1.0 Agriculture and Food Systems

Brief Summary of Program

Our research and education is directed toward improvement of the global food system as a whole from “farm to table” and including analyses of domestic and international policies affecting the system, food security and hunger. Extension and research programs fit within the University's priority of global health, defined as research, service, and training that address health problems that transcend national boundaries, that disproportionately affect the resource-poor, and that are best addressed through multidisciplinary solutions. Domestic programs enhance and may directly contribute to work internationally and particularly in developing countries. Programs cover multiple aspects of global food security such as soil resources and soil health, crop plant genomics, field evaluation of crops, reliable production guidelines, genetic improvement of animals and animal production, economics of production and farm management, integrated pest management, healthy produce, fruit and vegetable production and storage and facilitation of sustainable agriculture. Education complements research by encouraging farmers to grow new crop varieties and employ new production and business practices, through programs for agriculture sector businesses, by informing consumers about improved food products, and encouraging adults to serve the foods to children. Research analyses and education also affect policies to reform governmental food-related programs.

Research and extension programming to ensure agriculture, horticulture, and related business vitality is critical to the land grant mission. Cornell University has a commitment to farm and agricultural/horticultural business industries and to assist key decision makers in making the best choices in managing their farms or agriculturally related businesses. Research and educational programs help business owners improve productivity and sustainability through resource management, facilitate adoption of new technologies and practices, improved marketing strategies and business management skills and identifying alternative enterprises. Farm businesses, horticulturist, and natural resource managers utilize research-based knowledge to continue producing a stable, safe and affordable food, feed, fiber, and fuel supplies and robust, attractive horticultural plants in economically and environmentally sustainable ways.

Cornell University has a commitment to agriculture, horticulture, and natural resources enterprises and to assisting them in making the best choices when selecting production principles and practices to enhance economic and environmental sustainability in spite of changing climates. We provide comprehensive research and education programming focused on assessing existing and new production-management practices and techniques with special emphasis on agricultural environmental management. As part of our strategy, we emphasize integration of research and extension to accelerate: identification of problems, focusing scientific effort to resolving problems, field-testing and evaluation of technology and cultural practices, and implementation of environmentally superior innovations/practices for the agricultural, horticultural, and natural resource communities.

Situation and Priorities Statement

Agricultural and food industries contribute an estimated $30 billion a year to New York State’s economy. Improving production efficiency, and quality and safety of plants and animals in agricultural, horticultural, and natural resource production systems is fundamental to improving our ability to compete in a global economy. Managers of New York’s 36,000 farms and horticultural operations, and 3,000 natural resource producers face dynamic and complex production environments, including changing climatic trends. Extensive knowledge and skills are needed for identifying, selecting, and adopting principles and practices that optimize production management and improve profitability and sustainability in accordance with business goals. Technologies such as genetic engineering, satellite imagery and GIS, computer aided management decision tools are readily available today for adoption and use. Technical assistance providers have similar needs to remain up-to-date and able to provide appropriate recommendations for each enterprise.

Protecting and improving the integrity of our environment and maintaining ecological systems enable human prosperity. Expanding human populations cause growing consumer demands on the agriculture and food system. A finite or decreasing available land base and changing climates impose additional constraints. This magnifies challenges of balancing food production and processing with land stewardship and protection of the environment. The long-term sustainability of agriculture is inexorably linked to environmental quality.

Program priorities include: protecting and enhancing soil resources, crop plant genomics, field evaluation of crops, reliable production guidelines, genetic improvement of animals and animal production, economics of production and farm
management, integrated pest management, healthy produce, fruit and vegetable production and storage, facilitation of sustainable agriculture and analyses of food system policies. Education promotes use or development of new crop varieties and employment of new production and business practices, supports a viable agriculture business sector in the economy and informs consumers about improved food products and how to improve their food security. Promoting understanding of the economic and social roles of agriculture is important to sustainability of the agriculture sector.

Assumptions

- New science is needed for the production and procurement of adequate and acceptable nourishment for the world’s population.
- Tackling the issues of global food security and hunger requires multidisciplinary, multi-institutional and collaborative research and extension efforts.
- Addressing hunger involves not only providing adequate calories but also meeting total human nutritional needs.
- Food system research and education must encompass a broad spectrum of from the study of basic plant and animal genomes, to effective and efficient production, to marketing, distribution and consumption practices, to policies affecting the quality and availability of a secure food supply.
- Integrated systems approaches are needed to expand our understanding of trade-offs and develop BMPs that better address current and future challenges as well as food safety.
- Producers, horticultural business people, and natural resource managers often are not fully aware of or skillful in managing production principles and practices that may help optimize their operations for economic and environmental sustainability and/or business management and development needs.
- Many agricultural/horticulural/natural resources businesses have opportunity to strengthen profitability through improved planning and management.
- There is opportunity for growth in the agricultural/horticulural/natural resources sectors through alternative, new, and value added enterprises which may not be apparent to potential investors.
- The supply and effective management of labor resources is a key to the viability of agricultural/horticulural/natural resources enterprises.
- Producers, horticultural business people, and natural resource managers often are not fully aware of potential environmental impacts of their operations and/or requirements and opportunities of environmental regulations and programs.
- Technical assistance providers relied upon by producers, horticultural business people, and natural resource managers have parallel needs for current information on appropriate production practices.
- In most cases, it is possible to simultaneously meet economic and environmental sustainability goals.

Ultimate Goal(s) of the Program

- Boost US agricultural production.
- Improve global capacity to meet growing food demand in spite of changing climate.
- Foster innovation in fighting hunger by addressing food insecurity in vulnerable populations.
- Assure the long-term viability and well being of the agricultural/horticulture industry and rural communities in New York State.
- Promote economically and environmentally sound products and practices, and safer and healthier products.
- Assist producers, horticulture businesses, and natural resource managers to optimize production management and improve profitability and sustainability in accordance with their goals.
- Increase the use of sustainable practices to result in improved or protected soil, air and water quality and production of high quality and safe food and fiber.
- Improve soil health and productivity, resulting in increased farm profitability and improved environmental quality.

Activities

This is a comprehensive program entailing a wide range of applied research activities and multiple education methods depending on context and need. Campus-based faculty and extension associates, regional specialists and county-based educators all are involved in designing, implementing, and evaluating tailored educational efforts depending on the focus and scope of their role.

Multi-disciplinary, multi-institutional and collaborative program examples include: Collaborative Crops Research Program (CCRP), Cornell-Eastern Europe-Mexico International Collaborative Project in Potato Late Blight Control (CEEM), Cornell International Institute for Food, Agriculture and Development (CIIFAD), Institute for Genomic Diversity (IGD), Institute for
Global Learning, International Integrated Pest Management, International Programs Initiative for Biotechnology, International Research and Scientific Exchanges, Program in International Nutrition, Strategic World Initiative for Technology Transfer (SWIFTT), and The Essential Electronic Agricultural Library (TEEAL), work with the Gates Foundation, USAID and other private aid organizations.

Sample Statewide/Regional Initiatives that fall within this Plan of Work

- Capital District Vegetable and Small Fruit Program
- Central NY Dairy and Field Crops Program
- Cornell Vegetable Program (Western NY)
- Finger Lakes Grape Program
- Lake Erie Regional Grape Program
- Lake Ontario Fruit Program
- Northeast NY Fruit Program
- South Central NY Dairy and Field Crops Program
- Harvest NY
- Northwest NY Dairy Livestock and Field Crops Program
- Integrated Pest Management

Target Audiences

Key audiences served, directly and indirectly, in enhancing agribusiness viability include: established producers; new and young producers, consultants and service providers, input suppliers, cooperative directors and managers, marketing firms, governmental agencies, lenders, and local/state/federal governmental leaders.

Output and Outcome Indicators Highlighted indicators are collected.

<table>
<thead>
<tr>
<th>Outputs</th>
<th>Near-Term Outcomes</th>
<th>Mid-Term Outcomes</th>
<th>Long-Term Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td># patents</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td># publications</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Business Management Emphasis

<table>
<thead>
<tr>
<th>Outputs</th>
<th>Near-Term Outcomes</th>
<th>Mid-Term Outcomes</th>
<th>Long-Term Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1.1a) # producers/ horticulture/natural resources business persons completing education programs on business management, finance, business planning and marketing, human resource management, risk management, production economics, and business transitions.</td>
<td>(1.1b) # participants demonstrating knowledge or skill gains in business management, finance, business planning and marketing, human resource management, risk management, production economics, inter-generational transfer and other business transitions.</td>
<td>(1.1c) # participants documented to have applied knowledge or skills gained to strengthen existing business operations.</td>
<td>(1.1e) # participants reporting improved agricultural/ horticultural business profitability attributed at least in part to program participation.</td>
</tr>
<tr>
<td>(1.1d) # participating family-owned agricultural/ horticultural/natural resources businesses that plan for succession, transfer, or sale of their business.</td>
<td>(1.1f) # business owners successfully completing an intergenerational transfer or other desired dispensation of their business attributed at least in part to program participation.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Agriculture/Natural Resources Enterprises Labor

<table>
<thead>
<tr>
<th>Outputs</th>
<th>Near-Term Outcomes</th>
<th>Mid-Term Outcomes</th>
<th>Long-Term Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1.3b) # participants who demonstrate knowledge gains related to needs of potential employees and/or availability of qualified employees.</td>
<td>(1.3c) # participants documented to have made one or more changes in human resources practices to enhance labor availability or retention.</td>
<td>(1.3d) # producers/ horticultural businesses reporting improved labor availability, performance, and/or retention of higher skilled and more valuable human resource team members attributed at least in part to program participation.</td>
<td></td>
</tr>
<tr>
<td>Outputs</td>
<td>Near-Term Outcomes</td>
<td>Mid-Term Outcomes</td>
<td>Long-Term Outcomes</td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td>--------------------</td>
<td>-----------------------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>(1.2a) # producers, horticulture business persons completing programs to expand profitability, develop marketing options, diversify or substitute alternative products or enterprises, and/or increase operational efficiencies.</td>
<td>(1.2b) # participants demonstrating knowledge or skill gains related to expanding profitability, developing marketing options, diversifying or substituting alternative products or enterprises, and/or increasing operational efficiencies to solve immediate concerns.</td>
<td>(1.2c) # participants documented to have adopted innovations in food enterprises including production, allied services, processing, and distribution.</td>
<td>(1.2e) # of new food, horticultural, and agricultural businesses and/or new enterprises within existing businesses reported by program participants and attributed at least in part to program participation.</td>
</tr>
<tr>
<td>General Production Practices</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outputs</td>
<td>Near-Term Outcomes</td>
<td>Mid-Term Outcomes</td>
<td>Long-Term Outcomes</td>
</tr>
<tr>
<td>(1.4a) # producers, horticulture business persons, and/or natural resource managers completing education programs on existing and new production-management practices and techniques.</td>
<td>(1.4b) # of producers, horticulture business persons, and/or natural resource managers demonstrating knowledge/skill gains in existing/new practices and techniques; improved product handling and storage to maintain quality and food safety; and/or improving production efficiency and/or environmental protection through adoption of best management practices.</td>
<td>(1.4c) # of producers, horticulture business persons, and/or natural resource managers modifying existing practices and/or adopted new production best practices or technologies to address current issues and improve yield efficiency, consistency and/or quality and/or conservation of resources.</td>
<td>(1.4f) # of producers, horticulture business persons, reporting increased dollar returns per acre or reduced costs per acre.</td>
</tr>
<tr>
<td>(1.4d) # of producers, horticulture business persons, and/or natural resource managers who report improved ability to anticipate and respond to environmental and market variations through alternative production management strategies.</td>
<td>(1.4e) # technical assistance providers documented to have incorporated current best management practices in their recommendations.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Agricultural Environmental Management

(1.5a) # producers, horticulture businesses, and/or natural resource enterprise managers completing education programs on potential environmental impacts of practices, requirements and opportunities of environmental regulations and programs, and whole farm systems

(1.5b) # of producers, horticulture businesses, and/or natural resource managers demonstrating knowledge/skill gains in environmental impacts of practices, environmental regulations and programs, whole farm systems including integrated nutrient management, integrated pest management, waste management, and water protection.

(1.5c) # of producers, horticulture businesses, and/or natural resource managers documented to have assessed potential environmental impacts of their operations and developed and acted on plans to eliminate or minimize those concerns.

(1.5d) # of producers, horticulture businesses, and/or natural resource managers documented to have developed and implement nutrient management and/or waste management plans or modified existing plans to meet production and environmental goals and meet regulations.

(1.5e) # of producers, horticulture businesses, and/or natural resource managers documented to meet or exceed current environmental protection standards as a result of participating in relevant educational programs.

(1.5f) # resource managers reporting reduced environmental concerns for participating enterprises.

