Assessing Adaptive Capacity of Farmers: A Pilot Study in the Pioneer Valley

Angelica Carey, MRP and MSS, University of Massachusetts Amherst
Elisabeth Hamin, Professor of Regional Planning
USDA Northeast Climate Hub Partners Meeting
Rutgers University  3/14/18
GOALS

- Evaluate farmers’ adaptive capacity to climate change issues specific to PV region
- Using total farmers’ adaptive capacity scores, evaluate resiliency of PV region with a rating scale
- Adaptive Capacity only included three aspects of many others: Knowledge, Actions, & Use of Resources
- Adaptive Capacity Index would be comparable across counties and regions to find intervention points where extension and organizations could support
- Develop a highly structured interview form for farm comparison
PIONEER VALLEY
ADAPTIVE CAPACITY

- Resiliency includes different types of capital:
  - Social, Financial, Political, Business, Educational, etc.

- Capital types can each be measured to comprise a total resiliency score

- Resiliency v. Adaptive Capacity: Adaptive Capacity allows for depreciation or growth and includes many factors

- FOR THIS PILOT, 100% Adaptive Capacity was divided equally amongst:
  - 33% = Knowledge (professional/scientific) of climate change impacts and personal experience to changes in weather
  - 33% = Past actions taken to experienced weather changes (which will indicate likelihood to take action in future)
  - 33% = Awareness and use of resources (i.e. grants/subsidies, organizational support, technical advising) and best management practices
RESEARCH QUESTIONS

- What is each farmer’s total Adaptive Capacity when considering each of these components?

- What is the adaptive capacity for each county and greater Pioneer Valley?
### INTERVIEW SAMPLE

<table>
<thead>
<tr>
<th>County</th>
<th># Farms in Contact List</th>
<th># Towns Represented</th>
<th># Farms Surveyed</th>
<th># Towns Represented</th>
</tr>
</thead>
<tbody>
<tr>
<td>Franklin County</td>
<td>99</td>
<td>23</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Hampshire County</td>
<td>87</td>
<td>17</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Hampden County</td>
<td>42</td>
<td>17</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>218</td>
<td>57</td>
<td>10</td>
<td>7</td>
</tr>
<tr>
<td>Rate Surveyed</td>
<td></td>
<td></td>
<td>0.046</td>
<td>0.123</td>
</tr>
</tbody>
</table>

- 12 Question Structured Interview (Likert & Open-Ended)
- 10 farmers from 7 towns in Pioneer Valley, all <10 miles of CT River
- # Questions that addressed Knowledge: 8
- # Questions that addressed Actions: 4
- # Questions that addressed Resources: 7
COMBINED KNOWLEDGE

- 80% farmers noticed changes to farming
- 80% agreed they changed their farming methods in response to Climate Change
- Only 1 farmer had Climate Change knowledge specific to local geography
- 70% articulated belief in climate change, but in differing degrees, often ambiguous or would contradict
- Mostly unsure if climate change impacts would be more positive or negative
- When asked if climate change would impact their ability to farm now v. future, more responded in future
ISSUES & ACTIONS

- Issues amongst Farmers
  - Precipitation (36%) – Drought, Dry Weather & Wetter Periods
  - Temperature (19%) – Seasonal Changes (Earlier start, longer season, temperature changes in season)
  - Irrigation (16%) – Included Municipal Water Use
  - Other issues included: Yield Loss, Diseases/Pests, Labor Costs & Government Regulation

- Actions Taken by Farmers (Reaction & Future)
  - Irrigation (33%)
  - Soil Technique Manipulation (19%)
  - Costs associated with Labor (14%)
SUPPORT & RESOURCES

- 80% were unaware of practices/recommendations/policies related specifically for climate change

- BUT, 90% agreed they felt slightly to highly prepared to start following these if they knew of them

- ~50% identified regional organizations that “support farmers with climate change preparedness” → Based on past work history and not actual use of climate change resources

- Organizations = CISA, Farm Bureau, USDA (nonprofit & government)

- Mistrust and broken relationships with Government and Extension

- 80% would still welcome future aid for climate change adaptation
# FARMER PROFILES

<table>
<thead>
<tr>
<th>Adaptive Capacity Farms</th>
<th>Combined Knowledge</th>
<th>Past Actions</th>
<th>Support and Resources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average</td>
<td>17%</td>
<td>22.48%</td>
<td>17.59%</td>
</tr>
</tbody>
</table>
Exceptional: 80.5%
Satisfactory: 64%
Progressing: 49%
Needs Improvement: 33%

Farms in Hampshire performed best
Hampden farms performed worst

Index scaled according to farms’ scores

ADAPTIVE CAPACITY TOTALS FOR EACH FARM
PIONEER VALLEY
ADAPTIVE CAPACITY

Total Score for Region = 53.51% ➔ Progressing
RECOMMENDATIONS

- Continue to test interview form to finalize and distribute for use (by extension)

- Increased federal/state support to advise farmers for Voluntary Environmental Farm Plans

- States agencies collaboratively create a Rural Land Stewardship Guide

- Continue scientific research on climate and agriculture and share knowledge and best practices

- Work with agricultural stakeholders to advance both climate and farming sectors and offer aid

- Incorporate regional planning agencies and local town plans/climate initiatives into Index to provide accuracy at finer grain of data
CONCLUSION

- Farmers know how to adapt, they just may not have all of the knowledge or resources to do so that is *most effective*.

- Farmers are open to learning about climate change science and best practices, and most are willing to accept aid.

- Many factors to consider when understanding adaptive capacity/resiliency → all are important but not necessarily equally.

- Agricultural best practices designed to regional climate change impacts are needed and this must be shared with all key players.

- More funding and educational outreach is needed to support small farmers who may want to adapt but do not have that capacity.