

URBAN AGRICULTURE IN NEW BRUNSWICK



RALPH W. VOORHEES CIVIC ENGAGEMENT FELLOWS & COMMUNITY DEVELOPMENT FOOD STUDIO

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Fall 2011

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Acknowledgements

Many people helped make this studio possible. We greatly thank our community partner, Elijah's Promise and in particular Lisanne Finston and Paul Helms. And we warmly appreciate the partnership and support from many people within and outside of Rutgers. The people below helped tremendously before and during the studio. We especially want to thank Professor Jack Rabin for teaching us about high tunnels and so many other things.

- Michele Bakacs, RU Middlesex County Extension
- Michael Baker, Baker Farms
- J.R. Belt, Catherine Lombardi
- Vinnie Bevivino, Seed and Cycle
- Stacy Brody, SEBS Student
- Bob, George Street Co-op
- Win Cowgill, Rutgers Cooperative Extension of Hunterdon County
- Luke Drake, Doctoral Student, RU Geography
- Heather Fenyk, Doctoral Student, RU Urban Planning
- Lisanne Finston, Elijah's Promise
- Philip Forsyth, Philadelphia Orchard Project
- Gwen Greenburg, Christ Church Food Pantry
- John Karakoglou, RU Transportation
- John Leary, George Street Co-op
- Rick Ludescher, RU SEBS
- Lorena Gaibor, Unity Square
- Pam Mount, Terhune Orchards
- Joseph Nosker, Brickman Group
- Nik & Dom, Soupervan
- Glenn Patterson, City of New Brunswick
- Jack Rabin, Rutgers New Jersey Agricultural Experiment Station
- Lisa Tenore, Rutgers Dining Services
- Jennifer Rovito, Voorhees Transportation Center
- Caitlin Salemi, Food Planner
- Jaymie Santiago, New Brunswick Community Farmers' Market
- Dena Seidel, RU Mason Gross
- Theresa Viggiano, First Field & RU Doctoral Student, Sociology

Introduction

The Fall 2011 Community Development Studio and Ralph W. Voorhees Civic Engagement Fellows worked with Elijah’s Promise to explore the potential to grow and process food in New Brunswick, estimate the purchasing power for fresh produce grown in the city, and identify growing and processing models that meet community economic development goals, like job training, education, and entrepreneurial business development, as well as food security goals such as increasing community access to healthy food. More than 10 percent of New Brunswick’s residents are food insecure and almost all New Brunswick children (88%) fail to meet vegetable consumption recommendations. About half of New Brunswick parents report limited availability of fresh produce and low-fat items (U.S. Census, 2010; Elijah’s Promise, 2007; New Jersey Childhood Obesity Study, 2010). There is widespread demand for efforts to improve food security and directly address poverty.

Elijah’s Promise, formed in 1989 as a soup kitchen, has since expanded its programmatic offerings to include social services, health care, education, job training, and job creation with the objective of improving food security and increasing community economic development activities while using environmentally-friendly practices and serving healthy, fresh food (See figure 1). A Better World Café fights hunger and poverty while boosting community economic development. The café serves a wide variety of people who pay a sliding scale for sustainable, seasonal fare. Wealthier patrons can pay more to assist those with limited resources. The café employs graduates of Elijah’s Promise’s Culinary Training School, who are paid a living wage to prepare delicious food. It is environmentally friendly, reducing trash by allowing customers to choose their own portions, avoiding disposable silverware, serving fair trade coffee, and composting food waste. Elijah’s Promise recently started Raisin’ Dough, a bread CSA that raises money for the organization.

Figure 1. Elijah’s Promise Programs



To answer Elijah's Promise's questions, the Studio divided into three research teams: urban agriculture, buying power, and mapping. The mapping team surveyed and mapped places suitable for growing food in the city. The urban agriculture team researched ways to produce, distribute, and process food using cost effective, energy-efficient methods from production through post-consumption. The buying power team investigated who might buy produce grown in the city and what they might buy. The teams integrated what they learned and produced a few ideas to grow New Brunswick's Food Hub and improve food security while increasing jobs, education, and training. The teams employed a variety of methods. They interviewed restaurant, University, and soup kitchen food buyers; toured the Rutgers Food Innovation business incubator in Bridgeton with Margaret Brennan; visited Professor Jack Rabin at the Rutgers Student Farm; chopped tomatoes at the Rutgers Food Development and Manufacturing Center in Piscataway; tested soil and learned about recycling water with Jack Rabin and Michele Bakacs from the Middlesex County Agricultural Extension Office; toured the Rutgers Farm Market with Jaymie Santiago; hosted the SouperVan and learned about their social enterprise; and worked with Stacy Brody, Gwen Greenberg, Paul Helms, and Lorena Gaibor to refine maps, find what's growing and identify where else to grow. And we hosted a meeting with the Intersect Fund, EP, and City Planning to further think about realizing value added production. We pulled this information together into a report and presentation.



Rutgers Food Innovation Center



Processing Gleaned Tomatoes



Unity Square Community Garden

The report has three focal points: i) exploring possibilities to grow and process food in the city; ii) assessing the buying market for locally grown food; and iii) enhancing economic development through local food production models that link job training, education, and entrepreneurial opportunity. The report is an overview of where and how to grow food in New Brunswick along with who, in the region, might buy that food. In sum, the report is our vision for a New Brunswick Food Hub and suggestions for the path forward.

Clearly, one organization cannot accomplish all of this work alone. Along with representatives from several community organizations, Elijah's Promise has been instrumental in developing the New Brunswick Food Alliance. The Alliance unites community stakeholders to increase access to quality produce, stimulate the local economy, and broaden residents' interaction with local food systems. The Alliance is tackling the problems of food insecurity with gusto. And they are not alone. The research team met many other extraordinary people and institutions who will be wonderful partners moving forward.

Where to Grow Food in New Brunswick

The New Brunswick Farmers Market, community and religious groups, elementary schools, Rutgers, the Rutgers Student Permaculture Club (RIPE), and individual residents all grow food in the city. While we did not map every backyard, front yard, or smaller garden space, we recognize the growing potential of individual plots. On map 1 we identify where food is growing in green, such as community and school gardens and suggest where it might be grown in yellow including large open spaces, vacant lots, large back yards, and open areas around schools and parks¹.

Map 1. Growing and Growable Places in New Brunswick

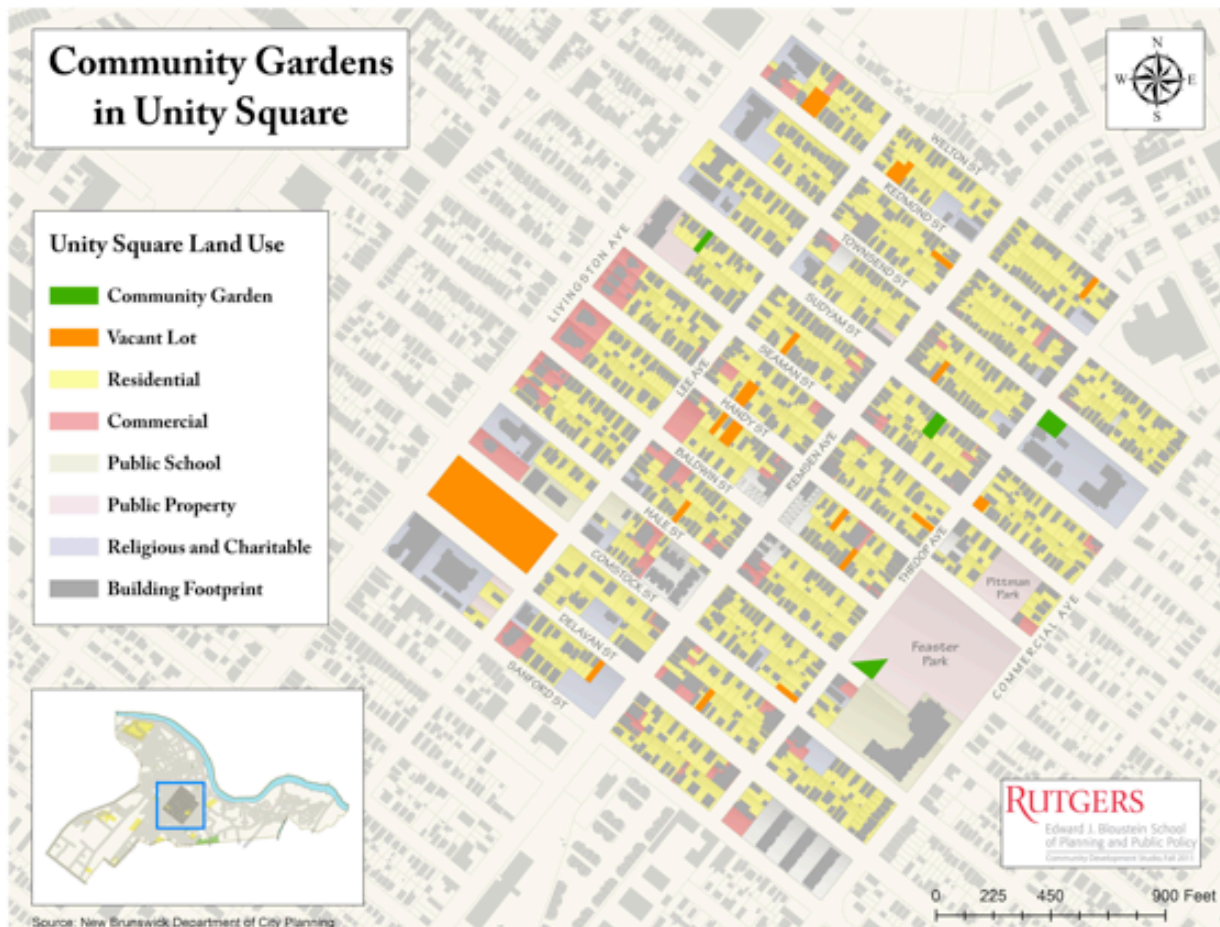


¹ The team learned about current and soon-to-be growing sites from Laura Lawson, Rutgers Department of Landscape Architecture, Stacy Brody, undergraduate student at SEBS, and Luke Drake, doctoral student in Rutgers Geography. We also learned about current local growing efforts and gathered information about where people might grow by consulting with RIPE, Elijah’s Promise, Unity Square Partnership and Christ Church.

Community Gardens

Since we could not survey property in every neighborhood, we explored one neighborhood in depth. As the Unity Square Neighborhood hosts three community gardens, we mapped it to show what is growing and where residents could grow. We created a neighborhood map (see map 2) and used tax data to differentiate residential, commercial, public school, public property and religious/charitable land. We highlighted the three existing community gardens: Sacred Heart Church garden (corner of Throop Ave. and Townsend Street), Feaster Park Community Garden (corner of Throop Ave. and Hale Street), and Suydam Street Community Garden (Suydam Street between Livingston and Lee Aves). To illustrate the potential land area available to grow food, we mapped all land without a building and all land around building footprints, (see orange and yellow areas on map 2) including backyard, front yards, and other undeveloped land parcels. As map 2 suggests, even in a developed residential neighborhood, there are many places to grow. Dominic Vitiello et al (2010) measured the production of community gardens in Camden and found that 48 gardens, which made up less than 4 acres, produced nearly 31,000 pounds of food which suggests lots of potential to grow here.

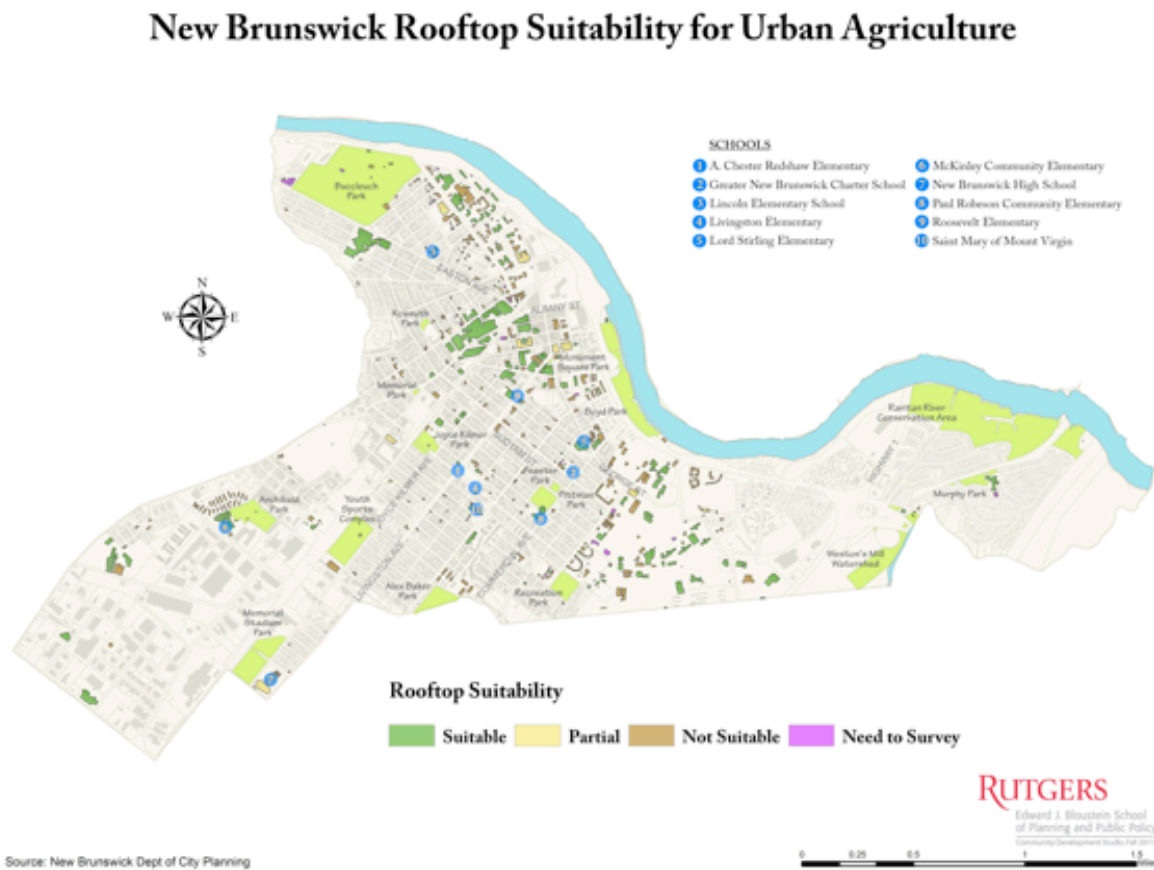
Map 2. Unity Square Neighborhood



Rooftops

Since many communities successfully garden on rooftops, the team decided to look at the rooftop landscape. The team narrowed its efforts to roofs on land owned by public or non-profit entities because it anticipated that the buildings on these lots were more likely to have large flat roofs which might be easier to access. The narrowed criteria produced 717 rooftops. The team created four categories and ranked the roofs accordingly. We labeled the roof "suitable" if it lacked any visible hindrance to gardening. Conversely, we labeled any roof with irregular angles or slopes as "not suitable." We labeled any roof that appeared appropriate for gardening on one section but not another as "partial." Finally, we labeled any roof whose physical characteristics could not be discerned as "survey" (see table 1). The team looked at the 717 rooftops using Microsoft Bing Maps' "Birds Eye View" feature linked to GIS, classified the rooftops and then created a map that showed the roof classifications (see map 3).

Map 3. New Brunswick Rooftop



A closer look at buildings downtown suggest that there are many large buildings with flat roofs, shown in green on map 4.

Map 4. New Brunswick Rooftops



Out of the 717 potential sites, 122 rooftops, or more than half of the total rooftop area, is suitable for growing. Government and Rutgers-affiliated buildings comprise more than three-quarters of those. The remaining are on lots owned by of Robert Wood Johnson-affiliated buildings, religious organizations, and “other” (see table 2). This is a very preliminary analysis only intended to identify flat roofs that might be further considered for gardening projects. Community groups interested in growing food in New Brunswick must further narrow the list of suitable sites by performing engineering studies, negotiating with owners, assessing water and shade needs, and addressing other issues discussed below.

Table 1. Rooftop Suitability

SUITABILITY	NUMBER OF ROOFS	AREA (SQ FT)	PERCENTAGE OF TOTAL AREA
Suitable	122	2,906,308	54%
Partially Suitable	16	481,177	9%
Non-Suitable	529	1,875,888	35%
Need to Survey	50	132,254	2%
Total	717	5,395,627	100%

Table 2. Rooftop and Parcel Ownership

PARCEL OWNERSHIP	NUMBER OF ROOFS	AREA (SQ FT)	PERCENTAGE OF SUITABLE AREA
Public	40	1,241,439	43%
Rutgers	47	944,895	33%
Other	15	472,209	16%
RWI	6	128,893	4%
Religious	14	118,872	4%
Total	122	2,906,308	100%

Growing in the City

In this section, we review different ways to grow in the city, the types of products that grow best, and the challenges and benefits of each model.

