefits.

Specific recommendations include:

- a. Subsidize climate-smart growing methods by urban growers to encourage ecosystem service provision
 - Methods may include composting as fertilizer, Integrated Pest Management (IPM), using renewable energy, planting and maintaining perennials³⁷
- b. Expand funding for sustainable production education and training for urban growers³⁸

36 The [New York State Young Farmers Loan Forgiveness Incentive Program](#) currently offers loan forgiveness for those operating or working on farms for 5+ years. The [NYS Science, Technology, Engineering and Mathematics \(STEM\) Incentive Program](#) provides tuition scholarships for those interested in the agricultural sciences (as a part of their larger STEM program) but covers a maximum tuition award amount of \$7,070 per year.

37 [NYS Connects: Climate Smart Farms and Forests Project](#) (new USDA funding) will fund producers using CSA methods. The City of Rochester offers [garden grants](#) to establish “pollinator habitats and waster stewardship gardens”

38 [Grow NYC’s beginner farming program](#) provides sustainable production trainings

- c. Investigate incentives, standards, and mandates for “cool roofing”/rooftop gardens for all new buildings and for retrofitting older buildings; incentivize the green roof market and expand urban agricultural production through a tax abatement plan linked to growing agricultural products on green roofs³⁹
- d. Through collaboration with municipal leadership, encourage the establishment of green infrastructure quotas in each city, including quotas for urban agriculture as a form of green space and green infrastructure⁴⁰
 - As suggested in [Recommendation 6](#), establish soil-based urban agriculture as CEAs
 - As suggested in [Recommendation 5](#), authorize increased focus on encouraging agricultural overlay districts in cities; through these efforts, encourage city planners to increase vegetation density and limit paving, potentially through the planting of fruit trees that both provide greater shading and urban cooling while increasing food access
- e. Create pathways for urban agriculture within programs created to combat pollution and run-off (like the Non-point Source Program (NPS) and Green Infrastructure funding)
- f. Fund grants to test innovative soil remediation techniques⁴¹
- g. As suggested in [Recommendation 6](#), incentivize long-term leases and licenses to encourage urban growers to invest in building up qualified soils and planting woody perennials like trees to maximize water filtration and carbon sequestration

Recommendation 10: Evaluate regional and local food systems supply chains to ensure greater access to markets for urban agricultural producers

Distribution capacity was cited as a key food access issue among urban growers in New York. Expanding urban agriculture depends on expanding access to markets and increasing the capacity of local and regional distributors. Strengthening food processing capacity will also increase the economic value and job opportunities of urban agriculture. Access to food safety training and processing and distribution

³⁹ [NYC Green Roof Tax Abatement](#) encourages rooftop gardens; [two-tiered green roof tax abatement](#) initially passed as S5554B sponsored by John C. Liu during the 2019 – 2020 New York State Legislative session; New York City’s [Climate Mobilization Act](#) mandates solar panels, green roofs, or some combination of both on all new buildings. The [Climate Smart Community program](#) currently incentivizes cities and communities to create green roofing, but this measure would be more focused on individuals and companies through a tax abatement program

⁴⁰ In New York City, [the Climate Mobilization Act of 2019](#) requires that all new buildings and one’s undergoing major roof renovations must have green roofs (or solar panels)

⁴¹ [Soil remediation](#) can restore contaminated soils (common in urban/post-industrial areas) to higher quality, benefiting the health of people who work in or eat food grown in these spaces; however, remediation can be expensive and may require trial-and-error

infrastructure are necessary to improve urban agriculture participation in local food markets. This participation will likely lead to multiplier effects of increased job opportunities, increased revenue generation for local businesses, and improved resiliency of local food systems.

Ensuring equitable access to purchasing farm products at market is a current and ongoing priority of the State. The State already subsidizes equipment and reimburses farmers for application vendor fees associated with accepting SNAP/ EBT, and New York's FreshConnect coupons allow public dollars to go further by offering an additional \$2 to spend on fresh produce at farmers markets when \$5 SNAP is spent. The Rochester Public Market is the largest user of FreshConnect coupons in New York, and other markets, like those in New York City, offer the Double Up program which matches SNAP spending on fresh fruits and vegetables at farmers markets.