External Factors

Agricultural/horticultural/natural resources enterprises operate in a complex and volatile context involving susceptibility to weather extremes, changing governmental policies and regulations, competitive land uses and shifting development patterns, evolving consumer demands, and globally influenced markets. Fundamental change is occurring in the state and regional economies within which agricultural/horticultural/natural resources enterprises operate. The specific implications of these external factors vary greatly by locale and across commodities and business forms. Population and land use changes in farming communities can lead to producer/neighbor issues that influence choice of production practices. Economic stress exacerbates issues of food insecurity and hunger and many community organizations are over-burdened and unable to meet demands.
Evaluation

The evaluation approach included in our plan can more accurately described as an evaluation "system" rather than as bounded "studies" or investigations. Because each of the plans addresses a broad combination of applied research and extension initiatives spanning multiple audiences, methods, and intended outcomes, a combination of routine program monitoring and documentation, near-term outcome assessment, and targeted follow-up activities is required to provide comprehensive assessment. In addition, specialized data needs of funding partners must be addressed, sometimes using methods and/or accountability structures required by the funders.

Cornell Cooperative Extension works with the Cornell Office of Research and Evaluation (CORE) to influence our evaluation patterns and procedures. CORE has piloted the Evaluation Partnership Project (EPP) over the last decade documenting processes that work for Cornell Cooperative Extension and teaching process. The CORE Evaluation Partnership Project has included intensive program development and evaluation planning with a number of targeted programs and counties.

We employ a combination of routine program monitoring and documentation, near-term outcome assessment, and targeted follow-up activities for each of our planned programs. The results are aggregated in a statewide accountability system which leads to the summary results reported in the State Defined Outcomes in each plan including selected impact statements and success stories from a pool of more than 400 documented narratives.

To strengthen evaluation of commercial agriculture programs, our two commercial vegetable regional specialist teams participated in an Evaluation Planning Partnership with the Cornell Office for Research on Evaluation in 2010 and 2011. Past participation in the EPP continues to drive evaluation efforts. This year the Small Farms Program participated in a self-driven version of the Evaluation Planning Partnership program.
Brief Summary of Program
In the past decade, Cornell researchers have focused on identifying and quantifying the level of climatic disruption caused by heat-trapping greenhouse gasses and the early, measurable impact on weather patterns, geographic bioregions, and living creatures. Now, researchers are exploring the looming challenges, investigating strategies to address expected impacts, and developing new resources to reduce the human “carbon footprint” that adds to greenhouse gas emissions. Multidisciplinary researchers, educators, and extension faculty – from plant biologists to economists to climatologists – are engaged in three vital areas of exploration for the well-being of future generations:

- Climate science: quantifying the current trend and predicting future impact
- Adaptation: moderating expected damage and identifying potential opportunities
- Mitigation: reducing the human “carbon footprint” to slow the pace of climate change

Situation and Priorities Statement
Climate data for the last 50 years show dramatic changes in temperature and precipitation at the global, national, regional, and state levels. In New York and elsewhere, global climate change is believed responsible for more erratic weather patterns, warmer temperatures, heavier rainfall, lower snow levels, and altered season length with intensifying impact on humans, wildlife, the economy, and the environment. Without action to reduce heat-trapping emissions today, scientists predict that summer in New York will feel like current summer weather in South Carolina by the end of this century.

Cornell researchers have been at the forefront in documenting climate change and its impact in the living world. New York farmers rely on Cornell research to make crucial decisions about controlling pests, applying fertilizer and optimal planting and harvesting times. CALS integrated pest management specialists say certain crop pests are arriving weeks earlier than they used to. Scientists are studying the worrisome prospect of potential over-wintering by some pest species that normally die out during the colder months. Scientists have studied the productivity of crop plants and how plants respond to changes in temperature. Water resources issues are closely tied to climate change, including both quantity and quality issues. Higher variability of surface water flows is expected to exacerbate pollution management and mitigation efforts.

Because carbon dioxide emissions are one of the major causes of global climate change, the study of carbon sequestration is a major research emphasis. Cornell researchers are exploring technological solutions to storing excess carbon, biomanipulative approaches to capturing carbon for use as fuel, and forest management strategies. Linking the science to the economic viability of each strategy is an area in which we have tremendous strength.

Climate change also heightens the importance of research and extension on invasive species. Invasives threaten the function and integrity of ecosystems, native species, and agricultural crops. Climate change opens new environments for invasion. Ecologically sound management of invasive species requires significant improvements in our understanding of the ecological impacts of invasives, as well as the effective management of their populations. Research spanning detection, prediction, and management of invasive species is conducted on plants, aquatic invertebrates, fish and insects.

The impact of these stressors to human habitability is borne disproportionately by the most vulnerable of human populations: the poor, the old and the young. Poor populations have limited resources to adapt to changes and stresses. Older populations are among the most at risk due to decreased mobility, changes in physiology, and more limited access to resources, all of which may limit adaptive capacity. Children, who have been underestimated in roles they might play in disaster preparedness, could face undue burdens in adapting to negative events caused by climate change and need tailored communications related to climate change challenges. Vulnerable populations will face adaptive challenges to their new environments, with potentially far-reaching implications for health as well as for societal strategies to cope with climate change effects at both the population and policy level.

Technical knowledge of climate change issues and mitigation strategies is evolving rapidly and there is much confusion and skepticism and limited climate change literacy across audiences. As climate events increase the need for education around flood control and management, soil conservation, storm water management is increasing. Individuals, businesses and communities are seeking current information in order to be better respond to changing needs.

Assumptions
- New science is needed for the reduction and mitigation of climate change.
- Adaptation to climate change is necessary and must continue, especially for climate-sensitive industries and populations.
- Tackling the issues of climate change requires multidisciplinary, multi-institutional and collaborative research and extension efforts.
• Integrated system approaches are needed to expand our understanding of trade-offs and develop approaches that address current and future challenges of climate change.
• Producers, natural resource managers, community leaders and individuals often are not fully aware of potential environmental impacts of their operations and actions and alternatives that would reduce factors that contribute to climate change.
• Technical assistance providers relied upon by producers, horticultural business people, and natural resource managers have parallel needs for current information on climate change.
• Residential, institutional and business conservation is a critical component in reducing the human carbon footprint.
• Knowledge of the interactions of environmental resources, public health, quality of life, and local economies will lead to an involved, proactive citizenry.

**Ultimate Goal(s) of the Program**

• Reduce factors contributing to climate change at the individual, community, industry, and institutional levels.
• Develop an agriculture system that maintains high productivity in the face of climate changes.
• Help producers and communities adapt to changing environments.
• Sustain economic vitality, identify challenges, and take advantage of emerging economic opportunities offered by climate change mitigation technologies.

**Activities**

This effort entails a wide range of applied research activities and education methods depending on local context and need. Campus-based faculty and extension associates, regional specialists and county-based educators all design, implement and evaluate tailored applied research and educational efforts. Example targeted activities include:

- a comprehensive “Climate Change Outreach Initiative” that focuses on increasing the capacity of Cornell Cooperative Extension (CCE) staff to provide climate change extension education in their existing programs, and to provide new climate change education and outreach materials for CCE to utilize with stakeholders, including farmers, gardeners, and municipal officials, and the general public.
- “Climate Change Carbon and Nitrogen” that serves to advance new climate adaptation and mitigation methods through research and educational efforts related to the Cornell Soil Health Test and the Adapt-N tool.

Since climate change is tied intimately to sustainable energy concerns, it is an important element of energy literacy initiatives for all audiences. More information can be found at:
http://cce.cornell.edu/EnergyClimateChange/Pages/ClimateChange.aspx

**Sample Statewide/Regional CCE Initiatives that fall within this Plan of Work**

- The New York Extension Disaster Education Network (NY EDEN)
- Cornell Climate Change Program Work Team (PWT)
- Invasive Species Education and Monitoring Efforts:
  http://cce.cornell.edu/Environment/Pages/InvasiveSpecies.aspx
- Master Watershed Stewards Program
- Stormwater Management
- Sustainability: http://cce.cornell.edu/sustainability/Pages/default.aspx

**Target Audiences**

Key audiences served, directly and indirectly include: agricultural, horticultural and natural resource producers; consultants and service providers, resource managers, governmental agencies, and local/state/federal governmental leaders and policy makers, non-government organizations, individual consumers, and youth.

**Output and Outcome Indicators**

Highlighted indicators are collected. Codes in parentheses are (new) and (old) classification system.

### 2.1 Climate Change and Producers/Organizations/Businesses

<table>
<thead>
<tr>
<th>Outputs</th>
<th>Near-Term Outcomes</th>
<th>Mid-Term Outcomes</th>
<th>Long-Term Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>(2.1a) # of agricultural/natural resources producers, and/or organization and business</td>
<td>(2.1b) # of consumers, residents, agricultural/natural resources producers, organization and business</td>
<td>(2.1c) # of agricultural/natural resources producers, organization and business representatives documented</td>
<td>(2.1e) # of agricultural/natural resources producers, and/or organizations and</td>
</tr>
</tbody>
</table>
representatives completing educational programs on the causes and implications of climate change and adaptive or mitigating strategies.

<table>
<thead>
<tr>
<th>Outputs</th>
<th>Near-Term Outcomes</th>
<th>Mid-Term Outcomes</th>
<th>Long-Term Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>(2.4a)  # of agricultural/natural resources producers, and/or organization and business representatives completing educational programs on managing water resources and/or environmental planning.</td>
<td>(2.4b) # of consumers, residents, agricultural/natural resources producers, organization and business representatives, and/or local government and community leaders who demonstrate knowledge gains about managing water resources.</td>
<td>(2.4c) # consumers, residents, agricultural/natural resources producers, organization and business representatives, and/or local government and community leaders documented to have modified existing practices or technologies and/or adopted new practices to protect/enhance water resources.</td>
<td>(2.4d) # documented instances when consumers, residents, agricultural/natural resources producers, organization and business representatives, and/or local government and community leaders have improved and/or protected water resources.</td>
</tr>
<tr>
<td>to have adopted recommended adaptation strategies for production agriculture and natural resources management, including invasive species, pest management, pollutant loads, wetlands, etc.</td>
<td>(2.1d) # of agencies/organizations/communities documented to have adopted recommended climate mitigation practices and policies.</td>
<td>businesses successfully adapting to climate change effects enhancing economic viability.</td>
<td>(2.2f) # of communities adapting successfully to climate change effects.</td>
</tr>
</tbody>
</table>
2.7 Biodiversity and Natural Resources Protection and Producers/Organizations/Businesses

<table>
<thead>
<tr>
<th>Outputs</th>
<th>Near-Term Outcomes</th>
<th>Mid-Term Outcomes</th>
<th>Long-Term Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>(2.7a)</td>
<td># of agricultural/natural resources producers, and/or organization and business representatives completing educational programs on managing natural resources, invasive species, and/or biodiversity.</td>
<td>(2.7b) # of consumers, residents, agricultural/natural resources producers, organization and business representatives, and/or local government and community leaders who demonstrate knowledge gains about managing natural resources, invasive species, and/or biodiversity.</td>
<td>(2.7c) # of consumers, residents, agricultural/natural resources producers, organization and business representatives, and/or local government and community leaders documented to have modified existing practices or technologies and/or adopted new practices to protect/enhance natural resources and/or enhance biodiversity.</td>
</tr>
</tbody>
</table>

External Factors
Climate change issues play out in a complex and volatile context involving weather extremes, changing governmental policies and regulations, competitive land uses and shifting development patterns, evolving consumer demands, and globally influenced markets. The specific implications of these external factors vary greatly by locale and across commodities and business forms. Technical knowledge of climate change issues and mitigation strategies is evolving rapidly. There is growing antagonism between climate skeptics and climate scientists further polarizing the issue.

Evaluation

The evaluation approach included in our plan can more accurately be described as an evaluation "system" rather than as bounded "studies" or investigations. Because each of the plans addresses a broad combination of applied research and extension initiatives spanning multiple audiences, methods, and intended outcomes, a combination of routine program monitoring and documentation, near-term outcome assessment, and targeted follow-up activities is required to provide comprehensive assessment. In addition, specialized data needs of funding partners must be addressed, sometimes using methods and/or accountability structures required by the funders.

Cornell Cooperative Extension works with the Cornell Office of Research and Evaluation (CORE) to influence our evaluation patterns and procedures. CORE has piloted the Evaluation Partnership Project (EPP) over the last decade documenting processes that work for Cornell Cooperative Extension and teaching process. The CORE Evaluation Partnership Project has included intensive program development and evaluation planning with a number of targeted programs and counties.

