Planning the Greylock Mills Rooftop Greenhouse: A Community Food Project

Katie Costantini, Brett Bidstrup, Ali Hill, Jack Ryan, and Alex Schidlovsky

Environmental Planning - ENVI 302
Fall 2015
Professor Sarah Gardner
Acknowledgements

The success of this report would not have been possible without the guidance and assistance of Professor Sarah Gardner, Liz Stretch, Salvador Perry, Karla Rothstein, all the people who participated in interviews listed below, and our fellow ENVI 302 classmates.
Table of Contents

Introduction 3
Site History and Description 5
North Adams Community Profile 7
Community Perspectives on Greylock Works 8
Local Food Production and Demand 10
USDA NIFA Community Food Project Competitive Grant Overview 13
Farm to School Programs and School Lunches in Mass 16
NBCC Partnership 18
Optimizing Greenhouse Yields 19
Greenhouse Methodology 21
Case Studies 22
Interviews 25
Legal Issues 34
Alternative Funding 34
Evaluation Matrix 37
Long-Term Recommendations 40
Conclusion 41
Introduction

Our project was to help plan the Greylock Mill Rooftop Greenhouse, located in North Adams, MA, with Liz Stretch and Sal Perry of the New York development firm, Latent Productions. This project is part of their larger initiative to transform the Greylock Mill Building into a hub for local food production and processing, which will be called Greylock WORKS. The space on the roof is 30,000 square feet, but we focused on producing a grant application for the USDA Community Food Project (CFP) Competitive Grants program to fund the construction of an initial module of the project, which will be a greenhouse between 1,000 and 3,000 square feet. Our research was conducted through the lenses of climate, markets, and ability to expand the initial project.

Figure 1: Image of Greylock Mill (Latent NYC).
While planning we considered impacts on the environment and food supply chain, market economics and viable business modeling, as well as social equity and access. In the process of putting the grant together, we looked into physical planning, methods of production, commercial viability of different products, and distribution planning. The broad goal was to help local agriculture and food access. Identifying partners was the most important step. We secured Wild Oats as one of our main buyers, and planned to use capital from this business partnership to implement a CFP to serve low-income people of North Adams. We found that there is a lack of local fresh produce in local public schools, especially year-round production. Ideally, this model would be a prototype to be implemented elsewhere. Our client, Salvadore Perry, is planning to work with a smaller decision scale in terms of what is grown and how buyers decide on purchasing produce, then slowly scale up and aggregate complexity.

(Left to right) Back: Adam Hinds, Jack Ryan, Salvatore Perry, Brett Bidstrup, Alex Schidlovsky. Front: Jennifer Munoz, Karla Rothstein, Katie Costantini, Ali Hill
Site History and Description

Our greenhouse project is planned to be on the lower roof part of Greylock Mill on the Mohawk Trail between Williamstown and North Adams, Massachusetts. Like many mills in the area, it is an old cotton spinning facility, sturdy in structure, with beautiful and large windows. The original mill was successful in the mid-1800s, so from 1870 - 1930 it was heavily invested in, resulting in the many different additions we see today. In total, it is 240,000 square feet. The rooftop we planned to build on is 30,000 square feet of this space, and as mentioned above we would only be using about 10% of the roof for our prototype. However, our clients have the goal of scaling up this prototype to use up to $\frac{2}{3}$, or 20,000 square feet of the rooftop. A major advantage of this location is that the brick, steel, and wood structure will hardly need to be modified to suit our needs. It is already structurally sound, and appealing to the eye.\footnote{Due Diligence Working Draft} From the rooftop, which may serve other purposes as well, there is a panoramic view of the Berkshire hills and surrounding countryside. One downside is the closeness to the road, but the greenhouse can also serve as a sound barrier if there are events on the roof.
Figure 2: Aerial view of roof space on Greylock Mill. The area relevant to this report is the “Weave Shed West South Wind.”

North Adams Community Profile

North Adams is a city in Berkshire County, Massachusetts. Settled in 1745 and being a mill town for most of its history, the city is now best known for Mass MoCA and MCLA. In 2017, Mass MoCA is set to become the largest contemporary art museum in the United States, while MCLA has ranked for four consecutive years as a Top Ten Public Liberal Arts College by

\[\text{Ibid}\]
U.S. News and World Report. With a population of 13,563 as of 2014 and a population growth of -6.54% since 2000, it is the least populous city in the state.

The city has a total area of 20.6 square miles, of which 1.31% is water. Route 2 runs through the city and is one of the three main alternatives (with Route 9 and U.S. Route 20) to the Massachusetts Turnpike/I-90 highway. The Greylock Mill is easily accessible from this road.

Between 2009-2013, the median income for a household in the city was $38,317 compared to $66,886 in the same period in Massachusetts. About 9.0% of families and 22.3% of the population were below the poverty line, including 15.6% of those under age 18. The unemployment rate in the city is 6.0%, but due to many people dropping out of the workforce, this number is not representative of the current situation in the city. According to the city-data.com, North Adams had a crime index of 496.4 in 2013, with the national average being 297.6. North Adams operates its own public school system, with three elementary schools and one public high school. These statistics clearly show that the city can benefit from an increase in food supply.

Community Perspectives on Greylock Works

The Greylock Mills project coincides extremely well with the Berkshire Regional Planning Commission’s local food and agricultural vision. The vision references local, healthy

---

4 “North Adams city, Massachusetts,” United States Census Bureau
6 “North Adams, Massachusetts,” City-Data.com
foods through education, networking opportunities and economic development activities. A focal point of the vision is to ensure that limited income families have access to healthy food options at affordable prices in order to ensure a hunger-free community. The green roof project at Greylock Mills is aimed at sustainably supporting all of these objectives. Our client’s economic investment in the area is solely focused on creating local, healthy food options. In the green roof area of the project, the focus is to partner with a local non-profit organization that already has community food project experience. The end result will be a vibrant facility that serves to meet the Berkshire Regional Planning Commission’s local food and agricultural vision.

In addition to calculated visions, local support for the project is marked by a hesitant optimism. Michael Nuvallie of North Adams Community Development Office likens the city’s view of the project to views of the early stages of Mass MoCA art museum. Nuvallie notes that the city has supported our clients in securing a grant only available through municipalities. The nature of the grant and the city’s support leave the city without any danger of incurring any financial burden of the project.

