

2017 Cornell University Research and Extension and NY State Agricultural Experiment Station Research Combined Plan of Work

Status: Accepted

Date Accepted: 07/19/2016

I. Plan Overview

1. Brief Summary about Plan Of Work

At Cornell University, Federal Capacity Funds are administered strategically to address a wide range of issues in the state and foster integration of applied research and extension programming.

Cornell University Agricultural Experiment Station (CUAES), the New York State Agricultural Experiment Station (NYSAES), and Cornell Cooperative Extension (CCE) work collaboratively to determine planned programs that align with NIFA priority areas and direct funds to research and extension projects as well as those that integrate research and extension. The approach used to integrate the work of the experiment stations and CCE is designed to serve the citizens of New York State and improve the human condition through excellence in scholarship; linking research, non-formal teaching and extension to "real life" challenges and opportunities. Director-level staff from CUAES, NYSAES, and CCE meet regularly as an Integrated Program and Research Team (IPaRT) to discuss relevant issues, research and extension projects and new opportunities.

IPaRT recruits and communicates with a group of richly diverse research and extension stakeholders, who provide input and inform priority-setting for use of Federal Capacity Funds. These stakeholders review proposals submitted through an internal competitive process by which faculty may apply for federal capacity funds for projects with research and extension components matching current priorities. In addition, we have 31 active Program Work Teams comprised of extension educators, faculty, and stakeholders from across New York State who work together to develop, implement, and evaluate priority programs.

University-wide strategic plans have reinforced the land grant research and extension mission. Cornell is a community of scholars, engaged in deep and broad research, teaching tomorrow's thought leaders to think otherwise and create knowledge with a public purpose. In 2014 the College of Agriculture and Life Sciences (CAL S) released the CAL S Strategic Plan: Knowledge with Public Purpose in a Changing World. The CAL S plan supports engaged learning and research that includes additional support for student internships and externships, faculty and staff participation in outreach through media, connections for research and extension to policy and regulatory actions and support for regional extension teams that build upon existing university and extension capacity. Likewise, the College of Human Ecology (CHE) is continuing to reinforce the bridges between science and practice, campus community partnerships, and leadership and outreach. The CHE Bronfenbrenner Center for Translational Research is dedicated to expanding, strengthening and accelerating the connections between research, policy, and practice to enhance human development and well-being. Both colleges are committed to research, teaching and extension and the need to translate knowledge for public purpose.

Each organization is described below to better explain our unique system at Cornell University.

Cornell University Agricultural Experiment Station

The Cornell University Agricultural Experiment Station links Cornell's world-class research facilities with

one of the nation's most comprehensive statewide cooperative extension systems. Through this engaged, interactive system we address pressing issues that directly affect the health and welfare of the state and beyond. With more than 130 years of experience identifying, quantifying, and responding to emerging issues in an ever-changing world, CUAES directs some of the most important projects in the state on a broad range of topics. Many of today's most urgent societal concerns - from childhood obesity to invasive species to global climate change - are not bound by state or national boundaries.

The station also has influence over 12,000 acres of farms and forests, seven farm facilities and over 177,000 square feet of greenhouse space--providing critical research services to scientists. Our student-run farm, Dilmun Hill, which uses organic agricultural practices, is a model of a student-run agricultural operation that has been emulated by other organizations and universities. Every aspect of our operation - from staff development to forest management to farm management- is viewed through the lens of sustainability.

The Cornell University Agricultural Experiment Station:

- Manages more than \$7 million in federal Hatch and Hatch Multistate funds.
- Annually distributes approximately \$1.5 million to new competitively reviewed projects. Federal capacity grants are an essential element of Cornell's research portfolio, supporting applied research that benefits residents of the state, region, and the nation.
- Manages an operational budget that is approximately \$5 million and employs roughly 50 full time operations staff and seven full time staff in administration.
- Operates seven farms with agricultural production and forest acreage across the state, from Willsboro on Lake Champlain to Long Island on the Atlantic Seaboard.

New York State Agricultural Experiment Station

Established in 1880, Cornell's New York State Agricultural Experiment Station (NYSAES) in Geneva has existed for more than 130 years developing cutting-edge technologies essential to feeding the world and strengthening New York economies. The focus of both research and extension programs at NYSAES is on the production, protection and processing of horticulture food crops, turf and hybrid willow for renewable energy. While our programs have traditionally addressed global food security and hunger issues, the Experiment Station is also well positioned to address other challenges identified as high priorities by NIFA.

The New York State Agricultural Experiment Station:

- Operates on a budget that is approximately \$35 million with \$9.1 million funded through SUNY's base budget.
- Employs 200 staff and 30 tenure-track professors.
- Partners with Faculty and Extension Associates: on the range of 10 visiting scientists, 20 postdocs, 25 research and extension associates.
- Extends research and knowledge through students. In recent years there have been 40-45 graduate students conducting masters and doctoral studies.
- Encourages cross departmental/Research Association operations: Our four departments -- horticulture; plant pathology and plant-microbe biology; entomology and food science - have faculty in Geneva and Ithaca. The main focus is on improving the genetics, cultivation, production, protection, handling and processing of fruit and vegetable crops.
- Partners with the Northeast Center for Food Entrepreneurship (NECFE), at the NY Food Venture Center at Geneva to provide assistance to over 200 food entrepreneurs annually, promoting sustainable economic development in rural communities.

Campus includes:

- the U.S. Department of Agriculture's Plant Genetic Resources Unit (PGRU), responsible for the collection of apple, sour cherry and cold-hardy grapes and selected seed-propagated crops, such as onion, garlic, broccoli, cabbage and winter squash; and the Grape Genetics Resources Unit (GGRU), responsible for the national program on grape genetics and genomics.
- A central Geneva campus made up of 20 major buildings, several smaller buildings for farm machinery storage and similar purposes, and 32 houses with rooms rented to graduate students, visiting scientists, and postdocs.
- Two pilot plants -- the Fruit & Vegetable Processing Pilot Plant and the Vinification & Brewing Technology Laboratory -- provide opportunities for entrepreneurs and processors to add value to the state's raw products.
- The NYS IPM Program
- The NYS Seed Testing Laboratory
- IR-4 Field Research Program
- Cornell Agriculture and Food Technology Park adjacent to the main NYSAES campus
- Administers other research/extension laboratories - Hudson Valley at Highland, NY, and the Cornell Lake Erie Research and Extension Laboratory at Portland, NY.
- Operates eleven farms for experimental plot work close to the Geneva campus with a total of 870 acres. There is also one acre of glasshouse space on the campus.

Cornell Cooperative Extension

Cornell Cooperative Extension extends Cornell University's land-grant programs to citizens all across New York State. With a presence in every county and New York City, CCE puts research into practice by providing high-value educational programs and university-backed resources that help solve real-life problems, transforming and improving New York families, farms, businesses and communities.

County associations of Cornell Cooperative Extension work with their local boards, committees and volunteers to influence decisions on program priorities and delivery. Our county extension associations and multi-county programs are separate 501(c) 3 organizations under the general supervision of Cornell University as agent for the state of New York.

Cornell Cooperative Extension:

- Annually reaches 1.4 million directly, and 15 million indirectly.
- Employs 1,013 local and regional staff and educators organized around program initiatives and local needs.
- Uses 48 specialists to provide programming in integrated pest management, dairy, grape, fruit, vegetable and field crop production and management.
- Extends community work by partnering with over 45,000 volunteers who advise, plan, teach and mentor in all program areas.
- Partners with approximately 393 Cornell staff and faculty; primarily from the College of Agriculture and Life Sciences and the College of Human Ecology.
- Engages a program development process that relies heavily on county input to identify issues of local importance. Often research is informed by the two-way flow of information and experience.
- Includes 57 distance learning centers across New York State, and is fully equipped to deliver events and instruction through various modes including webinars and on-demand videos to remote audiences.

CORNELL UNIVERSITY - NYSAES, CUAES & EXTENSION - PROGRAM SUMMARY

Cornell funded projects and efforts relate to the following 6 plans:

AGRICULTURE AND FOOD SYSTEMS: Support, maintain and develop a NY agriculture industry that is diverse, sustainable, and profitable, which produces a safe, reliable, healthy and local food supply.

CLIMATE CHANGE: Engage with multidisciplinary researchers, educators and extension faculty to quantify the current climate trends and prepare for future impacts. This plan also includes related topics - biodiversity and water quality/erosion control.

ENVIRONMENT, NATURAL RESOURCES AND SUSTAINABLE ENERGY: Engage in research and extension that uses available resources - including land and organic waste streams for renewable solutions. This plan also supports research and extension strategies that promote energy and natural resource conservation.

NUTRITION, FOOD SAFETY AND SECURITY, AND OBESITY PREVENTION: Support families, youth, communities and the agricultural industry with research and extension connected to childhood obesity prevention; youth, family and community nutrition; food security and food safety.

4-H YOUTH DEVELOPMENT/CHILDREN, YOUTH, AND FAMILIES: Enrich the lives of youth and families with research and extension programs. 4-H youth programs focus on life skill development and STEM opportunities. Family programs emphasize human development and social well-being, parenting, economic well-being, and quality of home and work environments.

COMMUNITY AND ECONOMIC VITALITY: 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. This plan also supports extension efforts related to entrepreneurship and workforce development.

Estimated Number of Professional FTEs/SYs total in the State.

Year	Extension		Research	
	1862	1890	1862	1890
2017	1058.0	0.0	40.0	0.0
2018	1058.0	0.0	40.0	0.0
2019	1058.0	0.0	40.0	0.0
2020	1058.0	0.0	40.0	0.0
2021	1058.0	0.0	40.0	0.0

II. Merit Review Process

1. The Merit Review Process that will be Employed during the 5-Year POW Cycle

- Combined External and Internal University External Non-University Panel
- Expert Peer Review

2. Brief Explanation

CUAES, NYSAES and CCE use one integrated process of merit review for applied research and extension projects, including integrated and multistate activities. Key elements of the process are described here, including statistics from the most current (2015) proposal cycle. Director-level staff from CUAES, NYSAES, and CCE) meet regularly as an Integrated Program and Research Team (IPaRT) to discuss relevant issues, research and extension projects, and new opportunities.

Review Process (Research, Extension, and Integrated Projects with Designated Funding):

- Principal investigators are asked to consult program priorities (established as outlined in the stakeholder involvement section) and develop short pre-proposals for new or revised projects funded by Federal Capacity Funds.
 - Pre-proposals are reviewed for purpose and relevancy by joint advisory external stakeholders, the principal investigator's department chair, Extension Program Associate/Assistant Directors, and the Agricultural Experiment Station directors (Ithaca and Geneva). Reviews are submitted via a secure website.

For research proposals:

- Agricultural Experiment Station directors make final determination of pre-proposals for development into full proposals.
- Full proposals are reviewed by two or three peer reviewers suggested by the PI and the PI's Department Chair.
- The final proposal is submitted to NIFA through REEPORT. Pending approval by NIFA, Hatch funds are allocated to a unique account associated with their specific project.