We employ a combination of routine program monitoring and documentation, near-term outcome assessment, and targeted follow-up activities for each of our planned programs. The results are aggregated in a statewide accountability system which leads to the summary results reported in the State Defined Outcomes in each plan including selected impact statements and success stories from a pool of more than 400 documented narratives. In 2010, we established an Energy and Climate Change team to provide leadership for statewide program initiatives. In 2011, the team entered into partnership with the Cornell Office for Research on Evaluation in their Evaluation Planning Partnership. This collaboration assisted the team in developing detailed logic models for initial program emphases and development of specific evaluation approaches for the coming year. The process continues to influence the way that the team is working.
3.0 Environment and Natural Resources and Sustainable Energy

Brief Summary of Program

Environment and Natural Resources and Sustainable Energy programs operate to assist New York state communities in sustaining and obtaining healthy ecosystems for the pleasure and functional viability of youth, families, communities, farms and businesses. The intent is to develop and seek connections between research and extension programs focused on natural resources conservation/conservation/protection and sustainable energy education that work toward long term planning for sustainable energy and proper use of natural resources.

Programs in Natural Resource Management reach varied audiences, addressing agricultural and natural resource producers, community decision makers, businesses, organizations, and individual consumers. Sustainability of natural resources, enhancement of biodiversity and habitat, and natural resources management for economic vitality is critical to residents of New York State, who enjoy and rely on abundant, healthy, and diverse natural resources. Continuing applied research and education on natural resources management, including inventory and mapping methods; habitat; biodiversity; invasive species; alternative land uses; and economics of sustainable natural resources, a viable local economy, and a healthy environment are critical to protecting, enhancing, and sustaining valuable natural resources.

With some of the highest energy costs in the nation, New York residents, businesses, and organizations need current information and decision-making criteria and approaches for energy supply alternatives and practical energy conservation and cost-saving measures to maintain financial security and vitality. Additionally, with more than 1 million acres of viable and non-food producing land available for production of biomass, and organic waste streams from dairy farms and concentrated urban areas, New York has multiple resource streams to contribute to the small, distributive renewable energy systems that are considered a vital part of forward-looking national energy policy. Producers and community leaders are hungry for information on viable renewable energy production and strategies to promote energy conservation, while farmers, forest owners and agricultural producers are eager to explore new markets.

Situation and Priorities Statement

With natural resources including forested mountains; aquatic environments from wetlands and marshes to estuaries to lakes; and an accompanying diversity of plant and animal species, New York residents rely on these resources for recreation, tourism, raw products such as timber and fish, and related businesses. Agricultural and natural resource producers, community decision makers, businesses, organizations, and individual consumers need current information on good management practices, alternative land uses, protection of open space, and development of environmentally-sustainable natural resource-based businesses. Communities need education targeted to their specific concerns, including the interaction of natural resources, the environment, and the economy.

Our sustainable energy program has two broad emphases: energy and agriculture and consumer and community energy resources. The agriculture program addresses NIFA priorities related to the goal of energy independence, development of biomass for bioenergy, design of optimum forestry and crops for bioenergy production, and production of value-added bio-based industrial products. The program also addresses energy conservation through agricultural applications of additional energy alternatives such as wood and grass pellet fuel production, recycling of vegetable oils as biodiesel, wind and solar energy production. Conversion of corn to ethanol, wind energy and hydro power are currently driving alternative energy systems in the U.S. Longer term, grasses and/or wood products may provide a substantial source of cellulosic ethanol and other bioenergy to meet the world’s energy needs. We have research strengths to pursue these opportunities and the agricultural and forestry resources to contribute substantively to energy production.

The consumer and community energy resources program is a multi-emphasis, multi-audience effort addressing community decision makers and individual consumers. High energy costs, particularly affecting the Northeast, further impact household budgets. New York State imports 85 percent of the energy it consumes. Reducing this figure through increased energy efficiency will lead toward a more secure energy future with a decreased dependence on imported energy, protection of our environmental resources, and increased economic development and job growth.
On average, New Yorkers spend $1,724 annually on energy per household. Reducing this figure creates more household disposable income which, in turn, spurs economic growth. Lower-income homeowners and renters are particularly hard hit by escalating energy costs and need appropriate alternatives for conserving energy and reducing costs, particularly for housing and transportation. A wide array of energy subsidies and conservation incentives are available to individuals and community organizations, but they are fractionated and unevenly available leading to confusion and inequitable treatment. Community agencies/organizations and local governments need to understand how their policies and practices influence energy use and adopt strategies to promote energy conservation. To realize economic development related to the green economy, workforce and business opportunities need to be fully understood. In addition, proposed large scale development of the Marcellus Shale natural gas reserve using hydrofracking technology is posing challenging decisions for individuals and communities in New York. It is a classic face-off between economic development and environmental interests.

With a wide range of waste producers, including individuals, agriculture, industry, and government, New York residents, agricultural producers, businesses/industry, and governments need current information and solutions on techniques for managing waste, reducing waste at the source, minimizing energy use and costs, and managing the risk and environmental inequities resulting from waste generation and disposal practices.

Assumptions

- The environment and natural resource require protecting and in some cases citizen action for remediation.
- Producers, local government, individuals, organizations, and businesses often are not fully aware of potential environmental impacts of their operations and/or requirements and opportunities of environmental regulations and programs.
- Technical assistance providers relied upon by producers, local government, individuals, organizations, and businesses have parallel needs for current information on appropriate production practices, waste management and reduction practices, and water resources management and protection practices.
- Knowledge of the interactions of environmental resources, public health, quality of life, and local economies will lead to an involved, proactive citizenry.
- It is possible to simultaneously meet economic and environmental sustainability goals; a sustainable, healthy economy depends on a healthy environment.
- There are new and renewed opportunities for locally owned energy production.
- Small distributive energy systems may be more economically feasible given biomass characteristics than large-scale production and may have other benefits in terms of local economics and energy security.
- Energy expenditures on local or in-state owned production alternatives stay in the state and local economies to the betterment of residents.
- Reduction of energy use provides cost savings to businesses and may retain dollars in the state and local economies.
- Significant barriers to the widespread adoption of renewable energy technologies — economic, environmental, social, logistic and physical—can be overcome with dedicated research and extension.
- As a major energy consumer, New York can contribute substantively to energy independence through energy conservation and adoption of renewable energy sources.
- Producers, local governments, individuals, organizations, and businesses and industry often are not fully aware of potential environmental impacts of their operations and/or requirements and opportunities of environmental regulations and programs.
- Technical assistance providers relied upon by producers, local governments, individuals, organizations, and businesses and industry have parallel needs for current information on appropriate waste management and reduction practices.
- Increased adoption of “clean” renewable energy technologies will help mitigate the threat of climate change.
- We need an energy literate public to move forward responsibly.

Ultimate Goal(s) of the program

- Healthy ecosystems
Youth, families, communities, farms, businesses that engage in long term planning for proper use of natural resources, sustainable energy, and environmental priorities.

- Natural resources that are protected and available for multiple uses, including agroforestry, fishing, recreation, agriculture, recreation, tourism, and other businesses/industry.
- The economic vitality of agricultural/natural resources and other businesses is improved, the health of individuals and families are enhanced, and local government operations are made more sustainable through the availability of high quality natural resources.
- Improved waste management and waste reduction efforts will result in an enhanced and protected environment, including soil, air, and water, and reduced risk for individuals and families.
- New York State becomes a leader in pursuing the national goal of energy independence.
- Use of locally produced and owned energy sources and/or lower cost external sources retains energy dollars within the local and state economy providing enhanced economic well-being.
- The economic vitality of agriculture/horticulture/natural resource and supporting businesses, and the financial security of individuals and families are enhanced and local government operations made more sustainable through reduced energy costs.
- Improved waste management and waste reduction efforts will result in an enhanced and protected environment, including improved soil, air, and water quality, and reduced risk for individuals and families.
- The economic vitality of agriculture/horticulture/natural resources and other businesses is improved, the health of individuals and families is enhanced, and local government operations are made more sustainable through waste reduction and economical and safe management of waste.

Activities

This is a program entailing a wide range of applied research activities and multiple education methods depending on local context and need. Campus-based faculty and extension associates, regional specialists and county-based educators all are involved in designing, implementing, and evaluating tailored applied research and educational efforts depending on the focus and scope of their role.

Topics include: Property rights, land use, conservation, interaction between environmental and economic, issues, quality of life issues, waste management, wildlife management and forestry, renewable energy resources, energy conservation and efficiency, heating with wood etc.

Sample Statewide/Regional Initiatives that fall within this Plan of Work

- Energy Team related work
- Urban Forestry
- Master Forest Owners
- Private Forest Stewardship Program
- Master Naturalist
- Maple Program
- Marcellus Shale Drilling Education
- Farm Energy Audits
- Save Energy, Save Dollars
- Green Building Seminar Series
- Energy Education in Camp
- 4-H Shooting Sports Program
- Master Composters
- Recycling Ag Plastics
- Farm Waste Management

Target Audiences

Residents and property owners are targeted with stewardship, natural resources protection, waste reduction and management, and water resources protection in their homes and on their properties. Businesses, organizations, and producers are targeted with information about improved management practices and alternative land uses, such as agroforestry. Local government and community leaders are targeted with information related to governmental management of natural resources, such as land use planning and open space preservation. Environmental planners and managers and technical assistance providers, such as foresters, are targeted with in-depth information related to their audiences/constituents. Teachers, youth professionals and volunteers are targeted with in-depth knowledge relevant to
Youth of all ages are provided with age and grade appropriate knowledge about water resources; activities to increase stewardship; and information about career opportunities.

Agricultural/horticulture/natural resource and supporting businesses are targeted both regarding bioenergy production opportunities and information regarding alternative energy sources and conservation. Policy education efforts relate to development of agriculture and natural resources based alternative energy sources.

Consumers, property managers, and community leaders are targeted for information regarding energy supply alternatives and energy conservation options for residential, facilities, and transportation needs. Citizens, community agencies and organizations are targeted for energy-related policy education efforts particularly as related to development of alternative energy sources and the interaction between land use and energy conservation.

Residents and property owners are targeted with stewardship and waste reduction and management in their homes and on their properties. Businesses, organizations, and producers are targeted with information about reducing impacts of their operations. Environmental planners and managers and technical assistance providers are targeted with in-depth information related to their audiences/constituents. Workforce development professionals receive information on energy and green economy career pathways. Teachers and youth professionals and volunteers are provided with curriculum and training. Youth are targeted with age appropriate education.

Local government officials and community leaders are targeted with education and resources related to a systems approach to energy transitions. This includes developing their capacity to assess the broad array of impacts of any # of energy development scenarios.

**Output and Outcome Indicators** Highlighted indicators are collected. Codes in parentheses are (new) and (old) classification system.

### 3.1 Bioenergy

<table>
<thead>
<tr>
<th>Outputs</th>
<th>Near-Term Outcomes</th>
<th>Mid-Term Outcomes</th>
<th>Long-Term Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>(3.1a) # of agricultural producers and agribusiness representatives completing educational programs on the potential for development of biologically-based fuels.</td>
<td>(3.1d) # of agricultural producers, agribusiness, or local and state leaders who demonstrate knowledge gains about the potential for development of biologically-based fuels.</td>
<td>(3.1f) # of producers, economic development organizations and other groups who collaborate to establish bioenergy as a viable alternative crop.</td>
<td>(3.1h) # of producers, horticulture businesses and/or natural resource managers reporting that cropping for and/or use of bioenergy leads to increased economic returns to their enterprises.</td>
</tr>
<tr>
<td>(3.1b) # of local and state leaders completing educational programs on the potential for development of biologically-based fuels such as biodiesel, ethanol, methane, recycled vegetable oils, space heating fuels etc.</td>
<td>(3.1e) # of forest owners and purchasers of forest products who demonstrate knowledge or skills gains about current markets for firewood and chips/pellets and associated cropping practices.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(3.1c) # of agricultural producers and agribusiness, and natural resource businesses representatives completing educational programs about cropping for bioenergy production.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 3.2 Producer Energy Alternatives/Conservation

<table>
<thead>
<tr>
<th>Outputs</th>
<th>Near-Term Outcomes</th>
<th>Mid-Term Outcomes</th>
<th>Long-Term Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>(3.2a) # of agricultural/horticulture/</td>
<td>(3.2b) # of agricultural/horticulture/</td>
<td>(3.2c) # of agricultural/horticulture/</td>
<td>(3.2d) # of producers/horticulture</td>
</tr>
</tbody>
</table>
### 3.3 Consumer Energy Alternatives

