

A photograph of raspberries growing on a trellis at night. The raspberries are in various stages of ripeness, from green to deep red. The background is dark with several out-of-focus, glowing white circular lights, creating a bokeh effect. The trellis structure is visible as thin, light-colored lines.

THE **NEW** AGRARIAN ECONOMY:

PAST, PRESENT, AND FUTURE
OF URBAN AGRICULTURE IN NEW YORK CITY

ERIC ADAMS BROOKLYN BOROUGH PRESIDENT

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OVERVIEW

With 2020 behind us, we have seen the 2019 Coronavirus Disease (COVID-19) categorically disrupt and displace our lives – everything we knew about our world, our society, our way of life, has been upended by a health crisis unseen by the United States for more than a century. This pandemic has also unearthed and exacerbated the fragilities in our already-compromised food, employment, and housing systems across our City. As of the fall, the national unemployment rate stood at 6.5 percent, with New Yorkers experiencing rates of roughly seven (7) points higher than that national average.¹ The result of those statistics means more people across the City are now food insecure. In May, Mayor Bill de Blasio suggested that number could likely top 2 million.² While the City has been working to provide food to children, families, and seniors through the GetFoodNYC Emergency Home Food Delivery program and the continual work of the New York City Department of Education (DOE)'s Office of Food and Nutrition Services (OFNS) school-lunch program, there is not yet concrete end-in-sight relief for either of the current public health and food insecurity “one-two punch” crises facing so many New Yorkers.

Throughout this pandemic, I have been delivering food, personal protective equipment (PPE), and other necessities to Brooklynites and New Yorkers. The unmet needs I have seen convinced me of the dire need to learn lessons from our last pandemic, the Great Influenza of 1918, to teach us to reimagine a stronger and more sustainable New York City.

What is not talked about is that before COVID-19 hit, New York City was experiencing an epidemic of chronic disease. As we know, those suffering from chronic diseases also suffer from worse outcomes of COVID-19. By continuously failing to address the causes and roots of consistent, pervasive rates of obesity, diabetes, cardiovascular disease, cancer, and other chronic conditions, national leaders were priming the nation – and disproportionately its Black and Brown people – to experience the effects of a viral pandemic that much worse and more intensely. Sixty percent of Americans suffer from at least one chronic illness,³ and the current food landscape in New York City perpetuates these trends. Diet is the leading driver of disease, and while there have been initiatives to alleviate hunger generally in the City, these attempts have failed to address nutrition in a productive way. I, myself, have seen the revolutionary effects of a healthy diet. When I was diagnosed with Type 2 diabetes, I suffered with an experience all-too-familiar to many Americans – tingling in my extremities and deteriorating eyesight, along with other harrowing symptoms. I turned to nutrition for help, and through following a whole food, plant-based diet rich in fruits, vegetables, whole grains, and legumes, I was able to reverse my disease. It is imperative that New York City ensure sufficient access to nutritious and healthy foods for all its residents, regardless of race or economic status, to ensure they have the resources and abilities to prevent and reverse chronic illness as I did.


Primarily, we see the revitalization and expansion of urban agriculture as a key component to unlock the economic growth and employment opportunities we need for healthier constituents, and ultimately, a healthier planet. After all, and perhaps surprisingly to some, at the end of the 19th century, New York City was one of the nation's leaders in agricultural production. The counties I call and have called home – Kings (Brooklyn) and Queens – were, I was proud to learn, agricultural powerhouses.

Since the beginning of my tenure as president of the borough of Brooklyn, we have invested money, time, and public advocacy into expanding urban agriculture here in Brooklyn and throughout the city through innovative partnerships between government, entrepreneurs, and community members. The report that follows delves into the reasons why urban agriculture in the city must grow by showcasing my office's work in this field to this point and putting forth a blueprint for a 21st century agrarian economy – a New Agrarian Economy – as the way forward for the city.

¹ "NYS Economy Added 45,600 Private Sector Jobs in October 2020, Marking 6th Straight Month of Gains", New York State Department of Labor, 19 Nov. 2020, labor.ny.gov/stats/pressreleases/pruistat.shtm.

² Mann, Brian. "In New York City, 2 Million Residents Face Food Insecurity, Officials Say." WNYC, NPR, 21 May 2020, www.npr.org/sections/coronavirus-live-updates/2020/05/21/860312565/in-new-york-city-2-million-residents-face-food-insecurity-officials-say.

³ "About Chronic Diseases." Centers for Disease Control and Prevention, 17 Nov. 2020, www.cdc.gov/chronicdisease/about/index.htm

A close-up photograph of a white bowl filled with a healthy breakfast. The bowl contains a layer of granola with almonds and raisins, topped with sliced banana, dragon fruit, and chia seeds. The background is blurred, showing another bowl of food. Large, semi-transparent pink and purple geometric shapes are overlaid on the top left of the image.

BY CONTINUOUSLY FAILING TO ADDRESS THE CAUSES AND ROOTS OF CONSISTENT, PERVASIVE RATES OF OBESITY, DIABETES, CARDIOVASCULAR DISEASE, CANCER, AND OTHER CHRONIC CONDITIONS, NATIONAL LEADERS WERE PRIMING THE NATION – AND DISPROPORTIONATELY ITS BLACK AND BROWN PEOPLE – TO EXPERIENCE THE EFFECTS OF A VIRAL PANDEMIC THAT MUCH WORSE AND MORE INTENSELY.

- ERIC ADAMS

A NEW ERA IN AGRICULTURE

We are on the cusp of a new era in agriculture. New York City is a center of innovation and commercialization of new agricultural technologies. When I think about what our city will look like in a greener and more equitable future, I see urban farming – not the traditional tractors or crop dusters we think about, but a whole range of new growing methods, many of them taking place indoors, where we can produce food 365 days a year. This new agriculture is based on non-traditional farming methods, which are better-suited to our modern urban landscape.

Agricultural advances during the second half of the 20th century were the result of and response to industrialization and more than 15 years of deprivation and suffering globally through the Great Depression and World War II of the 1930s and '40s. After the war, the agro-industrial complex set out on a singularly themed mission: make food widely available, affordable, and plentiful, through liberal use of automation and chemicals. Industrial agriculture enabled the production of larger and larger quantities of cost-effectively-produced food, but by fewer and fewer farmers. This trend resulted in a reapportioning of the workforce. In 1900, more than 40 percent of Americans worked in agriculture. By 2019, 10.9 percent of Americans worked in agriculture or food-related industries, but direct-on-farm employment constituted only 1.3 percent of American employment; within the remaining 9.6 percent of Americans working full and part-time jobs in agriculture and food related sectors, the majority (6.4 percent) are in food and beverage service.⁴

The data alone do not show the hidden prices: substantial damage to our health and environment caused by agricultural chemicals and industrial farming practices, the exploitation of farmworkers, the decline of mid- and small-sized, often more biodiverse, farms, and an enormous amount of methane emissions into our

air. In addition, the COVID-19 pandemic highlighted the fragility of our industrial food supply chain, which overly relies upon the concentration, mechanization, and focus on select commodity crops, and long-distance transport.

The low cost of transportation makes it possible for us to buy affordable produce grown year-round in California, Florida, Mexico, and other distant places. But this produce is picked before it's ripened and is then shipped thousands of miles, taking anywhere from one to three weeks to reach store shelves, losing flavor with each passing day. While, with regard to greenhouse gas emissions, food production is more impactful than food transport, the truck traffic contributes to air pollution, harming environmental and human health. For instance, the Hunts Point Food Distribution Center in the Bronx, the conduit for about 12% of New York City's food,⁵ exposes Bronxites to air pollution from daily truck arrivals and departures. And there are issues with the quality of food that is transported 3,000 miles over seven to 10 days from the farm, too.