Backyard Gardens

Backyard gardening refers to the practice of growing food in residential yards. Despite the “backyard” name, residential gardens could be located anywhere on the property. Gardeners can even use planters on a back patio or hang plants from a front porch; others might grow directly in the ground or in raised beds. Hoop houses or greenhouses can extend the growing season. Most backyard gardeners grow food to eat or share but some sell surplus produce through a farm market, restaurant, or small store. Groups of backyard gardeners can form a collective by pooling the food grown on their lots and farming themselves or hiring a gardener. Backyard gardening offers health benefits such as increasing access to fresh fruit and vegetables, improving physical and mental health through the exercise, relaxation, and satisfaction inherent to garden maintenance, and reducing grocery costs.

New Brunswick is located in Agriculture Zone 7 and the table below suggests potential products to grow.

Table 3. Potential Fruit and Vegetables and their Growing Seasons

	J	F	M	A	M	J	J	A	S	O	N	D
Apple							■	■	■	■		
Blueberries							■	■				
Cherries							■					
Raspberries							■	■	■			
Beets						■	■	■	■	■	■	■
Carrots						■	■	■	■			
Lettuce					■	■	■	■	■	■		
Mint				■	■	■	■	■	■			
Corn						■	■	■				
Peppers							■	■	■			
Tomatoes							■	■	■			
Tomatillos								■	■	■	■	
Brussels									■	■	■	
Sprouts									■	■	■	
Kales							■	■	■	■	■	
Swisschard							■	■	■	■	■	

Many community backyard gardening programs include education components. The Food Alliance might partner with local colleges and universities to offer some. The Rutgers Agriculture Extension master gardener program could offer urban gardening courses for local residents. Rutgers and Middlesex County College students could participate in the community programs while earning course credit as they learn how to garden in the city. Backyard gardening support programs can also provide access to gardening tools, plants, seeds, soil amendments, and soil testing. The Middlesex County Cooperative Extension currently supports many of these efforts and are expanding its efforts. Since many New Brunswick residents garden in their yards, ensuring that the soil is safe and supporting the expansion of these efforts in a safe manner is an easy complement to New Brunswick's existing green infrastructure.

Resources

- [Garden Angels](#). At the University of Maine, volunteers called Garden Angels, grow food in senior citizens' gardens of and, in exchange for their labor, receive some produce. The University of Minnesota's Urban Garden Youth Employment program trains middle-school aged children to cultivate gardens and they sell what they grow to chefs and restaurants.
- Elijah's Promise could implement and facilitate a program similar to the Master Urban Gardener Program at the Boston Natural Areas Network (<http://www.bostonnatural.org/MUG.htm>).
- [City Slicker Farms](#) in West Oakland, CA provides support to transform underused urban areas into "high yield" production areas. They current support more than 100 backyard gardens, farm stand, education program, and a greenhouse.
- [BUGS](#) (Building Urban Garden Stewards) uses backyard gardening to provide food to low income residents in the Chattanooga, TN area.



Unity Square gardens at Sacred Heart Church and Feaster Park (photo credit: Kathe Newman)

Rooftop Gardening

If no space on the ground is available or accessible for a garden, roofs may provide a growing space. Rooftop gardens can take on many different forms depending on the type of roof available and the purpose of the gardening activities. Gardening can be done in a wide variety of containers or directly on the surface of the roof, often referred to as a green roof. A green roof can be extensive (3-6" of soil), intensive (8 or more inches of soil), or a mixture of both. An intensive green roof system can be quite expensive to install, will put a heavier strain on the infrastructure of the building, and will require more maintenance, but it is best for growing vegetables (BCIT, 2009). Growing vegetables in containers (such as pots or wooden planters) is an option for those who lack time, money and/or structural soundness to build an intensive garden; however the gardener's yield will most likely be smaller in containers since they will not be maximizing the space available on the roof. In addition to the satisfaction of growing one's own food, gardening on the roof can provide other benefits such as reducing storm water runoff, insulating and increasing the energy efficiency of the building (keeping it cooler in the summer and warmer in the winter), serving as a habitat for wildlife, and it is widely believed that green roofs help improve the surrounding air quality (BCIT, 2009). Roof gardens can also add outdoor green space in urban areas, which may improve the building aesthetics and the surrounding community.

Beyond the many positive outcomes of roof gardens outlined above, the core idea is to grow food. People may grow food for a variety of reasons and it is important to consider the purpose of the roof garden before deciding what model to use. Food grown can be intended for personal consumption or to share with friends and neighbors. The individual or family may seek to reduce their monthly food costs or to grow specialty crops that might be difficult to find in the neighborhood, among other reasons. Growing food for sale is another great reason to start a rooftop garden. This can take on many different forms, and given the average size of rooftops in an urban area, will most likely work best on a relatively small and local scale. Because large scale farming is usually not appropriate, market gardening or urban farming models are often used in urban settings. According to the National Sustainable Agricultural Information Service (formerly known as ATTRA), market gardening is the small-scale commercial production of fruits and vegetables as a for-profit business. Harvested crops can be sold directly to consumers at farm stands and farmers markets, to institutions such as schools, food retailers, restaurants or through community supported agriculture (CSA) which are discussed later.

Often rooftop gardens have resulted from community partnerships, where everyone benefits. Loyola University of Chicago created a rooftop garden to study the potential for rooftop urban agriculture. All of the food harvested was given to the university community and local organizations. The university farmers invited people up to the farm to share tips and challenges to replicate the rooftop garden process. Students and faculty used the garden as an experimental station and the surrounding community benefited from the food produced and the shared expertise. The Trent University Environmental and Resource Sciences Vegetable Garden is a similar example, where students conducted environmental research on rooftop gardens and community members enjoyed the food it produced. With a resource such as Rutgers close at hand, there is great potential for such a partnership between the academic and surrounding New Brunswick community.

The United Methodist Church in San Francisco installed a rooftop garden using the container gardening method. Their primary goal was that of creating an educational resource for children in the community. Not only did

these students learn how to garden, but the classes were extended to the kitchen where they learned how to prepare the food they had grown. And, in the Hells Kitchen neighborhood of New York City, the Metropolitan Church of New York began growing food on their roof to directly supply their food pantry.

When deciding what type of roof garden is best, it is important to consider the following: if you are a renter, make sure you are permitted to use the roof for a garden before putting in the time and money of planning the garden. Make sure that your roof is structurally able to carry the load of a roof garden. This will add an incredible amount of weight that could potentially cause leaks in a weak roof so consultation with an engineer is highly recommended. Do you have access to water on the roof? Carrying water up to the roof will be difficult and inefficient, so it is best to have a direct water source. Is there access to electricity on the roof? If you decide to install a structure such as a green house or hoop house, first confirm that it will not be contrary to any local zoning ordinances.

Additional Resources

Information Guides

- [Sustainable Agriculture Project](#) - This site provides links to sustainable farming guides, informational webinars, internship and apprenticeship opportunities, and countless other resources for a farmer or gardener at any level of expertise.
- [City Farmer News – Roof Gardens](#) - News and ideas on rooftop gardening around the world
- [Rooftop Agriculture Systems](#)- 2004 paper on benefits, methods and case studies of rooftop farming
- [Rooftop Farming Information](#)- Information on how to grow on roofs and what to grow
- [Container Gardening Guide](#) - Advice on choosing the most appropriate container, what soil and fertilizer to use, tips on what to grow and how to water, as well as links to similar resources
- [Vegetable Gardening in Containers](#) - Resource from Texas A&M with detailed information on vegetables best suited for container gardening as well as identifying potential diseases and insects
- [Container Gardening Model](#) - This guide provides several specific models of container gardening, including wading pools, used tires, feed sacks and other containers that might be found in urban areas, and how to get each of these models ready for growing food.
- American Community Gardening Association - www.communitygarden.org
- Chicago community gardens – resources on how to start a garden, etc.
<http://www.cpdit01.com/resources/can.community-gardens/>

Examples

- [Brooklyn Grange Farm](#) – For profit rooftop farm on a privately owned building that incorporates composting, bee-keeping, raising chickens, educational programs and agritourism into its model.
- [Uncommon Ground Restaurant](#) - Uncommon Ground is 4-star certified by the Green Restaurant Association and has received numerous other awards for its sustainability programs. The restaurant has an organic farm production on its roof that directly supplies the kitchen below with fresh produce. This site details the materials and methods they used to install the farm, what they grew, partners they worked with and many other helpful rooftop gardening tips.

- [Loyola University of Chicago Rooftop Garden](#) - From the Center for Urban Environmental Research and Policy, this site describes the purpose, methods and outcomes of their rooftop garden experiment.
- [Trent University Rooftop Vegetable Garden](#) - This site provides a description of the purposes for the demonstration garden and the methods used for installation.

Urban Orchards

Apples, Blackberries, Blueberries, Figs, Nectarines, Pawpaws, Peaches, Pears, Plums, Persimmons, Raspberries, Strawberries, and Winter Squash are just some of the things that could grow in an urban orchard. This could be an exciting way to expand an urban agriculture program. Depending on the project's objectives, an urban orchard could be organized in many ways. Some variations increase food security by providing food for people who need it. Others focus on education about where food comes from and provide job training opportunities on fruit and fruit tree management. Still others provide fruit for food entrepreneurs.



(Photo credit: Katie Nosker)

The target of this model, and this plan in general, is to promote economic development in the City of New Brunswick and increase food security. Thus, the goal of this model would be to provide food to people who want to eat it, use it in their businesses (such as restaurants), or process it into a value added product. The broader socioeconomic impacts of growing fruit in the city are more substantial if the food is grown by individuals who want to harvest it to feed their families. If an orchard is grown to promote education, then residents of New Brunswick and surrounding towns could benefit from seeing how their food is grown, picking their own, and learning about the benefits of fresh food.

Before embarking on an urban orchard project Elijah's Promise might want to consider the reason for pursuing this model, in cooperation with community residents. Possible objectives include:

- Food could be produced by and for the community in a community garden style approach. This could increase food security and access to affordable, healthy, local food.
- Food could be produced, processed, and sold as part of a business model. New Brunswick apple sauce perhaps?
- Food could be produced and sold in raw form at farmers' markets or local grocery stores and bodegas
- Orchard could be run as an educational tool – youth/schools/families/kids could tour the orchard to learn where their food comes from and how it's grown. Could have pick-your-own elements that people could pay for. Could pay for the educational opportunities or not.

- Fruit trees could be grown as street trees to increase the urban canopy, decrease the urban heat island effect, and yield fruit for passers-by and other purposes.
- Elijah's Promise could grow their own fruit trees to provide food for their soup kitchen, Better World Café, and food training classes.
- Partner with Rutgers University to train students in urban fruit tree management – provide help to downtown community organizations while training students

Elijah's Promise will have a lot of models to choose from in terms of how to grow the fruit bearing plants. Possible models include:

- Fruit trees could be street trees. Although their life-span would be limited because trees grown in this model are stressed (their root growth is hindered by the sidewalk, the sidewalk will often buckle because of the root systems, water cannot penetrate concrete so root systems cannot absorb enough water).
- Fruit bearing plants could be arranged in layers the way the Philadelphia Orchard Project (POP) plants. POP uses a layering technique with a top canopy layer of dwarf or semi-dwarf trees, a middle layer of assorted berry bushes, and a lower story of perennials. This is done to attract beneficial insects, build soil fertility, deter pests, and avoid the need to spray toxic chemicals (Philadelphia Orchard Project, 2011).
- Fruit trees could be grown in front or back yards of residences, businesses, municipal, or university buildings.
- Many fruit trees could be grown on a large lot in rows the way most commercial orchards are set up. This would yield the most fruit.
- Many fruit trees, in dwarf variety, could be grown in rows like an orchard. The advantage to using dwarf varieties is that they would be smaller, it would be easier to pick the fruit, it would be conducive to educational and agritourism purposes because patrons (including children) could reach the fruit, and the yield would be smaller and more manageable. There are two big flat yards in front of the New Brunswick Middle School. That might be a potential place for a dwarf orchard?

In terms of quantities of fruit trees, often two are needed to successfully yield fruit because the trees need to pollinate each other. There are some exceptions, like crab apple trees, that are self-pollinating. Space for at least one or two trees is the minimum required for fruit trees. The upper limit will most likely depend on the lot size available, the reason the trees are being grown, and the type of trees or fruit bearing plants. According to Win Cowgill, a professor at Cook College and an expert in fruit trees, these plants are time and expertise intensive. Pests and diseases can be treated and prevented with careful management. Given the extensive expertise at Cook College regarding fruit trees growth and management, this could be a potential area of collaboration.

The next challenge will be for Elijah's Promise and other community members to decide what they would like to grow. The following table shows fruit-bearing plants that grow in this zone.

Table 4. Harvest Season of Fruit in New Jersey

	A	M	J	J	A	S	O	N	D	J	F	M
Apples												
Blackberries												
Blueberries												
Cantaloupes												
Figs												
Melons												
Nectarines												
Pawpaws												
Peaches												
Pears												
Persimmons												
Plums and Pluots												
Raspberries												
Strawberries												
Watermelon												
Winter Squash												

Sources: (Watson, 2011; The City Cook, Inc., 2011; Cooperative Extension, Rutgers New Jersey Agricultural Experiment Station, 2010; Wickes, 2011).

The costs of pursuing an urban orchard vary. Generally speaking, trees and berry bushes are not very expensive, ranging from \$14 for berry bushes to \$116 for a dwarf apple tree, according to prices from an online tree-ordering service called Fast-Growing-Trees.com. To get a completely accurate estimation of what resources (money and material) certain plants would require, Elijah’s Promise might want to speak with agricultural experts at Cook College, or directly with a nursery. Other cost elements include those of other materials needed to build an orchard, like hoses, shovels, compost, site acquisition, and labor costs. The labor costs would depend on the size of the orchard. If it is going to be a large orchard covering many acres and requiring a full-time farmer, Pam Mount, the owner of Terhune Orchards, suggests that the farmer would have to be paid fairly, at about \$60,000 a year plus benefits, which would add up to about \$100,000 a year. If there were fewer trees, then perhaps only a part time person would need to be hired to maintain the trees. This person (or people) would do such activities as weeding, watering, and harvesting. More hours would be needed initially to do siting and planting, as well as during harvest season. Fewer person-hours would be needed in between. Perhaps some of these tasks could also be shared with volunteers and food entrepreneurs.

Philadelphia Orchard Project

The Philadelphia Orchard Project (POP) is a nonprofit organization that was conceived to expand access to food in Philadelphia and to provide a productive use for disinvested land in the city. They partner with community groups around the city to provide them with the technical agricultural expertise, design, supervision, and support to build and maintain an orchard. POP has assisted community groups in constructing 27 orchards around the city. The

partner organizations maintain these orchards, harvest and distribute the fruit. They apply to POP, which then reviews the application, and meets with the community group to iron out the details. POP is staffed by only the founder, Phillip Forsyth, who works part time so the organization depends in large part on the partner organizations and volunteer labor to plant and maintain the orchards. It is funded by small grants, donations, fundraisers, like happy hours, appeal letters, and harvest festivals, along with in-kind support.

To choose an appropriate site and partner for the orchard, POP makes sure that the community group has long-term access to the land, because orchards take a long time to grow and bear fruit. POP requires that sites own or lease the land; if they are leasing, it must be at least a 15 year lease. This means that most vacant land is not eligible, but POP has had no shortage of applicants who meet the requirements. Next, POP begins to look at other factors. They do soil tests for lead, cadmium, and other toxins. They look up the history of the site to see how it was used in the past. It is also required that the site have some provision for water access, and POP can help them achieve that by building a water connection. The site is examined for sun and shade; the more sun the better.

The community groups usually come to POP already knowing the types of plants they want, but POP has some input and advice for them. First, he advises that while apples and peaches may be attractive options simply because people are familiar with the fruit, they can be difficult to grow without technical expertise. Other plants, like figs, pawpaws, and persimmons, are native to the area and are much easier to grow. POP gets its plants from a variety of sources. They have a small nursery where they grow some plants. They use local nurseries, but it can be harder to find some plants there in the fall. So POP sometimes uses distributors in North Carolina particularly for air root delivery. Many plants also are donated as in-kind support. POP advocates growing fruit bearing plants in layers. This is because many plants can work together to deter certain pests, and because some smaller plants, like berry bushes, produce fruit immediately, ensuring that community groups do not lose interest in the few years it can take for trees to bear fruit.