<table>
<thead>
<tr>
<th>Outputs</th>
<th>Near-Term Outcomes</th>
<th>Mid-Term Outcomes</th>
<th>Long-Term Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>(3.3a) # of consumers and community leaders completing educational programs about the availability and pros and cons of alternative energy sources.</td>
<td>(3.3b) # of consumers and/or community leaders who demonstrate knowledge or skills gains about the availability and pros and cons of alternative energy sources especially related to housing and transportation.</td>
<td>(3.3c) # of consumers documented to have adopted appropriate alternative energy sources.</td>
<td>(3.3d) # of consumers who report savings on energy costs attributable to adopting alternative energy sources.</td>
</tr>
</tbody>
</table>

### 3.4 Consumer Energy Costs

<table>
<thead>
<tr>
<th>Outputs</th>
<th>Near-Term Outcomes</th>
<th>Mid-Term Outcomes</th>
<th>Long-Term Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>(3.4a) # of consumers, property managers, and/or housing officials completing educational programs about potential energy cost savings, including selecting energy providers, and energy conservation strategies and measures especially related to housing and transportation.</td>
<td>(3.4b) # of consumers, property managers, and/or housing officials who demonstrate knowledge or skills gains and/or can articulate specific actions they will take related to energy cost controls and conservation measures especially related to housing and transportation.</td>
<td>(3.4c) # of consumers reporting to have adopted appropriate energy cost control or conservation practices.</td>
<td>(3.4e) # of consumers who report savings on energy costs attributable to adopting energy conservation measures.</td>
</tr>
</tbody>
</table>

### 3.5 Community Energy Planning

<table>
<thead>
<tr>
<th>Outputs</th>
<th>Near-Term Outcomes</th>
<th>Mid-Term Outcomes</th>
<th>Long-Term Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>(3.5a) # of community members, leaders and officials completing education programs about the relationships between development patterns and energy use/costs.</td>
<td>(3.5c) # of community members, leaders and officials who demonstrate knowledge gains about the relationships between development patterns and energy use/costs.</td>
<td>(3.5e) # of communities documented to have assessed local energy development proposals and/or the relationships between current policies and regulations and energy conservation.</td>
<td>(3.5g) # of new workers trained and energy-related businesses established at least in part due to participation in the program.</td>
</tr>
<tr>
<td>(3.5b) # of workforce professionals, economic developers and/or entrepreneurs participating in educational programs on energy workforce and business opportunities.</td>
<td>(3.5d) # of workforce professionals, economic developers and/or entrepreneurs demonstrating knowledge gains related to energy workforce and business opportunities.</td>
<td>(3.5f) # of community agencies’ organizations documented to have adopted appropriate alternative energy sources.</td>
<td>(3.5h) # of communities documented to have established or modified land use and development policies to promote energy conservation.</td>
</tr>
<tr>
<td>(3.5k) # municipalities involved in energy literacy trainings.</td>
<td>(3.5l) # of municipalities that demonstrate knowledge gains about systems approaches to energy transitions.</td>
<td>(3.5m) # of communities that adapt or revise policies in response to large scale energy development (e.g., Marcellus shale development) and/or include energy as a component of their comprehensive plans</td>
<td>(3.5i) # of community agencies/organizations reporting savings on energy costs attributable to adopting alternative energy sources.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Outputs</th>
<th>Near-Term Outcomes</th>
<th>Mid-Term Outcomes</th>
<th>Long-Term Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>(3.5k) # municipalities involved in energy literacy trainings.</td>
<td>(3.5l) # of municipalities that demonstrate knowledge gains about systems approaches to energy transitions.</td>
<td>(3.5m) # of communities that adapt or revise policies in response to large scale energy development (e.g., Marcellus shale development) and/or include energy as a component of their comprehensive plans</td>
<td>(3.5j) # of communities that report increased diversification of their local economies attributable at least in part to participation in the program.</td>
</tr>
</tbody>
</table>
the program.
### 3.6 Waste Management and Energy

<table>
<thead>
<tr>
<th>Outputs</th>
<th>Near-Term Outcomes</th>
<th>Mid-Term Outcomes</th>
<th>Long-Term Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>(3.6a) # of agricultural/natural resources producers, organization and business representatives, community leaders, and/or residents completing educational programs on managing and reducing waste</td>
<td>(3.6b) # of agricultural/natural resources producers, organization and business representatives, community leaders, and/or residents who demonstrate knowledge gains about waste management and reduction</td>
<td>(3.6c) agricultural/natural resources producers, organization and business representatives, community leaders, and/or residents documented to have modified existing practices or technologies and/or adopted new practices to manage and reduce waste.</td>
<td>(3.6d) # of agricultural/natural resources producers, organization and business representatives, community leaders, and/or residents documented to have reduced costs through improved waste management practices.</td>
</tr>
</tbody>
</table>

### 3.7 Environment & Natural Resources

<table>
<thead>
<tr>
<th>Outputs</th>
<th>Near-Term Outcomes</th>
<th>Mid-Term Outcomes</th>
<th>Long-Term Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>(3.7a) # of participants completing educational programs featuring natural resources management and the environment.</td>
<td>(3.7b) # of agricultural/natural resources producers, organization and business representatives, community leaders, and/or residents who demonstrate knowledge gains that reflect a new appreciation for natural resources management and the environment.</td>
<td>(3.7c) agricultural/natural resources producers, organization and business representatives, community leaders, and/or residents documented to have modified existing practices or technologies that will assist with natural resources management and the environment.</td>
<td>(3.7d) # of instances documented showing evidence of long term planning goals for natural resources or environmental management.</td>
</tr>
<tr>
<td>(3.7e) # of instances where enhanced quality of life/ecosystem indicators are observed as the end result of intentional planned programs.</td>
<td>(3.7f) # of policy changes or documented community action to protect, enhance or mitigate natural resources occurring as the result of intentional planned programs.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### External Factors

The interaction between natural disasters, the economy, and energy costs is well documented. Weather in particular has interrupted supplies and dramatically influences heating and cooling costs. Appropriations, public policy, and regulations directly affect the ability to pursue energy source alternatives, including bioenergy development, and to implement energy conservation alternatives, particularly for low-income households. Government regulation and policies driven by public priorities can change the circumstances of personal finances and the energy market. Public and private funders and CCE may have fewer fiscal resources and other resources to devote to energy matters although government incentives might offset that.

### Evaluation

The evaluation approach included in our plan can more accurately described as an evaluation "system" rather than as bounded "studies" or investigations. Because each of the plans addresses a broad combination of applied research and extension initiatives spanning multiple audiences, methods, and intended outcomes, a combination of routine program monitoring and documentation, near-term outcome assessment, and targeted follow-up activities is required to provide comprehensive assessment. In addition, specialized data needs of funding partners must be addressed, sometimes using methods and/or accountability structures required by the funders.

Cornell Cooperative Extension works with the Cornell Office of Research and Evaluation (CORE) to influence our evaluation patterns and procedures. CORE has piloted the Evaluation Partnership Project (EPP) over the last decade documenting processes that work for Cornell Cooperative Extension and teaching process. The CORE Evaluation Partnership Project has included intensive program development and evaluation planning with a number of targeted programs and counties.
We employ a combination of routine program monitoring and documentation, near-term outcome assessment, and targeted follow-up activities for each of our planned programs. The results are aggregated in a statewide accountability system which leads to the summary results reported in the State Defined Outcomes in each plan including selected impact statements and success stories from a pool of more than 400 documented narratives.
4.0 Childhood Obesity and Nutrition

Brief Summary of Program
Programs that are framed by this plan include research and extension linked to childhood obesity; youth, family and community nutrition; food security and food safety.

Childhood Obesity prevention

Childhood obesity prevention research and education are based upon an ecological approach, focusing on individuals and their interactions among the multiple environments that surround them. This approach recognizes that there are inherent multiple levels of influence that affect a child’s body weight. Research topics include nutrition and hunger, nutrition education and behavior, built and natural environments, physical activity promotion, healthful food availability, food product development and health care organization, services and policies.

Extension programs are designed to 1) connect research and practice, 2) result in behavior change, 3) build on the strengths of families and youth, 4) develop strong collaborations resulting in community changes for optimal health promotion and 5) provide policymakers with the knowledge to develop appropriate policies to promote healthy lifestyles. Extension programs target children, families and the community at large, with an emphasis on low- and moderate-income audiences. The programs are collaborative and work directly with key community organizations.

Food Security

CCE programs address one or more of the aspects of food insecurity: availability of and access to food, certainty of availability and access to food, sufficiency of food, social and cultural acceptability of food, and nutritional quality and safety of food. Work in this program area ties well with our work in agriculture, and youth, families and communities.

Food Safety

Cornell’s statewide food safety research and education program serves a broad constituency including food producers, processors and retailers, as well as consumers and research scientists. The program encompasses the National Institute of Food and Agriculture food safety components: investigating causes of microbiological contamination and microbiological resistance, educating consumers and food safety professionals and developing food processing and storage technologies.

Programs are developed and delivered through many channels, including workshops, research-based publications and ongoing, technical support for policy makers and regulators.

For example, Cornell’s National Good Agricultural Practices Program provides growers, packing house operators, government officials and industry trade association personnel with information and strategies to protect consumer health and reduce hazards and risks in the production of fresh fruits and vegetables. Educational materials designed and developed at Cornell are being used by collaborators in 25 states to provide farmers with a better understanding of good agricultural practices related to food safety.

Consumer education programs focus on safe handling and preparation of foods, conveying important practices in preventing illness along with avoiding food cross-contamination. Programs target moderate and low income adults, 4-H and other youth.

Situation and Priorities Statement

Nutrition and Obesity Prevention

Nearly one-fifth of children in the United States are overweight and have a greater risk for health problems that are placing a major strain on the U.S. health system and economy. Obesity is positively correlated with increased risk of chronic diseases such as cardiovascular disease, diabetes, stroke, hypertension, and some forms of cancer. An estimated 61% of overweight young people have at least one additional risk factor for heart disease, such as high cholesterol or high blood pressure. There is an increasing frequency of type 2 diabetes in children, even pre-adolescent children. Overweight children are at greater risk for bone and joint problems, sleep apnea, and social and psychological problems such as stigmatization and poor self-esteem.
Factors contributing to obesity in children include unhealthy dietary behaviors such as high consumption of sweetened beverages, low fruit, vegetable and dairy consumption and limited physical activity. Healthy lifestyle habits, including healthy eating and physical activity, can lower the risk of becoming overweight and developing diseases associated with increased obesity. Food insecurity and obesity or overweight can exist at the same time. This necessitates addressing hunger issues for some populations within programs on childhood obesity.

At the individual child level, both psychosocial influences (including food norms, preferences, knowledge, attitudes, skills, supports and role models) and biological influences (including: age, gender, genes, and physiology) interact within the child to direct eating and activity behaviors. The individual child is also interacting within a family that brings another level of influences on behaviors that include feeding practices, parent and childcare provider interaction related to feeding, family attitudes and attention to health care. At the community and organizational level, the interaction between the individual environment that children are in when not at home further influences their behaviors. Factors such as access to healthy and unhealthy foods in schools and after-school programs, access to healthy foods and activity opportunities in the child’s community, local public health programs and policies will all impact the child.

Effective programs are those that target children’s eating and activity-based behaviors through approaches aimed at children directly, as well as parental and community involvement, and environmental change. By taking an ecological approach to childhood obesity prevention, CCE professionals consider the many factors associated with childhood obesity and determine how to best create many points of impact that can result in positive change. In some communities, CCE may be a leader and form a coalition to take action on childhood obesity. In other locations, CCE will join existing coalitions and augment projects to increase effectiveness and target populations reached.

Food Safety
The food supply must be safe to ensure a healthy, well-nourished population. While the United States has one of the safest food supplies in the world, each year about 76 million illnesses occur, more than 300,000 persons are hospitalized, and 5,000 die from foodborne illness. Illnesses, such as E. coli and salmonella, not only take a toll on American consumers’ health, they cost the United States $152 billion annually in health care and other losses, according to a report funded by the Pew Charitable Trusts. Center for Disease Control compiled data indicate that known pathogens account for an estimated 14 million illnesses, 60,000 hospitalizations, and 1,800 deaths. Three pathogens, Salmonella, Listeria, and Toxoplasma, are responsible for 1,500 deaths each year, more than 75% of those caused by known pathogens, while unknown agents account for the remaining 62 million illnesses, 265,000 hospitalizations, and 3,200 deaths. An untold number of foodborne illnesses go unreported because people may not seek medical attention and due to varying capabilities of local and state health departments to collect and report incidences. Food contamination also affects the viability of firms in the food system, from small, to regional to international companies. Recent outbreaks have resulted in large recalls of peanuts, spinach and peppers. In 2008 and early 2009, salmonella contamination in peanut butter crackers and peanut paste sickened 714 people in 46 states and prompted the largest recall in history. Safety from farm to retail and then in the home can be improved through research and its application to training, collaboration among all involved in the food system, and information sharing.