The benefits of a stronger, more unified New York City and State regional foodshed are wide-reaching and include increased access to nutritious, affordable, regionally-grown food; farmland protection; the creation of new economic opportunities and good food jobs; increased in-state food production and consumption; and the forging of upstate/downstate partnerships, which strengthen the regional food system and purchasing power. The Greenmarket Regional Food Hub in Hunts Point enhances a regional foodshed, which will create jobs and distribute more New York State products to New York City residents. The City needs more opportunities such as this to increase access to fresh food, particularly for under-resourced populations like those in the Hunts Point community.

⁴ "Ag and Food Sectors and the Economy", Economic Research Service, United States Department of Agriculture, 16 December 2020

⁵ "Five Borough Food Flow: 2016 New York City Food Distribution & Resiliency Study Results," New York City Economic Development Corporation, P.9, Mayor's Office of Recovery and Resiliency, https://www1.nyc.gov/assets/foodpolicy/downloads/pdf/2016_food_supply_resiliency_study_results.pdf





A HOTBED OF AGRICULTURAL INNOVATION

New York City – and Brooklyn in particular – has a thriving start-up culture of emerging urban agriculture ventures: hydroponics, the practice of growing leafy greens, herbs, and vegetables in a soil-less, controlled environment, rooftop farms growing myriad fruits and vegetables including wine grapes, vertical farms experimenting with a variety of technologies, and “distributed” farms raising crops in small, networked units directly at the point of consumption in food stores and restaurants or in shipping containers that can be located anywhere. New agricultural technologies being developed and commercialized today provide food that ripened and was harvested mere days, rather than weeks, ago – food grown without pesticide use or the risk of fertilizer contamination of nearby water sources. Technically speaking, our urban agricultural economy is multiplying and advancing at a thrilling pace. As its new technologies develop fast, it is crucial that this economy maintain a similarly furious commitment to social justice. To build equity from the ground up and ensure it truly benefits all New Yorkers, the new agrarian economy must fulfill and maintain a rigorous commitment to racial justice, food sovereignty, and community growth.

New York City is home to landmark approaches to community greenspace and urban agriculture. The establishment of community gardens is educational, therapeutic, self-governed space that greens our city, increases community organization and food sovereignty, and diminishes the divides that characterize our city as well as informs the history and future of urban agriculture in New York City. The momentum for social justice in urban agriculture has been maintained particularly by organizations such as Just Food, Green City Force, and East New York Farms, to name a few, predominantly soil-based not-for-profit farms and/or food advocacy organizations that aim to dismantle the food systems that engender inequality in food access and throughout our food system.⁶ Controlled environment agriculture (hydroponics, aquaponics, and other forms of vertical farms) undoubtedly generates substantial capital and attracts investment. The values typical of soil-based urban agriculture – community-led efforts to increase food sovereignty and racial justice, to end food apartheid, and to create long-term carbon footprint reduction impact – must inform our approach to the new agrarian economy, regardless of the setting. Urban agriculture in New York City is and must remain as diverse as the city it serves, and should facilitate social inclusion, provide opportunities for recent immigrants to maintain elements of their cultural heritage, and empower and foster relationships between farmers and gardeners who represent the vast span of New York City’s cultural, ethnic, and racial groups.⁷

New York City is a veritable fertile ground for urban agricultural exploration purposes, with its roughly 1,000 acres of green space at developments under the purview of the New York City Housing Authority (NYCHA), and suitable for soilless indoor farming are the vast untapped rooftops, parking lots, as well as interim utilization of numerous brownfield sites. Other interim opportunities include approximately 5,000 acres of vacant lots across all five boroughs, and other as-of-yet unexplored space. Additional enclosed opportunities for year-round urban farming include establishing rooftop and open space-placed greenhouses as well as incentivizing the use of indoor floors (including those that have been newly constructed) of industrial buildings. New York’s colleges and universities also boast outstanding academic programs in food policy and food studies, environmental sustainability, and sustainable business. For instance, some academic policy institutes whose missions are centered around providing healthful, environmentally-friendly, and equitable food to all New York City residents include the Columbia Center for Urban Agriculture; the Hunter College NYC Food Policy Center; the Laurie M. Tisch Center for Food, Education & Policy; the NYU Nutrition and Food Studies Department, and the CUNY Urban Food Policy Institute. We have a wealth of talent at hand to develop the leading urban agriculture economy in the nation.

⁶ “NYC Organizations Working Towards Racial Equity Through Food” Hunter College New York City Food Policy Center, 9 June 2020 <https://www.nycfoodpolicy.org/nyc-organizations-working-toward-racial-equity-through-food/>

⁷ Reynolds, Kristin, “Disparity Despite Diversity: Social Injustice in New York City’s Urban Agriculture System”, Vol. 47 No. 1 2015 ISSN 0066-4812, pp. 240–259, Antipode, 2014 <https://nycfoodpolicy.org/wp-content/uploads/2015/02/Reynolds-2014-Disparity-Despite-Diversity-Antipode-vol-47-no-1.pdf>

AN ALLIANCE OF GOOD GOVERNMENT AND GOOD BUSINESS

Brooklyn's new agricultural companies and organizations tend to have strong community ties. They are New York Proud – and Brooklyn Proud. They proactively look to train high school students and professional apprentices. They help feed their food-insecure neighbors. These relationships can grow seeds of productive public-private partnerships into laying the foundation of a new agrarian economy – a greener, more resilient, more self-sustaining city; new jobs in new industries; a healthier citizenry, more conscious of the sources of their food, the connection between their diet and their health, with locally grown and accessible food. Many of these new farmers are already responding to New Yorkers' food insecurity by growing real food for real people at affordable prices.

Just as the 20th century agricultural system succeeded in producing enormous quantities of inexpensive food, our new agriculture systems will succeed in achieving new goals, like the roadmap to a healthier diet, more equitable distribution, and a more resilient supply chain. As with many goals worth pursuit, there are some obstacles. For example, the cost of New York City real estate is often too high for urban farmers to produce affordable food. However, our city will be stronger, our citizens healthier, and our economy more diverse as it takes root and grows here. Public policy should play a role in helping to provide affordable places for food production.

Diet accounted for 11 million deaths and 255 million disability-adjusted life years (DALYs) lost worldwide in 2017 alone.⁸ Per the WHO, DALYs are important in considering overall burden of disease, as mortality does not give a complete picture of a condition's impact in different populations. DALYs take into account years of life lost due to premature mortality and years of life lived in states of less than full health; taken together, one DALY represents the equivalent loss of one year of full health. In New York State, obesity is the leading risk factor contributing to DALYs⁹, demonstrating an opportunity for government interventions to address this clear health need on a local level.

We have evidence that many New Yorkers want locally grown food, and many even grow it themselves. On New York City property, there are more than 550 community gardens¹⁰, more than 800 school gardens¹¹, and more than 700 gardens at public housing developments¹². New York City is also blessed with an education system that in many ways embraces these ideologies. Our schools teach nutrition and hydroponics as part of New York State's public school curriculum. The GreenThumb program and our robust not-for-profit sector teach gardening skills, redistribute surplus food, and foster food resiliency by empowering families with the ingredients, knowledge, and skills for a fresh, delicious, and healthy diet.

Several studies have shown significant health benefits and cost savings stemming from community garden interventions. For instance, participating in community gardens positively influences participants to engage in increased consumption of fruits and vegetables, reduced fast and processed food intake, and improved nutritional knowledge, which also has an impact on dietary habits¹³. Efforts to

⁸ GBD 2017 Diet Collaborators. "Health Effects of Dietary Risks in 195 Countries, 1990-2017: A Systematic Analysis for the Global Burden of Disease Study 2017", Volume 393, Issue 10184, P:1958-1972, 2019 May 1, The Lancet.

