Planning the Greylock Mills Rooftop Greenhouse: A Community Food Project

Costantini, Hill, Bidstrup, Schidlovsky, Ryan
Project Goals

Main Goal: Planning a rooftop greenhouse to increase food security in North Adams

→ Recommendations for the USDA Community Food Project Grant Program proposal

1. How will we serve the community?
2. Who will buy/use the produce?
3. What will we grow?
4. How will we grow?
Site Description and History: Greylock Mills

- Lower roof part of Greylock Mill on the Mohawk Trail
- Old cotton spinning facility
  - 1870 – 1930
- 240,000 square feet
  - Rooftop = 30,000 square feet
  - 1,000 square foot greenhouse module
- Brick, steel, and wood structure will hardly need to be modified to suit our needs
- Panoramic view
Community Profile: North Adams

- settled in 1745
- least populous city in the state
- 09-13: median income was $38,317 ($66,886 in MA)
- 22% of population below poverty line
- crime index almost double that of national average

<table>
<thead>
<tr>
<th>Year</th>
<th>Pop.</th>
<th>±%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1880</td>
<td>10,191</td>
<td>—</td>
</tr>
<tr>
<td>1890</td>
<td>16,074</td>
<td>+57.7%</td>
</tr>
<tr>
<td>1900</td>
<td>24,200</td>
<td>+50.6%</td>
</tr>
<tr>
<td>1910</td>
<td>22,019</td>
<td>—9.0%</td>
</tr>
<tr>
<td>1920</td>
<td>22,282</td>
<td>+1.2%</td>
</tr>
<tr>
<td>1930</td>
<td>21,621</td>
<td>—3.0%</td>
</tr>
<tr>
<td>1940</td>
<td>22,213</td>
<td>+2.7%</td>
</tr>
<tr>
<td>1950</td>
<td>21,567</td>
<td>—2.9%</td>
</tr>
<tr>
<td>1960</td>
<td>19,905</td>
<td>—7.7%</td>
</tr>
<tr>
<td>1970</td>
<td>19,195</td>
<td>—3.6%</td>
</tr>
<tr>
<td>1980</td>
<td>18,063</td>
<td>—5.9%</td>
</tr>
<tr>
<td>1990</td>
<td>16,797</td>
<td>—7.0%</td>
</tr>
<tr>
<td>2000</td>
<td>14,681</td>
<td>—12.6%</td>
</tr>
<tr>
<td>2010</td>
<td>13,708</td>
<td>—6.6%</td>
</tr>
<tr>
<td>2011</td>
<td>13,648</td>
<td>—0.4%</td>
</tr>
<tr>
<td>2012</td>
<td>13,609</td>
<td>—0.3%</td>
</tr>
<tr>
<td>2013</td>
<td>13,470</td>
<td>—1.0%</td>
</tr>
<tr>
<td>2014</td>
<td>13,354</td>
<td>—0.9%</td>
</tr>
</tbody>
</table>

* = population estimate. Source: United States Census records and Population Estimates Program
Community Perceptions of the Project

From Berkshire Regional Planning Commission Local Food and Agriculture Vision:

“A place where… Eating local, healthy foods is promoted through education, networking opportunities, and economic development activities. It is also made possible for those of limited income or mobility to access more healthy food options at affordable prices to foster a hunger-free community.”

- North Adams Community Development Office
- Mayor Richard Alcombright
- Community Comments
Local Food Demand and Production

- demand outstrips supply
- institutional demand
- restaurant demand
- Dependability and seasonality
- addressing food insecurity

http://www.heirloomfm.org
http://williamstownchamber.com/directions/wild-oats-market/
Table FA4: Berkshire County Food Insecurity