For extension proposals:

- Extension Program Directors rank/recommend extension pre-proposals.
- Extension Program Directors meet with Agricultural Experiment Station (Ithaca and Geneva) staff to discuss potential research and extension linkages within extension pre-proposals.
 - Extension Assistant Director, Organizational Development & Accountability reviews for equal program opportunity and affirmative action considerations.
 - Extension Program Directors finalize Smith-Lever funding recommendations.

Cornell University Review Criteria:

- Anticipated significance of results relative to current priority needs or opportunities
- Scientific merit of objectives
- Clarity of objectives
- Appropriate methodology
- Feasibility of attaining objectives
- Accomplishment during previous projects
- Research performance and competence of investigator(s)
- Relevance of the proposed work to state, regional, or national goals

- Impact on underserved audiences
- Level of research-extension integration
- Relevance to stakeholders

For FY15, our most current data, a total of 110 pre-proposals were submitted to CUAES, NYSAES and CCE of which 79 were funded.

III. Evaluation of Multis & Joint Activities

1. How will the planned programs address the critical issues of strategic importance, including those identified by the stakeholders?

Our multistate, multi-institutional, and integrated activities occur within the same stakeholder involvement and program development processes as other programs and, as such, are directed to priority needs of priority audiences. Our program development structure for federal formula funds is integrated by definition (see stakeholder involvement and merit review processes reported). Background information on our program development structure and process is available at:

<http://cce.cornell.edu/learnAbout/pcs-pwts/Pages/ProgramCouncilsandTeams.aspx>

2. How will the planned programs address the needs of under-served and under-represented populations of the State(s)?

The great majority of our integrated and multistate expenditures are in the form of funded projects; only the minor proportion is allocated for FTE support. Because they are incorporated in our ongoing program development structures and processes, integrated and multistate projects abide by and benefit from the stakeholder involvement and audience outreach processes outlined in the following section of this plan. We expect all projects to be grounded in relevant needs as articulated through stakeholder involvement structures and use a wide variety of methods to reach out to under-served and under-represented audiences (again, see stakeholder involvement section in annual report for detail). The specific audiences and needs addressed are determined on a project-by-project basis as well as within the broader umbrella of priorities established through our advisory structures.

3. How will the planned programs describe the expected outcomes and impacts?

All projects outline expected outcomes and impacts and report against them. We require a "statement of relevancy", specific identification of intended outcomes, and descriptions of multistate and integrated activities in our project pre-proposal process and in final project descriptions. Ability to outline relevancy and specific intended outcomes is a determinant of funding decisions. Project leaders report against these outcomes and activities annually and upon project completion. Cornell Cooperative Extension staff also report against behavioral outcomes annually through an accountability database.

4. How will the planned programs result in improved program effectiveness and/or

The fundamental purposes of these efforts are to strengthen quality of programming by bringing together required disciplines and to ensure efficient use and maximum leveraging of Federal Capacity Funds across institutions. For more than 15 years, we have progressively integrated planning and accountability processes for Federal Capacity Fund allocation for research and extension, providing greater focus on priority needs and greater efficiencies in program development.

Decision criteria for illustrate the intent of greater effectiveness and efficiency:

- The problem involves evident cooperation and interdependence of disciplinary skills and insights, and their application to its solution.
- Research on the problem requires more scientists, equipment, and facilities than are generally available at one experiment station.
- The research approach is adaptable and particularly suitable for interstate and federal-state cooperation, resulting in better use of limited resources and a saving of research funds.
- The project attracts additional support for research on the problem that is not likely to occur through other research programs and mechanisms.
- The project is sufficiently specific to promise significant accomplishment in a reasonable period of time (five years or less).
- The project can provide the solution to a problem of fundamental importance or fill an important gap in our knowledge from the standpoint of the present and future agriculture of the region.
- The project can be effectively organized and conducted on a regional level.

The intent for multistate extension and integrated activities is parallel - greater program effectiveness by drawing on the broader expertise base of the land grant system and greater efficiency by eliminating parallel development of curricular resources and/or isolated research efforts. For some projects, efficiency and effectiveness are primary design criteria, such as for the eXtension effort or support for regional community development efforts. In others, those benefits accrue as integrated and collaborative program development.

IV. Stakeholder Input

1. Actions taken to seek stakeholder input that encourages their participation

- Use of media to announce public meetings and listening sessions
- Targeted invitation to traditional stakeholder groups
- Targeted invitation to non-traditional stakeholder groups
- Targeted invitation to traditional stakeholder individuals
- Targeted invitation to non-traditional stakeholder individuals
- Targeted invitation to selected individuals from general public
- Survey of traditional stakeholder groups
- Survey of traditional stakeholder individuals
- Survey of the general public
- Survey specifically with non-traditional groups
- Survey specifically with non-traditional individuals

- Survey of selected individuals from the general public

Brief explanation.

Gaining stakeholder input and encouraging stakeholder participation is a system-wide expectation of all levels and units. Across the system, all of the stakeholder participation methods listed are employed; no single unit uses them all.

At the state level, IPaRT has a single multidisciplinary external stakeholder group that provides guidance for CUAES, NYSAES and CCE by reviewing funding support requests. Membership is intentionally monitored and updated to ensure involvement and ties to traditional and non-traditional constituents, and established and emerging partnerships.

In addition, we have 33 active Program Work Teams (PWTs). PWTs are made up of extension educators, faculty, and stakeholders who work together to develop, implement and determine priority programs within PWTs and to advise IPaRT as needed. PWTs are expected to nurture research-extension integration, to encourage campus-field interactions and collaborations, to take multi-disciplinary approaches, to evaluate their efforts, and to involve their external members in all aspects of their work. More than 1000 participants were involved in the work of these teams in 2015.

Beyond this state-level stakeholder input structure/process, each of Cornell Cooperative Extension's county extension associations continue to work closely with local stakeholders via participation in their local governance structures, i.e. board of directors, and advisory committee structures. In 2015, more than 2,940 board and committee volunteers from diverse backgrounds participated and assisted in the direction, priority setting programs throughout the state, and over 34,000 committed volunteers assisted with program delivery adding to stakeholder involvement.

In local CCE offices stakeholder input is sought from all audiences including under-represented or under-served audiences. One of the strategies used for gaining input and developing working relationships with new audiences is by networking and partnering with organizations that do have existing and strong relationships with target groups. Local boards of directors and advisory committees also recruit an intentionally diverse membership representative of the people and the needs in the community.

Effective involvement of youth in program determination and implementation is a priority. Our local advisory committees are expected to include youth members as part of the needs assessment and decision making structure. In 2015, more than 11,000 youth reported serving in appropriate leadership, governance and program delivery roles statewide.

2(A). A brief statement of the process that will be used by the recipient institution to identify individuals and groups stakeholders and to collect input from them

1. Method to identify individuals and groups

- Use Advisory Committees
- Use Internal Focus Groups
- Use External Focus Groups
- Open Listening Sessions
- Needs Assessments
- Use Surveys

Brief explanation.

Across all levels of the system, all of the techniques listed will be used; the mix of methods varies from site to site and program to program. All of our units are expected to have active and diverse advisory processes and to intentionally consider audiences not currently served. Activities IPaRT stakeholders and PWTS are described in other questions in this section. Needs assessments, focus groups, and use surveys are conducted at the individual level of program units as well as in our statewide plan of work process.

As a method of tracking program needs and input received CCE educators are expected to submit narrative reports of efforts including efforts intentionally planned to engage underserved populations.

2(B). A brief statement of the process that will be used by the recipient institution to identify individuals and groups who are stakeholders and to collect input from them

1. Methods for collecting Stakeholder Input

- Meeting with traditional Stakeholder groups
- Survey of traditional Stakeholder groups
- Meeting with traditional Stakeholder individuals
- Survey of traditional Stakeholder individuals
- Meeting with the general public (open meeting advertised to all)
- Meeting specifically with non-traditional groups
- Survey specifically with non-traditional groups
- Meeting specifically with non-traditional individuals
- Survey specifically with non-traditional individuals
- Meeting with invited selected individuals from the general public
- Survey of selected individuals from the general public

Brief explanation.

All of the techniques listed will likely be used but will vary from site to site and program-to-program across the system. Structures and processes for aggregating data are addressed in this section. The most active data gathering occurred in three venues - local advisory bodies, PWTs, and the IPaRT stakeholders. Web based surveys; interactive webinars and response to social media also provide programmatic feedback.

Preparing staff to understand how to meet the needs of stakeholders is a priority. Educators are offered training through webinars and recorded short videos that are part of program development coursework. Webinars will be offered on: Needs Assessments, Developing a Local Plan of Work, and the reporting process. Recorded webinars and resources are available to meet on-demand needs. Training for senior level program staff will be offered as well to grow the capacity for staff who assess needs with regularity and confidence.

We will continue statewide efforts to provide resources for educators regarding equal program opportunity including training on Title VI Civil Rights, Understanding and Using

Socio-Economic Demographics, Diversity & Inclusion Among Advisory Members, Civil Rights Compliance Basics, and Unconscious Bias. These resources along with distance learning training in the program development process help staff learn the how to identify local needs and then meet the needs of audiences through programs.

3. A statement of how the input will be considered

- In the Budget Process
- To Identify Emerging Issues
- Redirect Extension Programs
- Redirect Research Programs
- In the Staff Hiring Process
- In the Action Plans
- To Set Priorities

Brief explanation.

The stakeholder input process for statewide program development jointly utilized by CUAES, NYSAES and CCE was established in February 2001.

IPaRT stakeholders and PWTs work to improve program focus, relevance, and planning activities. Stakeholder input informs federal capacity funding priorities and provides project specific input on relevance and value of proposed work. IPaRT stakeholders provide input that informs decisions around funding of current extension and research projects, contributing ratings of perceived relevance. Statewide applied research and extension priorities are updated annually, communicated to faculty and staff, and used as a consideration in funding decisions.

County associations of Cornell Cooperative Extension work with their local boards, committees, and volunteers to influence decisions on program priorities and delivery. County extension associations and multi-county programs are separate 501(c)(3) organizations under the general supervision of Cornell University as agent for the state of New York. Their local plans of work are established under guidance of stakeholders in local advisory structures and governing boards and are in alignment with the statewide plan of work.

Stakeholders help to frame and shape plans of work, funding proposals, programs, and educational activities. System wide IPaRT and PWTs have reaffirmed commitment to the NIFA priorities and have elevated needs and opportunities to make use of campus resources for educational programs. Feedback from stakeholders is sought in a variety of ways, welcomed and considered for planning. Communication between CUAES, NYSAES and CCE is open and regular at IPaRT meetings and through funding decisions.

V. Planned Program Table of Content

S. No.	PROGRAM NAME
1	Agriculture and Food Systems
2	Climate Change
3	Environment and Natural Resources and Sustainable Energy
4	Nutrition, Food Safety and Security, and Obesity Prevention
5	4-H Youth Development/Children, Youth and Families
6	Community and Economic Vitality

V(A). Planned Program (Summary)

Program # 1

1. Name of the Planned Program

Agriculture and Food Systems

2. Brief summary about Planned Program

Our research and education is directed toward improvement of food system as a whole from farm to table. Cooperative Extension (CCE) and applied research programs work together to cover multiple aspects of agriculture and food systems 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, and by informing consumers about new or improved food products. Research analysis and education also affect policies to reform governmental food and agriculture related programs.