⁹ The US Burden of Disease Collaborators. The State of US Health, 1990-2016: Burden of Diseases, Injuries, and Risk Factors Among US States. JAMA. 2018;319(14):1444-1472. doi:10.1001/jama.2018.0158

¹⁰ Hu, Winnie, "Food From Around the World, Homegrown in New York", New York Times, 30 July 2017

¹¹ GrowNYC School Gardens, <https://www.grownyc.org/grow-to-learn#:~:text=Our%20mission%20is%20to%20inspire,gardens%20in%20all%20five%20boroughs>.

¹² NYC Food By Numbers: Urban Agriculture, Hunter College New York City Food Policy Center <https://www.nycfoodpolicy.org/nyc-food-numbers-urban-agriculture/>

¹³ Malberg Dyg P, Christensen S, Peterson CJ. "Community Gardens and Wellbeing Amongst Vulnerable Populations: A Thematic Review". Health Promot Int. 2020 Aug. 1;35(4):790-803. doi: 10.1093/heapro/daz067. PMID: 31369084



increase fruit and vegetable consumption are especially cost-effective when targeting our youth populations. In a randomized control trial of metropolitan middle-school students, participants who were exposed to a health intervention promoting increased fruit and vegetable intake had a cost-effect of \$4,305 per quality-adjusted life year (QALY) saved. Society was predicted to save \$15,887 in medical care costs and \$25,104 in loss of productivity costs for a population of 310 students. While there is no generally accepted standard cutoff, less than \$30,000/QALY is often considered to be cost-effective, making this promotion strategy especially promising¹⁴. Lastly, most recent data has directly studied the impact of community gardens on health outcomes. Specifically, creating community gardens in urban London neighborhoods had about a \$4 return on investment for every \$1 spent when considering both mental and physical health impacts.¹⁵

It is in the public interest to nurture all these activities, whether public, commercial, or non-commercial. City government needs to encourage the cross-pollination of activities in food production and distribution, nutrition, and cooking skills. While I am a strong supporter of Brooklyn's new agricultural businesses, I have also seen New Yorkers take control of their food supply through gardening, cooking, and supporting farmers markets. This is not only the path to healthier families, but it is also the path to creating a stronger, happier, healthier, and more equitable city. Our future sustainable city landscape will not be the bleak, artificial world we often see in films, nor will it be a return to the 19th century. It will be more livable and unexpected than either of those extremes. It will be the blossoming of a new kind of agriculture that has sprouted and taken its root right here in Brooklyn.

There are (at least) two distinct approaches to urban farming: soil-based and vertical (soil-less). Soil-based farming tends to be not-for-profit in organization, with equal focus on food production and education, community empowerment, and increasing employment opportunities (e.g. Green City Force, Project Eats, etc...). These farms typically have a smaller annual yield and sell at farmers markets, through community supported agriculture (CSA), and/or at local, community-run markets, (e.g. Green City Force's NYCHA markets, where residents swap food scraps and/or volunteer time for fresh produce grown by GCF members). Controlled environment agriculture, or CEAs for short (e.g. Gotham Greens, Square Roots, and AeroFarms) are for-profit vertical farms, focused on technologically innovative and environmentally adaptable farming. While CEA products are currently sold at a premium, they help to popularize local, sustainable, and healthful foods and are one readily available metric of the economic potential of urban farming. Business records constitute greater availability of data available from CEA farms. To ensure that urban farming benefits all New Yorkers, it is necessary to invest in both hyper-profitable vertical farming opportunities and soil-based urban farming ventures, which generate more (non-automated, entry level) jobs and offer greater long-term carbon footprint offset. As not-for-profits, the economic benefits of soil-based farms are more difficult to calculate, but irrefutable. City greening, along with improved educational, health, and social outcomes of participants in soil-based urban farming, are financially sound investments in our city's future. The challenge is to integrate soil-based and CEA farming opportunities, to ensure a diverse (aka healthy) urban agricultural ecosystem and ensure a mutually supportive, greener, more equitable city. Together, soil-based and vertical farming operations attract development and investment, while increasing community enrichment, education, training, and employment opportunities, food sovereignty, and improved health outcomes.

¹⁴ Wang LY, Yang Q, Lowry R, Wechsler H. "Economic Analysis of a School-based Obesity Prevention Program." *Obes Res.* 2003 Nov;11(11):1313-24. doi: 10.1038/oby.2003.178. PMID: 14627751

¹⁵ Schoen V, Caputo S, Blythe C. "Valuing Physical and Social Output: A Rapid Assessment of a London Community Garden". *Sustainability.* 2020; 12(13):5452. doi: 10.3390/su12135452

An economic snapshot of the current state of urban farming in New York City only hints at the vast potential that exists in the sector. Successful business models employed by local New York City producers such as Brooklyn Grange, Square Roots, Gotham Greens, and many others have demonstrated market resilience and proven performance in profitability and employment capacity. If we expand and extrapolate these successful urban farming models to even broader acreage numbers, it is immediately easy to see the immense growth potential in this nascent industry. With just .5 acres of City-owned vacant land, for example, Square Roots informs us that it would be possible to deploy a commercial indoor farm integrating 100 or more of their hydroponic growing zones (built inside upcycled shipping containers), thus increasing yields per acre by orders of magnitude. If New York City optimizes its estimated 5,000 acres of vacant lots, 1,000 acres of NYCHA greenspace¹⁶ together with an estimated 14,000¹⁷ acres of unshaded rooftops, these urban farms could proliferate rapidly and become profitable businesses into the future. While these different spaces and terrains will have their own unique limitations, taken together they represent tremendous potential for expansion and growth in the Urban Agriculture economy in New York City.

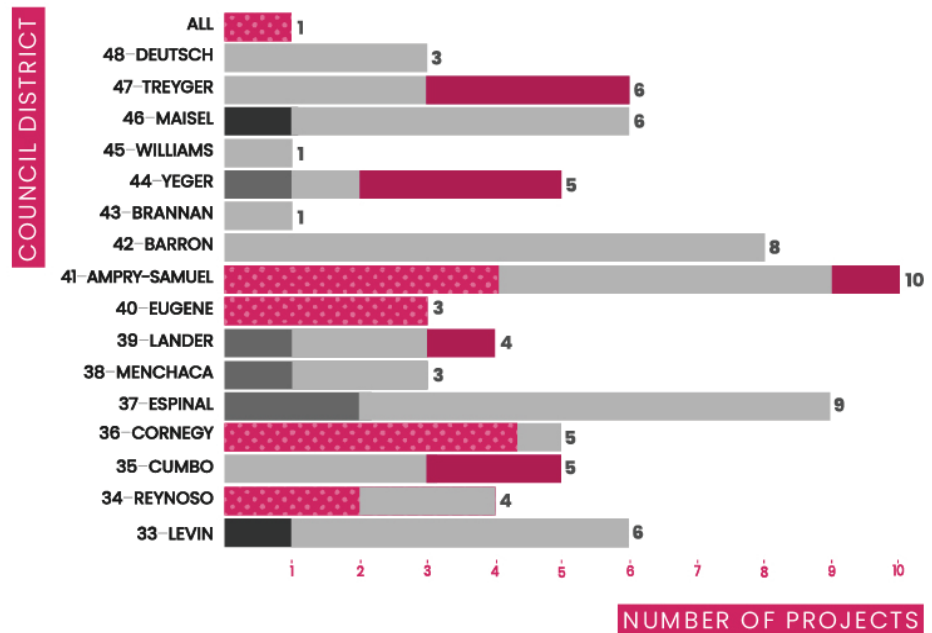
The New York City Department of Education (DOE) alone spends \$6.3 million on local produce annually¹⁸. Currently, the menu is the determining factor in food procurement and purchasing within City institutions. While shaped by policy issues, food trends, food preferences, and client health concerns, the menu ultimately drives the supply chain. To build greater local profits and increase investment in New York City urban agriculture, we propose inverting that order. New York City's economy would be both more effective and inclusive if we set the menu, first and foremost, according to what we can supply from local New York City urban agriculture (rather than menu-dictated demand). A menu built upon the products of urban agriculture would increase local profit and sustainability. For instance, as we struggle to recover from the economic devastation of the coronavirus pandemic, the millions of dollars currently spent on local produce could be redirected to local New York City producers ensuring that city dollars directly stimulate the city economy, taking advantage of the attendant multiplier effect.