Some challenges POP has run into include squirrels and vandalism. To protect against both, POP makes sure small fences are placed around the periphery of lots or sometimes just the trees themselves. POP does advocate spraying trees, but makes sure community groups use only organic products. These do not seem to diminish the yield. Included in POP's model is a robust educational component to community groups, so they know how to plant in good soil, care for the plants, and harvest them effectively, which achieves the joint objectives of making the site less attractive to pests like rodents, and making sure community residents are getting the most out of their orchard.

Selecting an Urban Orchard Model

The information included in this report provides a pathway for lots of different organizations in NB to grow urban orchards. To select which model is right, organizations might think about what works best for them and/or they might work with community residents to identify objectives. To narrow down the options, participants might consider: Why are you growing?, Who will grow?, What will you grow?, How will you grow?, and Where will you grow? Organizations should consider the business model. Will it be run as a business with the entrepreneur providing the labor? Perhaps Elijah's Promise will provide training for residents and run the orchard. In what way(s) might volunteers be used? To inform these choices, organizations might get input from community residents in a variety of ways including meetings, focus groups, surveys, or some combination of these activities.

Actually implementing the orchard will necessitate finding resources and building partners. This includes land, soil testing, fundraising, and in-kind donations. We wonder if there are opportunities to build relationships with the University which provides training the growing and care of fruit trees. Elijah's Promise, community members and other partners should plant, grow, harvest and eat, process or sell the food. The last step is perhaps the hardest: the model must maintain momentum. Each of these models will require continuous care and maintenance.

Additional Resources

- The Fruit Tree Planting Foundation and Dreyers Fruit Bars have a program called Communities Take Root, awards orchards to 20 communities around the country: www.communitiestakeroot.com
- The Chicago Rarities Orchard Project is a nonprofit organization created to establish community rare fruit orchards in Chicago: <http://www.chicagorarities.org/>
- One gentleman, Gene, walks through his backyard orchard where he grows dwarf apple trees, and blueberries: http://www.midfex.org/App_Pages/Yale/intro.aspx
- The Rapid City Urban Orchard Project is a nonprofit that was started to encourage urban orchards in the green spaces of Rapid City, South Dakota: <http://www.rapidcityurbanorchard.com/>
- TreeFolks is a nonprofit that grows urban forests around Austin, Texas, at retirement homes, schools, housing projects, in medians, residential right of ways, green belts, parks, and community gardens: <http://treefolks.org/programs/the-urban-orchard-project/>
- The City of San Francisco is planting fruit trees around its public housing complexes: http://www.sfenvironment.org/our_programs/interests.html?ssi=6&ti=85&ii=242
- Groups in Australia including Friends of the Earth Adelaide, Goodwood Good Food Co-op, the City of Unley and the Living Kaurna Cultural Centre got together to make a film, *An Urban Orchard*. Some copies of this film will be provided free to community groups who would like to screen the film to cultivate ideas and encourage dialogue about building sustainable, local food systems: <http://permaculture-media-download.blogspot.com/2011/05/urban-orchard-dvd-trailer.html>
- Phat Beets produce is creating a healthier and more equitable food system in North Oakland by providing community residents with access to affordable fresh produce, facilitating youth leadership in health and nutrition education, and connecting small farmers to urban communities through urban orchards, youth market gardens, farm stands, and farmers' markets: <http://www.phatbeetsproduce.org/the-farm/plant-an-urban-orchard/>
- This New York Times article, *Totally Green Apples*, describes how one man has been able to grow apples without pesticides: <http://www.nytimes.com/2011/11/17/garden/growing-apples-without-pesticides.html?hpw>
- The Portland Fruit Tree Project's mission is to increase access to healthy foods and strengthen communities by empowering residents to share in the harvest and care of produce grown in the city. Learn more about their efforts and urban orchards: <http://portlandfruit.org/>
- The Victory Garden Initiative in Milwaukee, Wisconsin, promotes the use of backyards, front yards, rooftops, and patios for the production of food. Learn more about their campaign to build a forest of fruit and nut trees in the city: <http://www.victorygardeninitiative.org/>

- Madison Fruits and Nuts is an organization that has put together a listing of urban edible landscaping programs, urban orchards, and fruiting street tree efforts in the US. See their listing: http://www.madisonfruitsandnuts.org/examples_edible.pdf
- Fallen Fruit is a nonprofit advocacy group in Los Angeles seeking to empower residents through food: <http://www.fallenfruit.org/>
- Davis, California has a community wiki to improve communication among community members. Among other things, it lists information about fruit trees that grow in the city: http://daviswiki.org/Fruit_Trees
- City Fruit, a Seattle-based organization has a grant to create a community stewardship program to care for fruit trees on municipal properties like parks, community gardens, and schools: <http://www.cityfruit.org/projects/parks.htm>
- The City of Scottsdale, Arizona, in collaboration with the Desert Botanical Garden, partnered in the creation of an edible landscape in the city inspired by Fritz Haeg's Book, "Edible Estates: Attack On The Front Lawn". In October of 2010, these groups held a contest for Scottsdale residents to apply for a free edible landscape front yard make-over. Learn more about the program, contest, winners, and progress here: <http://www.scottsdaleaz.gov/planning/ediblelandscapes>
- Win Cowgill, the Editor of Horticultural News, Professor and Area Fruit Agent, and Department head of the New Jersey Agricultural Experiment Station, Rutgers Cooperative Extension of Hunterdon County, recommended the following book on growing fruit trees in New Jersey: New Jersey Agricultural Experiment Station, Rutgers University, Rutgers Cooperative Extension. 2011 *New Jersey Fruit Tree Commercial Production Guide*, Rutgers Cooperative Extension.

Hoop Houses

Hoop houses are easy-to-construct non-permanent structures that increase production in a small area and extend the growing season for approximately twelve weeks (six at the beginning and end of the annual growing season). For communities with access to lots temporarily, hoop houses offer a flexible growing environment that minimizes capital and energy investments. The hoop house frame can be taken down in a day. Hoop houses, or a more specific variation called high tunnels, are comprised of a series of metal or PVS piping semi-circle or “hoop” shapes that are pushed into the ground or anchored to a foundation. The houses are covered in plastic or shade cloth (depending on season and growing needs) which provides a controlled environment to grow anything from seedlings to permaculture. Hoop houses mitigate the risk of growing crops earlier in the season and they increase harvest quality by protecting crops from extreme weather conditions such as wind, frost, sudden temperature fluctuations, and heavy storms. They also protect crops from disease and pest infestation which make them ideal for producing heirloom and specialty vegetables and spices (Jett, 2004; Neuman, 2010). Hoop houses isolate produce from harmful pathogens. They are well suited for the production of red peppers, basil, cut flowers, raspberries, strawberries, salad mix, baby spinach, tomatoes, melons, and, with enough vertical clearance, dwarf tree crops (Jett, 2004; Blomgren and Frisch, 2007).

Hoop houses offer a cost advantage over traditional glass-panel greenhouses. They can be constructed without electrical connections for ventilation or supplemental heat. Instead they are heated by the covers and cooled with roll-up sidewalls and detachable end walls (Jett, 2004). While hoop houses should hold their own in cold weather growing conditions, growers may opt to include a secondary heating systems instead of risking the loss of a sizable portion of their crops and income overnight. For a non-profit, there are many low cost solutions to ensure consistent heat. Hoop houses offer other economic benefits. They are typically classified as temporary agricultural structures for property assessment and taxation since they usually lack a concrete foundation or footing. Unlike traditional greenhouses, crops in high tunnels can be grown in the ground instead of hydroponically or in raised beds (which a hoop house is also capable of) and can be easily configured, or re-configured. Of course, this depends on soil quality.



<http://www.seedandcycle.com>, Rutgers Student Farm (2nd two photos by Kathe Newman)

The low cost makes it easier to buy or build multiple high tunnel systems. Next we explore hoop house models employed at small, medium, and large scales. In a subsequent section, we suggest how Elijah's Promise may implement these models in an example lot and climate considerations given the location in Central New Jersey.

Small Scale Hoop House Systems

The small scale hoop house model could be easily implemented in a backyard garden. Home gardeners can build a simple structure for less than 100 dollars. Backyard hoop houses can serve a variety of purposes beyond extending the family vegetable garden's growing season. During the spring, hoop houses create a temperate environment to germinate seeds. Later in the summer months, hoop houses can be used to propagate root cuttings. When temperatures drop, hoop houses can shelter outdoor porch plants (Boyette and Bilderbackm, 1990). With a backyard hoop house, even amateur gardeners can grow fresh vegetables and herbs for many months. Families could use their crops for everyday consumption and can, freeze, or otherwise preserve surplus for later use. Hoop houses allow for year-long access to healthy, fresh produce at a lower cost than produce purchased at the supermarket. After the initial investment in building the hoop house, a backyard gardener would only need to do periodic maintenance on the structure such as replacing the plastic cover every few years.

Low income families can get assistance to grow in this manner. They can buy seeds using food stamps. In a little known Amendment to the Food Stamp Act in 1973, Senator James Allen of Alabama proposed that the program "include seeds and plants for use in gardens to produce food for the personal consumption of the eligible household" (SNAP Gardens). While the initial investment is only meant for personal household consumption, there is no mention of using the resulting seeds from the produce to expand the agricultural process and even perhaps look into commercial uses. Organizations like SNAP Gardens have been working to better publicize this legislation as it provides an excellent opportunity for low income households to improve their food access and security at a significantly lower cost than buying the produce outright.

Urban Farm at the Battery

The Urban Farm at the Battery is a one-acre organic community farm located in Battery Park in Downtown Manhattan. The farm serves as an outdoor agricultural classroom for students from ten different schools, Kindergarten through high school. Students grow crops according to season. Springtime crops include lettuce, peas, carrots, beets, broccoli, collard greens, and kale ("Battery Park Farm", 2011). Since crops at the Urban Farm are grown directly in the soil, students performed soil testing and remediation before they could grow. The school cafeterias often use the produce in their school lunch programs (The Battery Conservancy, 2011). The Urban Farm offers plot space to community members, organizations, and local businesses that wish to grow their own produce. Surplus produce is sold at an on-site farm stand that operates twice weekly. Additionally, the Urban Farm grows food for two restaurants located in Battery Park (The Battery Conservancy, 2011).

Medium Scale Hoop House Systems

A medium scale hoop house would likely be the most suitable for a community garden or other such initiative. Several participating gardeners can grow different varieties of plants in their own "section" of the hoop house. Surplus crops can be preserved and organizations can teach gardeners how to preserve and store excess produce.

Alternatively, surplus crops can be sold in a partnering community farmers' market. Participating gardeners could also donate surplus crops directly to the soup kitchen and food banks (Cogger et al., 2009).

The ability to grow crops that are not native is an important element of hoop houses. This may be especially attractive to ethnic communities that want to grow culture-specific vegetables, herbs, and other plants. If there is a high enough demand, the surplus of these ethnic crops can be sold to local ethnic restaurants. There are plenty of examples of farms being used to help local restaurants, one of which that might parallel to Elijah's Promise is the FallowFields farm and restaurant in Oxfordshire, England. The founders of the business helped nurture two orchards that produce damsons, mulberries, walnut and crabs, gages, apples pears and plums (FallowFields, 2011). And while this facet of their organization does not quite work in an urban setting, the farm has over ten acres of land devoted to livestock like pig, cow, ducks, chickens, and even boar (FallowFields, 2011). What is encouraging about the FallowFields model is the sheer variety of their culinary offerings, and the vast majority of it is produced through their farm or from other local vendors, possibly providing a glimpse the future possibilities of urban agriculture models.

Earthworks Urban Farm

The Earthworks Urban Farm began in 1997 as a small garden at the Capuchin Soup Kitchen in Detroit, Michigan. The garden supplied some of the produce that was used in the food served at the soup kitchen. By 2001, the garden expanded into a two-acre urban farm, including a 1,300 square foot hoop house for seedlings. Nearly eighty percent of the fruits and vegetables grown on the farm, located in Detroit's Near East Side, are cooked into food served at the soup kitchen (Gabriel, 2009). The surplus is donated to a local food bank or sold at nearby produce markets (Capuchin Soup Kitchen, 2008). In 2001, Earthworks began a partnership with the Wayne County Department of Health. As a part of the department's Project FRESH program for WIC clients, Wayne County offers coupons for discounts on fresh, locally grown produce. However, many of the WIC client families did not own cars, and found it difficult to travel to farms to buy the discounted produce. Earthworks then began to hold traveling weekly produce markets at local health clinics, so those lacking transportation could purchase fresh crops (Capuchin Soup Kitchen, 2008). And in 2003, Earthworks forged a partnership with a local church to establish a youth program called "Growing Healthy Kids." This program, targeted at five to eleven year olds, focuses on nutrition and healthy eating habits for children, and hosts workshops on cooking and growing. For older children and teens, Earthworks holds a youth farm stand program. Participants in this program receive a stipend for their work, which includes tending the hoop house, harvesting and preparing vegetables for sale, and assistance in running various farm stands (Capuchin Soup Kitchen, 2008). Earthworks also holds programs in which patrons are able to can tomatoes, pickle beets, and make jams, that are farm stands. The farm also offers educational workshops that are focused on agriculture and gardening. Additionally, the farm has an apiary with over forty beehives, producing honey and beeswax hand balm that is also sold at the farm stands (Capuchin Soup Kitchen, 2008). In 2009, Earthworks Urban Farm was selected as number three of the top ten urban farms in America (Gabriel, 2009).

Garden State Urban Farms

Garden State Urban Farms (GSUF), formerly known as Brick City Urban Farms, is an urban agricultural initiative located in Newark, New Jersey. The project was founded by John Taylor, as well as Lorraine Gibbons, who has designed edible school gardens. The project was designed with the goal of improving access to fresh food in the

Newark area, through a method called Small Plot Intensive Farming, or SPIN farming. SPIN farming is characterized by commercial farming in small spaces (Hughes, 2009). GSUF is unique in that it utilizes “Earth Boxes”, which are portable containers, to grow crops. Much of the soil in the Newark area is contaminated, so the use of these containers to grow above ground eliminates the need for soil remediation and allows for growing on virtually any surface, including concrete. The Earth Boxes allow for GSUF to grow on property that has been temporarily leased, so the containers can be transported to a different location if necessary. Additionally, the farm can move if there is a change in development patterns, resulting in increased demand in a different area of Newark. Since the boxes can be placed anywhere, GSUF also grows on some rooftops of the numerous vacant warehouses in Newark (Taylor and Gibbons, 2009).

Earth Boxes are also versatile because they are sub-irrigated planters, or SIPs. SIPs are characterized by a water reservoir at the base of the planter, which allows water to soak up through capillary action as needed. In addition to reducing the risk of overwatering the plants, this allows for the crops to be watered less frequently, and does not require a complex water system (Garden State Urban Farms, 2011). The Newark project gets its water through a hose from the building of the Torchlight Academy School, located next to the vacant lot in which the initiative currently operates. In exchange for providing the water, Garden State Urban Farms provides educational opportunities for the Torchlight Academy students. The high school students are required to perform community service, and thus come to the lot to plant and harvest the crops, and then sell them at the initiative’s farmer’s market. By participating in the food distribution process from the beginning, the students learn where their food comes from, how it is grown, the length of time that is required for growth, and the amount of labor that is invested into the crops. GSUF also offers volunteer opportunities to residents of Integrity House, a drug and alcohol rehabilitation house located adjacent to the lot. The residents help with maintenance, planting, and harvesting. Some residents have even been hired upon graduation from the Integrity House. GSUF has developed partnerships with various restaurants that desire fresh, locally grown crops. Gramercy Tavern in Manhattan sends employees to the lot to help harvest the food (Taylor and Gibbons, 2009).

Large Scale Hoop House Systems

The largest sized hoop house could be used on a commercial farm. In this model, commercial farmers could raise a variety of crops, from flowers to produce, over an extended growing season which allows farmers to have an early supply of traditionally “seasonal” flowers or crops, thus gaining an early start over competing farmers. Hoop houses allow commercial farmers to have higher crop yields that are less susceptible to damage by natural elements. Also with a larger scale operation, expenses such as backup heat generators or insurance gain more financial benefit in the long run of the operation. Similar to the community garden, large-scale commercial farmers could grow ethnic crops for larger local restaurants and grocery stores, creating a niche market.