Cornell University has a commitment to agriculture, horticulture, and natural resources enterprises and assisting them in making informed choices when selecting production principles and practices to enhance economic and environmental sustainability. Cornell offers research and education programming focused on assessing existing and new production and management practices and techniques with special emphasis on both business vitality and 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.

As a result of our applied research and cooperative extension efforts, 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.

3. Program existence : Mature (More than five years)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : Yes

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
102	Soil, Plant, Water, Nutrient Relationships	5%		16%	
201	Plant Genome, Genetics, and Genetic Mechanisms	0%		10%	
202	Plant Genetic Resources	3%		10%	
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants	0%		3%	
204	Plant Product Quality and Utility (Preharvest)	15%		4%	
206	Basic Plant Biology	10%		1%	
211	Insects, Mites, and Other Arthropods Affecting Plants	5%		15%	
212	Diseases and Nematodes Affecting Plants	5%		12%	
213	Weeds Affecting Plants	2%		3%	
215	Biological Control of Pests Affecting Plants	3%		8%	
216	Integrated Pest Management Systems	3%		2%	
301	Reproductive Performance of Animals	1%		4%	
302	Nutrient Utilization in Animals	6%		3%	
305	Animal Physiological Processes	2%		1%	
307	Animal Management Systems	16%		1%	
501	New and Improved Food Processing Technologies	6%		2%	
503	Quality Maintenance in Storing and Marketing Food Products	10%		2%	
601	Economics of Agricultural Production and Farm Management	0%		1%	
604	Marketing and Distribution Practices	8%		1%	
610	Domestic Policy Analysis	0%		1%	
	Total	100%		100%	

V(C). Planned Program (Situation and Scope)

1. Situation and priorities

Agricultural and food industries contribute an estimated \$30 billion a year to New York State's economy. Improving production efficiency, 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 35,000+ farms, horticultural, and forestry operations face dynamic and complex production environments. 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.

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.

2. Scope of the Program

- In-State Extension
- In-State Research
- Multistate Research
- Multistate Extension
- Integrated Research and Extension
- Multistate Integrated Research and Extension

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

- New science is needed for the production and procurement of adequate and acceptable nourishment for the world's population.
- Tackling the issues of agriculture and food systems requires multidisciplinary, multi-institutional and collaborative research and extension efforts.
- 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/horticultural/natural resources businesses have opportunity to strengthen profitability through improved planning and management.
- There is opportunity for growth in the agricultural/horticultural/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/horticultural/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.

2. Ultimate goal(s) of this Program

Boost the sustainable production of safe and nutritious food.

- Improve global capacity to meet growing food demand in spite of changing climate.
- 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.

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2017	274.0	0.0	18.0	0.0
2018	274.0	0.0	18.0	0.0
2019	274.0	0.0	18.0	0.0
2020	274.0	0.0	18.0	0.0
2021	274.0	0.0	18.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

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.

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

- Central NY Dairy & Field Crops Program

- Cornell Vegetable Program
- Eastern NY Commercial Horticulture Program
- Finger Lakes Grape Program
- Harvest NY
- Integrated Pest Management
- Lake Erie Regional Grape Program
- Lake Ontario Fruit Program
- Northern NY Regional Agriculture
- Northwest NY Dairy, Livestock & Field Crops Program
- Pesticide Management Education Program
- South Central NY Dairy and Field Crops Program

2. Type(s) of methods to be used to reach direct and indirect contacts

Extension

Direct Methods	Indirect Methods
<ul style="list-style-type: none"> • Education Class • Workshop • Group Discussion • One-on-One Intervention • Demonstrations • Other 1 (webinars) 	<ul style="list-style-type: none"> • Public Service Announcement • Newsletters • TV Media Programs • eXtension web sites • Web sites other than eXtension • Other 1 (webinars) • Other 2 (on-line courses)

3. Description of targeted audience

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.

V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
 - Direct Adult Contacts
 - Indirect Adult Contacts
 - Direct Youth Contacts
 - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(H). State Defined Outputs

1. Output Measure

Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(I). State Defined Outcome

O. No	Outcome Name
1	(1.1a) Number participants documented to have applied knowledge or skills gained to strengthen existing business operations.
2	(1.1b) Number of participating family-owned agricultural/ horticultural/natural resources businesses that plan for succession, transfer, or sale of their business.
3	(1.1c) Number of participants reporting improved agricultural/ horticultural business profitability attributed at least in part to program participation.
4	(1.1d) Number of business owners successfully completing an intergenerational transfer or other desired dispensation of their business attributed at least in part to program participation.
5	(1.2a) Number of participants who demonstrate knowledge gains related to needs of potential employees and/or availability of qualified employees.
6	(1.2b) Number of participants documented to have made one or more changes in human resources practices to enhance labor availability or retention.
7	(1.2c) Number of 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.
8	(1.3a) Number of participants documented to have adopted innovations in food enterprises including production, allied services, processing, and distribution.
9	(1.3b) Number of participants or producer groups who adopt practices of value-added production through retaining control of their product further in the processing chain, starting their own value added business, or forming alliances.
10	(1.3c) Number 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.
11	(1.4a) Number 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.
12	(1.4b) Number 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.
13	(1.4c) Number of technical assistance providers documented to have incorporated current best management practices in their recommendations.
14	(1.4d) Number of producers or horticulture business persons, reporting increased dollar returns per acre or reduced costs per acre.
15	(1.5a) Number 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.
16	(1.5b) Number of producers, horticulture businesses, and/or natural resource managers documented to have developed and implemented nutrient management and/or waste management plans or modified existing plans to meet production and environmental goals or regulations.
17	(1.5c) Number 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.
18	(1.5d) Number of resource managers reporting reduced environmental concerns for participating enterprises.

Outcome # 1

1. Outcome Target

(1.1a) Number participants documented to have applied knowledge or skills gained to strengthen existing business operations.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 503 - Quality Maintenance in Storing and Marketing Food Products
- 604 - Marketing and Distribution Practices

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 2

1. Outcome Target

(1.1b) Number of participating family-owned agricultural/ horticultural/natural resources businesses that plan for succession, transfer, or sale of their business.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 604 - Marketing and Distribution Practices

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 3

1. Outcome Target

(1.1c) Number of participants reporting improved agricultural/ horticultural business profitability attributed at least in part to program participation.

2. Outcome Type : Change in Condition Outcome Measure

3. Associated Knowledge Area(s)

- 604 - Marketing and Distribution Practices

- 503 - Quality Maintenance in Storing and Marketing Food Products

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 4

1. Outcome Target

(1.1d) Number of business owners successfully completing an intergenerational transfer or other desired dispensation of their business attributed at least in part to program participation.

2. Outcome Type : Change in Condition Outcome Measure

3. Associated Knowledge Area(s)

- 604 - Marketing and Distribution Practices

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 5

1. Outcome Target

(1.2a) Number of participants who demonstrate knowledge gains related to needs of potential employees and/or availability of qualified employees.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 604 - Marketing and Distribution Practices

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 6

1. Outcome Target

(1.2b) Number of participants documented to have made one or more changes in human resources practices to enhance labor availability or retention.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 604 - Marketing and Distribution Practices

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 7

1. Outcome Target

(1.2c) Number of 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.

2. Outcome Type : Change in Condition Outcome Measure

3. Associated Knowledge Area(s)

- 604 - Marketing and Distribution Practices

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 8

1. Outcome Target

(1.3a) Number of participants documented to have adopted innovations in food enterprises including production, allied services, processing, and distribution.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 604 - Marketing and Distribution Practices

- 501 - New and Improved Food Processing Technologies
- 503 - Quality Maintenance in Storing and Marketing Food Products

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 9

1. Outcome Target

(1.3b) Number of participants or producer groups who adopt practices of value-added production through retaining control of their product further in the processing chain, starting their own value added business, or forming alliances.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 501 - New and Improved Food Processing Technologies
- 503 - Quality Maintenance in Storing and Marketing Food Products
- 604 - Marketing and Distribution Practices

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 10

1. Outcome Target

(1.3c) Number 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.

2. Outcome Type : Change in Condition Outcome Measure

3. Associated Knowledge Area(s)

- 501 - New and Improved Food Processing Technologies
- 604 - Marketing and Distribution Practices
- 503 - Quality Maintenance in Storing and Marketing Food Products

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 11

1. Outcome Target

(1.4a) Number 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.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 215 - Biological Control of Pests Affecting Plants
- 212 - Diseases and Nematodes Affecting Plants
- 213 - Weeds Affecting Plants
- 216 - Integrated Pest Management Systems
- 204 - Plant Product Quality and Utility (Preharvest)
- 102 - Soil, Plant, Water, Nutrient Relationships
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 503 - Quality Maintenance in Storing and Marketing Food Products

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 12

1. Outcome Target

(1.4b) Number 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.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 604 - Marketing and Distribution Practices
- 503 - Quality Maintenance in Storing and Marketing Food Products

- 501 - New and Improved Food Processing Technologies

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 13

1. Outcome Target

(1.4c) Number of technical assistance providers documented to have incorporated current best management practices in their recommendations.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 216 - Integrated Pest Management Systems
- 604 - Marketing and Distribution Practices
- 501 - New and Improved Food Processing Technologies
- 503 - Quality Maintenance in Storing and Marketing Food Products

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 14

1. Outcome Target

(1.4d) Number of producers or horticulture business persons, reporting increased dollar returns per acre or reduced costs per acre.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 604 - Marketing and Distribution Practices
- 501 - New and Improved Food Processing Technologies
- 503 - Quality Maintenance in Storing and Marketing Food Products

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 15

1. Outcome Target

(1.5a) Number 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.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 307 - Animal Management Systems
- 215 - Biological Control of Pests Affecting Plants
- 216 - Integrated Pest Management Systems
- 206 - Basic Plant Biology
- 102 - Soil, Plant, Water, Nutrient Relationships

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 16

1. Outcome Target

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

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 307 - Animal Management Systems

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 17

1. Outcome Target

(1.5c) Number 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.

2. Outcome Type : Change in Condition Outcome Measure

3. Associated Knowledge Area(s)

- 604 - Marketing and Distribution Practices
- 501 - New and Improved Food Processing Technologies
- 216 - Integrated Pest Management Systems
- 102 - Soil, Plant, Water, Nutrient Relationships

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 18

1. Outcome Target

(1.5d) Number of resource managers reporting reduced environmental concerns for participating enterprises.

2. Outcome Type : Change in Condition Outcome Measure

3. Associated Knowledge Area(s)

- 102 - Soil, Plant, Water, Nutrient Relationships
- 216 - Integrated Pest Management Systems

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy

- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Populations changes (immigration, new cultural groupings, etc.)

Description

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. During the last couple of years highly damaging flood events damaged crop and forest resources in highly productive areas of New York. Recovery is slow for many areas.