Mayor Richard Alcombright is enthusiastic about what the Greylock Mills project represents. He is repeatedly quoted as noting the significance of an outside team of investors injecting money into the local North Adams economy. Alcombright is most optimistic about the

---

7 “Local Food and Agriculture: An Element of Sustainable Berkshires, Long-Range Plan for Berkshire County” http://berkshireplanning.org/major-initiatives/sustainable-berkshire-regional-plan

longevity of the Greylock Mills vision, noting that the multi-year plan centers on a great vision for the entire complex.\(^9\)

Local resident reactions and comments on the project are marked by skepticism. An overwhelming portion of commenters on articles documenting the project expresses deep hesitation with the history of the property. Past uses of the mill and surrounding buildings are believed to have left surrounding ground and water supplies heavily contaminated with chemical waste. Additionally, one commenter expresses frustration over the fact that the last thing local residents need is a place to buy organic, overpriced food.\(^{10}\)

Despite public nerves, the project aligns perfectly with the planning vision of local agriculture and is supported by local government. Perhaps the public will be reassured of the project’s commitment to local residents and begin to change their minds about the project. When that happens, the Greylock Mill project will have dynamic community support.

**Local Food: Supply and Demand**

Demand outstrips the supply for local food in Northern Berkshire County. Demand for fresh vegetables is currently twice the current supply and demand for fruits is about four times the current supply.\(^{11}\) Regional demand for meat and dairy also outstrips the supply. The Keep Berkshires Farming Process identified local goals including getting more produce to low-income populations and to institutions, schools and companies, and increasing economic development of

---


\(^{10}\) Ibid

\(^{11}\) Local Food and Agriculture 2014
agricultural related businesses. All of these goals could be met with a greenhouse. One survey found that there were 117 farms in the North Berkshire Region, with North Adams having the smallest number in the region. None of the farmers indicated selling to schools and local institutions, but these channels could have been included in the “local” survey measure. About half of the farmers in the area are full-time farmers. Multiple schools in the area already have a school garden that is incorporated with the food program. Both the Williamstown Elementary School and the Buxton School have a garden on campus. The estimated combined institutional budget for the region is at least $1 million. Quality and freshness were the most important factor in purchasing food, followed by price and customer’s preferences. Overall, private institutions had larger budgets than public institutions.

<table>
<thead>
<tr>
<th>Table FA4: Berkshire County Food Insecurity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
</tr>
<tr>
<td>Food Insecurity Rate</td>
</tr>
<tr>
<td>Estimated Number of Food Insecure Individuals</td>
</tr>
<tr>
<td>Percent below SNAP threshold of 200% Poverty</td>
</tr>
<tr>
<td>Percent above SNAP threshold of 200% poverty</td>
</tr>
<tr>
<td>Child (Under 18) food insecurity rate</td>
</tr>
<tr>
<td>Estimated Number of Food Insecure Children</td>
</tr>
</tbody>
</table>

Source: Feeding America, 2012

Figure 3. Food insecurity in Berkshire County.

---

13 Ibid
14 Ibid
15 http://www.wlschools.org/page.cfm?p=658
16 Sustainability at Buxton
All fourteen institutions in the Keep Berkshires Farming Region Action Plan expressed interest in buying more local food, but cited budget and restrictions in the bidding process as the top challenges to purchasing more of it. The bidding process makes it difficult for public schools to buy more local food. In this report, Clarksburg Elementary, Mt. Greylock High School and North Adams Commons expressed interest in buying more local food. Most institutions in Northern Berkshire region purchase food from large distributors with small portions of local food. Other major concerns relate to how food would be delivered and food safety.

Forty restaurants were surveyed in the region. The more the meal cost, the more likely the restaurant considers local food in purchasing. Restaurants noted the largest barriers to local purchasing were connecting with farmers and the consistency of produce. Dairy products are in the highest demand by restaurants, followed by vegetables and fruits. One local challenge is the seasonality as well as reliability of the supply of the food is a challenge for local purchasers that would be solved by the Mill Greenhouse Project.

Some of the main problems in the local food system are the difficulty of buying large quantities, high price, safety concerns, and a farmer-purchaser communication gap. Dependability could be addressed by a greenhouse along with a relatively smaller quantity of produce. The tight budget of local public schools and low-income community members is an important factor when it comes to the greenhouse food production system. The greenhouse will

---

19 2012 “Keep Berkshires Farming”
20 Ibid
21 2012 “Keep Berkshires Farming”
have a local impact in the food supply chain especially during the off-season growing time. Wild Oats will be one of the main purchasers on the for-profit side of the business. Wild Oats is a community based market that strongly supports food in the area. Demand for local food is strong, and the greenhouse has a strong potential to fit the off-season niche for the greater community.

Relating to the goal of providing increased food access to the significant low income population of North Adams, the biggest factors for consumers purchasing habits are convenience and price. North Adams and other sections of the Berkshire County face food insecurity. 32.6% in North Adams responded that they sometimes can’t afford balanced meals and about one quarter of residents run out of food before they can get more. North Adams has one of the four food deserts in the North Berkshires region. In the 2012 Keep Berkshires Farming Report, 50.9% of Northern Berkshire community seeking food assistance “could not” or “sometimes could not” afford to eat balanced meals. Most respondents use WIC or SNAP programs which subsidize food from grocery of farmer’s markets, which shows an opening for local food by making it more readily available. The demand for local food is clear in this region and the greenhouse will have the ability to connect people from the North Adams area to affordable, local food through this project.

________________________________________________________________________
22 Ibid
24 2012 “Keep Berkshires Farming”
USDA and NIFA Community Food Projects Competitive Grant Program Overview

In order to fund the construction and operation of the rooftop greenhouse, we helped apply for the CFP Competitive Grants Program, administered by the United States Department of Agriculture (USDA) and the National Institute of Food and Agriculture (NIFA), which aim to supply funding to nonprofits, tribal organization, and food program service providers for CFPs that promote local food security and self-sufficiency, as well as provide solutions for low-income communities. The program was established in the 1996 Federal Agriculture Improvement and Reform Act and was reformed by the 2014 Farm Bill. For our grant cycle, it had $9 million available to fund CFPs, Plannings Projects, and Training and Technical Assistance. We applied for the CFP funding. The goals of a CFP are to (1) develop links among multiple sectors of the local food system, (2) support the development of local entrepreneurial projects, (3) develop innovative connections between for-profit and nonprofit models, (4) create connections among stakeholders and community members to increase the capacity of a community to address local food and agricultural issues, and (5) develop new resources to help reduce food insecurity with creative food resources, coordination of food services and reducing barriers to food access, and increasing nutritional and agricultural education. Some examples of CFPs include community gardens with market stands, value chain businesses, farmers’ markets, and farm-to-institution.