Big City Farms – Baltimore, MD

Big City Farms in Baltimore, MD uses hoop houses commercially. The farm is a private-funded venture that is looking to consolidate urban farmers and provide them with training and links to vendors to sell their produce (Shenot, 2010). The company is also looking to build a city wide network of farms within Baltimore to improve urban food security (Big City Farms, 2011). The company built six 148’x20’ hoop houses, representing approximately 17,760

sq. ft. of growing space (about two-fifths of an acre). The approximate cost to build each, including materials, was about \$10,000 and their use is solely to grow lettuce for sale and wholesale to vendors including food markets and local restaurants and eateries. There is no set pattern to how the lettuce is planted; growers at Big City Farms walk around the hoop house throwing seeds arbitrarily. They project that they will produce 120,000 dollars in revenue from the lettuce, a 200 percent return on investment from the 60,000 dollar building costs of the houses. While this does not include other costs like wages and distribution, that the construction costs were paid for twofold within one year suggests the viability of urban agriculture (Bevivino, 2011).

The Marquette Hoop House Pilot Project – Northern Michigan University

The Marquette Hoop House project was established in 2009 as a partnership between the Marquette Food Co-Op, Northern Michigan University, and Northern Initiatives, a non-profit community development organization. The hoop house was purchased by a greenhouse manufacturing company. It is 22 feet by 48 feet and is covered in clear poly carbonate and poly weave materials. The sides roll up and are further protected from animal intruders by chicken wire. The hoop house uses compost created from food waste from local businesses. In addition to plants, the hoop house has been used for a series of workshops, which included composting techniques, permaculture, and season extension (Cantway, 2010). As this hoop house was manufactured by a third party vendor, this plan does not outline the costs for construction, nor does it specify how much the finished greenhouse cost. However, it details the costs for maintenance in its second year. Annual maintenance was approximately 1,083 dollars, supplies for the interior structure (296 dollars), straw bales to surround the house in the winter (150 dollars), and soil amendments (120 dollars) were the top expenditures (Cantway, 2010). Interestingly, these costs might be mitigated by using the hoop house model Mr. Bevivino advocates in that the metal skeleton and plastic sheeting structure is meant to be long lasting. In addition, there are a variety of alternative heating measures, including thermal massing, that can offer the same level of heat stability at a fraction of the cost over the life of the hoop house. Using water as the thermal mass medium (in large part due to its relatively high specific heat to other materials) could theoretically produce enough BTUs to keep the hoop house at an optimal temperature for cool season crops even in winter (Capece, 2011). While the previous model in Michigan has to be tempered somewhat by the change in climate, the materials needed to grow the produce should be fairly static from location to location.

Looking at these figures suggests that the hoop house model can be profitable and appears to be a worthwhile venture. Local food, and the movement growing behind it, is a bold new direction in how consumers think about and buy their food. Because of the micro scale of most local food operations, it is especially important for local food growers to find cost effective solutions to extend their growing season and thus maximize their profit. Hoop houses are one such solution to accomplish this.

Beekeeping

Honeybees pollinate approximately one third of all agricultural crops in the United States making them an important component in the viability of urban agriculture. Unfortunately, due to disease and natural predators, wild bee colonies are not common, leaving humans to build and maintain colonies so that we may continue to enjoy a variety of food crops (NJDA, website). Whether in the backyard or on a roof, urban beekeeping has become increasingly

popular in the last few years as a part of the locavore movement and as a response to the widely publicized concern over colony collapse disorder. People breed honeybees for their delicious product, to make sure there will be colonies for future generations, and for the economic benefits. According to the New Jersey Department of Agriculture there are approximately 10,000 bee colonies in the state resulting in a honeybee industry of around 2.5 million dollars (NJ Dept of Agriculture, 2011). Many backyard beekeepers tend hives as a hobby, enjoying the honey and many of the rewards people experience from pets. Many of the newcomers to urban beekeeping are taking advantage of the profitability of locally produced honey in addition to the other benefits. While a full-time career from commercial beekeeping is probably not possible in urban areas due to limited space, city dwellers can easily maintain a few hives to supplement their income with honey.

Things to Consider

- What are your beekeeping objectives? Are the bees a hobby, are they pollinating your flower or vegetable garden, or is honey harvest your ultimate goal? One or all of these can be appropriate.
- Beekeeping training is important, if not crucial, to the colony's success. See the resources below for courses offered by Rutgers New Jersey Agriculture Experiment Station.
- Consider joining groups such as the Central Jersey Beekeeping Association, which can be a great way to get to know area beekeepers and share industry tips, especially for beginners.
- What is the best location for the hive? Is it easily accessed come honey harvest time? Does it have the proper amount of sunlight, ventilation and a nearby water source?

Additional Resources

Information

- [American Bee Journal](#) - One of the oldest bee publications with an archive and calendar with bee-related events
- [Bee Culture - The Magazine of American Beekeeping](#) - Current affairs in beekeeping, publications and links to people and other beekeeping resources
- [International Bee Research Association](#) - Publisher of bee-related research globally
- [State of New Jersey Department of Agriculture](#) - State specific information for beekeepers including the beekeeper registration form
- [Rutgers NJAES Beekeeping Classes](#) - Hands-on courses from local experts
- [DIY Backyard Beekeeping: A Guide for Beginners](#) - Great tips for beginning beekeepers
- [Beginning Beekeeping: Everything You Need to Know to Become a Beekeeper](#) - Tips on preparation, equipment, harvesting honey, and making money
- [Backyard Beekeeping Association](#) - Organization focused on hobbyists rather than commercial beekeepers

Organizations

- [New Jersey Beekeeping Association](#) - Forum for beekeepers in New Jersey
- [Central Jersey Beekeeping Association](#) - Local chapter of the state organization

- [Mid-Atlantic Apiculture Research and Extension Consortium](#) - Detailed information for beginner beekeepers and research publications
- [Bees Without Borders](#) - A non-profit organization that believes beekeeping can be a tool for economic empowerment and provides financial and technical assistance to individuals or groups in economically depressed areas.

Gleaning and Other Forms of Rescuing Food

Historically, farmers were encouraged to leave some produce in the fields for the poor and nomads (Hoisington et al., 2001). Today volunteers and nonprofit organizations glean or harvest what remains after a farmer is finished with the fields to avoid waste and increase access to fresh food for those who lack it. Produce can be donated to soup kitchens or given away at food pantries. The New Jersey Department of Agriculture's Gleaning Support Program provides competitive grants to gleaning organizations. Six emergency feeding efforts in New Jersey receive funds. Food Rescue is the term used to describe salvaging prepared foods from cafeterias, caterers, and bakeries. The United States Secretary of Agriculture, Dan Glickman, said that salvaging prepared food was more effective than gleaning from a field. "Anywhere from 10 to 20 percent of the food prepared in this country—in restaurants, cafeterias, and homes—is not eaten. A lot of that food could be served healthfully, but it requires a lot of grassroots management in terms of logistics...The big potential for gleaning is in prepared foods." ("More groups...", 1996). New Brunswick boasts many restaurants, company cafeterias, and catering businesses. Food Rescue might be a productive strategy in the city.

City Harvest

City Harvest is a major food rescue non-profit organization in New York City. Using a fleet of green trucks, cargo bikes, and volunteers on foot, City Harvest collects high-quality surplus food from restaurants, greenmarkets, wholesalers, grocers, farmers, and manufacturers, and redistributes it to a network of community food programs. These soup kitchens, food pantries, senior centers, daycares, shelters, and other agencies together help feed hundreds of thousands of New Yorkers each week. City Harvest strategically focuses their resources on low-income communities where affordable, healthy food is not readily accessible and where residents often suffer from high rates of diet-related diseases like diabetes and obesity. One of their projects is HarvestWorks. Fresh fruits and vegetables are secured directly from farmers and enhances the nutritional value of City Harvest's deliveries. Through HarvestWorks, they offer New York State growers incentives to harvest, pack, and deliver crops that might not be brought to market due to fluctuating prices and uncertain market demand. They also work with farmers at wholesale outlets and farmers markets within New York City to pick up produce that has not been sold at the day's end and would otherwise go to waste. (City Harvest, 2011).

ComLinks

ComLinks Community Action Partnership Cooperative Gleaning Program in Franklin County, NY operates a large scale gleaning project that rescues more than 1 million pounds of food each year from dozens of farms. Though they work with student volunteers, their outreach for gleaners includes groups of all ages and backgrounds, including churches, summer youth programs, department of corrections work crews, and community organizations. ComLinks has spent more than 15 years developing relationships with growers and building their distribution network, which allows them to pour hundreds of tons of food into the emergency food system each year (Hunger Action Network of New York, 2004).

The Gleaning Project in Washington

The “Gleaning Project,” a program of the Washington State University Cooperative Extension Expanded Food and Nutrition Education Program (EFNEP) in Pierce County, Washington, combines access to fresh produce with education and tools to prepare and preserve food. The “Gleaning Project” trains volunteers to harvest usable produce left after a “commercial pick.” The program provides training on food preservation, gardening, and nutrition. Farmers allowed volunteers to harvest their fields because they were supervised and professionally trained. Gleaners are allowed to pick as much produce as they need for themselves, with the remaining donated to local food banks (Hoisington et al, 2001). Gleaners took home approximately 25,000 pounds of fresh produce and donated about 85,000 pounds. They preserved about 48% (2,627 pounds) of what they took home and gave away about 43% (2,340 pounds). Most (83%) participants said that gleaning allowed them to use more fresh produce in their meals. Almost all (93%) of the participants preserved some of their produce for later use. Participants shared and received knowledge about cooking, gardening, nutrition, and food participation. All of the participants said that gleaning “helped them stretch their food budget, gave them a feeling of accomplishment, allowed them to bring home nutrition food for their family, and gave them a ‘good feeling’ about helping to provide food for the community” (Hoisington et al., 2001). Participants cited physical reasons, time constraints, and child care difficulties as barriers to gleaning.

Gleaning may improve food security. The workshops on food preservation, nutrition, and gardening provide knowledge and access to resources to improve diets. This educational component can be used to create job training, employment, and business opportunities that support the local food system. For example, one study participant created a “gleaner’s cookbook” to sell in her community. Another gleaner left to create her own farm. Gleaning projects like that EFNEP offers provides a unique opportunity to pair education with access (Hoisington et al, 2001).

Gleaning and Food Rescue in New Brunswick

Relying initially on trained volunteers, including local residents and university students, Elijah’s Promise could expand its already existing partnerships with area farmers. Adding transportation to the mix might expand the reach to the Rutgers training and research farms in addition to other private farms. Community groups in New Brunswick can expand their existing partnerships with Farmers Against Hunger who list gleaning as the third component of their organization. They organize 1,000 volunteers every year during harvest season. Another way to utilize this framework in New Brunswick is to seek out grocery stores and restaurants. Medoff Brothers is a wholesale and retail food source located on George Street that is willing to donate unsold food. Developing a formal partnership with Medoff could benefit many. Similarly, the George Street Co-Op is willing to donate unsold organic produce. For food that cannot be consumed, composting might be a potential solution producing compost for other urban agriculture projects in the city.

Available USDA Programs:

- “1-800-GLEAN-IT,” a toll-free hotline provides information about how to become a volunteer, donate food, or get involved in a local gleaning or food recovery program
- USDA’s Food Safety and Inspection Service worked with The Chef and The Child Foundation of the American Culinary Federation to create a training program on food safety for gleaned foods. “Understanding Prepared Foods”

(including a videotape and workbook) is available to State health departments, shelters, soup kitchens, and nonprofit feeding programs. It may be ordered from:

The Chef and the Child Foundation
American Culinary Federation
10 San Bartola Drive
St. Augustine, FL 32086
Phone: (904) 824-4468, Ext. 104

- Cooperative Extension System (CES) programs help agencies and community-based groups work together to establish local hunger programs, administer food recovery programs, and coordinate gleaning programs. The Rutgers CES may be able to provide education and training for recipients, staff, and volunteers working with food recovery such as food preparation and handling, nutrition, food preservation and safety, dietary guidance, and balanced menu planning. For more information contact:

Cooperative Extension of Middlesex County
Rutgers New Jersey Agricultural Experiment Station
42 Riva Avenue
North Brunswick, NJ 08902-4734
co.middlesex.nj.us/extensionservices

Composting

Compost is the biological material resulting from the decomposition of organic matter that can be used to help improve the chemical, physical and biological characteristics of soil as well as providing nutrients for plants (USCC, 2008). Most nitrogen or carbon based items could be composted such as table scraps, fruit/vegetable scraps, eggshells, garden plants, garden weeds, chicken manure, and coffee grounds, and tea bags. The process can be completed at home, at community gardens, at schools or other institutions, or, on a larger scale, compostable materials can be collected and taken to a central facility. Compost is essential to any garden because crops depend upon its nutrients for growth.

Composting offers benefits in addition to acting as soil fertilizer. Composting excess organic materials reduces waste in landfills while simultaneously producing nutrient-rich material for gardens, farms, landscaping and houseplants. Composting increases conservation and can divert up to 30% of household garbage waste by recycling kitchen and yard waste. Composting can be used as an alternative to chemical fertilizers. Compost can act as natural pest and disease control, reduce or eliminate the need for store-bought soil and synthetic fertilizers, promote higher crop yields, and remediate contaminated soils. In 2009, the United States generated 34 million tons of food waste and 33 million tons of yard trimmings, of which 2.5% or .85 million tons and 60% or 20 million tons were recovered for reuse respectively (EPA, 2010). Although the amount recovered has risen over the years, there is huge potential to recover more, especially food waste.

Elijah's Promise can start its own community composting program or help build compost pits at community gardens. The Lower East Side Ecology Center runs two community composting sites in New York City's Union Square and Lower Eastside neighborhoods. A rotating compost tumbler saves time but a compost pile will also work. There are many things to consider when thinking about a composting model:

- Where will compostable materials be collected?
- Will there be a need to work with municipal and private waste collection services to separate the materials or will materials be collected on the same site as the compost pile or bin?
- Where will the compost go?
- Who gets it?
- Will there be competition for the material or perhaps not enough interest for all of the soil produced?
- Who will be responsible for managing the compost? As compost requires regular maintenance, someone will need to make sure that compost is breaking down properly and attend to potential problems. If compost is not managed properly potential problems might include contamination of non-compostable materials, unpleasant odors and rodents or other pests.
- How will materials be transported before and after composting process?
- How will this be funded?

Compost also presents economic opportunities. Composting at a small scale, such as in home for a backyard garden, reduces the need to purchase soil, fertilizers and pest control substances. On a larger scale, there is potential for job creation at composting facilities and in transportation and distribution. If there is enough supply and demand,

there is also the potential to create revenue through the sale of compost. There is food scrap and excess food supply in a variety of local places such as institutions, restaurants, grocers, and farmers. Major producers of compostable materials in New Brunswick include Robert Wood Johnson University Hospital, Johnson and Johnson, public and private schools, Rutgers (dining halls and dorms), grocery stores, farmers markets (this could be a source of organic matter as well as a drop-off site for individual/home scrap collection, local restaurants, apartment complexes (best option will be those where there is already a successful recycling program), and Elijah's promise (A Better World Cafe, soup kitchen, culinary school and community gardens). And there are lots of existing gardening endeavors that could receive compost such as community gardens, backyard gardeners, and Rutgers farms (NJAES, Botanic Garden, Student Sustainable Farm). These farms might be potential sites for composting collected material. To support composting, the Food Alliance might prepare and distribute a "how to" guide for home composting, which could include how to use compost in a community, rooftop or backyard garden and where community members can take their food scraps if they don't compost themselves.

There are many potential composting partners such as RIPE (Rutgers Initiative for Permaculture Education), Rutgers Student Sustainable Farm, City of New Brunswick Public Works, Rutgers New Jersey Agricultural Experiment Station (NJAES), and the Rutgers NJAES Solid Waste Resource Renewal Group. The Food Alliance might approach the City of New Brunswick Public Works as a potential partner for transportation of compostable materials. As the Public Works department already picks up brush, leaves and Christmas trees throughout the year, the infrastructure already exists and can possibly be expanded to include food waste.