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 in some cases creating new market opportunities and in others erosion of traditional markets. Population and land use changes in farming communities has led in some places 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.

There is a growing interest by consumers, communities and producers to market local foods locally. This interest continues to influence programs, research and funding availability. These trends are expected to continue.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

The Agriculture and Food Systems plan is focused on improving the best practices and technologies of those working in agriculture and natural resource industries. The goal is to increase yield, efficiency, economic return and conservation of resources. Continued efforts on evaluation capacity building by staff are expected.

Plans also include:

- **Regional/Statewide documentation examples.** Many of our regional and statewide programs are receiving federal capacity funds. Documentation of outcomes and evaluation strategies will continue to be a requirement of funding. Results shape future program efforts and impact program design.
- **There is also a requirement for our local and regional programs to report on statewide outcomes/indicators:** Program documentation results are aggregated in a statewide accountability database which includes both qualitative and quantitative data for reporting and helping us to better understand impacts.

In 2017, we will continue to review the national outcome framework and connect it, as possible, to our statewide outcome framework.

V(A). Planned Program (Summary)

Program # 2

1. Name of the Planned Program

Climate Change

2. Brief summary about Planned 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

3. Program existence : Mature (More than five years)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : Yes

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
101	Appraisal of Soil Resources	4%		6%	
104	Protect Soil from Harmful Effects of Natural Elements	3%		0%	
111	Conservation and Efficient Use of Water	15%		1%	
112	Watershed Protection and Management	17%		11%	
125	Agroforestry	5%		0%	
132	Weather and Climate	14%		8%	
133	Pollution Prevention and Mitigation	10%		18%	
135	Aquatic and Terrestrial Wildlife	8%		24%	
136	Conservation of Biological Diversity	15%		4%	
141	Air Resource Protection and Management	2%		1%	
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants	2%		0%	
405	Drainage and Irrigation Systems and Facilities	5%		0%	
902	Administration of Projects and Programs	0%		27%	
	Total	100%		100%	

V(C). Planned Program (Situation and Scope)

1. Situation and priorities

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 (IPM) 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, bio-manipulative 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 are evolving rapidly and there is much confusion, 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.

2. Scope of the Program

- In-State Extension
- In-State Research
- Multistate Research
- Multistate Extension
- Integrated Research and Extension
- Multistate Integrated Research and Extension

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

- 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.
- As incidences of flooding and awareness of climate change increase, there will be a greater general need and request for trusted information about situational and behavioral mitigation.
- 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.

2. Ultimate goal(s) of this 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.

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2017	69.0	0.0	5.0	0.0
2018	69.0	0.0	5.0	0.0
2019	69.0	0.0	5.0	0.0
2020	69.0	0.0	5.0	0.0
2021	69.0	0.0	5.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

The initiative is guided by faculty and staff involved with several programs:

- **The Cornell Climate Change Program Work Team (PWT)** was formed in 2010 and currently has more than sixty five members comprised of Cornell faculty, staff, Cornell Cooperative Extension educators from around New York State, and external stakeholders who are working to advance climate change

research and outreach programs. The PWT provides a mechanism through which faculty and extension educators connect with stakeholders to identify the needs surrounding climate change impacts and opportunities in New York State, create educational materials, and design learning experiences that address these needs. You can view the list of Climate Change PWT members at the Cornell Cooperative Extension website.

- **The Cornell Institute for Climate Change and Agriculture (CICCA)** is focused on supporting farmers of New York and beyond with decision tools for strategic adaptation to climate change, so that they are better able to cope with potential negative effects of climate change, and are better able to take advantage of any opportunities that it might bring. A Climate Smart Farming Team (<http://climateinstitute.cals.cornell.edu/climate-smart-farming/climate-smart-farming-extension-team/>) has been established and is comprised of members of the CCE Area Agriculture Teams, representing commodity groups and farmers across the state. Adaptation and mitigation tools are being developed and made available on a new Web site (<http://climateinstitute.cals.cornell.edu/>).

- CCE educators from Dutchess, Putnam, Columbia/Greene, and Ulster have been working with the Hudson River Estuary Program (NYS Department of Environmental Conservation) and the NYS Water Resources Institute to develop and deliver storm resiliency programming, particularly in the wake of Hurricane Sandy and other recent high-impact storm events.

- CCE of Tompkins and other Associations are leading and contributing to development of local energy plans, adoption of renewable energy, and climate change education, including approaches to mitigation and adaptation.

- **The Atkinson Center for a Sustainable Future's (ACSF) Climate Change Focus Group** began in 2008 and currently has 17 interdisciplinary faculty members from across campus, representing disciplines such as: climate science, ecology, agriculture, engineering, economics, history, and social sciences, that guide research and teaching at the University.

- **NY EDEN** <http://emergencypreparedness.cce.cornell.edu/Pages/default.aspx> The New York Extension Disaster Education Network (NY EDEN) is a collaborative educational network based at Cornell University, dedicated to educating New York residents about preventing, preparing for and recovering from emergencies and disasters that could affect their families and communities. NY EDEN is affiliated with both the national USDA EDEN network and with Cornell University Cooperative Extension.

- **NYS Integrated Pest Management** <http://www.nysipm.cornell.edu/> Research, demonstrations, education, and outreach are part of a comprehensive plan to make IPM the safe, effective pest management solution for all New Yorkers. Solutions that help protect our health, our economic well-being, and our environment.

- **Invasive Species Education and Monitoring Efforts** The New York Invasive Species Clearinghouse at <http://www.nyis.info/> provides information on upcoming invasive species events and invasive species news of interest to New Yorkers, and has linkages with the New York Invasive Species Database (iMapInvasives). The New York Invasive Species Research Institute in the Department of Natural Resources at Cornell provides communication and coordination with researchers across NYS. The

Hemlock Initiative, also based in the Department of Natural Resources, engages CCE educators and volunteers in an effort to investigate and manage hemlock wooly adelgid. CCE continues to be involved with the State's eight PRISMs (Partnerships for Regional Invasive Species Management). CCE of Saratoga hosts the Capital/Mohawk PRISM. The AgroForestry Resource Center of CCE of Columbia/Greene is very involved in invasive species management, particularly with respect to forestry.

- **Master Watershed Stewards Program** <http://dnr.cornell.edu/outreach/watershedsteward/> The mission of the New York Master Watershed Steward Program is to strengthen local capacity for successful management and protection of watersheds by empowering volunteers.

- **Cornell Garden-Based Learning program** <http://gardening.cce.cornell.edu/> in partnership with CCE educators, CCE Master Gardener Volunteers and Cornell Plantations is supporting climate science literacy and environmental stewardship through climate change and gardening initiatives. Educational outreach activities target children, youth, adults and families audiences engaged in managing lawns, gardens and landscapes in school, community and residential settings with a focus on the adoption of adaptation and mitigation strategies that reduce carbon footprint, conserve water resources, promote biodiversity, limit invasive species and protect natural resources.

- **Stormwater Management** <http://www.clrp.cornell.edu/workshops/stormwater.html> Stormwater management training is part of the Cornell Local Roads program which provides training and technical assistance to local highway and public works officials in New York State. CCE of Orange County also hosts stormwater management training for consultants, engineers, and planners.

- **New York State Water Resources Institute (WRI)** <http://wri.cals.cornell.edu/about/> works to improve the management of water resources in New York State and the nation. WRI works with water research and water management communities and collaborating with regional, state, and national partners to increase awareness of emerging water resources issues and to develop and assess new water management technologies and policies.

2. Type(s) of methods to be used to reach direct and indirect contacts

Extension

Direct Methods	Indirect Methods
<ul style="list-style-type: none"> • Education Class • Workshop • Group Discussion • One-on-One Intervention • Demonstrations • Other 1 (Webinars) 	<ul style="list-style-type: none"> • Public Service Announcement • Newsletters • TV Media Programs • eXtension web sites • Web sites other than eXtension • Other 1 (webinars)

3. Description of targeted audience

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.

V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
 - Direct Adult Contacts
 - Indirect Adult Contacts
 - Direct Youth Contacts
 - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(H). State Defined Outputs

1. Output Measure

Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(I). State Defined Outcome

O. No	Outcome Name
1	(2.1a) Number of consumers, residents, agricultural/ natural resources producers, organization and business representatives, and/or local government and community leaders who demonstrate knowledge gains about on the causes and implications of climate change and adaptive or mitigating strategies.
2	(2.1b) Number of agricultural/ natural resources producers, organization and business representatives documented to have adopted recommended adaptation strategies for production agriculture and natural resources management, including invasive species, pest management, pollutant loads, wetlands, emergency preparedness etc.
3	(2.1c) Number of agencies/ organizations/ communities documented to have adopted recommended climate mitigation practices and policies.
4	(2.2a) Number 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 water resources.
5	(2.2b) Number of 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.
6	(2.3a) Number 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.

Outcome # 1

1. Outcome Target

(2.1a) Number of consumers, residents, agricultural/ natural resources producers, organization and business representatives, and/or local government and community leaders who demonstrate knowledge gains about on the causes and implications of climate change and adaptive or mitigating strategies.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 132 - Weather and Climate
- 135 - Aquatic and Terrestrial Wildlife
- 125 - Agroforestry
- 112 - Watershed Protection and Management
- 136 - Conservation of Biological Diversity
- 141 - Air Resource Protection and Management
- 133 - Pollution Prevention and Mitigation
- 111 - Conservation and Efficient Use of Water

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 2

1. Outcome Target

(2.1b) Number of agricultural/ natural resources producers, organization and business representatives documented to have adopted recommended adaptation strategies for production agriculture and natural resources management, including invasive species, pest management, pollutant loads, wetlands, emergency preparedness etc.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 405 - Drainage and Irrigation Systems and Facilities
- 133 - Pollution Prevention and Mitigation
- 132 - Weather and Climate
- 111 - Conservation and Efficient Use of Water

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 3

1. Outcome Target

(2.1c) Number of agencies/ organizations/ communities documented to have adopted recommended climate mitigation practices and policies.

2. Outcome Type : Change in Condition Outcome Measure

3. Associated Knowledge Area(s)

- 112 - Watershed Protection and Management
- 111 - Conservation and Efficient Use of Water
- 132 - Weather and Climate

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 4

1. Outcome Target

(2.2a) Number 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 water resources.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 5

1. Outcome Target

(2.2b) Number of 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.

2. Outcome Type : Change in Condition Outcome Measure

3. Associated Knowledge Area(s)

- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 6

1. Outcome Target

(2.3a) Number 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.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 111 - Conservation and Efficient Use of Water

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy

- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Populations changes (immigration, new cultural groupings, etc.)

Description

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. Flooding events during recent years continues to elevate consumer and community interest in disaster preparedness and water quality protection for families, communities and farms. The shift in interest, program offerings and campus and research support is evident. These trends are expected to continue.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

The Climate Change plan is focused on helping consumers, residents and producers to adopt adaptation strategies. The plan focuses on water resource protection/enhancements and protection of natural resources and biodiversity. In addition to outcomes measured around general climate change knowledge, adaptation/mitigation practices and policy changes there will likely be added outcomes that include a way to measure the success of the Climate Smart Farming initiative, a newer initiative that partners Extension staff with the Cornell Institute for Climate Change & Agriculture.