---

initiatives. 2015 grant money was awarded to applicants such as Jones Valley Urban Farm to build an urban teaching farm that will be integrated into the curriculum at a local high school, Pacific Youth and Community Development to support hydroponic farmers in American Samoa, and Grow Portland to increase food access for low-income residents through the construction of three new growing areas and community gardens.

In order to be eligible for the grant, the applicant had to have experience in community food work with small to mid-sized farms and provision of food to low-income communities, experience in training and business development for food-related operations in low-income communities, or experience in efforts to reduce food insecurity in the community. The applicant had to demonstrate the capacity to implement the proposed project, provide fiscal accountability, and collect, report and share data and information with researchers and other interested parties. The project had to involve collaboration with at least one local partner and achieve at least one “hunger-free communities goal”. These goals include community-based emergency food delivery networks, food security assessments, groups with low-income participants that plan and implement projects to reduce food insecurity, integrating public and private resources to alleviate hunger, increasing access to local food, projects to improve local food distribution, coordinating food services with recreational programs, and nutritional education programs.

---

Productions is a for-profit architectural and development firm. Therefore, in order to apply for this grant, we partnered with a local non-profit organization, which became the primary applicant. This organization, the Northern Berkshire Community Coalition, will run the CFP within the greenhouse space alongside other, for-profit agricultural operations, such as growing produce for Wild Oats.

The grant application itself included information about the site location and history, a description of the community involved in the project and the needs of the community that will be addressed, information about the organizations, individuals, and community members involved in the project, specific projects goals and intended outcomes, as well as systematic activities to achieve these goals, a plan for future evaluation of the project, and a plan for self-sustainability. The grant also had to provide evidence of experience, extensive community linkages, and commitment to direct involvement in the community. The project plan included thorough steps, timetables, and expected numbers of participants for each stage. This was organized using a “Logic Model,” which is a specific type of flowchart that demonstrates how sequences of action will lead to a goal.\(^3\) Latent Productions also submitted a budget, which can request up to $400,000 over four years and requires matching on a dollar-dollar basis.

---

Farm to School Programs and School Lunches in Massachusetts

The Massachusetts Farm to School Project was launched in 2004 with funding provided by the Massachusetts Department of Agricultural resources. The mission of the organization is to increase access to “healthy, locally-grown food in schools and other institutions.” They help facilitate sustainable purchasing relationships between farmers and schools in a way that promotes agricultural and nutritional education and wellness. With the work of this organization, the number of public school districts opting to purchase locally grown foods has gone from 12 to over 200. As a service to farmers, they provide technical support, initially at no charge, by evaluating the farm, determining appropriate crops, and helping to connect the farm with local schools. In order to be successful, a farm should have the capacity to deliver services, diverse products, and use safe agricultural practices.

Supplying local produce can help North Adams schools meet Massachusetts’s nutritional standard. The 2010 Act Relative to School Nutrition established standards for competitive foods and beverages sold or provided by public schools in order to ensure food that promotes learning, healthy development, and healthy eating behaviors. However, these regulations do not apply to federal school lunch programs, which follow USDA nutritional standards. According to the USDA Child Nutrition Program, all meals provided must have no trans fat, include at least one fruit or vegetable, and meet requirements for average calorie, fat, sugar, and sodium standards.

---

over five days. Meals must also be planned in order to include age appropriate portions, include a
meat or meat alternative, which includes nuts and seeds, enriched macaroni, yogurt, tofu, beans,
cheese, and eggs. Fruits provided must be fresh, frozen without sugar, or canned in light syrup.
The vegetables offered over the week must include dark green vegetables, red-orange vegetables,
beans and peas, and starchy vegetables. Also all grains must be enriched or whole grains, and
this requirement may be partially met with grain-based desserts. Also, according to the School
Nutrition law, local school districts can purchase fruits and vegetables from Massachusetts’s
farms without going through the normal bidding process, which normally requires buying from
the seller offering the lowest price, as long as the purchasing contract is below $25,000.33

The North Adams Public School District has implemented the Community Eligibility
provision under the National School Lunch and Breakfast programs, which allows all students to
receive one breakfast and one lunch each school day for free. Also, Brayton and Sullivan
Elementary schools offer a fresh fruit and vegetable program during the day, and these schools as
well as Greylock Elementary School offer fresh fruit and vegetables as after school snacks. Also,
the School District Wellness program provides nutritional and physical education programs. The
School Committee is committed to providing, “access to affordable healthy food, nutritional
information, physical activity, and resources for lifelong healthy habits.”34 Nutritional education
is not only in health classes, but also integrated into other areas of the curriculum. The meals

33Massachusetts Department of Health (2012) Healthy Students Healthy Schools: Revised Guidance for
Implementing the Massachusetts School Nutrition Standards for Competitive Foods and Beverages.
34 North Adams Public Schools. Food Services.

**NBCC Partnership**

Almost everyone we talked to about this project and the necessity of a non-profit partner put the Northern Berkshire Community Coalition on the top of their list of recommendations for us. They have been “improving the quality of life for the people in northern Berkshire by organizing, supporting, and empowering the community” for almost three decades. They influence a broad swath of the Northern Berkshires and have a great ability to connect this project with the community. The coalition would be a great partner for us because they already have fostered relationships in the community to inform local citizens, address issues, and engage people in their own community outcomes. The rooftop greenhouse will have the ability to add to this web. NBCC also holds monthly forums attended by over 80 people on average to address key issues, making sure residents are engaged in determining what resources are necessary for the community to thrive and in informing each other of available services.”

Additionally, specific programs of NBCC already address health and nutrition. For example, their Mass in Motion Program works to reduce obesity by encouraging healthy eating and active living. It also works to expand the pursuit of healthy eating and active living among the communities and initiate change at policy, systems, and environmental levels. They would benefit from adding an educational program in which kids learn about healthy food, growing

---

35 Email from Liz Stretch Nov. 23, 2015
36 Ibid
37 Ibid
food, and where the food on their plates come from. In general, most of what the NBCC does is build the infrastructure necessary to deliver the programs that help improve the community through close engagement and mobilization.\textsuperscript{38} After interviewing Amanda Chilson, who works for the coalition, we connected our clients to the executive director to facilitate an official partnership. We are excited for our clients to partner with them because of their experience and vision.