<table>
<thead>
<tr>
<th>Population</th>
<th>130,886</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food Insecurity Rate</td>
<td>10.9%</td>
</tr>
<tr>
<td>Estimated Number of Food Insecure Individuals</td>
<td>14,200</td>
</tr>
<tr>
<td>Percent below SNAP threshold of 200% Poverty</td>
<td>71%</td>
</tr>
<tr>
<td>Percent above SNAP threshold of 200% poverty</td>
<td>29%</td>
</tr>
<tr>
<td>Child (Under 18) food insecurity rate</td>
<td>17.2%</td>
</tr>
<tr>
<td>Estimated Number of Food Insecure Children</td>
<td>4,350</td>
</tr>
</tbody>
</table>

Source: Feeding America, 2012

Seeking food assistance sometimes could not or could not afford to eat balanced meals 50.9%
USDA Community Food Project (CFP) Grant

- What is a CFP?
- Eligibility
  - non-profit partner

Previous USDA Community Food Projects

Examples:

- American Samoa Community Hydroponics Development Project ($400,000)

- Serving and Learning: Students in Kentucky ($90,000)

http://www.farmbasededucation.org/page/q-a-with-chelsey-simpson
WRITING THE GRANT NARRATIVE

There are seven parts to the grant narrative:
1. The Community to Be Involved in the Project and the Needs to Be Addressed
2. The Organizations and Communities Involved in the Project
3. Project Goals and Intended Outcomes
4. Activities to Achieve the Goals
5. Relationship to Program Objectives
6. Evaluation
7. Self-Sustainability
Farm to School and School Food Laws

- Massachusetts Farm to School
  - Goals
  - History
- School Nutrition Standards
- National School Lunch Program
- North Adams Public Schools

http://www.massfarmtoschool.org/
Partnering with NBCC

- 29 years
- Monthly forums attended > 80 people
- Specific programs already address health and nutrition
- They would benefit from adding an educational program in which kids learn about healthy food, growing food, where the food on their plates comes from
- In general: they build infrastructure necessary to deliver the programs that help improve the community
Greenhouse Technology and Examples

- Soil vs. Hydroponics
- Four Season Farm
- Bright Farms
Berkshire County Harvest

<table>
<thead>
<tr>
<th></th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peppers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cucumbers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tomatoes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Basil</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spinach</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lettuce</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Microgreens</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kale</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Legend:
- Green: fresh and in season
- Dark green: available from storage

FarmFresh.org

The farms & food of Southern New England
Hydroponic Yields

- multiple hydroponic systems
- 1,996.3 pounds of food consumed per person
- 300,000 pounds distributed by Food Pantry in North Adams

<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>Cucumbers</td>
<td>5 - 6</td>
<td>5,500</td>
<td>110,000</td>
</tr>
<tr>
<td>Tomatoes</td>
<td>9 - 12</td>
<td>10,500</td>
<td>210,000</td>
</tr>
<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>
Case Study: Gotham Greens Rooftop Greenhouses

- Year-round rooftop greenhouses in 3 locations
- Retailers and restaurants
- Hydroponic, pesticide-free
- Sustainability

http://www.agriculture.ny.gov/cg/CGUrban.html
http://gothamgreens.com/
Case Study: Farm to School in Vermont

- Sarah Heusner—Farm to School Coordinator
- History
- Funding and current state
- Programming and education

Interview: Greenhouse Consultant

- Andrew + Henry @ Blue Planet Environmental
- Bay, year round, hydroponics
- Emphasized multi-outlet model
- Size disconnect
- Scaling up

Henry Gordon-Smith
Director of Business Development

Andrew Carter
Lead Systems Design
<table>
<thead>
<tr>
<th>Total Costs</th>
<th>Square Footage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction Protection</td>
<td>Greenhouse</td>
</tr>
<tr>
<td>Architectural</td>
<td>1012 sf</td>
</tr>
<tr>
<td>Specialty Equipment</td>
<td>Support room</td>
</tr>
<tr>
<td>Plumbing</td>
<td>200 sf</td>
</tr>
<tr>
<td>Sprinklers</td>
<td>Outdoor +</td>
</tr>
<tr>
<td>HVAC</td>
<td>400 sf</td>
</tr>
<tr>
<td>Electrical</td>
<td></td>
</tr>
<tr>
<td>+ Partners’ fees</td>
<td>1612 sf</td>
</tr>
<tr>
<td>~$316,000</td>
<td>$316,000</td>
</tr>
<tr>
<td></td>
<td>1612 sf</td>
</tr>
<tr>
<td></td>
<td>= $196 /sf</td>
</tr>
</tbody>
</table>
Interview: Wild Oats