Plans also include:

- **Regional/Statewide documentation examples.** Many of our regional and statewide programs are receiving federal capacity funds. Documentation of outcomes and evaluation strategies will continue to be a requirement of funding. Results shape future program efforts and impact program design.
- **There is also a requirement for our local and regional programs to report on statewide outcomes/indicators:** Program documentation results are aggregated in a statewide accountability database which includes both qualitative and quantitative data for reporting and helping us to better understand impacts.

In 2017, we will continue to review the national outcome framework and connect it, as possible, to our statewide outcome framework.

V(A). Planned Program (Summary)

Program # 3

1. Name of the Planned Program

Environment and Natural Resources and Sustainable Energy

2. Brief summary about Planned Program

This planned program is intended to develop and maintain connections between applied research and Cornell Cooperative Extension (CCE) programs focused on natural resources conservation/protection and sustainable energy education that work toward long term planning for sustainable energy and proper use of natural resources.

Programs in this plan reach varied audiences, addressing agricultural and natural resource producers, community decision makers, businesses, organizations, and individual consumers. The planned program includes applied research and education on natural resources management, inventory and mapping methods; habitat; solid waste management, outreach practices, and sustainable energy.

The outcomes of this plan are for individuals, families, communities, farmers, and businesses to make economically viable, sustainability-based decisions with the help of readily available research based education.

3. Program existence : Mature (More than five years)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : Yes

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
123	Management and Sustainability of Forest Resources	18%		0%	
124	Urban Forestry	10%		2%	
205	Plant Management Systems	0%		63%	
401	Structures, Facilities, and General Purpose Farm Supplies	14%		0%	
402	Engineering Systems and Equipment	8%		6%	
403	Waste Disposal, Recycling, and Reuse	25%		16%	
404	Instrumentation and Control Systems	5%		0%	
511	New and Improved Non-Food Products and Processes	0%		10%	
605	Natural Resource and Environmental Economics	20%		3%	
	Total	100%		100%	

V(C). Planned Program (Situation and Scope)**1. Situation and priorities**

This planned program includes applied research and Cornell Cooperative Extension efforts related to bio/alternative energy, consumer energy conservation waste management and natural resource conservation.

Sustainable Energy: 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.

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.

Waste Management: 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.

Environment & Natural Resources: New York residents rely on a wide variety of natural resources including forested mountains; aquatic environments (wetlands, marshes, estuaries, streams and lakes); and an accompanying diversity of plant and animal species, for recreation, tourism, and raw products. 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.

2. Scope of the Program

- In-State Extension
- In-State Research
- Multistate Research
- Multistate Extension
- Integrated Research and Extension
- Multistate Integrated Research and Extension

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

- 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.
 - 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.
- 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.
- Improved waste management and waste reduction efforts in cultivating lawns gardens and landscapes in community and residential settings will result in an enhanced and protected environment, including improved soil health with the making and use of high quality compost.

2. Ultimate goal(s) of this 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, gardening, agriculture, 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.
- 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.

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2017	64.0	0.0	3.0	0.0
2018	64.0	0.0	3.0	0.0
2019	64.0	0.0	3.0	0.0
2020	64.0	0.0	3.0	0.0

2021	64.0	0.0	3.0	0.0
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V(F). Planned Program (Activity)

1. Activity for the Program

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: Home and school composting, residential landscapes, waste management, wildlife management and forestry, renewable energy resources, energy conservation and efficiency, heating with wood, forestry etc.

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

- Consumer Education Program for Residential Energy Efficiency
- Energy Education in Camp
- Farm Energy Audits
- Farm Waste Management
- Green Building Seminar Series
- Maple Program
- Master Composters
- Master Forest Owners
- Master Naturalist
- Master Gardener Volunteer Program
- Private Forest Stewardship Program
- Recycling Ag Plastics
- Save Energy, Save Dollars
- Urban Forestry

2. Type(s) of methods to be used to reach direct and indirect contacts

Extension

Direct Methods	Indirect Methods
<ul style="list-style-type: none"> • Education Class • Workshop • Group Discussion • One-on-One Intervention • Demonstrations • Other 1 (webinars) 	<ul style="list-style-type: none"> • Public Service Announcement • Newsletters • TV Media Programs • eXtension web sites • Web sites other than eXtension • Other 1 (webinars) • Other 2 (on-line courses)

3. Description of targeted audience

- Key audiences served, directly and indirectly include: agricultural and natural resource producers; consumers and property owners, home/school/community gardeners businesses and organizations, local/state/federal governmental leaders.
- Businesses, organizations, and producers are targeted with information about improved management practices and alternative land uses, such as agroforestry. 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 for youth enrichment.
- Agricultural/horticulture/natural resource and supporting businesses are targeted both regarding bioenergy production opportunities and information regarding alternative energy sources and conservation. Consumers are targeted for information regarding energy supply alternatives and energy conservation options for residential, facilities, and transportation needs.
- Residents and property owners are targeted with stewardship and waste reduction and management in their homes and on their properties including lawns and gardens. Businesses, organizations, and producers are targeted with information about reducing impacts of their operations. Teachers and youth professionals and volunteers are provided with curriculum and training. Youth are targeted with age appropriate education.

V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
 - Direct Adult Contacts
 - Indirect Adult Contacts
 - Direct Youth Contacts
 - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(H). State Defined Outputs

1. Output Measure

Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(I). State Defined Outcome

O. No	Outcome Name
1	(3.1a) Number of producers, economic development organizations and other groups who collaborate to establish bioenergy as a viable alternative crop.
2	(3.1b) Number of existing or new producers documented to have modified existing practices or technologies and/or adopted best management practices for bioenergy production, harvesting, and/or storage systems.
3	(3.1c) Number 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.
4	(3.2a) Number of agricultural/horticultural/ natural resource businesses documented to have adopted appropriate alternative energy sources and/or energy conservation practices.
5	(3.2b) Number of producers/horticulture businesses/natural resource managers documented to have improved economic returns to agricultural/ horticultural business profitability and vitality resulting from adopting alternative energy sources and/or energy conservation.
6	(3.3a) Number of consumers documented to have adopted appropriate alternative energy sources.
7	(3.3b) Number of consumers who report savings on energy costs attributable to adopting alternative energy sources.
8	(3.4a) Number of consumers reporting to have adopted appropriate energy cost control and/or conservation practices.
9	(3.4b) Number of property managers, and/or housing officials documented to have taken measures to improve energy cost control or efficiency of existing and new buildings.
10	(3.4c) Number of consumers who report savings on energy costs attributable to adopting energy conservation measures.
11	(3.5a) Number of communities documented to have assessed local energy development proposals and/or the relationships between current policies and regulations and energy conservation.
12	(3.5b) Number of community agencies/ organizations documented to have adopted appropriate alternative energy sources.
13	(3.5c) Number 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.
14	(3.5d) Number of communities documented to have established or modified land use and development policies to promote energy conservation.
15	(3.5e) Number of community agencies/organizations reporting savings on energy costs attributable to adopting alternative energy sources.
16	(3.6a) Number of agricultural/natural resources producers, organization and business representatives, community leaders, and/or residents who demonstrate knowledge gains about waste management and reduction.
17	(3.6b) Number of 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.
18	(3.6c) Number of agricultural/natural resources producers, organization and business representatives, community leaders, and/or residents documented to have reduced costs through improved waste management practices.
19	(3.7a) Number of 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.

Outcome # 1

1. Outcome Target

(3.1a) Number of producers, economic development organizations and other groups who collaborate to establish bioenergy as a viable alternative crop.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 605 - Natural Resource and Environmental Economics
- 123 - Management and Sustainability of Forest Resources
- 404 - Instrumentation and Control Systems
- 402 - Engineering Systems and Equipment
- 403 - Waste Disposal, Recycling, and Reuse

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 2

1. Outcome Target

(3.1b) Number of existing or new producers documented to have modified existing practices or technologies and/or adopted best management practices for bioenergy production, harvesting, and/or storage systems.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 404 - Instrumentation and Control Systems
- 402 - Engineering Systems and Equipment
- 605 - Natural Resource and Environmental Economics
- 403 - Waste Disposal, Recycling, and Reuse

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 3

1. Outcome Target

(3.1c) Number 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.

2. Outcome Type : Change in Condition Outcome Measure

3. Associated Knowledge Area(s)

- 123 - Management and Sustainability of Forest Resources
- 605 - Natural Resource and Environmental Economics
- 403 - Waste Disposal, Recycling, and Reuse
- 404 - Instrumentation and Control Systems
- 402 - Engineering Systems and Equipment

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 4

1. Outcome Target

(3.2a) Number of agricultural/horticultural/ natural resource businesses documented to have adopted appropriate alternative energy sources and/or energy conservation practices.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 404 - Instrumentation and Control Systems
- 605 - Natural Resource and Environmental Economics
- 402 - Engineering Systems and Equipment
- 403 - Waste Disposal, Recycling, and Reuse

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 5

1. Outcome Target

(3.2b) Number of producers/horticulture businesses/natural resource managers documented to have improved economic returns to agricultural/ horticultural business profitability and vitality resulting from adopting alternative energy sources and/or energy conservation.

2. Outcome Type : Change in Condition Outcome Measure

3. Associated Knowledge Area(s)

- 605 - Natural Resource and Environmental Economics
- 403 - Waste Disposal, Recycling, and Reuse
- 402 - Engineering Systems and Equipment
- 404 - Instrumentation and Control Systems

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 6

1. Outcome Target

(3.3a) Number of consumers documented to have adopted appropriate alternative energy sources.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 605 - Natural Resource and Environmental Economics

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 7

1. Outcome Target

(3.3b) Number of consumers who report savings on energy costs attributable to adopting alternative energy sources.

2. Outcome Type : Change in Condition Outcome Measure

3. Associated Knowledge Area(s)

- 605 - Natural Resource and Environmental Economics

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 8

1. Outcome Target

(3.4a) Number of consumers reporting to have adopted appropriate energy cost control and/or conservation practices.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 124 - Urban Forestry
- 403 - Waste Disposal, Recycling, and Reuse
- 605 - Natural Resource and Environmental Economics

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 9

1. Outcome Target

(3.4b) Number of property managers, and/or housing officials documented to have taken measures to improve energy cost control or efficiency of existing and new buildings.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 403 - Waste Disposal, Recycling, and Reuse
- 404 - Instrumentation and Control Systems
- 605 - Natural Resource and Environmental Economics

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 10

1. Outcome Target

(3.4c) Number of consumers who report savings on energy costs attributable to adopting energy conservation measures.

2. Outcome Type : Change in Condition Outcome Measure

3. Associated Knowledge Area(s)

- 124 - Urban Forestry
- 403 - Waste Disposal, Recycling, and Reuse
- 605 - Natural Resource and Environmental Economics

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 11

1. Outcome Target

(3.5a) Number of communities documented to have assessed local energy development proposals and/or the relationships between current policies and regulations and energy conservation.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 124 - Urban Forestry
- 403 - Waste Disposal, Recycling, and Reuse

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 12

1. Outcome Target

(3.5b) Number of community agencies/ organizations documented to have adopted appropriate alternative energy sources.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 605 - Natural Resource and Environmental Economics

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 13

1. Outcome Target

(3.5c) Number 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.