Additional Resources

- [EPA Composting Information Guide](#) - Guide to basic composting information, frequently asked questions, composting publications and pertinent laws and statutes
- [EPA Food Waste](#) - Everything you need to know about recycling food waste
- [EPA Guide to Commercial Food Composting](#) - Detailed large-scale composting guide for grocery stores, restaurants and institutions, including related publications and articles
- [US Composting Council](#) - The USCC is a national organization dedicated to developing and promoting composting as an economically and environmentally beneficial practice. The USCC has established composting standards and provides educational and training opportunities
- [BioCycle](#) - The only magazine dedicated to composting that has the most up-to-date composting articles
- [Rutgers: New Jersey Agricultural Experiment Station – Composting Fact Sheets & Bulletins](#) - Guides for composting food waste and yard clippings
- [Grow NYC Compost at the Greenmarket](#) - Example of a community composting initiative where compostable materials are collected at neighborhood farmers markets

Buying in the City

Bringing the food supply back home can have immense benefits such as helping to fund emergency food assistance in the short term and pulling residents out of poverty and food insecurity in the long term. Every time money changes hands within the community, the community's level of economic activity and overall income get a boost. "And spending money at a locally based business has a greater multiplier effect, the theory goes, because locally owned businesses are more likely to re-spend their dollars locally" (DeWeerd, 2009: 1). For instance, "If the population in and around Seattle bought 20 percent of their food dollars at local businesses, it would inject an extra billion dollars each year into the local economy" (Black, 2009). There are several approaches to boosting economic development in New Brunswick through food, and deciding who will buy one's locally-grown produce or processed food is no small part of the equation. Factors such as purchasing power, stability, and the level of direct benefits to community members with the greatest need affect the type and amount of produce to grow and process. Consumers can buy locally-grown produce directly or businesses can purchase the produce and sell it to customers within and outside of New Brunswick. There are a variety of food-related programs with different objectives. The optimum program addresses community economic development and food security but it is also possible to run multiple projects with some reaching more community economic development goals and others more food security goals.

Residents

New Brunswick is a small city with tremendous buying power. More than 55,000 residents, half of whom make less than 35,000 dollars a year, call the city home. About fourteen percent of that income is spent for food. Access to low cost, healthy food would greatly extend their buying dollars and get good food into homes, especially if models incorporate food stamps and other subsidy programs (ACS, 2009). Residents purchase food and also receive food through healthcare institutions, food banks, schools, emergency food providers, and soup kitchens. Thinking about how and where food gets to residents in the city suggests many potential markets for local food production.

Restaurants and Grocery Stores

New Brunswick is home to many restaurants, one medium grocery store, many smaller grocery stores and bodegas/corner stores and will soon house a 45,000 square foot grocery store downtown. All of these present opportunities to increase the pathway for produce from ground to community. We spoke with some chefs in New Brunswick to find out whether they currently buy food produced locally and what sort of produce they might be willing to buy in the future. We spoke with Chef J.R. at Catherine Lombardi who currently buys local and would be interested in buying in the future. This restaurant would buy heirloom tomatoes, micro-greens (micro basil, arugula, etc.) and baby root veggies (baby carrots, beets, etc.). Chef J.R. stressed the importance of being able to deliver the produce to chefs. That, along with pricing and quality, is one of the main factors which help determine from whom they buy.

Farm-to-Restaurant Example: Michael Baker, Baker Farms

About 12 years ago, Michael Baker started growing heirloom tomatoes for the owners of Stage Left restaurant. As their relationship progressed, Baker experimented with growing other types of produce the owners wanted. Eventually, the quantity and variety of produce increased and Baker expanded into large-scale production on his farm. What started as 30 tomato plants turned into 80 and Baker is now provides Stage Left and Catherine Lombardi restaurants with locally grown specialty products. Every season, Baker brings the restaurant owners his produce catalogs. After noting the previous year's successes and failures, they select climate-appropriate vegetables they can't get elsewhere. From beet and carrot varieties to fruit like plums and colored watermelon, Baker enables the owners to experiment with different produce types. Some growing experiments are successful, like the long Asian string beans added this year, and some need more tinkering before making the menu, like orange watermelons. Fruit was more recently introduced into the partnership as fruit trees take longer to produce than vegetables. Ripe fruit is served fresh while extras are canned and preserved as jams for use throughout the year; excess tomatoes are canned at season's end and used for sauces. Lavender Ice Cream is one example of the restaurant extending its bounty beyond the growing season.

While Baker Farms is their only single-person, non-commercial farm partnership, Stage Left has several partnerships with other local providers like Griggstown, for poultry, and Dryer Farms. Stage Left often features ingredients sourced from several local farms with menu items like "Griggstown Quail" and "Truffled Bakers Farm Plum Barbeque Sauce." During the summer, Stage Left recognizes partnering farms with themed dinners that highlight new ingredients, such as an all-tomato menu, serving tomato soup, tuna with tomato plates, and tomato pie. Baker Farms also hosts an annual farm-to-table dinner, where Baker talks about the farm and a chef creates dishes with seasonal, farm-fresh ingredients. Baker mostly recommends growing produce targeted to gourmet market tastes. The high-end market prefers unusual, local produce that can be picked and consumed at peak ripeness. Baker suggests string beans, white watermelon, and haricots verts. Fresh peas are also in high demand but have a short season and must be picked at a specific time. He also notes that extending the growing season increases quantity and produce value as high demand items fetch premium prices when they are otherwise out of season.

The profit potential of urban agriculture is complicated by production costs and competing good produced in other regions. Baker feels the profit potential lies in gourmet markets and notes that good equipment and labor are crucial. Quality of produce and production methods are primary criteria: restaurants are businesses that sell food to customers, so they must trust that the farmer doesn't use dangerous or unethical techniques. The farmer and restaurant must develop a strong relationship that may require frequent farm visits. For example, while Baker Farms uses organic methods, organic certification is too costly for such a small operation. But, having visited Baker Farms, the owners and chefs trust Baker's methods and are confident in his produce quality. Baker suggests, however, that a farmer's market stand might be more economically viable than selling to restaurants, while also giving the farmer direct contact with the community, including families and children.

Eds and Meds

Rutgers, New Brunswick, Dining Services, including College Avenue, Cook, Douglass, Busch, and Livingston Campuses, serve 128,000 - 130,000 meals per week. Lisa Tenore is the Senior Buyer who purchases the food and beverages for these dining halls and all other food-services establishments in Rutgers New Brunswick, Camden, and Newark. Lisa is also the leader of a Menu Committee that meets periodically, with Head-Chef Julian, to create meals that are healthy, tasty and in season. A chef by trade, Lisa strongly believes in serving fresh, quality produce and Rutgers Dining fully supports efforts to grow locally for health and environmental benefits. Rutgers obtains some of its meat from Southern New Jersey. Most of the produce at Rutgers Dining is seasonal, and USDA guidelines inform decisions about the suitability of particular fruits and vegetables throughout the year. Rutgers Dining works with Jersey Fresh to purchase frozen vegetables; however, Lisa prefers to use fresh vegetables wherever possible (Tenore, 2011).

Rutgers has the buying power to get what it wants, when it wants it. Rutgers Dining works with over 100 purveyors to hedge risk and maintain competition. Yet, the different needs among the various venues at Rutgers University necessitate different buying patterns. Rutgers Dining participates in Fair Trade purchasing, where produce is bought directly from farmers. Purchasing standards at Rutgers Dining are very high and the approval process is long (Tenore, 2011). Local restaurants often buy from the same purveyors; the proprietor of Old Man Rafferty's consults with Rutgers University about food purchasing decisions. It might possible to organize one distribution network for local food and sell to multiple entities in the city. The university compresses leftover food and freezes it in 55-gallon drums. The food goes to a farmer and is used as pig feed. Single Stream Recycling is implemented throughout the university. And Rutgers Dining occasionally hires workers trained by Elijah's Promise.

The buyers suggest that identifying a niche market might be an effective strategy. For instance, there is a demand for edible flowers among the high-end restaurants in New Brunswick (e.g., Panico's, Frog and Peach), and they could also be useful for some catering events at Rutgers. Another strategy might focus on simple products that are easy to grow such as basil, herbs, tomatoes, and zucchini which are the widely used and low risk, and kale is a great option for the winter season. Rutgers will pay fair market price for all purchases and all products will have to be cleared. Processed items undergo a longer clearance process that includes sanitation approval (Tenore, 2011).

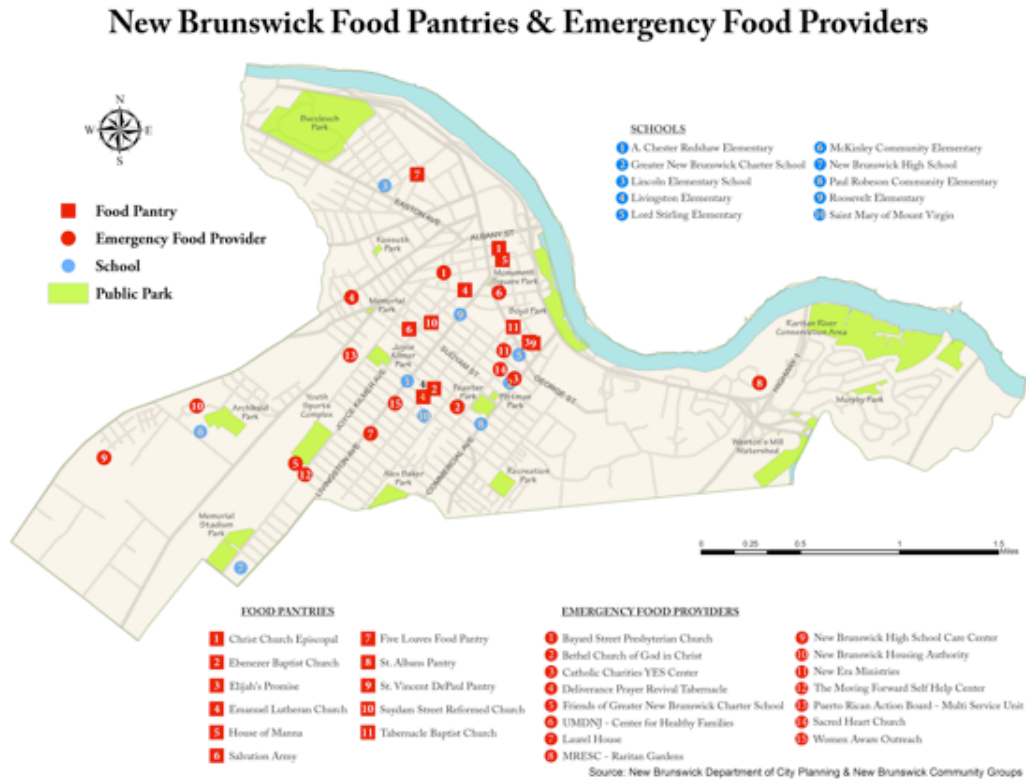
Robert Wood Johnson, UMDNJ, and St. Peter's Hospital also provide thousands of meals each week. They can facilitate a local economic development strategy based on food by purchasing locally. For instance, hospital programs can serve locally-grown produce to patients, which would benefit the local growers and help patients to heal through fresh foods. For example, Michigan's St. Joseph Mercy Health System has a 4-acre farm with two hoop houses for year-round production. Produce is sold on site at a farmer's market and to the hospital cafeteria (Healthy Food as Economic Development, 2011).

Elijah's Promise

Elijah's Promise has tremendous buying power through its soup kitchen, culinary school, catering operation, "Fresh is Best" program and A Better World Café. Catering serves about 400 meals per day and the soup kitchen between 200 and 250 (Fairbanks, 2011). Norna Fairbanks, the Food Purchasing Agent for Elijah's Promise, with the exception of the café, has expressed interest in the potential for local buying. Some of the top produce items that she

needs, and would buy locally, include romaine lettuce, carrots, celery, tomatoes and garlic, and fruit. A Better World Café has high demand for kale, cabbage and lettuce. There is also interest in buying locally-produced processed foods such as salsa and relish for the Elijah’s Promise entities other than the soup kitchen. And there are eleven food pantries in the city and fifteen emergency food providers (see map 5). Many can distribute fresh or lightly processed fresh food to consumers (Interview with Fairbanks).

Map 5. New Brunswick Food Pantries and Emergency Food Providers



Public Schools

The New Jersey Farm to School Network seeks to improve school food, promote locally grown produce, and educate students through school gardens. By connecting schools to local farms, the NJ Farm to School Networks improves student nutrition, provides health and education opportunities, and supports local farming efforts. Elijah’s Promise is part of this network and there are opportunities to expand to Farm to College Networks (Farm to School, 2011). The New Brunswick High Schools includes a culinary arts training program with a commercial kitchen. While getting fresh food into schools is, in many ways, challenging, that shouldn’t stop these efforts.

Growing New Brunswick's Food Hub

Locally-Supported Agriculture (LSA)

Community supported agriculture (CSA) links consumers and farmers to share the risks and rewards of farming. "Community" often means individual residents but can include community groups and businesses such as restaurants, soup kitchens and hospitals. A typical CSA share provides enough produce to meet a small family's needs. Though sometimes costly, many CSAs offer organic produce at below-supermarket-prices. Moreover, in good seasons, members may receive abundant produce which they can process and/or freeze for later use. A weekly share usually contains a set produce amount delivered to or picked-up by each member. HoneyBrook Farm in Pennington, NJ offers share pick up on their farm and delivers boxed shares throughout Central and Southern New Jersey. The Rutgers Farm Market on Ryder's Lane includes some innovative CSA models, like Chickadee Farms, where members pay up front and purchase against that account during the growing season. A larger, up-front commitment results in better discounts for market purchases. Distribution of CSA shares takes many forms. Members pick up their share at a community center, where they weigh and/or count share elements; members pick their share from fields, reducing farm labor but introducing legal issues; and some members participate in all stages of planting, growing, harvesting and logistics. Some cooperative models integrate sweat equity through food processing, such as pickling, canning, and dehydrating. CSAs usually focus on produce and may also provide meat, dairy, bread, honey, cheese and wine, through their own farms or in partnership with other local producers. For example, Griggstown CSA initially offered its own produce and complimented it with dairy and bread from other local producers². Elijah's Promise runs Raisin' Dough, a bread CSA that also raises money for the organization. Each week members receive a loaf of bread, a desert, and a surprise. Melick's Farm runs a fruit based CSA.³ CSAs could also include beekeeping and or chicken coops for eggs.



Chickadee Creek Farm (photo credit: Kathe Newman)

²Griggstown Farm. 2011. <http://www.griggstownquailfarm.com/csa/what-is-csa/>

³<http://www.melickstownfarm.com/melicks-farm-market-csa.htm>

In most CSAs, members pay a set price before the growing season begins. The farmer uses the money to purchase seeds, machinery, and other farming needs. This guarantees income for the farmer. CSA members share the farmer's risk by receiving more produce in a good season and less in a bad one. The CSA's upfront cost, however, may challenge people who lack the ability to pay upfront. A hybrid model can make membership affordable through varied income streams from businesses and individual members. Large businesses could offset the cost of subsidized or free memberships for non-profits and qualified members. Alternatively, businesses can pay their shares before the season so the farmer can get up and running. In turn, businesses receive the benefits of fresh produce and positive publicity. A CSA model might include a variety of members with different share types. For example, Rutgers University might buy shares, Elijah's Promise purchases a different number, while local residents pay as they go. Together, all members form sufficient demand to offset the farmer's risk. Local produce can be complemented with goods from nearby farms expanding the benefits and the New Brunswick entity may increase jobs as a central distributor.

CSAs provide a guaranteed market for farmers and ensure start-up capital. Farmers are closer to their buyers, and the shareholder-farmer relationship is known to be tighter-knit, in that the farmer feels more responsible for producing quality food. Meanwhile, members know where their food comes from, are closer to the source, often have the opportunity to learn how it is produced, try new foods and can potentially influence the demand for what is grown. Farms that include the option to pick produce provide members with opportunities to meet one another and build relationships. And members with children can get closer to their food, learn how things grow, get exercise, and enjoy being outside with bugs and birds. Farmers may use the CSA as a marketing tool for the farm, since for many, CSAs are only one part of their business. Griggstown, for example, is a poultry farm. By adding on a CSA, they increase traffic to the farm for the once-a-week pick up.