Whether in a community garden, soil-based farm, or CEA, urban agriculture in New York City ensures greater civic function and constituent health (social, fiscal, physical, and mental). Our role in government is to ensure any and all urban agriculture initiatives receive the funding and support to succeed. To nurture a new agrarian economy, we must continue to prioritize the creation of green assets. Figure 1 illustrates the current landscape of investment, by graphing the total number of capital projects (coded by type of urban agriculture and/or equipment investment) per council district.

TOTAL NUMBER OF PROJECTS BY COUNCIL DISTRICT FY15-FY21

SUB-CATEGORY

- Greenhouse
- Hydroponics
- Rooftop gardens
- Urban farming
- Vehicle purchase



¹⁶ Plunz, Richard, et al. "The Potential for Urban Agriculture in New York City", Urban Design Lab at The Earth Institute 2nd ed., P.29-37, Columbia University, 2012, http://urbandesignlab.columbia.edu/files/2015/04/4_urban_agriculture_nyc.pdf

¹⁷ Rifkin, Glenn, "Cash Crops Under Glass and Up on the Roof", 18 May 2011, New York Times.

¹⁸ "Food Metrics Report" 2019, The Mayor's Office of Food Policy, 2019, <https://www1.nyc.gov/assets/foodpolicy/downloads/pdf/Food-Policy-Report-2019.pdf>.

HOW FAR WE'VE COME: ACTIONS TAKEN

Policy Framework: In July 2017, we joined Council Member Rafael L. Espinal, Jr. in introducing legislation in the City Council (Intro 1661) to call for a comprehensive agriculture plan, by the New York City Department of City Planning (DCP)¹⁹. The multi-pronged plan included a variety of methods to harness the global urban farming industry, (which is estimated to value \$5.8 billion by 2022²⁰), targets community and youth empowerment, economic development, health care, and land use policies. In particular, the bill proposed to catalog existing and potential urban agriculture spaces; classify and prioritize urban agriculture uses; identify potential land use policies to promote the expansion of these practices across the city; and to analyze the City's Zoning Resolution (ZR) and building and fire codes to promote the industry.²¹ Further, the legislation pushed to expand healthy food availability to low-income communities; to integrate urban agriculture into the City's conservation and resiliency plans; to encourage youth development and education for local food production; to spur job creation, and to incorporate the food grown into school meal programs. The bill also encouraged the creation of a dedicated New York City Office of Urban Agriculture.

Supporting Innovation: The same year, Council Member Espinal and I committed to invest \$2 million in City Capital Funding – \$1 million each from our respective offices – toward the creation of an urban agriculture incubator in Brooklyn. The funds subsequently helped facilitate the adaptation of a dedicated space for emerging businesses engaged in sustainable food innovation, which is critical to growing an industry with significant economic potential for New York City. This incubator will help address their burdens particularly by reducing costs associated with procuring space so a more diverse entrepreneurship can access the industry, as well as place greater emphasis on measuring and understanding the true sustainability impact of these technologies.

Enhancing Education: In my commitment to supporting agricultural education in schools, we allocated more than \$21 million through our "Growing Brooklyn's Future" initiative to 63 schools in Bedford-Stuyvesant, Brownsville, Canarsie, Carroll Gardens, Cypress Hills, East New York, Mapleton, Marine Park, and Williamsburg. Together with NY Sun Works, we built hydroponic science labs in 40 K-12 schools across Brooklyn, enabling students to eat the food they grow right in their own classrooms, while learning the science behind it. NY Sun Works embeds in its program a year-round grade-specific science and sustainability curriculum aligned with New York City and New York State Science Standards. Students learn grade school-required science content while practicing all farming technical skills (from seed to harvest!), producing an average of 175 pounds of vegetables per classroom per school year.

Through this "Growing Brooklyn's Future" initiative, we also partnered with Council Majority Leader Laurie Cumbo to allocate \$3.05 million to fund a state-of-the-art hydroponic greenhouse at the Urban Assembly Unison School/PS 56 in Clinton Hill, operated by Teens for Food Justice (TFFJ). TFFJ converts Title I middle and high school classrooms and other school-based spaces into large-scale hydroponic farms, training students to grow more than 10,000 pounds of produce in each farm each year, according to internal TFFJ numbers. The "fruits" of their crops are served by school lunch

¹⁹ This bill was subsequently re-introduced in 2018 as Intro 1058 and is currently is laid over in the City Council's Committee on Land Use <http://www.nyc.gov/html/mancb4/downloads/pdf/december-2018/03-letter-to-speaker-johnson-re-intro-1058.pdf>

²⁰ "Vertical Farming Market Growing at a CAGR of 24.8% and Expected to Reach \$5.8 Billion by 2022." Bloomberg, Bloomberg, 28 June 2019, www.bloomberg.com/press-releases/2019-06-28/vertical-farming-market-growing-at-a-cagr-of-24-8-and-expected-to-reach-5-8-billion-by-2022-exclusive-report-by

²¹ In our recommendations with regard to the East New York Community Plan put forth by the New York City Department of City Planning (DCP), we called for enclosed urban agriculture in manufactory Zoning Districts to be treated as a community facility Use Group 4B to enable the preferential community facility floor area to be made available to house urban agriculture. Additionally, we called on the New York City Department of Buildings (DOB) to define the maximum height of floor space utilized for urban agriculture to be defined as one story of zoning floor area as a means to provide clarity for the industry.



programs and distributed to surrounding food-insecure communities. The nonprofit integrates farm-based lessons into each school's STEM classes, which are co-taught by school faculty and TFFJ's farmer-educators, empowering youth to lead our future in an urban farming economy. It also provides a comprehensive after-school program focused on hands-on food justice advocacy education and activities. Through this program, students learn nutrition and health skills they can share with their peers and neighbors to empower them to lead themselves and others toward healthier futures.

In August 2018, my office launched a comprehensive hydroponics curriculum for students in Brownsville with Farmshelf²², a smart indoor-farming company based in Brooklyn, through \$20,000 of discretionary funding to integrate hydroponic units for Brooklyn Democracy Academy students. Farmshelf enabled them to learn to grow and distribute produce, write code for related software programs, create "apps," and build and maintain vegetation units. The program was also designed to distribute the leafy greens and herbs that are provided to the City's senior centers, New York City Housing Authority (NYCHA) residents, and other community-based organizations.

Greening Public Housing: In a new initiative to repurpose and more maximally, innovatively utilize our City's land, we have partnered with NYCHA to establish a large-scale greenhouse, the first-of-its-kind on public housing property in New York City and allocated \$16.8 million to the project. Given the availability of space on NYCHA properties, this initiative may well demonstrate how we can establish a degree of self-sufficiency that could have sweeping benefits for NYCHA residents. This project has the potential not only to serve residents in terms of the provision of food, but also by providing proximity to green space, food production, and nutrition education for children and adults alike, skill-building within the urban agriculture industry, culinary workforce development, and a deep sense of community that comes from working together.