2. Outcome Type : Change in Condition Outcome Measure

3. Associated Knowledge Area(s)

- 124 - Urban Forestry

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 14

1. Outcome Target

(3.5d) Number of communities documented to have established or modified land use and development policies to promote energy conservation.

2. Outcome Type : Change in Condition Outcome Measure

3. Associated Knowledge Area(s)

- 401 - Structures, Facilities, and General Purpose Farm Supplies

- 403 - Waste Disposal, Recycling, and Reuse
- 402 - Engineering Systems and Equipment
- 123 - Management and Sustainability of Forest Resources

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 15

1. Outcome Target

(3.5e) Number of community agencies/organizations reporting savings on energy costs attributable to adopting alternative energy sources.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 605 - Natural Resource and Environmental Economics

4. Associated Institute Type(s)

- 1862 Research

Outcome # 16

1. Outcome Target

(3.6a) Number of agricultural/natural resources producers, organization and business representatives, community leaders, and/or residents who demonstrate knowledge gains about waste management and reduction.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 401 - Structures, Facilities, and General Purpose Farm Supplies
- 404 - Instrumentation and Control Systems
- 403 - Waste Disposal, Recycling, and Reuse
- 402 - Engineering Systems and Equipment

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 17

1. Outcome Target

(3.6b) Number of 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.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 404 - Instrumentation and Control Systems
- 403 - Waste Disposal, Recycling, and Reuse
- 402 - Engineering Systems and Equipment
- 401 - Structures, Facilities, and General Purpose Farm Supplies

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 18

1. Outcome Target

(3.6c) Number of agricultural/natural resources producers, organization and business representatives, community leaders, and/or residents documented to have reduced costs through improved waste management practices.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 404 - Instrumentation and Control Systems
- 402 - Engineering Systems and Equipment
- 401 - Structures, Facilities, and General Purpose Farm Supplies
- 403 - Waste Disposal, Recycling, and Reuse

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 19

1. Outcome Target

(3.7a) Number of 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.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 605 - Natural Resource and Environmental Economics

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Populations changes (immigration, new cultural groupings, etc.)

Description

The interaction between natural disasters, the economy, energy and waste management 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. Dramatic cuts in state funding for consumer energy education is a significant barrier. Public and private funders and CCE may have fewer fiscal resources and other resources to devote to energy and natural resource protection matters. These trends are expected to continue.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

The focus of the Environment and Natural Resources plan is on helping farms, families and communities evaluate energy and waste management options and adopt appropriate measures to improve costs and efficiency, encouraging bioenergy production and alternative energy adoption as appropriate. Continued general efforts on evaluation capacity are expected.

Plans also include:

- **Regional/Statewide documentation examples.** Many of our regional and statewide programs are receiving federal capacity funds. Documentation of outcomes and evaluation strategies will continue to be a requirement of funding. Results shape future program efforts and impact program design.

- **There is also a requirement for our local and regional programs to report on statewide outcomes/indicators:** Program documentation results are aggregated in a statewide accountability database which includes both qualitative and quantitative data for reporting and helping us to better understand impacts.

In 2017, we will continue to review the national outcome framework and connect it, as possible, to our statewide outcome framework.

V(A). Planned Program (Summary)

Program # 4

1. Name of the Planned Program

Nutrition, Food Safety and Security, and Obesity Prevention

2. Brief summary about Planned 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 on an ecological approach, focusing on individuals and their interactions across the multiple environments that surround them. This approach recognizes that there are inherently multiple levels of influence that affect a child's body weight. Research topics include nutrition and food security; nutrition education and behavior; policy, systems and environmental (PSE) approaches, physical activity promotion; and child nutrition in low wage working families.

Cornell Cooperative Extension (CCE) 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-income audiences. The programs are collaborative and work directly with key community organizations.

Food Security: CCE programs address 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 producers, consumers and food safety professionals; and developing food processing and storage technologies.

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

For example, National Good Agricultural Practices Program based on the Department of Food Science at Cornell University 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. National GAPs Program personnel have written and developed 12 nationally recognized, multi-lingual educational materials through collaboration with research and extension faculty at 33 Land Grant Universities, the United States Department of Agriculture, and the Food and Drug Administration. The National GAPs Program has distributed over 250,000 copies of these materials to all 50 states including territories such as Puerto Rico as well as internationally. These materials were developed in response to needs identified by stakeholders.

Consumer education programs focus on safe handling, preparation, and preservation of foods, conveying important practices in preventing food borne illnesses, and avoiding food cross-contamination.

3. Program existence : Mature (More than five years)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : Yes

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
303	Genetic Improvement of Animals	0%		2%	
311	Animal Diseases	0%		17%	
313	Internal Parasites in Animals	0%		3%	
315	Animal Welfare/Well-Being and Protection	0%		3%	
405	Drainage and Irrigation Systems and Facilities	0%		4%	
502	New and Improved Food Products	5%		3%	
603	Market Economics	0%		2%	
607	Consumer Economics	0%		1%	
701	Nutrient Composition of Food	15%		3%	
702	Requirements and Function of Nutrients and Other Food Components	15%		7%	
703	Nutrition Education and Behavior	40%		5%	
704	Nutrition and Hunger in the Population	0%		2%	
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources	0%		5%	
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	0%		21%	
721	Insects and Other Pests Affecting Humans	0%		2%	
722	Zoonotic Diseases and Parasites Affecting Humans	0%		3%	
723	Hazards to Human Health and Safety	0%		7%	
724	Healthy Lifestyle	25%		9%	
903	Communication, Education, and Information Delivery	0%		1%	
	Total	100%		100%	

V(C). Planned Program (Situation and Scope)

1. Situation and priorities

Roughly one-fifth of children and adolescents in the United States are obese and over one-third are either overweight or obese. The prevalence in New York State is similar with 17.3 % of children and adolescents considered obese and 33.9% considered overweight or obese, based on 2012-2014 data. Obesity statistics for the entire state, as well as for individual counties, can be found at www.health.ny.gov/statistics/chac/indicators/obs.htm.

An estimated 70% of overweight youth 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. Obese children are at greater risk for bone and joint problems, sleep apnea, and social and psychological problems such as stigmatization and poor self-esteem. Children and adolescents who are obese are likely to be obese as adults, with an increased risk of developing chronic diseases that are placing a major strain on the U.S. health system and economy; these include cardiovascular disease, diabetes, stroke, hypertension, and some forms of cancer.

Factors contributing to obesity in children include unhealthy dietary behaviors such as overconsumption 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 the context of childhood obesity prevention programs.

The socio-ecological model provides a framework for understanding influences on food choice and activity behaviors. At the individual child level, both psychosocial influences (including food norms, preferences, knowledge, attitudes, skills,) and biological influences (including age, gender, genes, and physiology) interact. The family provides the next layer of influences on child eating and activity, including parental/caregiver role modeling and feeding practices, attitudes, and attention to health care. The organizational and community environments and policies where children and families learn, work, and play have the potential to further influence children; influential factors include access to healthy foods and opportunities for physical activity in schools, after-school programs, parks, and programs delivered through youth-serving organizations.

Effective programs are those that target eating and activity-based behaviors through approaches aimed directly at children, at parents/caregivers and at the community. Policy, systems, and environmental (PSE) changes at the organizational and community levels can make healthy food and activity choices easier. 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 Security: Food security refers to sustained access at all times, in socially acceptable ways, to food adequate in quantity and quality to maintain a healthy life. Hunger is the uneasy or painful sensation caused by a lack of food, and is a potential, although not necessary, consequence of food insecurity. Having enough calories is not sufficient to assure nutritional adequacy, since foods available may not provide essential nutrients for health. Thus obesity and food insecurity can co-exist in the same individual. It is a priority of this plan to work with vulnerable populations to educate families and influence policies that will allow youth, families and communities to make sound nutritional decisions with constrained resources.

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, foodborne illness occurs and has a significant impact on both the health of Americans and the economy. By some estimates, foodborne illnesses cost the United States \$77.7 billion annually in health care and other losses. Center for Disease Control compiled data indicate that known pathogens account for an estimated 48 million illnesses, 128,000 hospitalizations, and 3,000 deaths annually. An untold number of foodborne illnesses go unreported because people may not seek medical attention and because of 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. Safety from farm to retail and then in the home can be improved through research, education and training that results in better practices that reduce contamination risks.

A variety of good agricultural and manufacturing practices can reduce the spread of microorganisms throughout the food system, farm to fork. This encompasses training of farmers, wholesalers, processors, retailers and consumers, areas where Cornell University has active research and training programs. Beginning at the farm level, both the National Good Agricultural Practices (GAPs) Program and the Produce Safety Alliance provide education and extension produce safety training programs for farmers statewide and nationally through both in-person and online delivery. Faculty in the Department of Food Science also provide Juice HACCP training for entities who are interested in juice production. The Northeast Center for Food Entrepreneurship (NECFE) offers safety and stability evaluation of food products in order to comply with state and federal regulation and to optimize product parameters such as shelf life for consumer use. The NECFE offers Better Process Control School to satisfy FDA requirements for the safe production of shelf-stable acidified (pickled) foods. The NECFE is currently working with restaurants to ensure the safety of sous vide processes which enable production flexibility, as well as ongoing work with over 700 New York State entities annually.

2. Scope of the Program

- In-State Extension
- In-State Research
- Multistate Research
- Multistate Extension
- Integrated Research and Extension
- Multistate Integrated Research and Extension

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

Childhood Overweight and Obesity

- Childhood overweight and obesity is increasingly being addressed by combining direct education with policy, systems and environmental approaches. These approaches help promote and support improved eating and physical activity behaviors of New York State children and families 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 provides guidance for individuals and families

enabling science-based decisions about health and well-being.

- In New York State, CCE delivers nutrition and wellness education informed by research on the etiology of obesity and chronic disease and developed in partnership with families, youth, and other community-based individuals and groups including nutrition and health practitioners.
- Research from Cornell and other academic institutions is applied to CCE programs promoting healthful and secure community food systems to address childhood obesity. Community resources complement federal, state, and local government support to implement this outreach.

Food Safety:

- 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.
- Increasing understanding about regulations contained with the Food Safety Modernization Act will increase constituent ability to meet regulatory requirements to ensure farm and company viability.
- Policies and practices across the food system affect the safety of foods and can be improved through education and training.
- Community, federal, state, and local government support will be provided to implement extension outreach.

Food Security

- Hunger is a complex social, economic and environmental issue.
- Hunger persists because people lack the resources to produce their own food, do not have access to such things as clean water and land, and/or they cannot afford healthy food.
- Community food security is a vision in which all people have access to culturally acceptable, nutritionally adequate, safely grown diet through a sustainable food system that maximizes community social justice and empowerment.
- Certain policies may perpetuate hunger, making it a social issue which requires social change.
- Thoughtfully conceived nutrition- and garden-based education, carried out in partnership with community members, has the potential to promote significant shifts which foster such social change.