Buying from a CSA is often less expensive than purchasing produce in a store and the food is often picked that day. CSAs often grow different varieties including heirlooms and things that spoil quickly. Finally, CSAs create a potential longer-term commitment to the farm on the part of the community, ensuring the continuation and success of the farmer. CSAs could employ a variety of production methods including hoop houses/high tunnels, in ground growing and terracing. The types of things produced in NJ are fairly broad. Honeybrook Farms offers produce from late May through early November and posts its production guide showing the breadth of food and the growing season.⁴ The Rutgers Student-run Farm, a CSA, offers varying picks depending on season and yield. On September 16th share members received 4 tomatoes, 4 bell peppers, 1 bundle of beans, 1 fry pepper, 3 jalapenos and 2 eggplants.⁵

Many CSAs start small and do a trial year to perfect their business model. CSAs can begin with a small number of shareholders, even fewer than a dozen, and expand to many more; some shareholders (i.e. businesses, restaurants) can hold multiple shares. After a trial year, this model can be expanded. They may even extend production into the fall as yield increases and include nearly year-round shares, some seasons going bi-weekly, if necessary (mostly for hoop house models, or areas with proven yields of winter crops). The CSA can start small, with potentially 1-3 part-time workers, and it can grow to include a network of several plots employing more individuals. As the CSA grows, it can work with outside producers, sourcing products it cannot or does not have (i.e. baked goods, eggs, honey, specialty produce, processed goods, etc.) to diversify offerings and draw more shareholders. This can be

⁴ <http://honeybrookorganicfarm.com/this-week/harvest-calendar/>

⁵ Visit to Student Sustainable Farm at Rutgers, September 16, 2011.

an opportunity to create community partnerships for smaller farms/gardens or small businesses looking for an entry into the local market, even as a test-run/soft-opening. In turn, this creates an alternative job market, for entrepreneurs in the food production/processing industry, as well as other farmers and gardeners. If this relationship is strong enough, it can also grow to become a self-sustaining network of local businesses built around food quality and access.

There are many innovative CSAs and local producers in New Jersey but most lack a distribution infrastructure to local cities. Some take their goods into New York City to the Union Square Green Market. And while the RU Farm Market on Ryder's Lane has improved access to local residents, there is still a disconnect between many farms and many NJ urban communities. One solution might be a CSA structure that brings in goods from other farmers. Some things might be produced in the city but the job of an urban CSA might also be to distribute food from rural farmers who agree to participate.

A CSA addresses quality food access, availability, and affordability, for residents and local businesses. Within a varied-role membership model, shareholders can be involved from simply picking up their share of weekly produce, to helping harvest and maintaining the farm. If they work on the farm enough, they can proportionally subsidize the cost of their share according to the amount of time and type of work they offer. This creates food security in the sense that people can have ownership over their food and processes and understand how it is grown, and they can also have regular access to fresh, quality produce which, for certain CSA models, is affordable.

We're suggesting a model called local supported agriculture which is a network of CSA-small business/restaurants that is self-sustaining, equitable and community-oriented. Community members can become further involved and increase their ownership, and thus access to opportunities, such as economic development, community involvement and agriculture. Such a model can be replicated from neighborhood to neighborhood, in turn lessening the strain of one CSA to provide for too many families or businesses, while simultaneously increasing access to all who are interested, as many CSAs are currently in such high demand that they are wait-listed. There is also the potential for CSAs, once in abundance, to become themed, or focus on certain types of crops, during certain seasons and develop a model which may be more beneficial to certain residents or businesses, in a way responding to a community-cated need for a specialty market.

According to farming expert and owner of Terhune Orchards, Pam Mount, the Garden State does not suffer from lack of fresh fruits and vegetables. The real problem is distribution. Even though a lot of food is successfully grown all over the state, it is inaccessible for many residents of urban communities. The challenge is to improve connections between farmers and food outlets such as bodegas, supermarkets, and soup kitchens. A distribution business could help fill this gap. A small business with an eco-friendly distribution vehicle could connect farmers around the region and within the city to food outlets. This distribution network would provide a user-friendly interface for farmers to connect with businesses, and it would provide the distribution service, via refrigerated truck, from farm to organization. It could be run as a for-profit business or as a nonprofit. Possible distribution models include a distribution network could provide soup kitchens with food farmers might otherwise throw away and a distribution network that could link farmers growing local NJ produce to bodegas, supermarkets, restaurants, fresh food carts, nonprofits or other local businesses in underserved neighborhoods. The benefits of such a connection center, nonprofit or business would be increased food security, increased access to locally grown produce, jobs, and the improvement of existing local businesses by providing them with access to high quality fresh produce.

Additional Resources

Farm Share Program

The Northeast Organic Farming Association of Vermont established a Farm Share Program in 1994 that subsidizes the membership cost for low-income families participating in Community Supported Agriculture. The program supports upwards of 1,400 individuals each year.⁶ As a simultaneous response to food insecurity in low-income families and farmers seeking local buyers in Vermont, the program addresses affordability as well as accessibility to fresh quality food. Through the economic viability of the concept, Farm Share helps combat food insecurity by increasing access to fresh produce, while securing a steady and growing client base for local farmers, enabling them to offset costs, grow their businesses and connect with their communities. Its success has given rise to CSAs in underserved areas statewide.

Food Stamp-CSAs

Uprising Organics, a small diversified farm in Washington state, started its Food Stamp CSA accepting only Food Stamps. The CSA is only 10% of their sales; the rest come from seeds, farmers' market, restaurants, and a local food co-op. Although seemingly complex to involve Food Stamps, the process is not quite so daunting when broken down. Since Food Stamps cannot be paid in advance for goods people receive at a later point in time and CSAs are run by the money that is paid upfront for an entire season, Uprising Organics used seed money and donations from their local farmers, community organizations and residents to create a fund. Each week, as the subscribers pay, the fund is replenished, and can be used in following years. Due to the regulations placed on Food Stamps, the farm must pass USDA and the state Department of Social and Health Services (DSHS) checks. Since the Food Stamps Program is run by the Electronic Benefits Transfer (EBT) (a type of debit card system) instead of the paper stamps, the farm needs to be set up to use it, and can do so by applying as a "farm stand" that operates once a week for a few hours, when members pick up their shares. JP Morgan, the bank that handles the EBT transactions, will provide a card-swiping machine as long as the CSA is USDA-approved, only accepts EBT (not debit or credit), and runs at least \$100 in EBT transactions per month. Since its CSA is seasonal, Uprising Organics applied as a "seasonal farmer stand" which meant that their account would be dormant when not in use, and also came with the flexibility of being able to notify the bank if they needed to begin sooner or end later, while keeping the service gratis during the season. It is possible to accept Food Stamps without the EBT machine, using the voucher system where the customer discloses their EBT account number and the payment amount and the farmer calls their bank on the spot, requesting the transaction, and, if approved, the farmer submits the voucher to the bank at a later date. In terms of the risk associated with the system, since CSAs are run on a weekly basis, where the farmer likely knows the members, it is much less likely for any fraud to occur. CSAs also have the option of billing Food Stamp subscribers up to two weeks in advance.

⁶Northeast Organic Farming Association of Vermont. "Farm Share." November 24, 2011. <http://nofavt.org/programs/farm-share>

Just Food

Just Food, a non-profit in New York City, works to improve “food access and security by increasing the production, marketing and distribution of fresh food.” They hold seasonal workshops on how to start and organize a CSA, breaching such topics as “Accepting SNAP (Food Stamps) at your CSA” and “Outreach to Low Income Community Members,” encouraging CSAs to diversify their payment options to attract all income level subscribers.⁷

Growing Power

Growing Power, Inc. provides workshops and on-site demonstrations, for a fee, to train farmers and communities. They promote youth education, maintain a volunteer base, do outreach to local and national farmers, and advocate for agriculture policy issues. They formed the Rainbow Farmer’s Cooperative, which sells products from more than 300 small family farmers to residents, restaurants and businesses, and to the Farm-to-City Market Basket Program, a year-round food security program. Formed in 1993 by Growing Power, the Rainbow Farmer’s Cooperative was created to support and provide technical assistance and education for small-scale farmers to address the growing number of small farms shutting down due to high operation costs. The RFC helps farmers by pooling their resources (staff, transportation, access to farmers’ markets, etc.) to get their products to market, while putting cash directly in their products to invest back into their farms. The buyers include farmers’ markets, direct to restaurants, and the Growing Power’s Farm-to-City Market Basket Program. The farmer members benefit from workshops, guidance with technical aspects of growing, assistance with grant writing, marketing skills training. “The market basket program is a cross between a mobile grocery store and a community supported agriculture (CSA) program. The produce comes from local farms and from small-scale wholesalers, offering us the freshest produce from their shelves. We believe this is the best way to create sustainable change, as well as jobs, in our communities.”⁸The program does weekly deliveries of healthy and affordable produce to neighborhoods throughout Milwaukee, Madison and Chicago. Most of the produce during spring, summer and fall comes from their Rainbow Farmer’s Cooperative of small, family farmers, and others come from their network local, larger-scale farms. During the winter, they draw from their greenhouses at select farms, the Southern farmers in the Cooperative, and smaller, local wholesalers who keep fresh fruits and vegetables during the off-season available and affordable year-round, while providing jobs locally.

Resources

Local Harvest about CSA - <http://www.localharvest.org/csa/>

Rutgers Student CSA- <http://aesop.rutgers.edu/~studentfarm/>

UCSC CSA - <http://casfs.ucsc.edu/community-outreach/produce-sales/community-supported-agriculture>

Griggstown CSA- <http://www.griggstownquailfarm.com/csa/what-is-csa/>

Honey Brook Organic Farm- <http://honeybrookorganicfarm.com/>

⁷Just Food. “CSA in NYC.” November 24, 2011. <http://justfood.org/csa/csa-workshops>

⁸Growing Power, Inc. “Market Basket Program.” November 11, 2011. http://growingpower.org/market_baskets.htm

Community One-Stop-Shop Garden Resources Center

A “one-stop-shop” for local residents can provide resources, a mini-library, equipment, tools, soil testing and remediation, seeds, and other information to garden safely, effectively, and efficiently. Residents may need help testing soils, accessing seeds, learning growing techniques, accessing and using equipment properly, water use and preservation, energy use, composting, diagnosing problems, and using or preserving what they have grown. It could be used as a networking center to build relationships and facilitate peer learning. The center could also act as a place where residents exchange extra produce. And it could be a center for community gardening education. EP could host workshops (e.g. beekeeping, permaculture, hoop houses, etc.) and provide information about certificate programs and other training opportunities. These workshops and certificate courses can train community members to become proficient in a niche area of gardening or agriculture so that they will earn the opportunity to teach the courses as supplemental income or without charge to the local community. What may begin as a weekend consulting gig can turn into a career in gardening and teaching. Shared community learning sessions where residents teach one another will provide an opportunity to socialize, bond and cooperatively learn. Whether they are beginning or expert gardeners, they can come to these learning sessions to seek or impart advice on gardening issues, connect and socialize over shared experiences and learn about what else the one-stop center has to offer. And the One Stop could provide a forum for potential collaborations between local businesses and restaurants and local gardeners/farmers to sell and buy. It could maintain lists of interested businesses and their needs, act as a liaison between community member and businesses, provide resources and advice on how to be a small business/market gardener, encourage local businesses to join, and provide a gardening shed with materials that can be borrowed/rented cheaply, especially some bigger machinery that residents would not be able to afford nor need due to small scale gardening.

Additional Resources

- Resources on how to obtain grants and funding for community, rooftop, etc. gardens. The *Financing Food Hubs* webinar provides a comprehensive listing of funding sources that include private sector grants and federal lending programs for food system actors such as small farms, CSAs and distributors.⁹
- Rutgers New Jersey Agricultural Experiment Station (NJAES) Cooperative Extension county offices in every county in the state. <http://njaes.rutgers.edu/soiltestinglab/howto.asp>
- Rutgers Soil Testing Laboratory, Rutgers, The State University of New Jersey
57 US Highway 1, New Brunswick, NJ 08901-8554, 848-932-9295 soiltest@njaes.rutgers.edu Monday – Friday
7:30 a.m. - 5 p.m.

⁹“Financing Food Hubs.” Video blog post. *National Good Food Network*. Web. 20 Oct. 2011.

<<http://ngfn.org/resources/ngfn-cluster-calls/financing-food-hubs/Financing%20Food%20Hubs.pdf>>.

High Tunnel Production System

Elijah's Promise has fostered successful catering, soup kitchen, and café business models. Increasing the amount of food that the organization grows can be a fruitful way to help increase its resources while creating community economic development benefits.¹⁰ Across the street from Elijah's Promise's community garden, there is a vacant lot at 15 Nielsen Street. The lot is 110' by 150' with 16,500 square feet of space. Figure 2 is a Google SketchUp rendering is what the lot could look like if developed to full capacity with ten, eighteen-by-forty foot hoop houses. The lot can comfortably contain ten hoop houses, each with 720 square feet, totaling in 7,200 square feet of available space. This is less than half of the space available to build on and leaves plenty of room for a tool shed to store materials. The cost per square foot to build a twenty by forty-eight foot hoop house (960 square feet) is between 2,000 and 2,500 dollars, resulting in a cost of 2.08-2.60 dollars per square foot (Bevivino, 2011). Extrapolating to the model presented in Figure 2 would result in a total cost of between 14,976 and 18,720 dollars for the ten hoop houses. This figure only covers the cost of the materials to build the hoop house and does not take into account the cost of soil or labor. Elijah's Promise and partners could recruit ten to twenty volunteers to build the hoop houses. In addition the lot is currently covered in rock hardscape that would need to be removed and the soil might not be suitable for agricultural production because of compacted soil and possible contamination.

Figure 2. Example of a High Tunnel Production System on a Vacant Lot



¹⁰ To think through what a production system might look like, we use the example of an empty lot downtown. The lot is privately owned. We use it here to think about the potential for urban agriculture to get a sense of how, where, and what groups might grow, how much they might produce, and what they might do with it. The example is meant to inform thinking about this in other places with vacant land and space to grow.

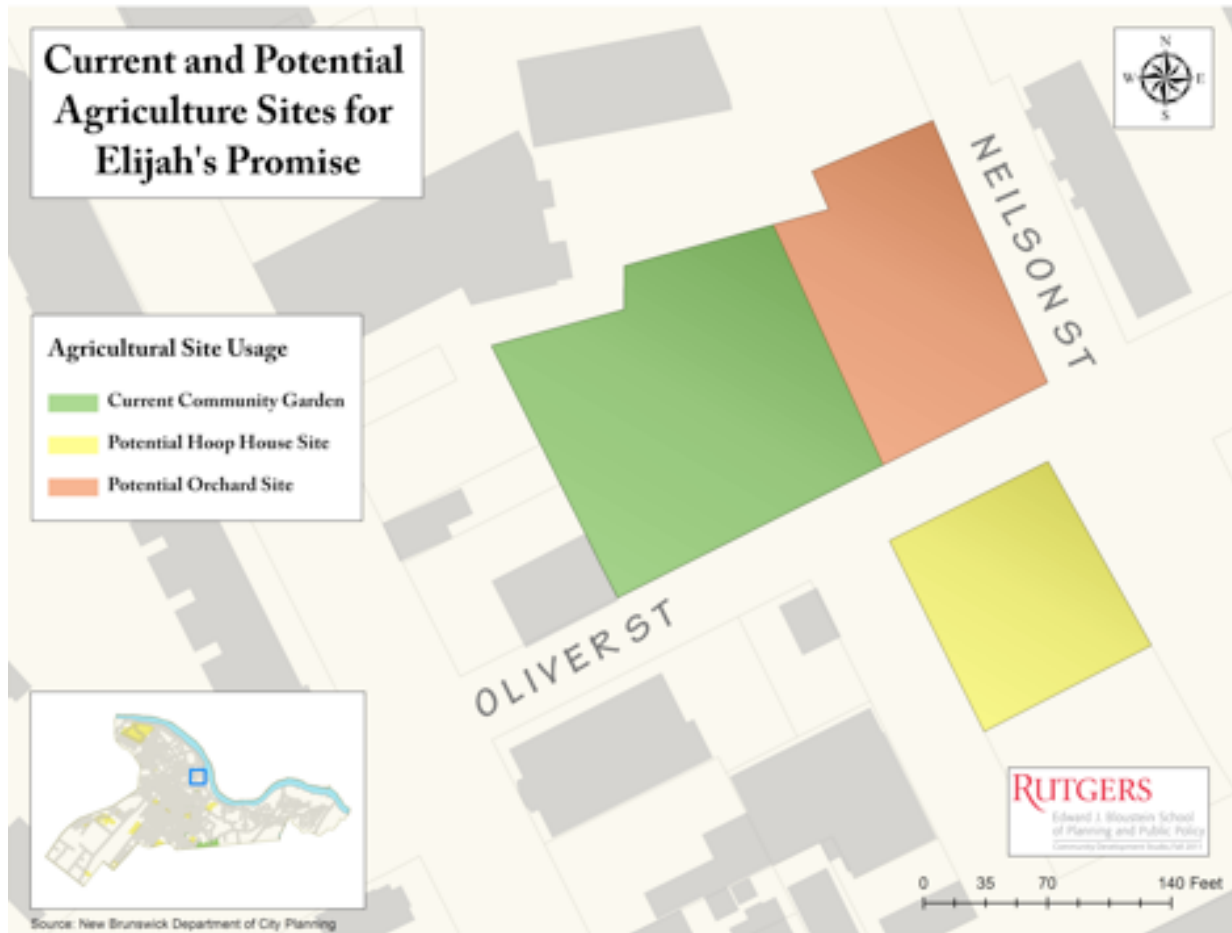
The biggest sources of lead contamination are from lead paint particles that chip and drift off from buildings, industrial intensive areas, and particulate matter left in roadways from when gas was still leaded pre-1995 (Environmental Protection Agency, 2011). Wind patterns and storm water runoff reinforce the need for multiple spot testing but testing the soil in multiple locations is expensive. Heavy metal soil tests cost twenty dollars per sample at the Rutgers University Soil Testing Lab; however the soil services are only set up for agriculture, lawn, garden, and turf grass; not urban gardening (Bakcas, 2011). Each test is specifically calibrated for each soil use with a predetermined range of contaminants and urban gardening is a hybrid of a multiple set ups that hinders accuracy when running the analysis. There are other private soil testing lab options; however the cost increases and, when considering the amount of samples needed, this option is less attractive. Fortunately, it might be possible to create a partnership through Rutgers University that will allow soil testing with a handheld X-ray florescence detector that is made to perform tests for heavy metal contamination for soils and has previously been used to test proposed urban agriculture sites in New York City (Rabin, November 22, 2011).¹¹ If the soil is contaminated or otherwise unsuitable for growing, there are methods to mitigate the soil problem as an impervious surface, such as black sheet plastic, can be laid down at the base of the hoop house with appropriate soil laid on top. The majority of plants used in the short term agricultural system that would be implemented in these hoop houses have root systems that do not go far down vertically in the soil, meaning that about four to six inches of top soil would be needed.