²² "Joined by Brownsville Students and Educators, BP Adams and Farmshelf Present First-Of-Its-Kind School Vertical Farming Program Teaching Youth to Grow Vegetables for Brooklynites in Need." Brooklyn-USA, Office of the Brooklyn Borough President Eric Adams, 13 Nov. 2018, www.brooklyn-usa.org/joined-by-brownsville-students-and-educators-bp-adams-and-farmshelf-present-first-of-its-kind-school-vertical-farming-program-teaching-youth-to-grow-vegetables-for-brooklynites-in-need/

RECOMMENDATIONS

To build a new agrarian economy, we must un-build some of the barriers we face. First, we must advocate for a re-design, re-imagining, and re-purposing of policies, to overhaul standing policies, such as zoning codes, which were not designed to accommodate agriculture. Second, we must make inclusiveness a top priority, engaging New Yorkers of all ages at every income level. Third, we must increase our coordination among and between our local municipalities when beneficial. The recommendations needed to meet these goals range from the granular threads focused on industry-specific regulations to more aggressive community empowerment and robust educational programs. When it comes to our food systems, there are three categories: production, sourcing, and distribution. In the pursuit of completeness, our recommendations address all three.

The NY COVID-19 Food Coalition's impressive, comprehensive report of recommendations for the NYC 10-Year Food Policy Plan included many innovative urban agriculture ideas.²³ We support many of these recommendations, including the proposed creation of a NYC Green Jobs Initiative "that has a food systems focus, providing farming and gardening training for BIPOC, immigrants, youth and/or the formerly incarcerated"; an "increase [in] funding for the Careers through Culinary Arts Program (C-CAP) and [expansion of] the DOE's Career and Technical Education program to include urban agriculture as a career path"; as well as the passing of the "NYC Council Int. 1663-2019 to establish an NYC Urban Agriculture Office, and Urban Agricultural Advisory Board and the development of a long-term urban agriculture plan."

The following recommendations all support a shift toward a more plant-rich food system, a transition that will offer numerous sustainability and public health benefits. First, plant-based diets are far less carbon intensive than meat- and dairy-based ones; animal agriculture contributes to approximately 53 percent of all food-related greenhouse gas emissions²⁴. Evolving toward a more plant-rich food system will also reduce our City's contribution to the risk of future pandemics like COVID-19, as, according to the CDC, three out of four emergent infectious diseases originate in animals²⁵, and scientists warn that intensive animal agriculture systems are likely to be the breeding ground for the next pandemic²⁶. Finally, plant-rich diets are proven to significantly reduce the risk of our city's most common and deadly chronic diseases, including heart disease, Type 2 diabetes, cancer, high blood pressure, and others²⁷. For these reasons and others, this transition to a food system centered on plant-based agriculture is essential. We must design an economy, food system, and health system that work together to mutually reinforce healthy eating, healthy and equitable communities, and a healthier environment.



²³ NY COVID-19 Food Coalition, Equity Advocates, "NYC 10 Year Food Policy Plan Recommendations," 24 September 2020, <https://sites.google.com/nyequityadvocates.org/covid-19/home>

²⁴ Ritchie, Hannah. "Food production is responsible for one-quarter of the world's greenhouse gas emissions." One World in Data, 6 Nov. 2019, <https://ourworldindata.org/food-ghg-emissions#>:

²⁵ "Zoonotic Diseases," Centers for Disease Control and Prevention, <https://www.cdc.gov/onehealth/basics/zoonotic-diseases.html>.

²⁶ Hollenbeck, James E., "Interaction of the Role of Concentrated Animal Feeding Operations (CAFOs) in Emerging Infectious Diseases (EIDs)," *Infect Genet Evolution*, Vol. 38: 44–46. Elsevier Public Health Emergency Collection, March 2016 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7106093/>

²⁷ Willet, Walter, et al "Food in the Anthropocene: The EAT-Lancet Commission on Healthy Diets from Sustainable Food Systems", Vol 393, Issue 10170, P 477-492, 02 February 2019, *The Lancet*.

A. STRATEGY AND POLICY

Continue to Press for a Comprehensive Plan

- While our efforts to compel the DCP to produce a comprehensive urban agriculture plan through legislation has not yet come to fruition, as we await these steps, we can and must engage our entrepreneurs, academics, and community advocates to continue applying pressure and providing advice to relevant officials and stakeholders to do so. Other large cities, including Chicago and Atlanta are much further along in planning sustainable food systems for their citizens. Closer to home, Jersey City is pressing forward with a complete portfolio of urban agriculture initiatives, designed to improve both food access and health. New York City must develop and support a plan now that creates the opportunity for a needed restructuring and resettling of our economy that can fully tap into the potential of urban agriculture.
- Comprehensive plan is the only kind of plan. This is especially so when we talk about increasing the City's resiliency. The COVID-19 crisis highlighted and continues to highlight the vulnerability of our City's food supply, underscoring the dire need to strengthen it and to get it right.

Centralize Food Agencies

- Currently, New York City food services are managed by various agencies such as New York City Department of Education (DOE), US Department of Health and Human Services (HHS), New York City Department of Citywide Administrative Services (DCAS), as well as other agencies. The decentralized management of these agencies poses some challenges related to coordination, economy of scale, and procurement efficiencies. All food services derive their direction from food policies (health-, political-, and consumer-driven) and the menu they follow. To this end, by unifying the agencies under one umbrella agency we could achieve the following: 1. Unified citywide policy on nutritional standards, meal patterns, and prohibited ingredients, resulting in centralized menus which, in turn, lead to: 2. Economy of scale in budget, staffing, and distribution management, 3. A unified procurement strategy, which will allow for increased buying power, better coordination, and cheaper procurement and distribution and 4. A significantly quicker pathway for new and healthier foods to get to those who need them. Unifying the agencies would also allow for the coordination of policies aimed at creating a single market with strong demand for local, fresh, and healthy food.
- A New York City Food Procurement Department should, as a first step, prioritize supporting our small businesses and minority- and women-owned businesses (M/WBEs) to build equity in the City's food procurement system. One effective way to do so is to establish pathways for smaller farms and food processors and M/WBEs to bid into the school systems to respond to smaller, non-aggregated orders.
- This singular department must work directly in coordination with other City agencies in their respective mission areas, including the New York City Department of Health and Mental Hygiene (DOHMH)

to ensure food provided by the City is healthy and nutritious, and the New York City Office of Sustainability to ensure environmental health is taken into account in the food procurement process.

Mandate Higher Proportion of Spending on Local Fruits and Vegetables

- In line with the above initiatives, we should raise the proportion of spending within all food services annual budgets to allow procurement policies aimed at higher costs related to buying more locally and regionally produced food – specifically, produce and legumes – thereby increasing the “organic offering,” and expanding “New York Thursdays” to multiple days of the week.²⁸ On a similar note, “Meatless Monday,” a program we began as a pilot in Brooklyn and which has subsequently been expanded citywide, need not be restricted only to days of the week beginning with the alliterative “M” – we should expand this initiative to multiple days of the week to support more produce consumption and a shift toward a more sustainable diet. For instance, both black beans and kidney beans are New York State products, sources of plant-based protein, and can be served as either the primary protein or as vegetable serving in the school meal program.

Provide Continuous Support of the “Get the Good Stuff” Program

- We must expand and continue to invest in the “Get the Good Stuff” program. This initiative incentivizes fruit, vegetable, and legume consumption for Supplemental Nutrition Assistance Program (SNAP) users and is a fundamental step in the right direction toward a healthier New York City.

Supporting Community Food Hubs to Address Food Access Issues

- New York City should create and provide technical support for the building of food hubs in communities experiencing “food apartheid” (a term describing a state of lack of access to healthy food, often coupled with an excess of unhealthy food retailers, which fittingly seeks to highlight the intentional, rather than naturally occurring, nature of inequities in food access). Food hubs reduce the distribution costs of healthy food and have the potential to attract appropriate stakeholders and engage City residents in local food production, economics, and conversations about their health.
- To further ameliorate food access issues, access to fresh food should be considered by DCP, with environmental implications of large-scale development reviewed along with access to education and housing units per capita for population projections and neighborhood redevelopment.