**Hydroponic Yields**

Due to the fact that the grant that our clients applied for consisted of proposing a community food project, we needed to think about how much food could be produced in the Greenhouse. The grant constrained the size of the greenhouse to between 1,000 and 3,000 square feet, but our clients decided on a 1,000 square foot initial module. The amount of food that can be produced is highly dependent on a wide variety of variables, most importantly on the method of growing and the produce that are grown. In terms of the method of growing, our clients’ research led them to the conclusion that a hydroponic system would be best suited for our greenhouse. We then looked for information on the amount of produce that can be produced per square foot of space. Andrew Carter from Blue Planet Environmental was able to provide us with data regarding the crops most commonly grown in greenhouses (see Figure 4 below).\textsuperscript{39} We then cross-referenced these produce with the Local Food Guide to Berkshire County and its Harvest calendar, which lists when all crops are in season or available from storage.\textsuperscript{40} From this source

\textsuperscript{38} Email from Liz Stretch Nov. 23, 2015  
\textsuperscript{39} Email from Liz Stretch Dec. 16, 2015  
\textsuperscript{40} “Berkshire County Harvest Calendar - Local Food Guide MA.” Berkshire County Harvest Calendar - Local Food Guide MA. Web. 16 Dec. 2015.
we were able to find that crops such as peppers, tomatoes, cucumbers and basil are only freshly available in the Berkshire County for 4-5 months, whereas Microgreens, Kale and Lettuce are available for 8-12 months (see Figure 5 below). Considering the fact that, according to the Food and Drug Administration, the average American consumes 1,996.3 lbs. of food per year, and the fact that The Friendship Center Food Pantry in North Adams last year was able to distribute nearly 300,000 pounds of food, the yield numbers for a 1,000 square foot module show how limited of an impact the initial greenhouse would have. If, however, the greenhouse was able to expand to the allotted 20,000 square feet that is available, the operation would be able to produce more than 100,000 pounds of one of the four crops that is only available locally for a third of the year, thus helping the community breach the gap between supply and demand.

In terms of the combinations of crops that can be grown in our greenhouse, Andrew made it clear that tomatoes, peppers, and cucumbers are grown in one type of system, whereas leafy greens are grown in another. And although there is a high demand for microgreens in the area, these are not typically suited for greenhouses.

<table>
<thead>
<tr>
<th>Crop (single-layer)</th>
<th>Yield Range (lbs/sq.ft./year)</th>
<th>Total (lbs/1,000 sq.ft./year)</th>
<th>Total (lbs/20,000 sq.ft./year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peppers</td>
<td>4 - 8</td>
<td>6,000</td>
<td>120,000</td>
</tr>
<tr>
<td>Tomatoes</td>
<td>9 - 12</td>
<td>10,500</td>
<td>210,000</td>
</tr>
</tbody>
</table>

43 Email from Liz Stretch Dec. 16, 2015
<table>
<thead>
<tr>
<th>Cucumbers</th>
<th>5 - 6</th>
<th>5,500</th>
<th>110,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basil</td>
<td>6 - 8</td>
<td>7,000</td>
<td>140,000</td>
</tr>
<tr>
<td>Spinach</td>
<td>3 - 4</td>
<td>3,500</td>
<td>70,000</td>
</tr>
<tr>
<td>Lettuces</td>
<td>6 - 12</td>
<td>9,000</td>
<td>180,000</td>
</tr>
<tr>
<td>Kale</td>
<td>2 - 3</td>
<td>2,500</td>
<td>50,000</td>
</tr>
<tr>
<td>Microgreens</td>
<td>9 - 15</td>
<td>12,000</td>
<td>240,000</td>
</tr>
</tbody>
</table>

Figure 4. Hydroponic Yields for a variety of crops grown in a single-layer greenhouse.

Figure 5. Availability of Crops during a calendar year in Berkshire County

**Greenhouse Methodology**

In researching what is actually going to go on the roof, the decision was between soil and hydroponics. The exterior structure of greenhouses is relatively standard based on a site’s features, but growing techniques vary. We have considered models for each method and ultimately realized hydroponics makes the most sense for this project.

The debate between hydroponics and soil is philosophical. In a conversation with Michael Pollan, he shared his opinion that hydroponically grown food falls short on quality and...
taste when compared to food grown in soil. According to Pollan, Hydroponic systems are not yet able to mimic the full extent of the natural process of soil growing, and hydroponic produce typically has less taste and richness than produce grown in soil. That being said, hydroponic systems offer a number of functionality advantages. Hydroponic systems provide farmers with higher yields, faster turnover times, less water demand, disease resistance and more detailed control. The comparison boils down to a preference for natural growing, or precise growing – organic or efficient.

Michael Pollan is an avid believer in soil grown food. During his visit to our class, he referenced Elliot Coleman and Four Season Farm in Harborside, Maine. As Pollan referred to the farm, Coleman has “perfected” indoor growing in the New England climate. Four Season Farm uses greenhouses to provide year long growing environments. The farm grows their crops exclusively in soil. While Coleman does not have to deal with the added complication of raising his operation to the roof of a mill building, his farm has successfully created a model for year round growing in New England. Four Season Farm is merely set up as a model and did not offer the greenhouse services that we were searching for with this project, however they do provide a concise list of trusted companies to build and equip greenhouse facilities to follow their model.

Relevant Case Studies

Case Study: Gotham Greens Farms

Gotham Greens, which was founded in Brooklyn in 2009, created its first commercial rooftop greenhouse in Brooklyn, New York in 2011. It now has three other operations in Brooklyn, Queens, and Chicago, which add to a total of 170,000 square feet. The company was inspired by local, urban farming and wanted to create a sustainable way to grow produce year-round at competitive prices. They use a fully for-profit model and sell to local retailers and restaurants.

The initial farm in Greenpoint, Brooklyn is over 15,000 square feet and produces more than 5 tons of leafy greens every year. The greenhouse uses on-site solar panels and high-efficiency LED lighting as well as passive ventilation and thermal curtains to lower energy consumption. The greenhouse also acts as insulation for the building underneath. The greens are grown hydroponically, which reuses water and is pesticide-free. The second greenhouse, in Gowanus Brooklyn, was built in 2013 and operates above a Whole Foods Market. This operation is 20,000 square feet and produces over 10 tons of greens, herbs, and tomatoes annually. Together, the market and greenhouse use a Combined Heat and Power Plant and a solar system in the parking lot. There is also rainwater collection used for irrigation. The third greenhouse was built in Hollis, Queens in 2015 and is 60,000 square feet, producing over 750,000 pounds of produce per year. It is located on top of the Ideal Toy Company.45 The most recent project, in

Chicago, will be the largest commercial rooftop greenhouse at over 75,000 square feet and is being built about the Method Products factory, which is powered completely by renewable energy.  