Over the last several decades there has been a noticeable increase in the consumption of fresh fruits and vegetables in the United States. Public health officials have observed significant increases in the number of produce-associated foodborne disease outbreaks. Recently outbreaks of salmonella and E. coli infections caused serious health consequences, disrupted the supply of nourishing foods and caused significant economic harm.

A variety of good agricultural and manufacturing practices can reduce the spread of microbes among plant foods and animals and prevent the contamination of foods at retail. The safety of prepared foods is also of concern given the important proportion of foods consumed away from home and purchased already prepared. Targeted training for food producers, preparers and retailers is a priority. In addition, consumer education on proper food handling and preparation in the home is a vital component to ensuring food safety. Consumers continue to improve their food safety practices but some are still unknowingly practicing some unsafe behaviors. The country’s ability to pinpoint a food contamination source is hampered by the lack of an integrated system for federal agencies and the food industry to coordinate information through compatible electronic databases. Coordination, practice and policy changes are needed.

Food Insecurity
Food insecurity, as defined by the USDA, refers to sustained access at all times to food adequate in quantity and quality to maintain a healthy life in socially acceptable ways. Hunger is the uneasy or painful sensation caused by a lack of food, and is a potential although not necessary, consequence of food insecurity. Between 800 million to 1 billion people worldwide lack enough food to meet their daily energy requirements. In 2008, 21 percent of U.S. households with children (8.3 million households) were food insecure, up from 16 percent in 2006 and 2007. This figure was the highest recorded since the Federal Government began monitoring household food security in 1995. Having enough calories is not sufficient to assure nutritional adequacy. Foods available may not provide essential nutrients for health. Called “hidden
hunger," this type of malnutrition affects more than 3 billion people in developing countries. In developed countries, the problem of overweight may be characterized by high caloric consumption but inadequate levels of important nutrients.

**Assumptions**

Childhood overweight and obesity is best addressed ecologically through support of integrated community and family systems. These systems are necessary to promote improved eating and physical activity behaviors of New York State children and to reduce the prevalence of childhood obesity.

The National Institute of Food and Agriculture supports childhood obesity research and education programs on affordable and available nutritious foods and guidance for individuals and families enabling science-based decisions about health and well-being. In New York State, research on the etiology of obesity and chronic disease is applied by Cornell Cooperative Extension (CCE) to locally based nutrition and wellness education developed in partnership with families, youth, health and wellness professionals, and other community-minded individuals and groups. Cornell and other academic research are applied to CCE programs promoting healthful and secure community food systems to address childhood obesity. Neighborhood and community resources complement federal, state, and local government support to implement this outreach.

- Food safety can be increased by improving: agricultural practices before harvest; how foods are processed, stored and marketed and how foods are handled and served in the home and commercially.
- Cornell and other research on food contamination will be applied to education on effective food safety practices.
- Policies and practices across the food system affect the safety of foods and can be better coordinated.
- Community, federal, state, and local government support will be provided to implement extension outreach.

**Ultimate Goals of Program**

- Affordable, available nutritious foods
- Guidance for families to make science-based decisions about health and well-being
- Prevention of childhood overweight and reduction of long term risks for chronic disease by encouraging healthy eating and increased physical activity
- Provide for the nutritional well-being and safety of New York State residents through helping to assure a continuous, reasonably priced supply of wholesome foods.
- Improve food safety and food-handling practices throughout the food system.
- Reduce incidence of food-borne illnesses.
- Improved community food security and healthful food-choice options

**Activity**

This is a statewide multi-disciplinary extension program with emphases cutting across many content areas and audiences. Campus-based faculty and extension associates provide leadership and participate in work teams with CCE educators. Programs draw upon Cornell and other academic research. All are involved in designing, implementing and evaluating tailored outreach. Trained Extension nutritionists and parenting and 4-H educators lead local program activities. Researchers in horticulture and agricultural economics and marketing investigate options for improving local production and direct marketing of fresh produce into areas where they are currently lacking.

Programs for children and youth are delivered through a variety of settings: 4-H camps, clubs, fairs and afterschool as well as through child-parent/grandparent involvement projects and in-school student education. Family-focused programs promote a positive parent/care-giver-child feeding relationship and planning for good nutrition and physical activity. Extension staff collaborate with community leaders to improve the local environment for healthy eating and active living. Activities include sequential learning events, "community workshops" and engagement with community and civic leaders to improve the environment for nutrition and wellness and support of the local food system.

Example food safety activities include:

- Convey general knowledge and understanding of food safety science to New York State residents and beyond via varied communication strategies;
• Provide educational programs in collaboration with regulatory agencies involved with assuring the safety and wholesomeness of food processed, prepared, sold and handled and consumed by the public in New York State;
• Via courses, presentations and materials, support transfer of new research-based information for appropriate applications in the agricultural production, manufacturing, retailing and food service industries;
• Communicate current food safety production, manufacturing and technical problems to researchers at Cornell;
• Conduct specialized instruction in the effective application of laboratory methods to maintain and improve product safety and quality in the dairy and food industry.

Sample Statewide/Regional Initiatives that fall within this Plan of Work
• Choose Health at 4-H Camps
• Choose Health Officers (CHO)
• Choose Health: Fun, Food & Fitness (CHFFF)
• Choose Health Action Teens (CHAT)
• 4-H Produced in New York (PiNY)
• Adopting Healthy Habits (AHH)
• Collaboration for Health, Activity, and Nutrition in Children’s Environments (CHANCE)
• Cornell Healthy After School Self-Assessment (CHASE)
• Cornell Farm to School Research and Extension Program
• Cornell Farm to School Research Program
• Creating Healthy Places to Live, Work, and Play
• Eat Smart New York (ESNY)
• Expanded Food and Nutrition Education Program (EFNEP)
• Families Growing Together for Healthy Living
• Farmers Market Nutrition Program
• Youth Healthy Eating and Active Living Program Work Team (YHEAL PWT)
• Cornell NutritionWorks
• Supplemental Nutrition Assistance Program Education (SNAP-Ed)
• Small Steps Worksite Wellness

Description of Target Audiences
Audiences reached include: moderate and low income families; 4-H youth; children in and out of school; nutrition, health, and family professionals; front-line family workers; school food service staff; community leaders; and government and agency leaders at the local, state, and federal level.

Food safety audiences reached include: processors, producers and consumers with targeted programs for moderate and low income families; 4-H youth; nutrition, health, and family professionals; front-line family workers; food service and food production staff and their managers and directors; and government and agency leaders at the local, state, and federal level.

Food security and hunger programming addresses individuals and families, caregivers, nutritionists, community leaders, human service providers and food policy makers at the local, state, and national levels.

Output and Outcome Indicators Highlighted indicators are collected annually. Codes in parentheses are (new) and (old) classification system.

<table>
<thead>
<tr>
<th>4.1 Healthy Eating and Active Living</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Outputs</strong></td>
</tr>
<tr>
<td>(4.1a) # children, youth, parents/caregivers and other adults reached via healthy eating and active living programs</td>
</tr>
<tr>
<td><strong>Near-Term Outcomes</strong></td>
</tr>
<tr>
<td>(4.1d1) # of children and youth who demonstrate knowledge or skill gains related to healthy eating and active living</td>
</tr>
<tr>
<td><strong>Mid-Term Outcomes</strong></td>
</tr>
<tr>
<td>(4.1g) # of youth program participants documented to have applied healthy eating and/or active living recommendations</td>
</tr>
<tr>
<td><strong>Long-Term Outcomes</strong></td>
</tr>
<tr>
<td>(4.1j) # of vulnerable children and youth documented to have reduced incidence of overweight and obesity as a result of</td>
</tr>
<tr>
<td>(4.1d2) # of parents/caregivers and other adults who demonstrate knowledge or skill gains related to healthy eating and active living</td>
</tr>
<tr>
<td>(4.1e) # of women and health providers demonstrating increased knowledge or skill gains related to healthy weight gain during pregnancy and breastfeeding</td>
</tr>
<tr>
<td>(4.1f) # of extension educators or volunteers demonstrating knowledge or skill gains related to healthy eating and active living programs for obesity prevention</td>
</tr>
<tr>
<td>(4.1k) # of adult program participants documented to have reduced one or more chronic disease indicators associated with overweight.</td>
</tr>
</tbody>
</table>

4.2 Food Resource Management

**Outputs**

<table>
<thead>
<tr>
<th>Near-Term Outcomes</th>
<th>Mid-Term Outcomes</th>
<th>Long-Term Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>(4.2a) # of program participants reached to improve their food resource management and food security</td>
<td>(4.2b) # of program participants who demonstrate knowledge or skill gains related to food resource management and food security</td>
<td>(4.2d) # of program participants documented to have improved food resource management and/or food security</td>
</tr>
</tbody>
</table>

4.3 Decision Makers/Policy Education

**Outputs**

<table>
<thead>
<tr>
<th>Near-Term Outcomes</th>
<th>Mid-Term Outcomes</th>
<th>Long-Term Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>(4.3a) # of community and/or government/agency members completing educational programs on issues related to childhood obesity prevention programs and policy related to healthy living</td>
<td>(4.3b) # of program participants who demonstrate increased knowledge or skill gains related to childhood obesity prevention programs and policies</td>
<td>(4.3e) # of participating schools and/or communities reporting decline in incidence of childhood overweight and/or indicators of chronic diseases associated with obesity.</td>
</tr>
<tr>
<td>(4.3c) # of program participants documented to have increased involvement in public/community childhood obesity prevention actions</td>
<td>(4.3d) # of participating schools and/or communities documented to have made practice and/or policy changes to promote healthy eating and active living</td>
<td></td>
</tr>
</tbody>
</table>

4.4 Food Security and Hunger

**Outputs**

<table>
<thead>
<tr>
<th>Near-Term Outcomes</th>
<th>Mid-Term Outcomes</th>
<th>Long-Term Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>(4.4a) # of children, youth, and adults completing education programs on: identifying food insecurity, how to</td>
<td>(4.4c) # of program participants who demonstrate knowledge or skill gains related to status of food security in</td>
<td>(4.4g) # of individuals or households documented to have improved food security status.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
obtain food assistance, how to balancing available resources by planning food choices, and improve the sufficiency and quality of the diet.

(4.4b) # of policy makers and citizens participating in education programs on status of food security in their communities and possible actions to promote increased food security.

<table>
<thead>
<tr>
<th>(4.4f) # of community action plans implemented as a result of community based assessment.</th>
</tr>
</thead>
<tbody>
<tr>
<td>(4.4h) # of participating communities reporting declines in food insecurity indicators.</td>
</tr>
</tbody>
</table>

### 4.5 Food Safety and Consumers

#### Outputs

<table>
<thead>
<tr>
<th>Near-Term Outcomes</th>
<th>Mid-Term Outcomes</th>
<th>Long-Term Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>(4.5a) # of consumers participating in programs on: reducing food safety and/or food borne risks and illnesses including recommended purchasing, handling, storage, and preparation practices.</td>
<td>(4.5b) # of consumers who demonstrate knowledge or skill gains related to reducing food safety and/or foodborne risks and illnesses including recommended purchasing, handling, storage, and preparation practices.</td>
<td>(4.5d) Reduced incidence of foodborne illness among program participants. (no target).</td>
</tr>
</tbody>
</table>

### 4.6 Food Safety and Producers/Processors/Retailers/Food Service Providers

#### Outputs

<table>
<thead>
<tr>
<th>Near-Term Outcomes</th>
<th>Mid-Term Outcomes</th>
<th>Long-Term Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>(4.6a) # of producers/processors/food service providers participating in programs on: reducing food safety and/or food borne risks and illnesses including recommended production, processing, storage, handling, marketing, and preparation practices (no target).</td>
<td>(4.6b) # of producers/processors/food service providers who demonstrate knowledge or skill gains related to reducing food safety and/or foodborne risks and illnesses including recommended production, processing, storage, handling, marketing, and preparation practices.</td>
<td>(4.6d) Improved safety of foods available through wholesale and retail outlets and institutional foods.</td>
</tr>
</tbody>
</table>

### 4.7 Food Safety and Decision Makers

#### Outputs

<table>
<thead>
<tr>
<th>Near-Term Outcomes</th>
<th>Mid-Term Outcomes</th>
<th>Long-Term Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>(4.7a) # food safety decision-makers, policy makers and other officials reached with science-based information to improve food safety practices and policies.</td>
<td>(4.7b) # of food safety decision-makers, policy makers and other officials who demonstrate knowledge gains relative to improved food safety practices and policies.</td>
<td>(4.7c) # of communities/firms/or organizations documented to have assessed practices or food safety policies as a result of participating in relevant educational programs.</td>
</tr>
<tr>
<td>(4.7d) # of communities/firms/or organizations documented to have implemented improved practices or food safety policies as a result of participating in relevant educational programs.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
External Factors

The scope and scale of outcomes is greatly enhanced by augmenting Federal Formula Funds with external sources of support. However, external grant funds may only support certain activities or aspects of this plan. Local governments, an important funder for local extension staff, face diminished revenues and increased mandated costs outside of the non-mandated extension programs. Thus having professionals available to implement new research-based programming is not always possible. A very slow recovery from the recession and pockets of high unemployment in the state affect how public and private funds are allocated to educational activities. In some instances, family subsistence will be a higher priority than improved nutrition and opportunities for physical activity. As an example of the latter, in New York State, cost cutting proposals include closing some public parks and reducing recreational physical activity programs. Some decision-makers and others in the community may not agree with all aspects of an ecological approach to childhood obesity prevention. They may disagree with community or institutional policy changes such as eliminating non-nutritious snacks from after school activities and place all responsibility on the individual and within the family, disregarding most environmental factors outside the family.