Expand FRESH

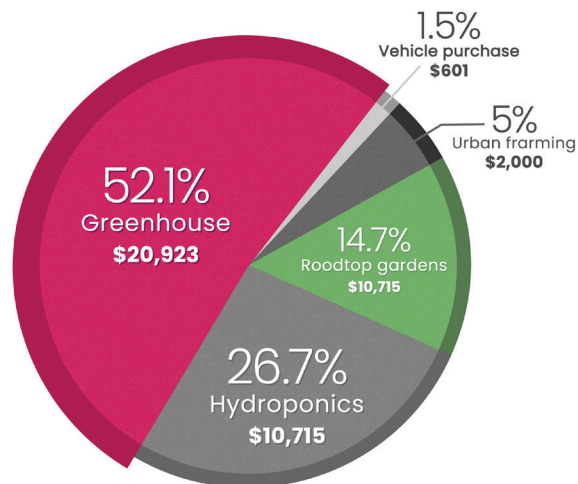
- The City should build on the Food Retail Expansion to Support Health (FRESH) program²⁹ and work to increase transparency around areas where New York City residents most often experience the effects of food apartheid.

²⁸ “Food Metrics Report” 2019, The Mayor’s Office of Food Policy, 2019, <https://www1.nyc.gov/assets/foodpolicy/downloads/pdf/Food-Policy-Report-2019.pdf>.

²⁹ “Food Retail Expansion to Support Health [FRESH].” NYC EDC, <https://edc.nyc.gov/program/food-retail-expansion-support-health-fresh>

FY15-21 | Total \$40,154

(\$ in thousands)



is leveraging its zoning resolution to allow these forms of urban agriculture to be liberalized in industrial zones to promote further private development of more urban agriculture operations. This could achieve a series of positive outcomes: 1. Provide new local job creation. 2. Alternative career opportunities for New York City youth (alternative solutions to college for careers), complemented by Career and Technical Education (CTE) curriculums and policies at DOE to shepherd students through alternative and vocational degrees. 3. Provide healthy local produce and fruit to the food procurement agency at a negotiated cost. 4. Provide a source of income for the City by selling overproduction to private food service. 5. Lower the carbon footprint for these products.

- According to our 2017 “Craft Beverage Report,” the New York City Economic Development Corporation (EDC) should create an incubator for urban agriculture. This will promote the creation of a direct link between ingredients and the brewing and distilling industries. Stimulating the urban agriculture industry will provide craft beverage producers with access to a wider variety of high quality ingredients, and encourage innovation in beverage production.³²
- The City must also continue to fund and support urban agriculture community-based organizations (CBO), as City funding often comprises a large portion of the budget of CBOs, and the demand for emergency services is very high, as a result of COVID-19.

B. EDUCATION

Increase Garden, Nutrition, and Cooking Education for All New York City Schools

- A great first step is to further educate the next generation of leaders on the importance of a new agrarian economy by infusing experiential garden- and cafeteria-based learning and nutrition education in the classroom and in our curriculum, including education about food systems, how food gets from farm to table, healthy food preparation and cooking, and nutrition. Any and all school gardens should also be connected to school kitchens. I've seen the magic that happens when children have the opportunity to eat the food they have grown, another reason for my Office's investment of capital allocation to education as seen in Figure 2. There are several ways to achieve this: The Garden to Café initiative is already in many DOE schools and can be expanded to all schools; another opportunity is DOE-led family and consumer sciences classes, a subject taught in many schools around New York State and around the country, but not in New York City, which includes nutrition and cooking as a regular part of the curriculum. The Coalition for Healthy School Food has already partnered with schools outside of New York City to work with family and consumer sciences classes to teach these subjects.
- DOE should partner more closely with the 40+ organizations currently offering nutrition education programming³³ to build teaching gardens and implement accompanying structured nutrition, agriculture, and cooking education. Some organizations involved in this work currently include Bronx Health REACH, Edible Schoolyard NYC, GrowNYC, Green Bronx Machine, Teens for Food Justice, the

An outstanding policy brief released by the CUNY Urban Food Policy Institute outlines various innovative ways to reform FRESH, such as focusing more toward supermarket food's healthfulness, affordability, and desirability, rather than solely on square footage of retail space; expanding efforts to support smaller retailers such as fruit and vegetable grocers, and ethnic markets, which sometimes meet the needs of residents more effectively; and prioritizing NYCHA residents in the program, as they suffer the highest rates of diet-related diseases in the City.³⁰ At the same time, considering the limited interest shown in the FRESH program by food markets, New York City should incentivize and support alternatives that are also designed to bring healthy food to underserved neighborhoods. One such option is City Harvest's Healthy Neighbors program (and DC Central Kitchen's Healthy Corners program), which has seen success expanding the range of fresh foods and healthy snacks stocked by corner stores and bodegas.

Promote Public-Private Partnerships

- Urban farmers attempting to operate in New York City often face high real estate cost challenges. Smart public-private partnerships can offer urban farmers real estate they can't otherwise afford, in exchange for commitments to supply City-run and non-profit programs, with dedicated stock from their production. Channeling funds from city programs like the Department of Environmental Protection's (DEP) Green Infrastructure program to support urban farms as green infrastructure is one example of this.
- By expanding private-public partnerships, the City can leverage unused real estate (City buildings, private buildings leased by the City³¹, DOE school building roofs, parks and, on an interim basis, empty lots awaiting development), as well as updating the ZR to qualify enclosed urban agriculture as a community facility use to incentivize use of preferential community floor area, to allow development of urban (vertical and hydroponic) farming. The City

³⁰ Cohen, Nevin, “REFRESH: Modifying the Food Retail Expansion to Support Health Program to Improve Healthy Food Access.” CUNY Urban Food Policy Institute, CUNY Urban Food Policy Institute, 16 July 2018, www.cunyurbanfoodpolicy.org/news/2018/7/16/refresh-policy-brief.

³¹ A policy we initially established in August 2017 as part of our ULURP recommendations regarding the New York City Office of Emergency Management (OEM) warehouse lease renewal and expansion application with regard to 930 Flushing Avenue in Bushwick (“Emergency Management Warehouse Recommendation – 170352 PQR”, Office of the Brooklyn Borough President Eric Adams, <https://www.brooklyn-usa.org/wp-content/uploads/2017/08/Emergency-Management-Warehouse.pdf>

³² Brooklyn Borough President's Office, “Brewing an Economic Boom in Brooklyn?,” May 2017 <https://www.brooklyn-usa.org/wp-content/uploads/2017/05/Craft-Beverage-Report.FVa...pdf>

³³ Laurie M. Tisch Center for Food, Education & Policy: Food Ed Hub, Food Ed Finder, <https://www.tc.columbia.edu/tisch/food-ed-hub/nepnyc>.

- Children's Aid Society, City Growers, Coalition for Healthy School Food, NY Sun Works, Cornell University Cooperative Extension, United Community Centers/East New York Farms!, Seeds in the Middle, Stone Barns Center for Food and Agriculture, Universe City NYC, Wellness in the Schools, and the Youth Farm.

Establish Roosevelt Island and Governors Island as Farming Hubs

- The GrowNYC Teaching Garden is an example of an educational farm, established on Governors Island, that has been producing food in the wake of and in response to the needs that have emerged due to the COVID-19 pandemic.³⁴ By encouraging youth from the Summer Youth Employment Program (SYEP) as well as from the Green City Force program, which trains NYCHA youth in agriculture, to get involved in established and new farms on Roosevelt and Governors islands, the two islands can quickly become farming hubs for the city. Not only does this increase our city's food resilience but it also provides much-needed locations for learning and career development for youth.
- The City can also take advantage of the new Cornell Tech Campus on Roosevelt Island to help develop and automate urban farming there. This could be a catalyst to create a hub of technology and ingenuity surrounding urban agriculture, as well as giving students the opportunity to actively participate in creating the future of food.