The CEO of Gotham Greens explained that hydroponic growing methods allow them to “really control the nutritional recipes that these crops are getting…” and that the “minerals and vitamins are in precise, measured quantities, which arguably makes them more tasty and nutritious than conventionally grown produce.” Therefore, these greenhouses are a great example of the potential of the Greylock WORKS rooftop farm. Once the full 10,000 square feet on the roof is used for growing, the operation could possibly produce about 5 tons of greens based on the sizes of the existing Gotham Greens farms.

Case Study: Burlington School Food Project

One thriving example of a Farm to School Program is the Burlington School Food Project in Vermont. The program started in 2003 and has expanded since then to serve eleven kitchens in the area. They have different gardens at schools in the program and a half-acre farm at the middle school. There is also an orchard at the elementary school.

The initial grant was a USDA grant for development that brought together stakeholders in the community to get the Burlington Food Project off the ground. The Burlington School Project is 100% funded by the Burlington school district; it is a nonprofit within the municipality. Sarah Heusner, who we interviewed, works as the Farm to School Coordinator for this program. The

---

funding from the school district is helpful in continuing to support and expand the Farm to School program in Burlington. The district’s food budget is over a million and one third of this budget goes to the Burlington School Food Project. On top of the district funding, they also use additional private and public funding sources. For example, a new greenhouse was privately donated to the Burlington School Food Project, which is now on a partner farm that supplies food to the project. Other grants include a Lowe’s Grant that helped finance the orchard and maintenance for gardens. Most recently, they got a USDA grant for expanding the local beef for the project through a $100,000 National Farm to School Grant. Each project is funded by different sources. They also worked with the department of labor for work, but do not still do so. They continue to piece together funding beyond the school district’s funds to cover new and old projects and sections of this program.

The Burlington Food Project has successful programming for the students at the schools. Most of the programs are at the middle and high schools with less at the elementary school. There is a food truck summer training program for high school students that is a great way for students to gain business experience in the food domain. There is one greenhouse on school property that is an old, soil-based greenhouse from the 1960s where they grow the starts of the plants. In the high school, they incorporate a food science class into education inside the greenhouse. They have a middle school dinner that serves up to 700 people. This dinner revolves around coursework that the students have worked on in coordination from the classroom to the gardens. The students even do the cooking at some of the events. In addition to programming like the dinner, the Burlington Food Project partners with a local co-op and offers summer hours
from the co-op to do tasks like weeding and brush clearing for the gardens. The Burlington Food Project not only provides a substantial amount of fresh food to the local schools, but also incorporates education for the students and includes community members beyond the school making it a prime example of a successful Farm to School program.\footnote{Sarah Heusner, pers. comm., November 30, 2015}

**Interviews**

We conducted many interviews in order to research all aspects of this project including feasibility, similar successful programs, community needs, and to get a general sense of how this project can fit into the North Adams and greater Berkshire community. We talked to a wide variety of people with different areas of concern and expertise. Those interviewed included leaders of the community such as Mayor Alcombright, businesses such as the Wild Oats Co-op, non-profit organizers, and greenhouse professionals.

*Leigh-Anne Nicastro Interview: Wild Oats Co-op*

We met with Leigh-Anne Nicastro, who is a produce manager at Wild Oats in Williamstown, MA. Wild Oats was one of the first buyers identified for the greenhouse produce. Leigh-Anne said that she would commit 100% to buying produce from the greenhouse. She would like to see more of broccoli, mesclun, carrots, and lettuce in the offseason, but that she would buy almost anything that is produced.

Commitment from Wild Oats would provide a certain profit from selling some produce that could subsidize crops for a Community Food Project that would make food accessible for
those in North Adams who have limited access to healthy food. A mixed model of selling for profit at Wild Oats combined with selling for less than market value could potentially be sustainable for the greenhouse.

Northern Berkshire Community Coalition Interview

We interviewed Amanda Chilson who works for the Northern Berkshire Community Coalition (NBCC). As introduced above, the NBCC is an organization that seeks to “promote dialogue leading to action about emerging community issues” through works and forums to keep community informed. NBCC is nearly 30 years old and has numerous programs that engage the Berkshire community on many levels from neighborhoods, to families to youth development and more. 49 NBCC is a great partner for the grant due to the Coalition’s long standing base and proven competency and experience in community food work, especially with low income communities.

Amanda works specifically with Mass in Motion. As mentioned above, Mass in Motion is a statewide program that promotes healthy eating and active living. 50 Connecting the greenhouse to provide education and food around healthy eating would tie in easily to Mass in Motion. Additionally, she has worked to increase SNAP accessibility and works with food pantries to increase healthy, fresh options. She has worked on an incentive program to reward healthy purchases to get people to change their habits towards a healthier diet.

In this interview, we also learned that NBCC has a neighborhood program, and one of the focus locations is the neighborhood behind Getty gas station nearby the greenhouse. There are many problems in this neighborhood, including isolation. As a long standing coalition, NBCC has community connections in places like this neighborhood, which could be a target for a Community Food Project using the greenhouse as a source of food or for programming. Chilson explained how there is a lack of understanding and education that can help people who do not choose healthy food to make a change when available and feasible. Education and programming to promote changing habits into healthier lifestyles is a potentially powerful aspect to tie into a Community Food Project.

NBCC is a great resource and partner to work alongside the greenhouse in development to begin to work in the North Adams community to reduce food insecurity and increase the health and nutrition of the locals.

North Adams Mayor Alcombright Interview

We interviewed Mayor Alcombright of North Adams to learn more about community perspectives and expectations for the rooftop greenhouse. The Mayor has been involved in the development of Greylock WORKS from the beginning and has been in support of previous USDA grant applications, which have so far added up to $160,000-$170,000 in funding. He is excited about the “great outreach potential” of the rooftop greenhouse, and thinks it can take the existing nutrition and gardening programs in the local public schools to a new level.

He is hopeful that the project can help increase local interest in sustainability and agriculture. He hopes it will become a “cool” project that North Adams residents will take
advantage of in the same way that they have made use of the SNAP benefits available at the
town farmers’ market. With the North Adams SNAP benefits, qualified residents are able to get
$2 worth of produce for every $1 spent. He has seen how this SNAP program has helped
community members buy more local fresh produce, and thinks a rooftop farm can help continue
to change people’s mindsets about nutrition and awareness of where their food comes from.