The other factor to consider is that the figures cited by Mr. Bevivino of Seed and Cycle are only for the construction of hoop houses were for only one. As the volume of the materials to be purchased increases, the cost of each goes down. Exact figures would be hard to quantify without a set plan, but it is possible that the cost for the model cited above would be lower (Bevivino, 2011). With so much land available, there are a variety of models at different scales that the organization may consider which are highlighted in the following sections. Combined with the possibility or nurturing an orchard, Elijah's Promise has the potential to drastically transform what were underutilized urban lots into an agricultural center within New Brunswick (see map 6).

A team of researchers at the University of Michigan estimated how much a hoop house production system would cost and how much it would produce. The scenario included two hoop houses totaling 5,600 sq. ft. of growing space (or the equivalent of about six 48'x20' hoop houses). The study concluded that the farmer sold 12,810 dollars worth of cold season crops in addition to 9,185 dollars worth of warm season crops assuming one warm season and one and a half a cool season each year. Naturally, it can't be assumed that all the crops would be sold, but even the seventy percent revenue figures of 8,967 dollars and 6,430 dollars for cold and warm season crops respectively (Conner, 2010) is substantial. This is more promising considering that 5,600 sq. ft. represents only a little over two-thirds the available area in the example shown in Figure 5. In addition, Michigan is colder than NJ so production levels in NJ might be higher. Another factor to consider is that mostly salad greens and vegetables were grown in this hoop house model; spices and seedling models could produce a greater return.

¹¹ Thus far, there has been one soil sample taken which showed an eleven to one calcium (Ca) to magnesium (Mg) ratio, ideally the ratio should be four-five to one. This is not atypical in vacant lots as that type of ratio may suggest the presence of recycled pulverized concrete. Compacted soil presents a problem to agriculture in that there is very little open space within the soil that would allow for air and water permeation, root growth, and soil dwelling organisms like worms (Rabin, November 18, 2011).

Map 6. Hypothetical Sites for Agriculture¹²



¹² These sites are currently privately owned and are only meant as an illustration of what an urban agriculture project could look like downtown.

Urban Agriculture - AmeriCorps Partnership

The community's ability to produce resources to run the initiative and volunteers to work with the initiative are integral to the long term success of the urban agriculture project. In dealing specifically with hoop houses and other projects that are labor intensive, a steady flow of trained personnel is necessary. This can be achieved with hired labor such as paid student-farmers, professional farmers or volunteers who would work as a service requirement through community based programs. AmeriCorps, a national community service organization funded by federal and state governments, provides funding for volunteers and its use could be expanded in relation to the urban agriculture efforts. Elijah's Promise and the Food Alliance might act as hosts independently or in partnership with Rutgers. As a recipient of the grant, the partners would then be responsible for recruiting, selecting, and supervising AmeriCorps members. The grant application is a two step process that first deals with AmeriCorps and the state of New Jersey through the New Jersey Commission on National and Community Service. The Urban Agriculture program would be eligible to qualify under "Strategic Objective 2: Reducing Childhood Obesity and Increasing Access to Nutritious foods", which is categorized under AmeriCorps Healthy Futures Focus Area. The application for the grant closes January 18 of the preceding year and selected organizations are notified in May.

Value Added Production

Value added production can help to extend the growing season, use surplus produce, and create new products. It could help to achieve the two goals of increasing community food security while increasing community economic development opportunities. Individuals and organizations can add value by canning or otherwise preserving the summer harvest. At a larger scale, food grown in the city can be transformed into new products and businesses could emerge. The RU Food Innovation Center is a business incubator created to grow food-related businesses. It is located in South Jersey near farms. It won awards for business incubation before their production system was in place. They provide business plan assistance, marketing, label design, food labeling and much more. The center trains food production workers and provides a summer internship for youth. The Spring 2012 Rutgers Community Studio will conduct a community economic development impact study of the Food Innovation Center to fully understand how it works and relates to the community and then to consider how the lessons learned can be translated to New Brunswick. Some of the key components are already in place through Elijah's Promise, the Intersect Fund, City Planning, Rutgers, and Devco. Most of these partners met this Fall to talk about the potential for thinking about what a food production model in New Brunswick would look like. There is interest in these types of efforts nearby in New York City which ensures a growing support network.¹³



Rutgers Food Innovation Center (photo credit: Kathe Newman)

¹³ Learn more at: http://council.nyc.gov/html/action_center/food.shtml

Land Use Regulations and Urban Agriculture

Zoning is a primary mechanism by which governments regulate land use. In New Jersey, the governing bodies of municipalities are empowered to adopt and enforce zoning ordinances which, amongst other things, segregate land use types into distinct districts as well as the kinds of built structures which may occupy land within a zoning district (N.J.S.A. §§ 40:55D-62, 65). Further, zoning ordinances adopted by a municipality must be designed to effectuate the goals of that municipality's master plan, which is a comprehensive statement of principles and objectives for development in and of the municipality (§§ 40:55D-28, 62). A master plan which includes a statement of objectives regarding urban agriculture as it pertains to food security and economic development could go a long way toward implementing zoning policies which not only permit but, in fact, encourage appropriate agricultural activity within city bounds.

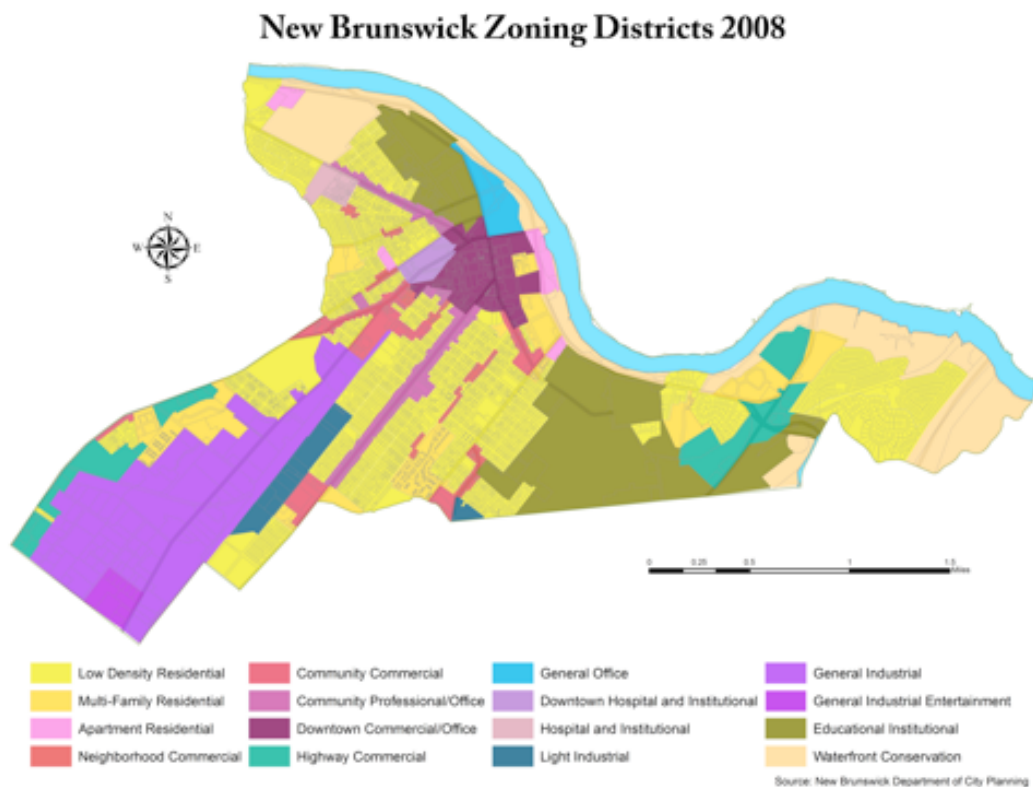
A survey of New Brunswick's Master Plan suggests that the current development plan does not address urban agriculture, food production as economic development, or food insecurity. The Master Plan's initial section, "Planning Issues, Vision and Planning Goals", is an overarching statement of the issues facing New Brunswick and a statement of the city's development goals. This section does not discuss: food security for New Brunswick residents; access to healthful, affordable produce; economic development through food and/or agricultural production; educational opportunities provided by local agriculture; or access to land for growth of plants for any purpose. Nine sections follow this section which elaborate on each element raised in the initial section. A search of all substantive portions of the Master Plan, including 10 different sections totaling 196 pages, yielded zero relevant hits for the following terms: i) "food" ; ii) "agriculture"; iii) "produce"; iv) "vegetable(s)"; or v) "garden" . Accordingly, the New Brunswick zoning code, which restricts land use to effectuate development goals expressed in the Master Plan, does not provide for agricultural and/or food production in a clear manner.

The New Brunswick Zoning Code designates seventeen types "Zoning Districts", each with distinct regulations dictating the types of buildings, structures, and uses permitted on the land parcels in that district. Further, as a general rule, only those uses "specifically identified as permitted [in a specified district] ... shall be permitted. All other uses are prohibited" (City of New Brunswick, Zoning Ordinance § 17.03.010(c)). As agricultural production is, for the most part, not contemplated as a land use in New Brunswick's Master Plan or zoning ordinances, agricultural production is not identified as a permitted use in any district except for two instances. First, "agricultural research" is one of the "Principal Permitted Uses" in the "Educational Institutional Zones" which include the College Avenue Campus District and the Cook/Douglas Campus areas (§17.04.040). Second, "fish farms and similar uses" is one of the "Principal Permitted Uses" in the "General Industrial District" (§17.04.040-F-). However, definitions for neither "agriculture" nor "farm" are provided to enable broader interpretations of those terms. The absence of any real consideration for agricultural land use in New Brunswick's Master Plan or zoning code places the permissibility and security of any such use on unsure ground.

The areas of New Brunswick in which the zoning code expressly allows for urban agriculture are extremely limited. As mentioned above, agricultural research is permitted on the Rutgers campuses and "fish farms" are permitted in the General Industrial District. Further, residences with private yards are permitted to have greenhouses and storage sheds as permitted accessory uses but are subject to height, bulk, and yard size restrictions. However, the

ability to cultivate a private residential yard for profit may be restricted. First, while “home occupation” is a permitted accessory use in most residential districts, the definition of “home occupation” requires that any such activity “be conducted in the resident’s dwelling” and prohibits any “display of goods” being visible from the street. Thus, the agricultural cultivation of a residential yard for profit may be prohibited as it does not occur inside the dwelling and vegetation in an exterior yard could be defined as visible goods. On the other hand, while none of the residential districts permit on-site sales, the “General Regulations” section of the zoning code allows for sidewalk or yard sales “upon approval of a permit for same by the appropriate City agency” (§ 17.03.200-A). Further, the zoning code also allows issuance of temporary permits, which last up to six months, for a non-permitted use that: i) promotes the general welfare of the City; ii) does not adversely affect surrounding properties; and iii) does not have a detrimental impact on the goals and principals of the Master Plan (§ 18.08.030-D). Temporary permits may allow some flexibility in obtaining approval for on-site sales where otherwise prohibited.

Map 7. New Brunswick Zoning Districts 2008



While no zoning ordinance defines “community garden” or identifies “community garden” as a permitted use in any district, the zoning code may be interpreted to permit community gardens as a conditional use in several districts. While none of the low-density residential districts (single-family to single- and two-family residential) permit any conditional uses except for town houses, the Multi-Family Residential District permits “Quasi-Public, Nonprofit Clubs and Organizations” as a conditional use so long as the “proposed use is ... operated solely for the recreation and enjoyment of the members of said organization” (§17.04.040.C-9). Thus, Elijah’s Promise may be permitted to operate a community garden in the Multi-Family Residential District as a conditional use, but the community garden probably cannot be open for sales or tours without a temporary permit or variance. Further, the non-profit conditional use may not be operated within 200 feet of a school, library, or place of worship, unless the use is associated or affiliated with the school, library, or place of worship. Several districts within the Commercial Zone also permit the operation of non-profit organization as a conditional use but without the criteria that the operation be confined to organization members. Thus, Elijah’s Promise may be permitted to operate a community garden in several districts of the Commercial Zone that is open to the general public. However, as the zoning code does not contemplate a community garden, itself, as a particular kind of use, the applicability of some of the requirements of the non-profit, conditional use in the Multi-Family Residential District and Commercial Zone is unclear, like the extent to which a community garden would be required to provide parking.

In the face of uncertainty regarding the permissibility of agricultural uses that are undefined by the zoning code, the cost of obtaining approvals for agricultural use of any parcel without penalty can be very high in terms of both time and money, especially when considering that a language barrier may exist between many residents of New Brunswick and its governmental institutions. The hurdles imposed by a zoning code that does not address agricultural production and which, by its own regulations, requires express permission for any type of land use, may be so high as to inhibit the development a food hub. Thus, in order to implement a food plan which provides broad based and affordable access to agricultural produce and production, the Master Plan and zoning ordinances of New Brunswick should be amended to expressly identify, define, and permit various types of area-appropriate agricultural activity.

Model Zoning Ordinances Enabling Urban Agriculture

As discussed above, generally, zoning regulates local land use by prohibiting uses that are not expressly permitted. As the benefits of local food systems have gained attention in the past few years, cities throughout the country have sought to foster local agricultural production by amending their zoning codes to permit and, at times, promote agricultural land use. Commonly recited policy goals motivating such amendments include: addressing food insecurity; providing entrepreneurial and employment opportunities through local food production; offering outdoor recreational opportunities; increasing nutritional and environmental education; and enhancing environmental sustainability. Most cities have amended their zoning codes by adding an agricultural use category which contains sub-types of use that are permitted or prohibited in pre-existing zoning districts. An agriculture use category may be divided into use sub-types such as community gardens, which are often broadly permitted across zoning

districts but limited to non-commercial use by community members, and commercial agriculture, or urban farms, which may be permitted in less zoning districts but allow more types of agricultural use. Another approach includes adopting an urban agriculture zoning overlay which can be applied to specified areas throughout the city and which operates in conjunction with the rules of the underlying district. Finally, while most dense cities generally do not have zoning districts designated primarily for agriculture, adopting an agricultural or garden district that can be applied to specified land parcels may be a powerful tool to preserve desirable agricultural uses from loss to development. The amended zoning codes of four cities which provide for urban agriculture using some or all of these methods are explored below.

Jersey City

On February 2, 2011, the Jersey City Planning Board adopted the “Re-examination Report of Jersey City’s Master Plan and Regulations” which recognized a “desire to integrate urban agriculture in the city’s land use map and zoning code” as a response to food deserts and economic inequality. Subsequently, the Jersey City Municipal Council amended its zoning code to enable agricultural land use. The preamble to the ordinance expressed, amongst other things, the following purposes for the amendment: i) addressing food insecurity, malnutrition, and lack of recreational open space; ii) generating income for residents through local food production; and iii) providing opportunities for environmental education and revitalization (Municipal Council of Jersey City Ordinance # 11-041, 2011).