Specific recommendations include:

- a. As suggested in [Recommendation 2](#), collaborate with municipalities, grassroots organizations, and producers to identify and lower barriers to sales and revenue generation at the local level; for example, supporting efforts by local organizations to advocate for the ability of community gardens to increase the threshold for produce sales and allowing gardens to host fundraising events on-site
- b. Incorporate mechanisms that support urban agricultural farm products into relevant state, municipal and local purchasing programs⁴²
- c. Expand access to GAP food safety training for urban producers
- d. As suggested in [Recommendation 2](#), create grants to promote urban food systems collectives like food hubs, group GAP collective models, grocery cooperatives, and community-owned CSAs⁴³
 - Incentivize or subsidize collaboration between regional distributors and local, urban producers and processors, including specific incentives for distributing locally grown foods to urban food retailers like bodegas, street carts, and independent grocers via regional distribution networks and hubs, especially distribution of culturally appropriate foods and distribution to food retailers in "food deserts"⁴⁴
 - Incentivize the development of affordable, distributed spaces for small- scale food processing through grants for co-packing facilities

42 The [Good Food Purchasing Bill](#), for example, doesn't explicitly prioritize urban agriculture, but would shift institutional procurement to financial and values-based system (supporting BIPOC farms, NYS production, animal welfare, etc.)

43 45 Dig Acres @ the Chester Agricultural Center has tested the group GAP model with success, allowing for cost sharing in the GAP audit process and securing significant wholesale and institutional contracts; The Park Slope Co-op in New York City has established a successful model for grocery stores that could be scaled

44 The [African Heritage Food Co-op](#) in Buffalo, NY has received state funding to connect consumers to local, culturally relevant food systems

and shared industrial kitchens

- e. As suggested in [Recommendation 7](#) invest in business development for urban agriculture
- Fund training and development programs for regional urban food processors and for regional distributors, including trainings covering food safety, business and marketing, procurement, and logistics certifications
 - Fund small business grants and incentives to strengthen regional food distribution industries and increase their ability to compete with national distributors at the local scale

Study Challenges and Limitations

This study compiles recommendations from scholarly research and stakeholders in New York State to support and promote urban agriculture. These recommendations work to support urban agriculture generally and include recommended actions to promote specific types and benefits of urban growing. However, not all recommendations may be relevant to all types of urban agriculture. For example, accessible soil testing is less relevant to organizations that are non-soil based.

Interviews and public feedback sessions with producers, decision-makers, and advocates informed this work. The research team interfaced with as many stakeholders as possible, but there is always more room for decision-makers to hear directly from producers and advocates. Included in the second recommendation focused on collaboration, field days can help policymakers build familiarity with farm operations, markets, and communities to hear directly and regularly from growers.

As mandated, this report focuses on urban agriculture. There are many important issues facing communities that intersect with urban agriculture, like food access, educational equity, and nutritional security. These issues deserve equal consideration but were largely outside the scope of this study.

Areas for Further Research

A detailed survey of all commercial and non-commercial urban agriculture entities within New York State is still needed. Limited information around the total number, size, and capacity of urban farms and gardens can limit the ability to design policy and programs for growers. Creating a database of existing information and surveys would give policymakers more clarity on the current status of urban agriculture.

Additional modeling work is needed to better understand the potential costs of implementing the recommendations outlined in this report, as well as the direct and indirect economic contributions of urban growing in general. While literature generally supports the idea that urban growing creates jobs and economic benefit in urban areas, the research team could not find any models of the economic multiplier effects of urban agriculture for New York state. However, this study team believes that an input-output model of statewide urban agriculture would provide justification for increased investment in the infrastructure, capital, and knowledge needed to expand urban agriculture production and distribution. More information on the inputs used by urban growers is required to generate such a model. Professors at Cornell University's Dyson School of Applied Economics and Management have built such models and could be appropriate partners in such future endeavors.

Conclusion

This study aims to provide a comprehensive overview of the various forms of urban agriculture operations in New York State along with their benefits and limitations, as illustrated through case studies and feedback from stakeholders. As the threat of climate change and the COVID-19 crisis continue to impact our food system, urban agriculture will serve as a crucial tool to promote food sovereignty and resilience in cities across our state. Using an equity lens framework, the recommendations set forth in this report aim to address the inequities of our current food system, which disproportionately affect communities of color. The program and policy recommendations highlighted in this report are intended to advance urban agriculture as a whole and position New York as a leader in this space for all.

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