Engage School Wellness Councils as Advocates for Food Policy, Connectors to Urban Agriculture and Sustainability

- The NYC DOE Wellness Policy currently encourages all schools to support and sustain a School Wellness Council³⁵, and the most recent New York State Education Department (NYSED) Reopening Guidelines call for the establishment of an advisory council or collaborative working group composed of community members and certified professionals to "inform the comprehensive developmental school counseling program plan."³⁶ NYC DOE School Wellness Councils should operate in this same way to promote healthy food policy.
- Give Sustainability Coordinators the support they need, as we have encouraged the DOE to do since our 2016 report³⁷, "Supporting Sustainability In Schools: A Greener Path Forward." In this report we recommend compensation akin to football coaches, scheduled planning/prep for them, and regular exchange of best practices for sustainability coordinators across the city.

Partner with Academic Institutions to Bring Online Training to the New York City Food Workforce

- Food businesses have suffered high unemployment rates as a result of COVID-19, making this the optimal time for the City to work with academic institutions, such as Cornell University's College of Agriculture and Life Sciences and CUNY, to develop online workforce training and retraining opportunities that allow currently unemployed food industry workers to take advantage of online

entrepreneurship and food processing courses to extend their knowledge and experience in varied food-related careers, such as those in urban agriculture. Various agencies have continuous needs for educated and motivated young people to start their careers in the food industry. A clear career path must be developed and provided throughout all City agencies.

Establish a Youth Climate Corps

- A government-funded youth training fellowship to incentivize participation in local environmental action. The Climate Corps would offer youth green job training and fieldwork opportunities in New York City environmental non-profits such as Billion Oyster Project, Big Reuse, LES Ecology Center, Earth Matter, BK Rot, Cafeteria Culture, NYC Environmental Justice Alliance, etc. Designed as a direct avenue to impact and community power, corps members would present new policy and legislative solutions to the Mayor and City elected officials at the end of their fellowship.

C. REIMAGINING EXISTING INFRASTRUCTURE AND ASSETS

Harness Opportunities at NYCHA Developments

- Enabling farmers markets, commercial growers of fresh, local produce, and community gardeners to sell their products on NYCHA property and/or adjoining wide sidewalks and parking lane space with curbside parking street signage coordinated with intended hours of operations as a subset of the New York City Department of Transportation's (DOT) Open Streets initiative, would serve both consumers and producers in a new agrarian economy. It is critical that the City make every effort to connect residents in all income strata, housing environments, and at every age, to fresh, healthy food. The City can further support growers selling goods on NYCHA property and/or peripheral property by focusing Health Bucks distribution at sites located within NYCHA developments, so that products are more affordable, leveling the playing field to make access to fresh, healthy food more equitable.
- Encouraging programs that enable teaching NYCHA residents interested in growing their own food, either through soil or hydroponic farms on NYCHA property, is another opportunity to empower health-focused citizens. Even when accounting for the NextGeneration NYCHA vision, NYCHA property has open areas that do not warrant consideration for new building placement. For instance, Red Hook Urban Farm, the first of six farms on a NYCHA property, provides fresh produce for Red Hook Houses' residents, while simultaneously serving as an education, community engagement, and job training hub.³⁸ We allocated \$100,000 to install a water hookup for the farm, and it is a prime example of current and future projects to support.

³⁴ "GrowNYC Teaching Garden at Governors Island." GrowNYC, GrowNYC, www.grownyc.org/gardens/manhattan/governors-island-teaching-garden.

³⁵ "Department of Education Wellness Policy." NYC Department of Education Info Hub, DOE Wellness Policy, <https://infohub.nyced.org/in-our-schools/policies/doe-wellness-policy>.

³⁶ "Recovering, Rebuilding, and Renewing: The Spirit of New York's Schools – Reopening Guidance." New York State Education Department, www.nysed.gov/reopening-schools/recovering-rebuilding-and-renewing-spirit-new-yorks-schools-reopening-guidance.

³⁷ Brooklyn Borough President's Office, "Supporting Sustainability In Schools: A Greener Path Forward," April 2016 https://www.brooklyn-usa.org/wp-content/uploads/2016/05/Sustainability-Coordinators_Desktop.pdf

³⁸ "Farms at NYCHA: Final Evaluation Report," CUNY Urban Food Policy Institute, June 2019 <https://greencityforce.org/wp-content/uploads/2020/04/Farms-at-NYCHA-Final-Report.pdf>.

Utilize Existing and Unused Kitchen, Food Processing, and Culinary Infrastructure

- The pandemic has left the restaurant and hospitality industry in a tenuous and fragile position. With unemployment in the sector at soaring levels and many restaurants, kitchens, and food processing environments going unused, we should explore the potential for utilizing this existing infrastructure as a means to bring food production, processing, preparation, and delivery to New Yorkers in every neighborhood, similar to the way neighborhood bakeries function. Allowing food processing below a certain size to be considered a retail use can offer new opportunities for employment, utilization of commercial space, and community engagement all while supporting our local small businesses during this difficult time.

Partnering with Hospitals and Schools for Rooftop Gardens

- Helping hospitals and schools with preexisting accessible rooftop space create rooftop gardens can provide nutritious produce to children and hospital patients. Hospital and school foods can always be improved with more access to fresh fruits and vegetables. Therefore, taking advantage of the unused space to grow healthful foods can do “double duty” by providing a learning opportunity for students and delicious fresh produce for hospital patients and have climate benefits by greening our rooftops and making them more permeable and reducing rainwater runoff.

Strengthen Urban Alternative Protein Production

- Plant-based “meat” and other plant-based alternative proteins can create a diversified urban and indoor food system that provides high-quality protein to consumers. Alternative protein production requires significantly less space and fewer resources than conventional meat production while protecting against supply chain disruptions such as those caused by COVID-19 and other natural disasters against which we must guard. New York is home to a growing alternative protein market and has emerged with the potential to become a national leader in the field. The City should support the development of new plant-based protein companies to boost economic growth, create jobs, and provide sustainable and secure protein to New Yorkers.³⁹ As a rapidly growing part of the urban food system, these companies should be included within the previous recommendations to build mentorship and skills development partnerships via youth employment and internship programs.

Utilize Green Spaces at Correctional Facilities to Build Skills, Foster Engagement, Reduce Recidivism to Incarceration

- We can point to many successful programs, including the GreenHouse gardening program on Rikers Island, where community gardeners, local farmers, and urban agriculture industry entrepreneurs teach skills to incarcerated and formerly incarcerated individuals, contributing to the fresh produce served at the facility. These partnerships can and will create opportunities for skills-building, mentorship, and connectivity between food, the environment, and health. GreenThumb properties would be excellent locations to jump-start this work and encourage entrepreneurship.

- There has been shown to be a significant decrease in recidivism rates among the incarcerated who participate in outdoor community service programs compared to those who participate in those indoors.⁴⁰ One organization already putting this knowledge to use is Friends of Brook Park, based in the South Bronx, through their Alternatives-to-Incarceration community gardening program for youth. In addition, establishing urban agriculture projects in correctional facilities can promote rehabilitation and positive mental health outcomes.

D. ENVIRONMENTAL PRESERVATION

Bolster Community-Supported Agriculture to Increase Environmental Preservation

- The City must increase the accessibility of Community Supported Agriculture (CSA) and farm share initiatives, potentially through subsidization. These programs help support local farmers and consequently decrease food miles, while increasing the city's general food security. With additional funding, organizations such as Corbin Hill Food Project could be replicated on a larger scale, in which they are building not only food access, but community wealth.