Mayor Alcombright was in full support of establishing a farm to school system. He thinks
that children will help translate interest in local food to their parents: “if you give food to schools
and get 2nd, 3rd, 4th graders excited, they will get parents excited.” Overall, he agrees that the
rooftop greenhouse will be beneficial for the community. It will help create more jobs and it is
among many new investments in North Adams, which will help grow and support the local
economy. In the Mayor’s words, for developers, North Adams is becoming “the place to be”

Corbett Nicholas Interview: Director of Food Services at North Adams Public Schools

We interviewed Corbett Nicholas, the Director of Food Services at North Adams Public
Schools, to gauge interest in setting up a farm to school system with the rooftop farm. He was
supportive of the idea and would love to purchase the fresh produce, so long as an efficient and
organized system is put in place. The school currently participates in the “Harvest of the Month”
program, but almost all their produce come from a distributor in New York, Ginsberg Food. The
Greylock rooftop farm would not need to supply all of their produce, but would need enough
volume to be worth having a weekly pick-up from the farm. He would also need to have
assurance of the safety and quality of the produce. North Adams schools can afford to buy the
food, but they must still choose the lowest of three quotes for an item. He was also in support of connecting the farm to the classroom through field trips, visits to the school, and opportunities for local families to visit the greenhouse. His most in demand vegetables are romaine, peppers, tomatoes, cucumbers, and carrots.

Valerie Schwarz Interview: Berkshire Food Project

Berkshire Food Project (BFP) is a free meal program serving North Adams residents in need of food Monday through Friday. Valerie Schwarz is the Executive Director of the BFP. Valerie said 80-100 meals are usually served on week days, and up to 300 are served on special events like the Thanksgiving Sunday meal. Valerie says nutrition is high on the list of priorities at BFP. While people are at the BFP, she wants them to have a nutritious and balanced meal. BFP gets local food from a few farms: Caretaker Farm, Square Roots, and Many Forks Farm. One of the barriers for food access Valerie talked about was the access to food and how to transport the food. At BFP, volunteers pick up food from Caretaker Farm and Square Roots Farm and Many Forks Farms delivers to BFP. She has come in before and “green beans were hanging over the door”. A local farmer also delivers eggs to BFP. BFP has a range of local sources that only works through the community efforts to transport the food to the BFP itself without needing to fund transport and pickup.

Valerie mentioned that getting food out into the community is one of the biggest obstacles to food access in the area, since there is local availability of fresh food. Currently, community vans and Berkshire rides offer transportation, but cost is a limiting factor for those with low food security. She also mentioned the Hoosac Harvest gleaning efforts to get food out
into the community as a means of getting fresh food where those who need it can access it. Specifically relating to the Greylock WORKS project, Valerie thinks getting food out into the school is a great idea, and she even commented that the “food is horribly unhealthy” in the North Adams school where her two sons are. She also talked about how it is important not just to get the food out, but also to change the way people eat. She is supportive of the rooftop garden project and hopes the grant comes through. Valerie wants to be part of the project.

*Jen Munoz Interview: Growing Healthy Garden Program*

Jen Munoz, known as the local garden guru, facilitates school and community gardens in more than a dozen locations around Adams and North Adams. She has extensive experience with local sustainable food systems and has personally fostered connections between the community and agriculture by teaching people of all ages to harvest their own food. She has started some public school gardens and organized workshops where kids learn how the agricultural process works. The main takeaway from our conversation with her was that if a young student learns how a plant grows from a seed into a vegetable they can eat, they are usually fascinated and eager to try it. There is no better way to get kids to eat vegetables and begin healthy habits. We share the opinion with her that if students at local schools learn about local agriculture and where their food comes from at a young age, they will have a valuable understanding later in life and may also be able to grow their food themself as long as they are taught how.

---

51 Austin Banach, 2013
http://edibleberkshires.com/fall-2013/growing-healthier-habits-garden-program-plants-seeds-for-change/
Jen also emphasized that NBCC would be the best partner to reach out to. They have a history of experience in this particular community and have the desired impact area. We followed her advice and pursued the partnership. She also assisted in writing letters of support for various parties that were submitted with the grant to show the backing of the relevant parties (MCLA, Williams, North Adams Public Schools, DC Central Kitchen, mayor Alcombright’s office). Munoz also discussed with us the feasibility of our project, how we can make it work as a sustainable nonprofit, and how to have the best impact on kids in North Adams. She will also be willing to help get the community food project off the ground because she has vast experience in the way of community food and connectivity.

*Andrew Carter Interview: Blue Planet Environmental Greenhouse Consultants*

Blue Planet Environmental is a New York City consulting firm offering advisory services in the design, implementation and operation of urban agriculture projects. Our clients have decided to partner with Blue Planet to ensure they get the most out of their greenhouse roof. Andrew Carter, Blue Planet’s lead systems designer, and Henry Gordon-Smith, Blue Planet’s Director of Business Development, have spearheaded the partnership with our clients.

In our interview with Andrew, he advised our group on construction, mechanics, size and industry insight. For the Greylock Mill’s specific roof, Andrew recommended a year round, hydroponic, bay greenhouse. Along with the 1012 square foot interior of the greenhouse, a four hundred square foot outdoor support area and a two hundred square foot indoor support area will make up rooftop greenhouse structure. Andrew specializes in pairing hydroponic technology
with growing techniques to ensure the highest yields, and will guarantee that this project is technically sound.

In our conversation with Andrew, he stressed a disconnect between the greenhouse industry and those who plan to build greenhouses. The conflict stems from the fact that greenhouse and hydroponic equipment is purchased on a large scale, yet greenhouse owners try to start off on a small scale to limit overhead. The equipment is sold with a four to five acre operation in mind. What this means is that even with our one thousand square foot greenhouse, our clients will be purchasing enough equipment to operate a four-acre (one hundred seventy five thousand square foot) facility. According to Andrew, the four-acre size is the market sweet spot and break-even size for greenhouses. Our clients have surely fallen into this disconnect. In Andrew’s experience, successful greenhouses must occupy a relatively large area to be self-sufficient. With the help of Andrew and his firm, we provide our clients with industry expertise to overcome the greenhouse market inefficiencies.

