

Farmer-Driven Climate Smart Decision-Making for the Northeastern United States

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Regional Climate Change & Agriculture

Agriculture in the Northeast (NE) is characterized by a diversity of products and production systems, scales of operations, and landscapes. Farmers need a variety of practices and tools to inform their decisions regarding climate change adaptation and mitigation.

Top agricultural products in the region:

- Dairy and Livestock
- Vegetables
- Field Crops and Pasture
- Tree Fruit, Berries, and Grapes
- Horticultural Products
- Aquaculture
- Maple Syrup



Figure 1. Map of the US Northeast Climate Hub.

Motivation

As farmers in the NE face increasing climate variability and change, researchers and extension specialists need to provide them with user-friendly climate change information and tools, to help them make climate-informed decisions. Land grant universities partnering with the USDA Northeast Climate Hub are developing new extension materials, toolkits of adaptation practices, and web-based decision-support tools, grounded in baseline assessments of risks and needs, and based on ongoing input from extension specialists and farmers.



Key Climate Risks

The following are the most critical effects of climate change on NE agriculture, based on our analysis of state and regional assessments:



- Increased temperatures and evapotranspiration, leading to changes in soil moisture, risk of short-term drought, heat stress, and enhanced fire risk
- Shorter, warmer winters, earlier onset of spring, and longer growing seasons
- Increased extreme precipitation, leading to flooding, and soil erosion and deposition
- Increases in disease, pests, and pathogens

Analyzing the Literature

Agricultural adaptation strategies must incorporate **farmers' values, beliefs, goals, and social networks** in order to be successful (Bartels, 2012).

- We summarized 60+ studies from 2000-2014 on the views and actions of U.S. agricultural stakeholders towards climate change.
- Agricultural stakeholder views on climate change have been well characterized in the Midwest and Southeast, but not in the NE.



Research Methods

- 1) **Baseline assessment** of the climate change impacts on key NE agricultural crops and livestock
- 2) **Literature review** of farmer and extension specialist attitudes about climate change beliefs and actions
- 3) **Informal interviews** with farmers in New York, which were videotaped and transcribed to identify adaptation and mitigation themes
- 4) **Participant observations** at regional agricultural meetings with extension specialists and farmers
- 5) **Surveys** of NE research and extension capacity and stakeholder views

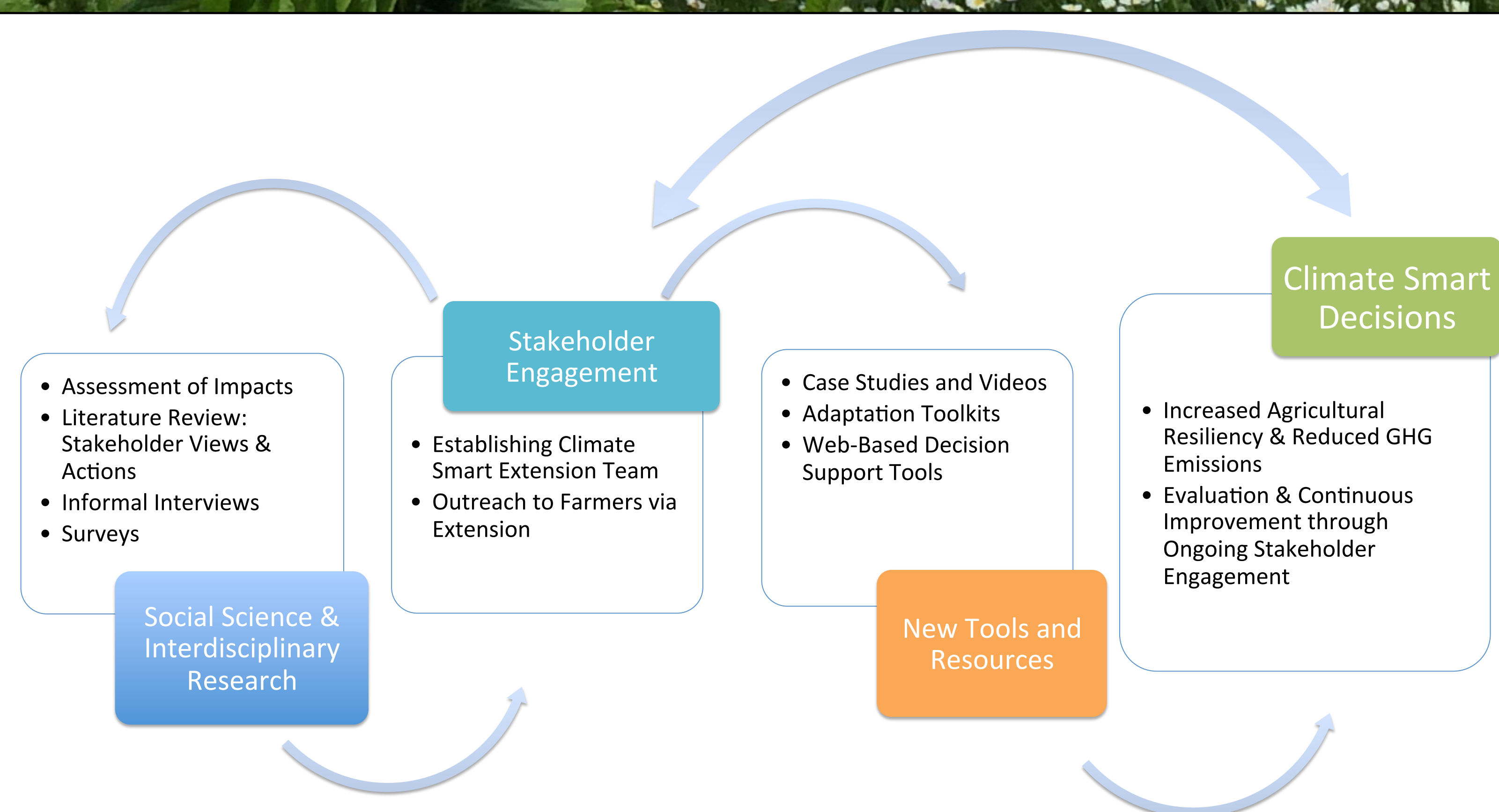


Figure 2. Collaborative Framework for Developing Climate Smart Farming Practices, Tools and Resources.

Stakeholder-Informed Tools and Resources

Baseline assessment highlights the need for:

- **Social Science Research:** Conducting an extensive survey of research and extension capacity with the 15 universities in the NE Hub, and a comprehensive stakeholder survey of farmers and consultants in the region
- **Extension Support:** Creating a statewide Climate Smart Farming Extension Team of agricultural specialists in New York
- **Peer-to-Peer Farmer Education:** Developing video clips and case studies of farmers discussing impacts and adaptations on their farm
- **Decision-Support Tools:** Developing web-based tools to help farmers make climate-informed decisions, and toolkits of adaptation practices
- **Partnerships:** Cultivating partnerships with agencies and foundations to fund long-term, transdisciplinary research, from the farm to regional level



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