Evaluation

The evaluation approach included in our plan can more accurately be described as an evaluation "system" rather than as bounded "studies" or investigations. Because each of the plans addresses a broad combination of applied research and extension initiatives spanning multiple audiences, methods, and intended outcomes, a combination of routine program monitoring and documentation, near-term outcome assessment, and targeted follow-up activities is required to provide comprehensive assessment. In addition, specialized data needs of funding partners must be addressed, sometimes using methods and/or accountability structures required by the funders.

Cornell Cooperative Extension works with the Cornell Office of Research and Evaluation (CORE) to influence our evaluation patterns and procedures. CORE has piloted the Evaluation Partnership Project (EPP) over the last decade documenting processes that work for Cornell Cooperative Extension and teaching process. The CORE Evaluation Partnership Project has included intensive program development and evaluation planning with a number of targeted programs and counties.

We employ a combination of routine program monitoring and documentation, near-term outcome assessment, and targeted follow-up activities for each of our planned programs. The results are aggregated in a statewide accountability system which leads to the summary results reported in the State Defined Outcomes in each plan including selected impact statements and success stories from a pool of more than 400 documented narratives. Some of the food and nutrition programs implemented through Cornell Cooperative Extension are the result of larger grant/contract supported projects that require specific evaluation strategies. Programs like EFNEP, Eat Smart New York, Choose Health Action Teens, and Choose Health at Camp are evaluated with consistent measures and strategies across the state. This information now feeds into our State Defined Outcomes related to Nutrition and Childhood Obesity. One example of evaluation in this plan of work framework:

- Within EFNEP, the Expanded Food and Nutrition Education Program (EFNEP) and Supplemental Nutrition Assistance Program - Education (SNAP-Ed) are nutrition education programs designed to enhance the quality of life for a low-income (<=185% of poverty) participants and their families. Participants complete an assessment form at entry into the program and at exit. The question sets used are based on the content of classes delivered. Enrollment in the program is usually limited to 4 - 12 lessons, but may occasionally be longer, depending upon the needs and desires of the individual participant. The assessment form collects demographic information, a maximum of 25 behavior checklist items and a 24-hour dietary recall. These collected data are entered into a web-based electronic database, specifically designed by the USDA to capture these evaluation data. SNAP-Ed is provided to any person who meets the income guidelines.
- The web-based EFNEP evaluation system provides multiple levels of assessment on participant and program outputs. The web-based system provides individual assessment: providing output reports which summarize participant reported behaviors to use with program participants to facilitate awareness of current practices and improved practices, at the conclusion of the sessions. The web-based system provides aggregated reports of program participant data which summarizes output and outcome (reported behavior and diet changes) at the local county level. The web-based system then enables to aggregation of data at the state and federal levels, to facilitate program reporting and evaluation assessment at each of these levels.
5.0 4-H Youth Development/Children, Youth, and Families

Brief Summary of Program

This plan frames research and extension programs connected to 4-H Youth Development/Children, Youth and Families.

Youth development is defined as an ongoing process that enables individuals to lead a healthy, satisfying, and productive life as youth and later as adults, because they gain the competence to earn a living, to engage in civic activities, to nurture others and to participate in social relations and cultural activities; Youth development is also defined as an approach emphasizing active support for the growing capacity of young people by individuals, organizations, and institutions, especially at the community level. The practice of youth development refers to the application of principles to a planned set of practices, or activities, that foster the developmental process in young people (Hamilton, Hamilton, & Pittman, 2003). Positive youth development is an approach that assumes all young people have assets regardless of their socio-economic status, race/ethnicity and gender.

The Youth Development program applies positive youth development including life skill development to the 4-H national mission mandates of science, technology engineering and math (STEM), civic engagement (citizenship), and healthy living (Components of the latter focused on healthy eating and active living are described in the Childhood Obesity and Nutrition Plan of Work). Each Youth Development mandate has NYS and national logic models to guide program priorities and to identify youth outcomes.

Family emphases include human development and social wellbeing, economic wellbeing, and quality of home and work environments. Parenting and care practices, and care programs and policies affect the quality of life for children, youth, elders and their families. Cornell Cooperative Extension parenting and dependent care programs are designed to integrate research with community education on parenting and infant/child care-giving practices and policies. Research focuses on behavioral and psychological development from conception through later life.

The family economic security extension program aims to increase our service to and empower low and moderate-income households who are especially vulnerable to financial setbacks and have less disposable income to commit to savings. Education promotes enhancing financial literacy skills and adopting effective management behaviors. The effort includes assistance to low-income households who often live in poor-quality housing that has high levels of radon, carbon monoxide, lead, asbestos, and basement mold. Research draws on a broad-based and diverse set of social science and design methodologies to understand how planning, design and management of the built environment affects individuals, groups, organizations and communities, and how this knowledge can feed the imagination to generate innovative design solutions to pressing social and cultural issues.

Situation and Priorities Statement
Youth development through experiential learning is the foundation of 4-H programming. Participation in high quality out-of-school programs is linked with a lower incidence of problem behaviors, such as decreased academic failure, substance abuse, and delinquency (Lerner, Lerner, & Phelps, 2008). Relative to science literacy, in international comparisons, U.S. student performance in mathematics and science is at or below levels attained by students in other countries in the developed world (Provasnik et al 2012). Science (or STEM) literacy is routinely identified as a key to our economic future and a significant public value of 4-H STEM programming. The National Academy, Learning Science in Informal Environments (2009) report links experiential learning with higher student performance in mathematics and science.

Effective parenting practices differ across several developmental stages of childhood, and include a range of outcomes, some of which can be customized to meet special needs, address cultural differences and still be sensitive to the needs of particular family structures. There is a continuing need for education on what constitutes high quality child care to help parents and guardians select and monitor their children’s care, and targeted education for other stakeholders and decision-makers affecting these issues. Economic security, financial and other household resource management are educational priorities. There are a multitude of economic challenges facing communities in New York State and the nation as well.

Assumptions

Youth
- Program educators and volunteers who work with youth need training and support in how to incorporate research findings and evaluation plans into program design at the local level with a focus on best practices to meet the needs of youth at various stages of their development.
- Curriculum design and learning experiences incorporate best practices for building life skill competencies and recognize how different delivery methods may impact life skill development.
- Youth have different interests and needs and therefore respond differently to the same opportunities. They should have choices about which activities they participate in and they should have a chance to help shape those activities.
- Many opportunities exist to connect youth to the educational resources of Cornell University in the area of STEM, Healthy Living and Civic Engagement.

Family
- Most parents and relative caregivers want to do the best they can for their children.
- Parenting and child development knowledge and skills are applicable to many family situations and can improve parent-child interactions and child nurturance over time.
- Selection of high quality childcare can be improved through education.
- Increased household disposable income and improved indoor environments will result in improved quality of life for individuals, more prosperous communities and overall improvement in the NYS economy.

Ultimate Goals of the Program

Youth
- Facilitate programming that supports positive youth development
• Prepare youth for success in postsecondary educational and career pursuits by exposing children and youth to a variety of career opportunities
• Youth lead healthy, satisfying, and productive lives
• Youth become caring and contributing members of society
• Youth become life-long learners
• Youth become knowledgeable, contributing participants in STEM-related, Healthy Living and Civic Engagement issues in their communities

Family
• Enable vibrant and resilient communities
• Improve parenting practices that result in better child and youth outcomes
• Improve parent/care giving practices resulting in parents and caregivers reporting increased confidence in their roles
• Improve financial status of targeted NYS residents
• Improve indoor air quality in low income households resulting in better health outcomes

Activities Youth

This is a comprehensive, statewide positive youth development program entailing a wide variety of applied research and multiple education methods depending on local context and need. Campus-based faculty and extension associates, Program Work Teams (PWTs), the NYSACCE4-HE professional development committee and county-based educators all are involved in designing, implementing, and evaluating tailored educational efforts depending on the focus and scope of their role.

A variety of educational strategies will be used to help county educators and volunteers gain the skills and knowledge necessary to fully understand and differentiate between the ranges of possibilities that exist within and between initiatives. Trained 4-H staff, teachers, community agency staff, volunteers, and teens lead youth in 4-H projects, which are a planned series of learning experiences through which youth develop knowledge (robotics, firearm safety, computer science), practical skills (woodworking, gardening, cooking, etc.) and life skills (decision-making, self-discipline, leadership, etc.) in a variety of settings including: after-school programming, camps, 4-H Clubs, school enrichment activities, and community events.

Family

This is a comprehensive, statewide educational program entailing multiple education methods depending on local context and need. Campus-based faculty and extension associates and county-based educators are involved in designing, implementing, and evaluating tailored, as well as statewide, educational efforts depending on the focus and scope of their role.

Sample Statewide Program Initiatives that fall within this Plan of Work:
• 4-H Clubs
• 4-H Afterschool Programs
• 4-H Camps
• 4-H School Enrichment Activities: I&E (etc.)
• Statewide Events: Career Explorations, STARR, Dairy Discovery Days, Animal Crackers, Public Presentations State Fair etc.
• 4-H and NYS Library Partnership
• Operation Military Kids
• ACT (Assets Coming Together) for Youth
• Children, Youth, and Families at Risk Program (CYFAR)
• Cornell Early Childhood Program
• Cornell Research Program on Self-Injurious Behavior
• The Parenting in Context Initiative
• PROSPER
• The Role of Grandparents in the Lives of Adolescent Grandchildren
• Family Economics and Resource Management
• Design & Environmental Analysis: knowledge, ideas, and designs that contribute to improving the places in which we work, live, learn, heal, and play
• 4-H National Mentoring Program
• 4-H Volunteer Forum
• Tractor Safety
• Shooting Sports

Target Audiences

Youth
• Young people
• Youth development educators and workers
• Youth development volunteers
• Parents and guardians
• Youth serving organizations
• Teachers and schools
• Community leaders
• Priority audiences include youth not formerly served and military youth and families.

Family
• Parents, grandparents and other caregivers
• Child care providers
• Community stakeholders such as employers, leaders and policy makers at the local and state levels
• Low and moderate-income households who are especially vulnerable to financial setbacks and have less disposable income to commit to savings.
• Low-income households living in poor-quality housing.
**Output and Outcome Indicators** Highlighted indicators are collected and reported annually. Codes in parentheses are (new) and (old) classification system.