Henry Gordon-Smith provided our team with a pricing estimate for the implementation phase of the project. Broken down into construction and equipment costs, the total price tag for our project is $315,970. The total square footage of our project is made up of the greenhouse area, the outdoor area and the indoor support room. In total, the project will occupy one thousand six hundred and twelve square feet. This breaks down to a cost of one hundred and ninety six dollars per square foot. In context, the four-acre sweet spot breaks down to sixty-five dollars per square foot with the cost model we were provided.
Figure 6: Price Per Square Foot Figure: This figure illustrates the relative price per square foot for the potential sizes of greenhouses that will fit on our rooftop space, as derived by Henry Gordon-Smith’s pricing model. The red column (far left) at 1012sf correlates to a cost of $196/sf. The green column (far right) is Andrew Carter’s four acre sweetspot size inputted into the cost model and correlates to a cost of $65/sf. Our proposed size is more than three times more expensive per square foot. However, the 10,000 sf column represents the maximum space of the roof and correlates to a cost of $84/sf. As this figure represents, the greenhouse will be relatively less expensive in dollars per square foot terms as the greenhouse grows in size.

Fortunately for our clients, the master plan for the rooftop includes scaling up our original one thousand square foot module. At one thousand square feet, we occupy a tenth of the roof and have a price per square foot of one hundred and ninety six dollars. If the greenhouse were to cover the entire ten thousand square foot rooftop, the cost per square foot would drop all the way to eighty-four dollars. While this is still nearly twenty dollars per square foot more than the sweet spot, the price per square foot now is more than three times the sweet spot rate. With
expansion in mind, our clients will already have the hydroponic equipment necessary to drive down the cost of expansion.

**Legal Issues**

It was brought to our attention that grant funds secured by a non-profit organization cannot be used to fund a for-profit project. In other words, our clients cannot take the prospective grant money from NBCC to build the greenhouse and then use the fruits of the greenhouse to turn a profit. Our greenhouse, and the Greylock Works project as a whole, is a for-profit venture so we must clarify how the grant’s funds will be used.

As our clients informed us, the for-profit entity (our clients) can issue a lease to the non-profit entity (NBCC) for partial use of the facility and partial yields of the produce. NBCC will rent the right to use the greenhouse and use the grant funds to support its local food mission via educational opportunities and portions of the produce. The matched funds, procured by our clients, will fund the for-profit agenda of the greenhouse.

The ethical balance at hand is ultimately the responsibility of our clients, who must be sure to establish a clear for-profit non-profit delineation to keep the project legal. In the scope of our project, the combination of for-profit and non-profit entities creates added diversity to further advance the successful possibilities of the project.
Alternative Funding Sources

In terms of sources that would help with the maintenance of the overall food operation, there are a number of grants that are based out of the USDA. One possible program that can be used in the future is the Farm to School Grant Program. The grants in this program are designed to increase availability of local foods in school. Grants range from $20,000 to $100,000.\footnote{“Farm to School Grant Program,” USDA} A local fund would be through the Carrot Project. This fund provides capital as well as business and financial management to small and mid-sized farmers using sustainable or organic practices serving markets within the greater Berkshire area or nearby states.\footnote{“Greater Berkshires,” The Carrot Project}

There are also a few grants in the USDA related to energy and renewables, which could help decrease costs associated with the production of the food. One grant program is through the Energy Quality Incentives Program (EQIP). This is open to any applicant that is considered an agricultural producer, has control of the land, in compliance with land conservation. The applications are accepted on a continuous basis. Through EQIP, NRCS (National Resources Conservation Service) provides technical and financial assistance to conservation practices that benefit soil, water, air, plants and animals.

There are also grants that can help with energy efficiency. This is a way for the greenhouse operation to decrease costs in the future. One of these is the Rural Development’s Energy for America Program (REAP), which is due in the spring. REAP helps fund renewable
energy systems, so could help with powering the greenhouse. REAP will fund up to 25% of eligible project costs. Another energy related source of funding would be the Mass Farm Energy Program, which is part of the Massachusetts Department of Agricultural Resources. This grant supports farms interested in “energy, conservation and renewables.” The incentives are based on the total projected annual energy savings. The Agricultural Energy Grant Program given out by the Department of Agricultural Resources (DAR) is also one that provides reimbursement for up to $20,000 of operational energy efficiency improvements and alternative clean energy adoptions.

Philanthropic sources of funding are also possible through the Blue Moon Fund, W.K. Kellogg Foundation and the Ford Foundation. The Blue Moon Fund has shown interest in the promise of food hubs and building human and natural resilience. The W.K. Kellogg Foundation supports efforts to create conditions to help vulnerable children to achieve success. This broad goal can be reached through food and providing healthy and affordable foods. The Ford Foundation has also historically been a supporter of food systems and has specific initiatives related to food hubs.

**Alternative Expansion Plans: Freight Farming**

We believe it would be beneficial for the greenhouse to expand past the initial module size for maximum efficiency and to increase the amount of food that can be produced at

---

54 “Rural Energy for America Program,” Energy.gov
55 “Agricultural Energy Grant Program,” Mass.gov
Greylock WORKS. If there is space on the ground level on site, there could be a future outdoor seasonal garden, or another greenhouse like the rooftop one. One idea is Freight Farming as another alternative to greenhouses. It is a new model originating out of a startup in Boston. The idea is to have a contained hydroponic system within a freight shipping container (40’ x 8’ x 9.5’).  

“It arrives, you plug it in, and are growing on day one;” said a customer of this model. It can be managed anytime anywhere with its connection to the Cloud. It is a modular and stackable design, which makes it easy to scale up. The vertical towers is a dense growing space with room for over 4,500 plants, including lettuce, which is in high demand in the area. This is a plausible and unique option to expand the hydroponic production as part of Greylock WORKS.

**Evaluation Matrix**

We chose to do a Planning Balance Sheet with comparisons of the costs and benefits of a few different alternate plans for the greenhouse (See Figure 6). This matrix examines the non-monetary measurements of different business models. Each of the plans would benefit from all season availability from the greenhouse. Plan A is a fully non-profit model that includes Farm to School and education. The benefit here is mainly for the schools and the students. The greenhouse itself at Greylock WORKS would have a positive reputation in the community for focusing entirely on food access in the community. The school would get a higher percent of the produce, but might have to pay a higher price. The students would directly receive this benefit.

---

56 “Freight Farms”  
57 “LaGrasso Bros”  
58 “Freight Farms”
and would benefit from programming with the greenhouse. Wild Oats and restaurants would receive no benefits from this model, and community members beyond the school system would have little access to the produce. This model would give a great community reputation with the input into the schools, but would struggle to remain financially sustainable.