2. Ultimate goal(s) of this Program

- Affordable, available, safe and nutritious foods.
- Food, nutrition, and physical activity knowledge and skills necessary for people to make choices consistent with a healthy lifestyle.
- Food and activity environments that support healthful eating and active living.
- Improved food safety and food-handling practices throughout the food system.
- Reduced incidence of food-borne illnesses.
- Improved community food security and healthful food-choice options.
- Social change which takes place when Cornell Cooperative Extension works with community partners to foster longer term impacts in those communities.

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
		1862	1890	1862

2017	190.0	0.0	8.0	0.0
2018	190.0	0.0	8.0	0.0
2019	190.0	0.0	8.0	0.0
2020	190.0	0.0	8.0	0.0
2021	190.0	0.0	8.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

Programs for children and youth are delivered through a variety of settings: afterschool programs, in-school student enrichment, 4-H clubs, summer camps, and fairs, as well as through cooking or other educational programs involving both children and their parent or caregiver. Family-focused programs promote a positive parent/caregiver-child feeding relationship and an understanding of age appropriate nutrition and physical activity. Extension staff also collaborate with community leaders to improve the local policies, systems, and environments 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. Professional development is provided to county and regional staff through in-person and online trainings.

Food safety activities provide educational programs in collaboration with regulatory agencies involved with assuring the safety and wholesomeness of food grown, processed, prepared, sold and handled and consumed by the public in New York State. They are delivered via courses, presentations and educational materials, support transfer of new research-based information for appropriate applications in the agricultural production, manufacturing, retailing and food service industries.

Food security activities may be aimed at both/either nutrition and garden-based efforts which address culturally acceptable, nutritionally adequate, safely grown diets and sustainable growing projects through a variety of means, including school and community gardens and youth-led food systems activities.

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

- Adopting Healthy Habits (AHH)
- Choose Health Action Teens (CHAT)
- Choose Health: Fun, Food & Fitness (CHFFF)
- Choose Health Officers (CHO)
- Cooking Up Fun!: Vary Your Veggies
- Cornell Healthy After School Self-Assessment (CHASE)
- Cornell Farm to School Research and Extension Program
- Cornell NutritionWorks Online Professional Development Program
- Discovering Our Food System
- Expanded Food and Nutrition Education Program (EFNEP)
- Farmers Market Nutrition Program
- Master Gardener Volunteer Program
- National GAPs Program Online Produce Safety Course
- Northeast Regional Nutrition Education and Obesity Prevention Center of Excellence (NE-RNECE)
- Produce Safety Alliance Grower and Train-the-Trainer Programs
- Seed to Supper

- Supplemental Nutrition Assistance Program - Education (SNAP-Ed)
- Youth Grow
- Youth Healthy Eating and Active Living Program Work Team (YHEAL PWT)

2. Type(s) of methods to be used to reach direct and indirect contacts

Extension

Direct Methods	Indirect Methods
<ul style="list-style-type: none"> • Education Class • Workshop • Group Discussion • One-on-One Intervention • Demonstrations 	<ul style="list-style-type: none"> • Public Service Announcement • Newsletters • TV Media Programs • eXtension web sites • Web sites other than eXtension • Other 1 (webinars) • Other 2 (on-line courses)

3. Description of targeted audience

Childhood obesity prevention program audiences reached include: low-income families; 4-H youth; children in and out of school; nutrition and health professionals; school food service staff; community leaders; and government and agency leaders at the local, state, and national levels. Food security program audiences reached include: low-income individuals and families; and child caregivers, community leaders, human service providers and food policy makers at the local, state, and national levels.

Food safety program audiences reached include: produce growers, dairy farmers, food processors, producers and consumers with targeted programs for low- and moderate- income families; 4-H youth; nutrition and health professionals; food service and food production staff and their managers and directors; and government and agency leaders at the local, state, and national levels.

V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
 - Direct Adult Contacts
 - Indirect Adult Contacts
 - Direct Youth Contacts
 - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(H). State Defined Outputs

1. Output Measure

Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(I). State Defined Outcome

O. No	Outcome Name
1	(4.1a) Number of children and youth who demonstrate knowledge or skill gains related to healthy eating and active living
2	(4.1b) Number parents/ caregivers and other adults who demonstrate knowledge or skill gains related to healthy eating and active living.
3	(4.1c) Number of youth program participants documented to have applied healthy eating and/or active living, recommendations
4	(4.1d) Number of adult program participants documented to have applied healthy eating and/or active living, recommendations
5	(4.2a) Number of program participants who adopt food resource management and/or food security practices
6	(4.3a) Number of program participants documented to have increased involvement in public/community childhood obesity prevention actions
7	(4.3b) Number of participating schools and/or communities documented to have made practice and/or policy changes to promote healthy eating and active living
8	(4.4a) Number of program participants who have acted to improve their food security status.
9	(4.4b) Number of community action plans implemented as a result of community based assessment.
10	(4.5a) Number 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.
11	(4.5b) Number of consumers documented to have implemented new and/or increased application of ongoing safe food purchasing, handling, storage, and preparation practices.
12	(4.6a) Number of producers/ processors/food service providers documented to have implemented new and/or increased application of ongoing safe food production, processing, storage, handling, marketing, and preparation practices.
13	(4.7a) Number of communities/ firms/or organizations documented to have assessed practices or food safety policies as a result of participating in relevant educational programs.
14	(4.7b) Number of communities/ firms/or organizations documented to have implemented improved practices or food safety policies as a result of participating in relevant educational programs.
15	(4.4c) Number of program participants who have acted to improve their food security status by growing food.
16	(4.4d) Number of program participants who have assisted another/others in improving their food security status through growing food.

Outcome # 1

1. Outcome Target

(4.1a) Number of children and youth who demonstrate knowledge or skill gains related to healthy eating and active living

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 724 - Healthy Lifestyle
- 702 - Requirements and Function of Nutrients and Other Food Components
- 701 - Nutrient Composition of Food
- 703 - Nutrition Education and Behavior

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 2

1. Outcome Target

(4.1b) Number parents/ caregivers and other adults who demonstrate knowledge or skill gains related to healthy eating and active living.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 703 - Nutrition Education and Behavior
- 724 - Healthy Lifestyle
- 701 - Nutrient Composition of Food

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 3

1. Outcome Target

(4.1c) Number of youth program participants documented to have applied healthy eating and/or active living, recommendations

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 703 - Nutrition Education and Behavior
- 701 - Nutrient Composition of Food
- 724 - Healthy Lifestyle

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 4

1. Outcome Target

(4.1d) Number of adult program participants documented to have applied healthy eating and/or active living, recommendations

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 703 - Nutrition Education and Behavior
- 701 - Nutrient Composition of Food

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 5

1. Outcome Target

(4.2a) Number of program participants who adopt food resource management and/or food security practices

2. Outcome Type : Change in Condition Outcome Measure

3. Associated Knowledge Area(s)

- 701 - Nutrient Composition of Food
- 703 - Nutrition Education and Behavior

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 6

1. Outcome Target

(4.3a) Number of program participants documented to have increased involvement in public/community childhood obesity prevention actions

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 703 - Nutrition Education and Behavior
- 701 - Nutrient Composition of Food
- 724 - Healthy Lifestyle

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 7

1. Outcome Target

(4.3b) Number of participating schools and/or communities documented to have made practice and/or policy changes to promote healthy eating and active living

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 703 - Nutrition Education and Behavior
- 702 - Requirements and Function of Nutrients and Other Food Components
- 724 - Healthy Lifestyle
- 701 - Nutrient Composition of Food

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 8

1. Outcome Target

(4.4a) Number of program participants who have acted to improve their food security status.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 702 - Requirements and Function of Nutrients and Other Food Components

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 9

1. Outcome Target

(4.4b) Number of community action plans implemented as a result of community based assessment.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 702 - Requirements and Function of Nutrients and Other Food Components

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 10

1. Outcome Target

(4.5a) Number 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.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 724 - Healthy Lifestyle

- 703 - Nutrition Education and Behavior

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 11

1. Outcome Target

(4.5b) Number of consumers documented to have implemented new and/or increased application of ongoing safe food purchasing, handling, storage, and preparation practices.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 703 - Nutrition Education and Behavior
- 502 - New and Improved Food Products
- 724 - Healthy Lifestyle

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 12

1. Outcome Target

(4.6a) Number of producers/ processors/food service providers documented to have implemented new and/or increased application of ongoing safe food production, processing, storage, handling, marketing, and preparation practices.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 703 - Nutrition Education and Behavior
- 502 - New and Improved Food Products
- 724 - Healthy Lifestyle

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 13

1. Outcome Target

(4.7a) Number of communities/ firms/or organizations documented to have assessed practices or food safety policies as a result of participating in relevant educational programs.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 14

1. Outcome Target

(4.7b) Number of communities/ firms/or organizations documented to have implemented improved practices or food safety policies as a result of participating in relevant educational programs.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 724 - Healthy Lifestyle
- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 15

1. Outcome Target

(4.4c) Number of program participants who have acted to improve their food security status by growing food.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 703 - Nutrition Education and Behavior
- 903 - Communication, Education, and Information Delivery
- 724 - Healthy Lifestyle

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 16

1. Outcome Target

(4.4d) Number of program participants who have assisted another/others in improving their food security status through growing food.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 704 - Nutrition and Hunger in the Population
- 703 - Nutrition Education and Behavior
- 903 - Communication, Education, and Information Delivery

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

- Economy
- Appropriations changes
- Public Policy changes

- Government Regulations
- Competing Public priorities
- Populations changes (immigration, new cultural groupings, etc.)

Description

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 physical activity behaviors, or improved access to healthy food and activity opportunities. As an example of the latter, in New York State, cost cutting proposals include closing some public parks and reducing recreational physical activity programs. In addition, 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 the family, disregarding environmental influences outside the family.

In 2014, the NYS Office of Temporary and Disability Assistance released an RFA to competitively fund SNAP-Ed. Previously about half the state SNAP-Ed funding had supported CCE programs on a non-competitive basis. Seven regions across the state outside of NYC received awards and will continue to deliver SNAP-Ed programming. However, the approach has shifted dramatically in two ways: (1) The focus has shifted to include major efforts to address policy, systems and environmental approaches. Direct education of participants is still required but at a reduced effort. (2) Paraprofessional nutrition educators are no longer able to be employed to conduct nutrition programming. Educators must have degrees in nutrition, public health, or health education. This change has had a major impact on staffing within the CCE system.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

The Nutrition, Food Safety and Security and Obesity Prevention plan includes food and nutrition programs for youth and families, food security planning aimed at decision makers, and food safety programs intended to help families and business/agricultural practices. Continued general efforts on evaluation capacity are expected.