Increase the Amount of and Accessibility to Food-Producing Community Gardens

- Aside from providing access to fresh fruits and vegetables, community gardens that grow food contribute the same benefits as any other planted areas such as beautify neighborhoods and result in slightly cooler air temperature than their surrounding areas. All such gardens during the summer months directly improve air quality, providing much-needed relief for residents, compounded with decreasing truck travel miles to bringing product to consumers, with reduction of emissions along such routes.

Expanding Composting Programs

- At the onset of the COVID-19 pandemic, the City announced a suspension of its curbside composting program through June 2021.⁴¹ As of 2018, municipal solid waste landfills are the third-largest source of methane emissions in the country.⁴² Approximately one third of New York City residents' waste is composed of food and yard materials. The City should reinstate and expand the curbside composting program citywide, as soon as possible. As we navigate the ongoing pandemic, we should secure temporary funding for additional food scrap drop-offs at local farmers markets, and/or additional funding to Compost Project, which supports community compost efforts all over New York City, with or without access to farmers markets.
- When the COVID-19 pandemic has abated, establish the brown bin compost project citywide so all New Yorkers have access to free, public food scrap recycling. Write waste management into Local Law 97 and incentivize the brown bin program by providing a tax credit to all New York City participating buildings.

³⁹ Support Sustainable Protein Production: Plant-based Meat and Cultivated Meat. The Good Food Institute, 2020 <https://www.gfi.org/images/uploads/2020/07/POL-FS-Sustainable-Protein-2020-0721.pdf>

⁴⁰ Holmes, Megan, and Tina M. Waliczek. “The Effect of Horticultural Community Service Programs on Recidivism,” *HortTechnology* 29.4, 19 July 2019: pp.490-495, <https://journals.ashs.org/horttech/view/journals/horttech/29/4/article-p490.xml>

⁴¹ “Food Scraps and Yard Waste.” DSNY, The City of New York Department of Sanitation, www1.nyc.gov/assets/dsny/site/services/food-scraps-and-yard-waste-page.

⁴² Basic Information about Landfill Gas.” EPA, Environmental Protection Agency, 6 Aug. 2020, www.epa.gov/lmop/basic-information-about-landfill-gas.

- As we had brought up in our 2017 “Craft Beverage Report,” the New York City Department of Sanitation (DSNY) should work with craft beverage businesses and private carters to incorporate their waste streams into existing and expanding composting programs. Private carters will be required to take advantage of DSNY’s Greenpoint anaerobic digestion facility by creating new routes for businesses with uncontaminated organics waste.⁴³
- Organizing community composting spaces is vital to creating a more sustainable and environmentally conscious future. Supporting initiatives like the New York City Department of Sanitation (DSNY)’s NYC Compost Project, which incentivizes city gardens and farms to accept organic waste materials from community members, and empowers communities to create their own composting locations, will create a discernible positive difference for New Yorkers and our environment.

Support Vertical Farming, Hydroponics, Soilless Farming

- There is much opportunity in exploring and expanding upon vertical and soilless farming, including hydroponics. Commercial hydroponic farming is a burgeoning industry in the region with the potential to provide jobs both as well as fresh, locally grown food. Gotham Greens and Bowery in New York City, and AeroFarms in Newark, New Jersey, have been major innovators in the vertical farming field, with many other farms also joining the market. Gotham Greens, Bowery, and Square Roots in New York City, and AeroFarms in Newark, New Jersey, have been major innovators in the vertical farming field, with many other farms also joining the market. Moreover, programs such as NY Sun Works give high school students technical skills required in the emerging agricultural industry in Brooklyn. We should seek to scale this up further.
- Some benefits of vertical farms include reduced water and land usage, year-round production, the eradication of the need for pesticide use, reduced food travel miles, and crops’ imperviousness to potential adverse weather conditions. While the process is energy- and capital-intensive, and thus far has mostly been used to grow only leafy greens and herbs, the benefits of vertical farming make it worth incorporating into the City’s food system while continuing to search for solutions to mitigate its issues and improve upon its capabilities. Furthermore, when incorporated with community and educational programs, such farms connect people to the sources of their food, which has been shown to promote healthier food choices.⁴⁴
- To stimulate these developments within manufacturing zoning districts, indoor urban agriculture developments should be categorized as a community facility use, rather than commercial and industrial use permitting floor area, in order for them to be able to occupy the additional unutilized potential of available preferential community facility floor area.

E. WORKFORCE AND ECONOMIC DEVELOPMENT

Support Community-Owned and Community-Run Urban Farms and Gardens in Connection with Industry Leaders, Elders, and Youth

- Growing one’s own food brings both economic empowerment, a sense of self-sovereignty and autonomy, and a personal connection to the food system that ultimately sustains us all. Early life participation in community gardens by youth have been shown to lead to sustained positive outcomes, such as increased interest in science, interest in staying in school, consumption of vegetables later in life, and confidence and leadership among youth.⁴⁴ The Harlem Grown model is a prime example of empowering youth to lead more healthful and sustainable lives, while also building confidence and leadership skills.⁴⁵
- Supporting community-owned and -run urban gardens works to place fresh fruits and vegetables directly in neighborhoods experiencing food apartheid.
- GrowNYC is a big part of New York City’s local and regional food landscape. While we have mentioned the educational importance of GrowNYC for our community, there are also immense opportunities for urban farmers to partner with them for training and access to Greenmarket farmers markets, Youthmarkets, and Fresh Food Box pick-ups. Promoting this partnership can assist in a more robust and developed urban agricultural system in Brooklyn and the greater New York City area.



⁴³ Brooklyn Borough President’s Office, “Brewing an Economic Boom in Brooklyn?,” May 2017 https://www.brooklyn-usa.org/wp-content/uploads/2017/05/Craft-Beverage-Report.FVa_.pdf

⁴⁴ Litt, Soobader, Turbin, Hale, Buchenau, & Marshall, “The Influence of Social Involvement, Neighborhood Aesthetics, and Community Garden Participation on Fruit and Vegetable Consumption”, Vol. 101, No. 8, pp. 1466-1473, American Journal of Public Health, August 2011, <https://ajph.aphapublications.org/doi/full/10.2105/AJPH.2010.300111>

⁴⁵ Ober Allen, Alaimo, Elam & Perry “Growing Vegetables and Values: Benefits of Neighborhood-Based Community Gardens for Youth Development and Nutrition”, Volume 3, Issue 4, pages 418 – 439, Journal of Hunger & Environmental Nutrition, 2008 <https://nccommunitygardens.ces.ncsu.edu/wp-content/uploads/2014/02/researchOberAllenAlaimoElamPerry.pdf?fw=0>

CONCLUSION

Food is essential and it must be an ever-increasing proportion of the City's economy. We must harness the power of a new agrarian economy to spur economic growth, maintain and increase the diversity of the urban agriculture landscape, and universally supply and sustain access to healthier foods.

We must remove regulatory hurdles, design smarter administrative systems, and include communities of color at every step of the process; this is critical as we build a fairer, more equitable, and more just city. The new agrarian economy empowers individuals, communities, and the city as a whole by providing educational opportunities that clarify the connections between diet and health and increase constituent well-being, ensure healthier, more resilient communities, as well as a more egalitarian, higher functioning city and urban economy. In this moment of tremendous upheaval and challenge, we must sow the seeds of change. It is time to establish a diverse, equitable, ingenious new agrarian economy that reflects and benefits all of New York City.



OFFICE OF BROOKLYN BOROUGH PRESIDENT ERIC ADAMS
BROOKLYN BOROUGH HALL · 209 JORALEMON STREET · BROOKLYN, NEW YORK 11201