The ordinance added an “Agriculture” use category with three sub-types of use: community gardens; commercial farms; and rooftop gardens and raised planters. A community garden is defined as land that is held “publicly or privately and is used collectively for the cultivation and harvesting” of plants which “can be done in outdoor raised planters or greenhouses, hydroponically or in soil” (Jersey City Municipal Code, Art. I § 345-6). Community gardens are expressly permitted in all zones and are exempt from site plan approval (Art. V § 345-60.V(1)). While not defined, “rooftop gardens and raised planters” are also expressly permitted in all zones and exempt from site plan review. Commercial agriculture is defined similarly to community gardens except cultivation need not be performed collectively and may occur indoors and on rooftops in addition to outdoors. Moreover, plants cultivated through commercial agricultural use may be sold for “food, use in landscaping, or ornamental purposes” (Art. I § 345-6). Commercial agriculture is permitted in all commercial, industrial, and mixed-use redevelopment plan area zones while commercial greenhouses smaller than 5,000 sq. feet are subject only to the maximum- rather than maximum and minimum – height restrictions of the zoning district (Art. V § 345-60.V(2)).

In addition to three agriculture use types, the amended zoning code also provides for “green roofs” which are defined as “vegetated roof system[s] ... which typically involve a water proof membrane and root repellent, a drainage system, filter cloth, a lightweight growing medium and species appropriate plants” (Art. I sec. 345-6). Green roofs are generally exempted from site plan approval and are always exempted from the 20% area limit for roof top “appurtenances” (Art. I. § 345-60-W)

Chicago

In September 2011, Chicago amended its zoning code to improve local food security and “access to healthy food in underserved neighborhoods” by encouraging expansion of community gardens and commercial agriculture

within the city. The ordinance preamble sets forth urban agriculture as a tool for economic development in job creation and “resident entrepreneurship in creating food-related small businesses”. Community gardens are defined as “neighborhood based organizations” with the primary purpose of enabling community members to grow plants for “beautification, education, recreation, community distribution or personal use” (Municipal Code of Chicago § 17-17-0103). Community gardens are managed by public or civic groups and are generally permitted in all zoning districts -- including all residential, business, commercial, and downtown districts -- except manufacturing districts (§17-5-0207). Community gardens may be a maximum size of 25,000 sq. feet - which is approximately one-third the area of a regular city block -- but do not have any size restrictions in the public open space special districts (§ 17-9-0103.5-A). On-site sales are permitted if subordinate to the primary use of the community garden and limited to “incidental” sales of surplus plants and produce grown and cultivated at the community garden (§17-9-0103-.5-D). Similarly, composting is permitted but limited to the materials generated on site and may only be used at the community garden (§17-9-0103-.5-C). Moreover, hoopouses “or other fabric based shelters” are not considered accessory structures on the community garden and are, therefore, not subject to the area occupancy restrictions applied to other accessory structures such as storage sheds (§17-9-0103-.5-B).

The Chicago zoning code refers to land being used for commercial agriculture as an “urban farm”. An urban farm is defined as the “[g]rowing, washing, packaging and storage of fruits, vegetables and other plant products for wholesale or retail sales” (§ 17-17-0104-H). Urban farms are divided into three types: i) an “indoor operation” in which all activities are enclosed; ii) an “outdoor operation” which is conducted in unenclosed or partially enclosed structures; and iii) a “rooftop operation” which occurs on the roof of a building. Dividing urban farms into three types of use categories allows for a more finely grained apportionment of permissiveness as some types of urban farms are permitted in areas where other types are prohibited. For example, while no urban farms are permitted in any residential districts, rooftop operations are broadly permitted in most other zoning districts while outdoor operations are mainly limited to the commercial and manufacturing districts. Indoor operations are permitted a bit more broadly than outdoor operations but less broadly than rooftop operations. Off-street parking requirements for both community gardens and urban farms are relaxed to accord with the number of employees rather than land area (§§17-10-0207, 0208).

Finally, the Chicago zoning code permits the maintenance of aquaponic systems (symbiotic propagation of plants and fish in indoor, constructed environments) as well as apiaries, or honeybee colonies. Apiaries are permitted as an accessory use but are limited to five colonies on any site. However, the preamble to the ordinance amending the zoning to enable urban agriculture noted that the Chicago is researching whether the five colony limit should be raised.

Kansas City

In 2008, Kansas City adopted a Climate Protection Plan through which they committed to being a “green city”. Among other things, the Climate Protection Plan expressed a desire to promote residential food production, create local employment opportunities in the field of green infrastructure, and offer opportunities, especially for children, to learn about environmental sustainability. Accordingly, in June 2010, the Council of Kansas City adopted an ordinance which amended the zoning code to expressly permit various types of agricultural production. The Kansas City zoning code establishes an “Agriculture” use category with three types of agricultural use: i) Crop Agriculture;

ii) Animal Agriculture; and iii) Urban Agriculture. The “Urban Agriculture” use category is further divided into three sub-types: i) Home Garden; ii) Community Garden; and iii) Community Supported Agriculture (CSA) Farm. All three types of urban agriculture uses are permitted in all zoning districts as either principal or accessory uses, except CSA Farms cannot operate in any residential district without a special use permit (Zoning and Development Code § 88-312-02).

A “Home Garden” is maintained by residents of a dwelling located on the same property as the garden. On-site sales of “whole, uncut fresh foods and/or horticultural products” are permitted within a reasonable time of harvest between May 15 and October 15th. Further, home garden on-site sales are exempted from the definition of commercial activity and are, therefore, not subject to regulations governing “home occupations”. Home gardens are prohibited from growing “row crops” in the front yard but that prohibition does not extend to row crops that are part of the front yard’s borders (§ 88-312-02-A).

A “Community Garden” is defined as “an area of land managed and maintained by a group of individuals to grow and harvest food and/or horticultural products” for consumption, sale, or donation. It seems as though yards on occupied residential properties may be used as community gardens because members “may or may not reside on the subject property” and community gardens may be a principal or accessory use (§88-312-02-B). Further, community gardens may engage in on-site sales of whole, uncut, fresh produce if the community garden is not located on an occupied property that is residentially zoned. Similarly, community gardens may grow and sell row crops so long as the community garden is not located on occupied, residentially zoned property (§88-312-02-B).

A CSA farm is comprised of shareholders who work on the farm or pay for a portion of the food and/or horticultural products in advance of cultivation. CSA Farms are prohibited from residential districts without a special use permit as CSA Farms, generally, are more intensively cultivated and serve more people than community gardens (§88-312-02-C).

The “Crop Agriculture” use category is defined as a land area managed or maintained by an individual or group to grow and harvest food crops and/or horticultural products (including trees, bees, and apiary products) for off-site sale in retail districts. Crop Agriculture sites differ from Urban Agriculture sites in that they may be cultivated by individuals for the purpose of commercial sale rather than consumption or donation. While permitted in each district, Crop Agriculture sites may not perform on-site sales without a special use permit.

Cleveland

After losing several community gardens to development, on March 5, 2007, Cleveland passed a zoning ordinance which created an urban garden zoning district. Unlike an urban agriculture use category which inserts newly permitted uses into pre-existing zoning districts, the Urban Garden District is a preservation tool which designates a particular site as its own district specifically zoned for agriculture. An urban garden district designation provides stability by subjecting any change in the designated parcel’s character to public review. The zoning code notes the purpose of an urban garden district designation as, amongst other things, protection of the means to meet the needs of local food production, community health and education, garden-related job training, and preservation of green space (Cleveland Zoning Code § 336.01). An urban garden district site may contain one of two use types: i) a community garden; or ii) a market garden. A “community garden” is defined as a land area managed and maintained by a group to grow and harvest food crops and/or non-food crops for consumption or donation. A “market garden” is

managed and maintained by an individual or group for cultivation and harvest of food crops and/or non-food crops to be sold for profit. Community gardens may have occasional on-site sales of crops grown at the site while market gardens may engage in on-site sales of crops produced at the site as a main function (§§ 336-02, 03). Rather than exempting market and community gardens from certain structural requirements applied to predominant land uses in broader types of zoning districts, the urban garden district contains its own regulations regarding structures particular to agricultural use. Hoophouse, greenhouses, coldframes and other structures used to extend the growing season are permitted accessory uses along with storage sheds, farmstands, and other uses and/or structures which facilitate the urban garden's primary purpose (§ 336.04). No building or structure may exceed 25 feet in height and the combined land area occupied by all buildings cannot exceed 15% of the site (§ 336.05). Moreover, instead of requiring off-street parking, urban gardens are prohibited from providing parking unless they exceed 15,000 sq. feet in lot area and, even then, parking cannot occupy more than 10% of the garden lot (§336.05).

In addition to preserving agricultural use of designated lots through the Urban Garden District, on November 3, 2010, Cleveland amended its zoning code to permit agricultural use in residential districts. The "permitted uses" section of the residential district was amended to include "agricultural uses" (§ 337.23(3)). Greenhouses, fences, hoophouses, coldframes, chicken coops, farmstands, and storage sheds are permitted accessory structures which are restricted to 15 feet in height. Accessory use structures are not permitted in front or side yards, except for fences and farmstands. On-site sales are permitted in residential districts subject to approval by the local zoning board which must consider factors such as proximity to other dwellings, proximity to other food stands serving the neighborhood, and traffic. On-site sales in residential districts are primarily restricted to properties that are used solely for agricultural use. If on-site sales are approved, signs advertising the hours of sale may be placed at least five feet back from each street frontage. Similar to Kansas City and Chicago, on-site sales are limited to agricultural products grown at (or within 1000 feet of) the property. Further, sales may only occur between 8 a.m. and dusk.

The Cleveland Planning Commission is also considering creating an Urban Agriculture Overlay District (UAOD). If implemented, the UAOD could be applied to any land area deemed appropriate within the city. Amongst other things, the UAOD goals are to facilitate local food production and improve community health as well as to provide opportunity for agriculture-based entrepreneurship and employment. The UAOD would include "community gardens", "urban farms", and "market gardens" as permitted principle uses in addition to the permitted uses enumerated in the underlying zoning district. Similarly, structures which extend the growing season (greenhouses, hoophouses, etc...), seasonal farms stands, storage sheds, fences, and rain barrel systems, and other accessory uses and/or structures which facilitate agricultural use would also be permitted. Except for greenhouses, buildings on urban agriculture use sites within the UAOD would be restricted to 15 % of the lot area. In addition to composting, the UAOD sets regulations for the keeping of animals and bees and allows on-site slaughter of animals if shielded from public view. Further, retail sales of agricultural products are permitted within the UAOD even if otherwise prohibited by the rules for the underlying district. Unlike the urban garden and residential districts, however, any agricultural use within the UAOD must obtain site plan approval from the local planning board (Draft Amendment 336A.01).

Additional Resources

Legal Resources

- Cleveland Zoning Code § 336.
[http://www.amlegal.com/nxt/gateway.dll/Ohio/cleveland_oh/codifiedordinancesofthecityofcleveland?f=templates\\$fn=default.htm\\$3.0\\$vid=amlegal:cleveland_oh](http://www.amlegal.com/nxt/gateway.dll/Ohio/cleveland_oh/codifiedordinancesofthecityofcleveland?f=templates$fn=default.htm$3.0$vid=amlegal:cleveland_oh)
- Cleveland Zoning Code, Ordinance 814-10, amending §§ 337.02, 337.23, 337.25.
<http://planning.city.cleveland.oh.us/zoning/pdf/337-02%20UrbanAgricultureinResidential.pdf>
- Cleveland Proposed Amendment to Zoning Code Ordinance, Draft Chapter 336A.
<http://planning.city.cleveland.oh.us/zoning/pdf/337-02%20UrbanAgricultureinResidential.pdf>
- Chicago Municipal Code, Title 17 §§ 2-0207 through 17-0270.7.
<http://chicago.legistar.com/LegislationDetail.aspx?ID=935378&GUID=2D52B92E-75BA-4AAB-BC26-2CD4EF5691EE&Options=ID%7cText%7cAttachments%7c&Search=agriculture>
- Jersey City Ordinance 11-041, Amending Municipal Code Articles I and V § 345
[http://www.jerseycitynj.gov/uploadedFiles/Public_Notices/Agenda/City_Council_Agenda/2011/2011_Ordinances_1st_Reading/agenda%20placeholder\(5\).pdf](http://www.jerseycitynj.gov/uploadedFiles/Public_Notices/Agenda/City_Council_Agenda/2011/2011_Ordinances_1st_Reading/agenda%20placeholder(5).pdf) (see pages 36-40)
- Jersey City Reexamination Report, Master Plan & Regulations, adopted Feb. 15, 2011
http://www.cityofjerseycity.com/uploadedFiles/City_Government/Department_of_Housing_Economic_Development_and_Commerce/16%20-%20Reexamination%20Report%2002-11-2011.pdf
- Kansas City Ordinance No. 100299, Zoning and Development Code, § 88-214.
<http://www.kcmo.org/idc/groups/cityplanningdevelopmentdiv/documents/cityplanninganddevelopment/100299.pdf>
- New Brunswick Master Plan, 2004
http://www.cityofnewbrunswick.org/09site/Government/Departments/Economic_Development/master_plan.html
- New Brunswick Ordinances, Chapter 17, "2007 Zoning Ordinance of the City of New Brunswick, New Jersey"
http://www.cityofnewbrunswick.org/09site/Government/Departments/Economic_Development/zoning_plan.html
- New Jersey Municipal Land Use Law N.J.S.A. § 40:55D-1, et seq.

Information

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- "Land Stewardship Project Fact Sheet #21: How U.S. Cities are Using Zoning to Support Urban Agriculture," Land Stewardship Project, accessed December 4, 2011, <http://www.landstewardshipproject.org/pdf/factsheets/21-Urban-Ag-Zoning.pdf>

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- Voigt, Kate, "Pigs in the Backyard or the Barnyard: Removing Zoning Impediments to Urban Agriculture," 38 B.C. Envtl. Aff. L. Rev. 537 (2011). <http://lawdigitalcommons.bc.edu/ealr/vol38/iss2/14>

What Next?

This section outlines the next steps for choosing and implementing a food production and/or processing model. Organizations could work collaboratively with residents and other partners to determine what models will work best for them. Outreach could take place in the form of public meetings, focus groups, surveys, or some combination of these activities. During these interactive sessions, groups and individuals could identify the goals for which they will be pursuing food related community economic development. The following questions could be posed to groups and residents: Why are you growing?, Who will grow?, What will you grow?, How will you grow?, and Where will you grow? A related series of questions around processing food would be important too.



Photo credit: Katie Nosker

Once the goals are identified, Elijah's Promise and partners could begin building resources and capital. Funding could be acquired, possibly in the form of grants or other in-kind donations of materials. Building partnerships will be critical at this stage, possibly including the University, community members, businesses, and the Food

Alliance. Elijah's Promise and partners could consider holding a charity event that brings together local restaurants, food business entrepreneurs, New Brunswick institutions, and the public to: 1) Raise funds for Elijah's Promise, 2) Raise awareness about growing and processing food in New Brunswick, and/ or 3) Raise money to support the development of the New Brunswick Food Hub, build relationships, and further develop partnerships. Local Restaurants, food business entrepreneurs, and New Brunswick Institutions (e.g. Rutgers Dining, Rutgers Club, J&J) come together to promote local food. They set up stands and serve food and hors d'oeuvres for free. The public will eat for free but then they will be strongly encouraged to donate money directly and/or bid on various items (e.g., New Brunswick restaurant tickets, theater tickets, vouchers to Farmer's Market depending on the time of year) for Elijah's Promise's benefit. The studio can create a short program with video and speakers or can post other graphic material to showcase the project. Or, instead of serving food for free, people can buy food, and a certain proportion of each purchase will go directly to Elijah's Promise..

Next, the community will need to consider who will do the labor associated with the model. Will it be run as a business with the entrepreneur providing the labor? Will Elijah's Promise hire someone to plant and maintain the garden? Will volunteers be used? Or will it be some combination of these options? If necessary, the community could then begin thinking about how to acquire or secure the land they would like to use for growing. This can be one of the most challenging, and critical, steps, as plenty of evidence indicates that community gardening efforts are too often discarded in favor of "higher and better uses." Once the land is secured, the community could begin acquiring materials, carrying out and maintaining the model. At this stage of the game, Elijah's Promise, community members and other partners can enjoy the "fruits" of their labor. They can plant, grow, harvest and eat, process or sell the food!

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