<table>
<thead>
<tr>
<th>Youth</th>
<th>5.1 Positive Youth Development Including Life Skill Development</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outputs</td>
<td>Near-Term Outcomes</td>
</tr>
<tr>
<td>(5.1a) number of youth program educators and adult volunteers participating in programs on positive youth development.</td>
<td>(5.1c) number of youth participants who demonstrate gains in vocational/citizenship skills – knowledge, attitudes, and/or aspirations.</td>
</tr>
<tr>
<td>(5.1b) number of youth participating in projects related to vocational skills and/or citizenship.</td>
<td>(5.1d) number of youth participants who learn to set goals, make plans and identify resources to achieve goals and demonstrate decision-making abilities.</td>
</tr>
<tr>
<td>(5.1e) number of youth program educators and adult volunteers who demonstrate knowledge and/or skill gains in meeting the needs of youth at various stages of development.</td>
<td></td>
</tr>
</tbody>
</table>
## 5.2 Science, Technology, Engineering, and Math Literacy

<table>
<thead>
<tr>
<th>Outputs</th>
<th>Near-Term Outcomes</th>
<th>Mid-Term Outcomes</th>
<th>Long-Term Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>(5.2a) number of 4-H members enrolled in STEM project areas.</td>
<td>(5.2d) number of participants demonstrating increased awareness of STEM, interest in STEM, improved STEM abilities, and/or increased awareness of opportunities to contribute to society using STEM skills.</td>
<td>(5.2e) number of participants that report improved school achievement or have been observed to improve academic improvement, success in school science and/or increased interest in STEM.</td>
<td>(5.2j) Increased number and diversity of 4-H youth pursuing education and careers in STEM related fields.</td>
</tr>
<tr>
<td>(5.2b) number of youth reached through school enrichment and special interest programs, 4-H camp, and after school programs coded as STEM related (as reported on ES-237).</td>
<td>(5.2f) number of youth applying STEM learning to contexts outside 4-H programs, e.g., school classes, science fairs, invention contests, etc.</td>
<td></td>
<td>(5.2k) Increased and more diverse pool of trained teachers, educators, scientists.</td>
</tr>
<tr>
<td>(5.2c) number and diversity of 4-H and other youth program educators and adult volunteers participating in programs on STEM for youth.</td>
<td>(5.2g) number of youth expressing interest/demonstrating aspirations towards STEM careers, e.g., career fairs, job shadowing, volunteer work or internships.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(5.2h) number of youth adopting and using new scientific methods or improved technology.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(5.2i) number of youth and adult volunteers documented to become contributing participants in STEM related issues in their communities and/or choose STEM related professions and who attribute same at least in part to involvement with the program.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(5.2j) Increased number and diversity of 4-H youth pursuing education and careers in STEM related fields.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(5.2k) Increased and more diverse pool of trained teachers, educators, scientists.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## 5.3 Youth Civic Engagement
### Outputs | Near-Term Outcomes | Mid-Term Outcomes | Long-Term Outcomes
---|---|---|---
(5.3a) number of youth participating in education programs leading to civic engagement initiatives. | (5.3e) number of youth and adults demonstrating knowledge gains related to Youth/Adult Partnerships and civic engagement initiatives. | (5.3f) number of youth documented to have practiced life skills in authentic decision-making partnerships with adults as a result of participating in the program. | (5.3h) number of documented instances in which youth and adults partner to improve quality of life within a community as a result of participating in the program. |
(5.3b) number of youth participating in train-the-trainer programs related to civic engagement. | | (5.3g) number of adults documented to have applied knowledge, skills and abilities and behaviors necessary as they assist youth developing into productive community members as a result of participating in the program. | |
(5.3c) number of adults participating train-the-trainer programs related civic engagement. | | | |
(5.3d) number of communities participating in 4-H civic engagement initiatives. | | | |

### 5.4 Human Development: Individuals

#### Outputs | Near-Term Outcomes | Mid-Term Outcomes | Long-Term Outcomes
---|---|---|---
(5.4a) number of infant and child caregivers completing non-formal education programs about quality dependent care giving. | (5.4c) number of participating infant and child caregivers who demonstrate knowledge or skill gains related care-giving practices. | (5.4e) number of participating infant and child caregivers reporting to have applied positive care-giving practices. | (5.4g) number of participating persons with care-requiring dependents reporting positive change in childcare as a result of participating in educational programs. |
(5.4b) number of persons with care-requiring dependents completing non-formal education programs on selection of care-giving individuals and facilities. | (5.4d) number of participating persons with care-requiring dependents who demonstrate ability to evaluate the quality of care programs. | (5.4f) number of participating persons with care-requiring dependents reporting to have used childcare quality characteristics in their care selection. | |

### 5.5 Human Development: Community Level
<table>
<thead>
<tr>
<th>Outputs</th>
<th>Near-Term Outcomes</th>
<th>Mid-Term Outcomes</th>
<th>Long-Term Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>(5.5a) number of organizations, agencies, and institutions participating in non-formal educational programs about social and public policy issues to enhance opportunities for safe, economical, and developmentally appropriate caregiving programs for infants, children and youth.</td>
<td>(5.5b) number of program participants who demonstrate knowledge or skills gains regarding community approaches to family care.</td>
<td>(5.5c) number of program participants reporting to have been involved in community level assessments of family care needs.</td>
<td>(5.5d) number of communities documented to have taken action to address family needs that can be related to educational programs and/or critical community collaborations provided.</td>
</tr>
<tr>
<td><strong>5.6 Parenting</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outputs</td>
<td>Near-Term Outcomes</td>
<td>Mid-Term Outcomes</td>
<td>Long-Term Outcomes</td>
</tr>
<tr>
<td>---------</td>
<td>--------------------</td>
<td>-------------------</td>
<td>--------------------</td>
</tr>
<tr>
<td>(5.6a) number of persons completing complete non-formal education programs about parenting.</td>
<td>(5.6b) number of parents, grandparents and other adults providing parental care gaining knowledge or skills gains regarding developmentally appropriate and effective parenting methods.</td>
<td>(5.6c) number of parents and other adults providing parental care adopting developmentally appropriate and effective parenting methods.</td>
<td>(5.6d) number of parents/relative caregivers reporting to have experienced positive change in parent-child relationships and child nurturance that they attribute to implementing new parenting behaviors learned in educational programs.</td>
</tr>
</tbody>
</table>
### 5.7 Economic Security

<table>
<thead>
<tr>
<th>Outputs</th>
<th>Near-Term Outcomes</th>
<th>Mid-Term Outcomes</th>
<th>Long-Term Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>(5.7a) number of persons completing education programs on age-appropriate topics like spending and saving concepts, appropriate use of money, financial goals, tracking expenses, budgeting, credit management, financial planning, and/or wealth generation strategies.</td>
<td>(5.7b) number of participants who demonstrate knowledge or skill gains and/or can articulate specific actions they will take related to spending and saving concepts, appropriate use of money, setting financial goals, tracking expenses, budgeting, credit management, financial planning, and/or wealth generation strategies.</td>
<td>(5.7c) number of program participants reporting they are practicing improved money management skills such as comparison shopping, paying bills on time, paying more than minimum payment, checking credit report, and reviewing and understanding bills/statements as a means to meeting financial goals.</td>
<td>(5.7d) number of program participants reporting to have met day-to-day financial obligations while also progressing on future goals for home ownership, savings, retirement accounts, etc.</td>
</tr>
<tr>
<td>(5.7e) number of program participants reporting to have reduced debts and/or increased savings.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 5.8 Indoor Environment

<table>
<thead>
<tr>
<th>Outputs</th>
<th>Near-Term Outcomes</th>
<th>Mid-Term Outcomes</th>
<th>Long-Term Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>(5.8a) number of consumers and property managers completing programs on indoor air quality issues.</td>
<td>(5.8b) number of consumers and property managers gaining awareness and knowledge of indoor air quality issues and remediation options.</td>
<td>(5.8c) number of program participants documented to have taken measures to prevent or remediate indoor air quality issues.</td>
<td>(5.8d) number of program participants documented to have reduced short-term health effects of indoor air pollutants (such as irritation of the eyes, nose, and throat, headaches, dizziness, and fatigue) as a result of participating in educational programs.</td>
</tr>
<tr>
<td>(5.8e) number of participants reducing risks of respiratory diseases, heart disease, and cancer by implement measures such as radon remediation, controlling indoor triggers of asthma: secondhand smoke, dust mites, pet dander, and pests.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
External Factors

Youth

Fiscal pressures internal to Extension and among community organizations influence the scope and quality of programming available to youth. Increasing diversity of our populations creates need for a broader array of program materials, strategies and for a focus on multicultural competencies. Changing educational standards influence acceptability of existing curricula. Regional demographic differences and differences across communities influence both needs and program strategy; demographics shifts and under-served audiences will require professional development to build staff competencies for working with non-traditional populations.

Family

The economic, political and governmental sectors affect the quality, availability and accessibility of childcare. The growth of aging and minority populations in the US means more diverse cultures and values related to parenting, childcare, and family care giving. Natural disasters and the economy affect household financial status and impact energy issues. They also affect the quality of the indoor air environment. Government regulation and policies driven by public priorities can change the circumstances of personal finances, the energy market and the quality of the indoor household environment. Public and private funders and CCE may have fewer fiscal resources and other resources to devote to the quality of life in financial, energy and indoor air quality matters.

Evaluation Methods

The evaluation approach included in our plan can be more accurately described as an evaluation "system" rather than as bounded "studies" or investigations. Because each of the plans addresses a broad combination of applied research and extension initiatives spanning multiple audiences, methods, and intended outcomes, a combination of routine program monitoring and documentation, near-term outcome assessment, and targeted follow-up activities is required to provide comprehensive assessment. In addition, specialized data needs of funding partners must be addressed, sometimes using methods and/or accountability structures required by the funders. Cornell Cooperative Extension works with the Cornell Office of Research and Evaluation (CORE) to influence our evaluation patterns and procedures. CORE has piloted the Evaluation Partnership Project (EPP) over the last decade documenting processes that work for Cornell Cooperative Extension and teaching process. The CORE Evaluation Partnership Project has included intensive program development and evaluation planning with a number of targeted programs and counties.

We employ a combination of routine program monitoring and documentation, near-term outcome assessment, and targeted follow-up activities for each of our planned programs. The results are aggregated in a statewide accountability system, which leads to the summary results reported in the State Defined Outcomes in each plan including selected impact statements and success stories from a pool of more than 400 documented narratives.

Several of the program areas including Parenting in Context and Family Economics and Resources Management have created an evaluation plan and resources for statewide evaluation efforts.
moving in that direction with the staff working closely with National 4-H Headquarters and Council to use national outcomes and measures systematically.
6.0 Community and Economic Vitality

Brief Summary of Program

This plan frames the programs that aim to empower individuals and communities to make sound decisions for the future through access to research, data and resources, best practices, university-based resources and community education.

Community emphases include community and economic development processes, community sustainability and resiliency, agriculture and food systems development, land use and energy, emergency preparedness and to some extent entrepreneurship and workforce development. Cornell has a commitment to New York citizens and local officials to build their capacities so they can solve problems and build strong and vibrant communities. Agriculture and food systems development includes efforts that promote community farmland protection initiatives, promote local foods, supports agricultural entrepreneurship, public issues education related to specific agriculture/community conflict. Our educational programs support inter-municipal and regional collaborations, and new public-private partnerships that spur innovative strategies to address complex community development issues.

Situation and Priorities Statement

Our focus is on developing capacity among citizens, leaders, and local officials so they are better prepared to address challenges and opportunities, improve quality of life, and build strong and vibrant communities. Building local capacity for governance, enhancing local economies, and investing in human capital by providing research-based knowledge, public issues education, and education and training are keys. We work toward the long term sustainability and well-being of communities through collaborations and partnerships and promote active and representative participation toward enabling all community members to shape their collective future. Even in the most rural areas, changing populations and land use patterns often bring agriculture/horticulture/natural resource enterprises in contact with neighbors or visitors who do not understand or appreciate the nature of their operations and contributions to the community. Local municipal leaders must balance private property rights, community growth, quality of life issues and environmental protection. Partnerships, based on mutual respect and trust, unleash community potential of and provide a powerful tool to create positive and lasting change for communities.

Assumptions

- The institutional capacity and needs of New York’s smaller and rural local governments are far different than is often defined by larger municipal and state government organizations.
- When a number of communities have a common goal, but each is unable to pursue it separately, collaboration may be a possible solution.
- Local governments experience a “boundary problem” when each community operating alone cannot see the problem nor identify what needs to be done because the problem has a multi-jurisdictional nature.
- Knowledge of the interactions of environmental resources, quality of life, and local economies will lead to an involved, proactive citizenry.
- Citizens are concerned about the impacts of a variety of decisions on the environment and on quality of life issues, and citizens want to pay attention to the connection between work, civic life, and residential patterns.
- Collaboration between agriculture/horticulture/natural resource enterprises, community leaders and members can lead to identification of mutual interests and minimization or resolution of conflicts.
- Economic development occurs in a different context than in the past.
- There is increased interest in community readiness and resiliency, especially in efforts to adapt to a changing climate.
- Communities that utilize a community development approach to areas like ag and food systems, land use and energy will learn to use that approach for other community issues.
Ultimate Goals of the Program

- More resilient communities
- Ensure that diverse interests and populations in communities are reflected within and engaged as key stakeholders – this includes engaging community networks that link diverse sub-groups
- Better utilize community resources to improve and sustain quality of life
- Increased local capacity for management and protection of local environmental resources
- Avoid or minimize conflicts between agriculture/horticulture/natural resource enterprises and community members and resolve them within communities when they occur
- View agriculture/horticulture/natural resource enterprises as contributing and positive elements in the community
- Retirees develop leadership capacity to engage in the application of science-based solutions to environmental problems at the community level.
- Communities experience high quality of life, social cohesion, ecological integrity, effective decision making, and new economic opportunities
- More sustainable local economies through diversification
- Institutionalize sustainable practices so that communities actively manage their environments protecting and enhancing financial, infrastructure, human, environmental, and social capitals

Activities

CCE, CUAES and NYSAES have a commitment to the people of New York to build self-capacity among citizens, leaders, and local officials so they are better positioned to address challenges and opportunities, improve quality of life, and build strong and vibrant communities. Through integrated research and extension agendas, we can help develop effective and collaborative agriculture, energy, emergency management, and land use/natural resource management approaches and policies that enhance economic, environmental and social connections. Program staff work with a variety of state and local groups to tackle projects that that vary in nature from applied research to pilot projects or case studies. These activities, which are demand driven (locally or regionally initiated usually with sponsored or self-financing), provide valuable insights, resources and materials for extension education.