Another alternative plan is fully for-profit model involving selling to Wild Oats and restaurants in the area. This model would be self-sustainable and likely maximize profits by selling at higher prices but would not be involved nearly as much in the North Adams community with helping improve food access. Wild Oats and the restaurants would receive produce from the greenhouse and the schools would struggle to compete with the prices that Wild Oats and restaurants would offer. Finally, the model we think would be the most effective, and the model that is in line with the grant proposal is the mixed non-profit and for-profit model. The greenhouse would be self-sustainable with profit from Wild Oats and restaurant sales subsidizing the lower prices for the produce for the schools. Nutrition and education around food would increase from programming with the greenhouse. This model connects for profit and nonprofit sectors of the food industry. The mixed model plan takes most of the benefits of the fully non-profit and fully for-profit model to produce a self sustaining greenhouse that would provide food to the schools and would ideally expand in size to serve a larger population. The mixed model plan is the most beneficial for a few different sectors of the town and for the community.
<table>
<thead>
<tr>
<th>Producer</th>
<th>Benefit</th>
<th>Cost</th>
<th>Consumer</th>
<th>Benefit</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greenhouse</td>
<td>- Great community reputation - Reach greater proportion of those in need</td>
<td>- Not financially independently sustainable - Need constant large fundraising efforts - People who want to survive on the food can't rely on it always being there</td>
<td>Wild Oats</td>
<td>- None</td>
<td>- No produce from project</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Restaurants</td>
<td>- None</td>
<td>- No produce from project</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Schools</td>
<td>- Get larger percent of produce - Might have to pay a higher price - Are the focus of the project and can have more control of it</td>
<td>- Production less reliable if not financially stable - Added time/effort of getting food from the greenhouse and using in meals - Food safety concerns?</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Students</td>
<td>- Get larger percent of produce in short term - Get to visit the greenhouse for edu</td>
<td>- Supply of produce not reliable in future without financial stability</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Community Members</td>
<td>- Do not get produce at restaurants or Wild Oats</td>
<td>- Less actual job opportunities (only volunteer opportunities)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Greenhouse</td>
<td>- self-sustainable - maximizing revenues - ability to sell at highest price</td>
<td>- unhappy community members - price negotiations - at the mercy of consumers in terms of products</td>
<td>Wild Oats</td>
<td>- new producer - local food - ability to solve seasonality issue</td>
<td>- high price of food - limited scale</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Restaurants</td>
<td>- ability to get necessary and fresh food - ability to solve seasonality issue</td>
<td>- competition with other restaurants on price - limited scale</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Schools</td>
<td>- fresh local food</td>
<td>- disadvantage over restaurants due to lack of capital</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Students</td>
<td>- the small amount of food would be local and fresh</td>
<td>- not fulfilling the full needs</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Community Members</td>
<td>- solves seasonality in restaurants - job creation?</td>
<td>- dissatisfaction with business model - no increase in food availability</td>
</tr>
</tbody>
</table>

Plan A: Fully Non-Profit (Farm to School and Education only)

Plan B: Fully For-Profit (Sell to Wild Oats and Restaurants)
Figure 7: Evaluation Matrices for the Rooftop Mill funding sources

**Long-term Recommendations**

The main grant that Latent Productions applied for involves a major community food project component, which will involve giving food to North Adams community members at no cost or at relatively low prices. As time goes on, however, the amount of capital from the initial grant will begin to shrink and the greenhouse operation will have to look into ways of subsidizing selling food at cheap prices. One way to do this is to sell the produce to restaurants in the area, which can attract more customers by serving locally grown food. Due to the large number of local restaurants and the large demand for fresh food, this would allow for the sale of produce at the highest price and would maximize profit margins.
One other sales option is engaging with local food markets. SNAP benefits make it easier for locals to purchase locally grown fresh food. Thus although this doesn’t maximize profits for the greenhouse as selling to restaurants would, it would engage a wide variety of community members and would thus benefit the community more than the restaurant option.

Another important factor that Mayor Alcombright talked about as it pertains to food safety and education in North Adams was the success of promoting the consumption of locally grown food through kids. As the mayor said, getting kids excited about food and having them talk about it with their parents promotes the consumption of local food and helps create healthier diets. Thus, one thing that the greenhouse could provide is a space where kids could come in and learn about how food is grown and potentially about renewable energy. This, however, would only be an opportunity once the greenhouse expands past the initial stage of 1,000-3,000 square feet.

**Conclusion**

The grant was successfully submitted on November 30th, 2015 with NBCC as the main applicant. Latent NYC plans to start constructing the initial module of greenhouse in the spring of 2016 with the hope of continuing expansion over time. If the operation is successful, this greenhouse has the opportunity to improve year round food security as well as provide a boost for the local economy in North Adams. Not only will it provide produce for local retailers and schools, but it will be a year-round source, an educational experience and a model for New England year round growing. Also, we hope that the greenhouse will be able to help increase
North Adams’ sense of community by allowing people to interact and come together through growing, preparing, and eating locally grown produce.
Cited Interviews

1. Michael Pollan, Author, October 20, 2015

2. Corbett Nicholas, Director of Food Services for North Adams Public Schools, November 12, 2015


4. Amanda Chilson, Northern Berkshire Community Coalition, November 10, 2015

5. Jen Munoz, November 12, 2015

6. Valerie Schwartz, Berkshire Food Project, November 23, 2015

7. Leigh-Anne Nicastro, Wild Oats, November 2, 2015

8. Sarah Heuser, Burlington Vermont Farm to School, November 30, 2015 (phone)

9. Andrew Carter, Blue Planet Environmental, November 29, 2015 (phone)
References


“American FactFinder,” United States Census Bureau. 

Ballard, Mark “The World’s Largest Rooftop Farm,”

"Berkshire County Harvest Calendar - Local Food Guide MA." Berkshire County Harvest Calendar - Local Food Guide MA. Web. 16 Dec. 2015.


   iBerkshires.com August 7, 2015. 


“Farm to School Grant Program,” USDA. 


“Greater Berkshires,” The Carrot Project 


<http://www.buxtonschool.org/about/sustainabilityatbuxton>.


USDA & NIFA. Community Food Projects Competitive Grant Program RFA.  
<http://nifa.usda.gov/sites/default/files/rfa/FY%202016_CFP%20RFA.pdf>

<http://cris.nifa.usda.gov/cgi-bin/starfinder/0?path=fastlink1.txt&id=anon&pass=&search=%28GC=LN.B;LN.C%29%20AND%20%28IY=2015%29&format=WEBTITLESIGY>

USDA & NIFA. Logic Model Planning Process.  
<http://nifa.usda.gov/resource/logic-model-planning-process>

USDA National Agricultural Library. Hunger Free Communities.  
<http://ric.nal.usda.gov/10583>