- Met with Leigh-Anne Nicastro
- Commitment from her
- Community Food Project

Interviews: Jennifer Munoz

- Facilitates school and community gardens
- No better way to get kids to eat vegetables than showing them how the growing process works
- Assisted Liz in getting letters of support (MCLA, Williams, North Adams Public Schools, DC Central Kitchen, mayor’s office)
- Key resource for grant application
Interview: Corbett Nicholas

- In support of project
- “Harvest of the Month”
- Current food sources
- Incorporate into curriculum

http://www.napsk12.org/
http://chiefmarkets.com/products/produce
Interviews: Val Schwarz

- Executive Director
  Berkshire Food Project (BFP)
- Transport as an obstacle in food access
- Her take on our rooftop greenhouse project

http://www.berkshirefoodproject.org

Interviews: Mayor Alcombright

- Involvement in Greylock WORKS
- Increase community interest in local food and sustainability
- In support of Farm to School
- North Adams as the “Place to Be”
From the grant description:

“The primary goals of the CFP are to: … Promote comprehensive responses to local food access, farm, and nutrition issues; and meet specific state, local or neighborhood food and agricultural needs including needs relating to: equipment necessary for the efficient operation of a project; [and] Planning for long-term solutions”
Alternative Funding Sources

Grants

- food operation
  - Farm to School
  - Carrot Project
- energy efficiency
  - REAP
  - AEGP

Philanthropy

- Blue Moon Fund
- Ford Foundation
- W.K. Kellogg Foundation
Evaluation Matrix

- Fully non-profit
- Fully for-profit
- Mixed non-profit and for-profit
<table>
<thead>
<tr>
<th>Producer</th>
<th>Benefit</th>
<th>Cost</th>
</tr>
</thead>
</table>
| Greenhouse | - Self sustainable  
- Increases food access in North Adams  
- Connects different sectors of food industry | - Less profit than fully profit model  
- Managing connecting food to multiple consumers |

<table>
<thead>
<tr>
<th>Consumer</th>
<th>Benefit</th>
<th>Cost</th>
</tr>
</thead>
</table>
| Wild Oats | - Able to sell local food and support a new business  
- Fresh taste  
- All season availability | - Food bought for higher price  
- Less food purchased |
| Restaurants | - Able to sell local food  
- All season availability  
- Fresh taste | - Food bought for higher price  
- Less food purchased |
| Schools | - Low price, local, healthy food to include in the school lunch  
- If meals are more attractive to faculty and staff, this income will help the food program overall invest more locally and taste-wise | - Added time/effort of getting food from the greenhouse and using in meals  
- Food safety concerns  
- Less food available for school |
| Students | - Able to have fresh, local produce at lunch  
- Nutritional education | - none |
| Community Members | - Nutritional education  
- Create jobs and volunteer opportunities  
- New fresh taste  
- Increased food security for North Adams | - none |
Recommendations for Future Development

- restaurants
- local farmers markets
- food education
Conclusions

- Grant successfully submitted with NBCC
- How does this project meet the grant criteria?
  - Improve food security in North Adams
  - Opportunities for education
  - Connect community through food
Acknowledgements

- Sarah Gardner
- Liz Stretch
- Sal Perry and Karla Rothstein
- Corbett Nicholas
- Jen Munoz
- Mayor Richard Alcombright
- Val Schwarz
- Andrew Carter
- Sarah Heusner
- Leigh-Anne Nicastro