Sample Statewide/Regional Initiatives that fall within this Plan of Work

- Agriculture and Food Systems Development: Community and Economy
- Community and Energy
- Leadership Development
- Workforce Development
- Community Capacity Building
- Land Use Education
- Regional Economic Development
- Training for Local Officials
- Entrepreneurship
- New York Extension Disaster Education Network (NY EDEN)
- Master Gardener Volunteer Program

Target Audiences

- Elected officials, community leaders, business and economic leaders, not-for-profit agencies, schools, environmental groups, agribusiness leaders, etc.
- Retirees and other elders who have time to engage in community stewardship
- Engaged community citizens
- Communities as whole: youth and adults organizations, businesses, schools, and other institutions
- Agriculture/horticulture/natural resource enterprise managers, community residents and visitors, youth, local media, local officials, and local planning and economic development staff
- Workforce development specialists
### 6.1 Community and Economic Development

<table>
<thead>
<tr>
<th>Outputs</th>
<th>Near-Term Outcomes</th>
<th>Mid-Term Outcomes</th>
<th>Long-Term Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>(6.1a) number of local officials, residents, community leaders, entrepreneurs, economic and community development professionals participating in programs re: workforce, entrepreneurial climate, diversification, economic impact analysis, e-commerce, market development, business planning, partnerships.</td>
<td>(6.1c) number of local officials, residents, community leaders, entrepreneurs, economic development professionals demonstrating knowledge/skill gains re: workforce, entrepreneurial climate, diversification, economic impact analysis, e-commerce, market development, business planning, and partnerships.</td>
<td>(6.1f) number of communities who plan for and implement initiatives on community based agricultural economic development, land use, energy, workforce development, business and entrepreneurial development and assistance, non-profit sector development and/or other elements of sustainable growth.</td>
<td>(6.1j) number of communities establishing an infrastructure and climate to support entrepreneurs, local farms and agribusinesses attributable at least in part to initiatives of the program.</td>
</tr>
<tr>
<td>(6.1b) number of neighborhoods and communities, economic developers and/or entrepreneurs participating in educational programs on “green” business opportunities.</td>
<td>(6.1d) number of local officials, residents and/or community leaders, demonstrating knowledge/skill gains about enhancing facilities and/or other community resources or services.</td>
<td>(6.1g) number of residents and/or community leaders, who plan for and initiate steps to enhance facilities, and/or other community resources or services.</td>
<td>(6.1k) number of communities documenting improvements in facilities and/or other community resources or services.</td>
</tr>
<tr>
<td>(6.1e) number of citizen groups, workforce professionals, economic developers and/or entrepreneurs demonstrating knowledge gains related to “green” workforce, business opportunities, and community development.</td>
<td>(6.1h) number of new workers trained and “green” businesses established at least in part due to participation in the program.</td>
<td>(6.1i) number of sustainability initiatives adopted.</td>
<td>(6.1l) number of communities that report increased diversification of their local economies attributable at least in part to participation in the program.</td>
</tr>
</tbody>
</table>

### 6.2 Community Capacity Building

<table>
<thead>
<tr>
<th>Outputs</th>
<th>Near-Term Outcomes</th>
<th>Mid-Term Outcomes</th>
<th>Long-Term Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>(6.2a) number of community members participating in educational programs related to community decision-making, public participation, planning and monitoring processes, and collaborative approaches.</td>
<td>(6.2b) number of community members demonstrating knowledge or skills gains related to community decision-making, public participation, planning and monitoring processes, collaborative approaches, and/or emergency preparedness.</td>
<td>(6.2c) number of communities instituting new or enhanced participatory processes related to economic development.</td>
<td>(6.2e) number of documented instances in which a community effectively resolves a need or strengthens community assets attributable at least in part to participation in the program.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(6.2d) number of collaborative partnerships established within and across communities for issue resolution and collective action and/or to improve community services.</td>
<td>(6.2f) number of communities reporting specific improvements in quality or scope of community services.</td>
</tr>
<tr>
<td>6.3 Land Use and Energy</td>
<td>6.4 Community Sustainability and Resiliency Decision-making</td>
<td>6.5 Land Use</td>
<td>6.6 Land Use and Public Spaces</td>
</tr>
<tr>
<td>--------------------------</td>
<td>----------------------------------------------------------</td>
<td>-------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td><strong>Outputs</strong></td>
<td><strong>Near-Term Outcomes</strong></td>
<td><strong>Mid-Term Outcomes</strong></td>
<td><strong>Long-Term Outcomes</strong></td>
</tr>
<tr>
<td><strong>(6.3a)</strong> number of neighborhoods and communities, municipalities participating in educational programs related to land use and/or community and energy issues</td>
<td><strong>(6.3b)</strong> number of citizen groups, communities and municipalities demonstrating knowledge gains related to effective use of their land base and community-based energy development scenarios.</td>
<td><strong>(6.3c)</strong> number of communities and municipalities that address the connection between their land base and possible energy scenarios.</td>
<td><strong>(6.3d)</strong> number of sustainability initiatives adopted.</td>
</tr>
<tr>
<td><strong>(6.3e)</strong> number of communities that incorporate energy use and development in their comprehensive plans.</td>
<td><strong>(6.3f)</strong> number of communities that make land use decisions to be more sustainable and resilient</td>
<td><strong>(6.4a)</strong> number of residents and community leaders participating in programs on community sustainability, community assets, citizen involvement, property rights, land use, conservation, interaction between environmental, economic, and quality of life issues.</td>
<td><strong>(6.4b)</strong> number of residents and/or community leaders demonstrating knowledge or skill gains related to community sustainability, community assets, property rights, land use, environmental conservation, interaction between environmental, economic issues, quality of life indicators.</td>
</tr>
<tr>
<td><strong>(6.4c)</strong> number of community leaders documented to apply community economic development and quality of life indicators to support decision-making.</td>
<td><strong>(6.4d)</strong> of communities implementing projects that enhance community sustainability and/or protect public health and community well-being through sound environmental management.</td>
<td><strong>(6.5a)</strong> # of municipalities adopting land use planning tools that incorporate environmental dimensions and/or develop new institutional arrangements to support land use planning and environmental management.</td>
<td><strong>(6.5b)</strong> # of communities adopting or updating farmland preservation and/or agricultural economic development plans.</td>
</tr>
<tr>
<td><strong>(6.5c)</strong> # of additional acres covered by open space preservation, environmental conservation and/or protection programs attributable at least in part to participation in the program.</td>
<td><strong>(6.6a)</strong> # of residents and/or community leaders, demonstrating knowledge/skill gains about sustainable communities and enhancing public spaces.</td>
<td><strong>(6.6b)</strong> # of residents and/or community leaders, who plan for and initiate steps to enhance public spaces.</td>
<td><strong>(6.6c)</strong> # of new or enhanced community organizations or networks linking diverse subgroups and focused on enhancing community sustainability.</td>
</tr>
<tr>
<td><strong>(6.6d)</strong> # of communities documenting improvements in public spaces.</td>
<td></td>
<td><strong>(6.6e)</strong> number of communities that report increased balance of environmental, social cohesion, and economic vibrancy.</td>
<td></td>
</tr>
<tr>
<td>Outputs</td>
<td>Near-Term Outcomes</td>
<td>Mid-Term Outcomes</td>
<td>Long-Term Outcomes</td>
</tr>
<tr>
<td>---------</td>
<td>-------------------</td>
<td>------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>(6.7a) number of agriculture/horticulture/natural resource business persons participating in education programs on potential environmental, health, social, and cultural impacts of their operations from the perspective of the community.</td>
<td>(6.7b) number of agriculture/horticulture/natural resource business persons demonstrating knowledge or skill gains related to potential environmental, health, social, and cultural impacts of their operations from the perspective of the community.</td>
<td>(6.7c) number of instances in which producers/horticulture businesses/natural resource enterprises, residents and community leaders work together to address issues.</td>
<td>(6.7d) number of documented instances in which agriculture/community conflicts are resolved locally.</td>
</tr>
</tbody>
</table>

6.8 Social and Economic Contributions of Agriculture – embed this with previous section

<table>
<thead>
<tr>
<th>Outputs</th>
<th>Near-Term Outcomes</th>
<th>Mid-Term Outcomes</th>
<th>Long-Term Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>(6.8a) number of community members and/or local leaders participating in education programs on the roles of agriculture/horticulture/natural resource enterprises in the local community, tax base, and environment.</td>
<td>(6.8c) number of community members and/or local leaders demonstrating knowledge or skill gains related to the roles of agriculture/horticulture/natural resource enterprises in the local community, tax base, and environment and how they are affected by local policy.</td>
<td>(6.8e) number of communities that assess how current policies and infrastructures sustain or impede agriculture/horticulture/natural resource enterprises (such as farmland protection or including such enterprises in economic development planning) and how the enterprises are affected by public policy.</td>
<td>(6.8g) number of communities documented to adopt, maintain, or expand policies supportive of appropriate agriculture/horticulture/natural resource enterprise development and/or community agriculture.</td>
</tr>
<tr>
<td>(6.8b) number of local community members and/or leaders participating in programs on the potential benefits of community-based agriculture and opportunities for promoting same.</td>
<td>(6.8d) number of youth demonstrating knowledge or skill gains related to the agriculture and food system and/or natural resource enterprises.</td>
<td>(6.8f) number of communities that initiate specific plans to address agriculture/horticulture/natural resource enterprise related issues or capitalize on new opportunities including community agriculture initiatives.</td>
<td></td>
</tr>
</tbody>
</table>
## 6.9 Master Gardener Program

<table>
<thead>
<tr>
<th>Outputs</th>
<th>Near-Term Outcomes</th>
<th>Mid-Term Outcomes</th>
<th>Long-Term Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>(6.9a)</td>
<td>number of hours of instruction by Master Gardener volunteers in educational programs for youth and adult audiences.</td>
<td>(6.9c) number of community residents gaining knowledge and skill in weighing the environmental impacts and consequences of management actions taken in residential landscapes and homes.</td>
<td>(6.9f) number of community residents practicing management tactics in residential landscapes and homes that work to sustain or enhance a healthy community and environment.</td>
</tr>
<tr>
<td>(6.9b)</td>
<td>number of hours by Master Gardener volunteers in general program support.</td>
<td>(6.9d) number of community residents enhancing knowledge and skill in using research-based information to make plant and management choices among alternatives.</td>
<td>(6.9g) number of community residents with improved availability and access to fresh fruits and vegetables.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(6.9e) number of community residents gaining knowledge and skill in choosing and growing food crops for home, school and community gardens.</td>
<td>(6.9h) number of community education/demonstration food gardens established or maintained.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(6.9i) Pounds of produce donated for distribution through local food organizations.</td>
</tr>
</tbody>
</table>

### External Factors

Communities operate in a complex and volatile context involving susceptibility to weather extremes, changing governmental policies and regulations, land uses demands and shifting development patterns, evolving consumer demands, and globalization related economic factors. Weather related disasters can greatly impact communities in terms of infrastructure damage and direct costs. The global, statewide, and regional economies directly impact local economies. Fundamental change is occurring in the state and regional economies. The specific implications of these external factors vary greatly by locale and across regions.

### Evaluation Methods

The evaluation approach included in our plan can more accurately be described as an evaluation "system" rather than as bounded "studies" or investigations. Because each of the plans addresses a broad combination of applied research and extension initiatives spanning multiple audiences, methods, and intended outcomes, a combination of routine program monitoring and documentation, near-term outcome assessment, and targeted follow-up activities is required to provide comprehensive assessment. In addition, specialized data needs of funding partners must be addressed, sometimes using methods and/or accountability structures required by the funders.

Cornell Cooperative Extension works with the Cornell Office of Research and Evaluation (CORE) to influence our evaluation patterns and procedures. CORE has piloted the Evaluation Partnership Project (EPP) over the last decade documenting processes that work for Cornell Cooperative Extension and teaching process. The CORE Evaluation Partnership Project has included intensive program development and evaluation planning with a number of targeted programs and counties.

We employ a combination of routine program monitoring and documentation, near-term outcome assessment, and targeted follow-up activities for each of our planned programs. The results are aggregated in a statewide accountability system which leads to the summary results reported in the State Defined Outcomes in each plan including selected impact statements and success stories from a pool of more than 400 documented narratives.