Plans also include:

- **Regional/Statewide documentation examples.** Many of our regional and statewide programs are receiving federal capacity funds. Documentation of outcomes and evaluation strategies will continue to be a requirement of funding. Results shape future program efforts and impact program design.
- **There is also a requirement for our local and regional programs to report on statewide outcomes/indicators:** Program documentation results are aggregated in a statewide accountability database which includes both qualitative and quantitative data for reporting and helping us to better understand impacts.

In 2017, we will continue to review the national outcome framework and connect it, as possible, to our statewide outcome framework.

V(A). Planned Program (Summary)

Program # 5

1. Name of the Planned Program

4-H Youth Development/Children, Youth and Families

2. Brief summary about Planned Program

This plan frames applied research and Cornell Cooperative Extension (CCE) 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. The practice of positive youth development refers to the application of core principles, such as the importance of hands-on learning, positive interactions with a caring adult, and creating opportunities for youth to guide their own learning, to a planned set of practices, or activities, that foster the developmental process in young people (Hamilton, Hamilton, & Pittman, 2003). Positive youth development assumes all young people -youth of diverse socio-economic status, race, ethnicity, sexual identity and gender identity - have assets that can help them succeed. Positive youth development practices can help youth gain the competence to earn a living, engage in civic activities, develop healthy living behaviors, and embrace the opportunity to participate in social relations and cultural activities. Positive youth development emphasizes the importance of active support for the growing capacity of young people by individuals, organizations, and institutions, especially at the community level. The overall goal of positive youth development is achieved through 4-H program areas: Science, Technology, Engineering and Math (STEM), Healthy Living, Civic Engagement, and Agriculture and Food Systems.

The National Institute for Food and Agriculture (NIFA), the federal home for Cooperative Extension within the USDA, states that any Extension youth development program facilitated by an Extension professional or volunteer is a 4-H Youth Development program. 4-H integrates positive youth development with learning opportunities in the program areas of science, technology engineering and math (STEM), civic engagement, healthy living, and agriculture, to engage youth in the work of Cornell University, and Cornell Cooperative Extension.

The family emphases in this plan include human development and social wellbeing, economic wellbeing, and quality of home and work environments. This emphasis area includes 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. Current research focuses include behavioral and psychological development from conception through later life.

Also included in this plan is an emphasis on family economic security. This emphasis 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. The effort includes education to low-income households where housing may have a greater incidence of indoor air issues: 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 generate innovative design solutions for pressing social and cultural issues.

3. Program existence : Mature (More than five years)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : Yes

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
134	Outdoor Recreation	4%		12%	
607	Consumer Economics	7%		0%	
608	Community Resource Planning and Development	15%		0%	
610	Domestic Policy Analysis	4%		0%	
801	Individual and Family Resource Management	8%		0%	
802	Human Development and Family Well-Being	12%		54%	
803	Sociological and Technological Change Affecting Individuals, Families, and Communities	7%		0%	
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures	4%		22%	
805	Community Institutions and Social Services	9%		0%	
806	Youth Development	30%		12%	
	Total	100%		100%	

V(C). Planned Program (Situation and Scope)

1. Situation and priorities

The demographics and needs of NYS youth and families have changed dramatically in recent decades as have the structure of the economy and resulting workforce needs. New York State has approximately 3.1 million youth, approximately 6% of the total youth population in the United States. New York is one of nine states that together account for more than 50% of the nation's total youth population. The 4-H program must find ways to maintain its historically strong programs, volunteers and local funding support, while expanding the reach of 4-H in urban and suburban communities.

The NYS 4-H YD program exists to connect youth to hands-on learning opportunities that help them grow into competent, caring, contributing members of society. Positive youth development through experiential learning is the foundation of 4-H programming. NYS 4-H reaches between 150,000 to 200,000 youth between the ages of 5-19 on an annual basis. The goal moving forward is a program that is growing in reach and relevance and representative of the increasing diversity of New York State. International

comparisons reveal that 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). In addition, STEM literacy is routinely identified as a key to our economic future. Participation in high quality out-of-school programs have been linked with a lower incidence of problem behaviors, such as decreased academic failure, substance abuse, and delinquency and increased thriving (Lerner, Lerner, & Phelps, 2008). The National Academy Learning Science in Informal Environments (2009) Report, links experiential learning with higher student performance in mathematics and science. Research suggests that 4-H youth are twice as likely to participate in STEM program during their out of school time. Helping youth to take positive action in their community grows the confidence needed for youth to take responsibility and leadership. Research suggests that 4H youth are more civically active and contribute more to their community than youth in other outofschool time activities. Healthy lifestyle habits, including healthy eating and physical activity, can lower the risk significantly of becoming overweight and developing diseases associated with increased obesity. Research suggests that 4-Hers are two times more likely to make healthier choices. Finally, an increase in agricultural literacy is a critical step in helping youth understand the relationships between agriculture and the environment, energy systems, technology and can help youth make informed health decisions and explore career opportunities in agriculture and food systems.

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.

2. Scope of the Program

- In-State Extension
- In-State Research
- Multistate Research
- Multistate Extension
- Integrated Research and Extension
- Multistate Integrated Research and Extension

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

Youth

- NYS 4-H goals are reflective of the following NYS 4-H program values:
 1. 4-H reflects the principles of positive youth development, experiential learning, and the importance of having fun!
 2. 4-H promotes the development of skills that help young people succeed in higher education, their chosen career path, and as members of their families and communities.
 3. 4-H is committed to achieving a community of staff, volunteers, and program participants that reflects the diversity of NYS
 4. 4-H creates opportunities for youth to have a voice in the development and evaluation of the program at the local, state, and national level

5. 4-H experiences reflect local needs and culture while also preparing youth for success in a rapidly changing world

6. 4-H makes science come alive by connecting youth to Cornell University and the research based resources of the land grant college system

- Curricula, programs, and learning experiences incorporate evidence and best practices for building life skill competencies and college and career readiness. Best practices related to specific delivery methods provide rich opportunities for deep impact.

- Program educators and volunteers working with youth receive professional development and support on how to incorporate research findings and evaluation plans into program design. These efforts focus on best practices to meet the needs of youth at various stages of their development.

- Youth have different interests and needs; therefore, they may respond differently to the same opportunities. Youth should have choices about activities in which they participate, including the chance to help shape those activities.

- Many opportunities exist to connect youth to the educational resources of Cornell University and other Land Grant Universities and engage them in the work of Extension, especially in the areas of Agriculture, 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 New York State economy.

2. Ultimate goal(s) of this Program

Youth

- 4-H participants develop a passion for life-long learning opportunities that reflect the principles of positive youth development, experiential learning, and the importance of having fun!
- 4-H participants develop skills that help them succeed in higher education, their chosen career path, and as members of their families and communities.
- 4-H participants develop increased intercultural competence and have the skills they need to thrive in an increasingly diverse society.
- 4-H participants develop higher levels of scientific competency, understanding and applying research based knowledge in their careers, communities, and families.

Family

- Enhance parenting practices that result in improved child and youth outcomes.
- Improve parent/caregiving 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.

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2017	308.0	0.0	4.0	0.0
2018	308.0	0.0	4.0	0.0
2019	308.0	0.0	4.0	0.0
2020	308.0	0.0	4.0	0.0
2021	308.0	0.0	4.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

Youth: 4-H Youth Development is a comprehensive, statewide positive youth development program. 4-H entails a wide variety of applied research and educational methods based on need and local context. Campus-based faculty and Extension Associates, Program Work Teams (PWTs), State Office staff, the New York State Association of CCE 4-H Educators (NYSACCE4-HE), county-based educators, volunteers, and youth leaders are all involved in designing, implementing, and evaluating program efforts.

NYS 4-H's first priority is to create a safe, inclusive space for learning, sharing, and collaboration welcoming to people from diverse backgrounds, cultures and perspectives. A 4-H Learning Experience is an active, reflective learning and growing process where young people, connected in transformative relationships with educators and each other, engage in progressive learning pathways in the dynamic ecology of positive youth development. Young people participate in a variety of 4-H Learning Experiences through 4-H projects. A project is a planned series of experiential learning opportunities that focuses on a particular topic area and learning goals over a period of time. 4-H Learning Experiences includes a wide array of delivery modes, ways of learning, project and topic areas, and local adaptations. All young people who participate in a 4-H Learning Experience are considered members. Members may participate in one or several 4-H Learning Experiences, through one or many delivery modes and in one or many project areas. They may join for a short-term experience or remain involved for several years.

Through their 4-H Learning Experiences, youth develop understanding, practical skills, life skills, contribute to their community, and explore their sparks. A spark is a special quality, skill, or interest that a young person is passionate about and is a source of meaning and purpose. 4-H Learning Experiences, projects, and programs aim to support young people as they develop the 6 Cs: caring, character, confidence, competence, connection, and contribution.

A variety of educational strategies are also used to support county educators and volunteers. Professional development goals include assisting colleagues in gaining the knowledge and skills necessary to assess the ranges of possibilities that exist within and among program areas. Trained 4-H educators and staff, volunteers, youth, schoolteachers, community agency staff and others lead youth in 4-H projects.

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 state-wide) educational efforts depending on the focus and scope of their role.

Sample Statewide Program Initiatives that fall within this Plan of Work:

- 4-H Youth Development Program (clubs, events, camps, afterschool, school enrichment)
- 4-H and NYS Library Partnership
- 4-H National Mentoring Program
- ACT (Assets Coming Together) for Youth
- 4-H Public Presentations
- Children, Youth, and Families at Risk Program (CYFAR)
- Cornell Early Childhood Program
- Cornell Research Program on Self-Injurious Behavior
- Design & Environmental Analysis: knowledge, ideas, and designs that contribute to improving the places in which we work, live, learn, heal, and play
 - Events: 4-H Career Explorations Conference, State Teen Action Representative Retreat (STARR), National 4-H Conference, Dairy Discovery Days, Animal Crackers, Public Presentations, State Fair, etc.
 - Family Economics and Resource Management
 - Operation Military Kids
 - Parenting in Context Initiative
 - Role of Grandparents in the Lives of Adolescent Grandchildren
 - Volunteer development opportunities and events

2. Type(s) of methods to be used to reach direct and indirect contacts

Extension

Direct Methods	Indirect Methods
<ul style="list-style-type: none"> • Education Class • Workshop • Group Discussion • One-on-One Intervention • Demonstrations • Other 1 (webinars) 	<ul style="list-style-type: none"> • Public Service Announcement • Newsletters • TV Media Programs • eXtension web sites • Web sites other than eXtension • Other 1 (webinars)

3. Description of targeted audience

Youth

- Young people ages 5-19: Cloverbuds (5-8), pre-teens (9-12), and teens (13-19)
- Youth development educators, staff, and volunteers
- Families, parents, and guardians
- Youth-serving organizations
- Teachers and schools (elementary, middle, high school)
- Community leaders
- Underserved communities (Black, Latino, Native American, Asian youth).

Family

- Parents, grandparents and other caregivers
- Child care providers
- Community stakeholders such as employers, leaders and policy makers at local/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

V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
 - Direct Adult Contacts
 - Indirect Adult Contacts
 - Direct Youth Contacts
 - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

- Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(H). State Defined Outputs

1. Output Measure

- Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(I). State Defined Outcome

O. No	Outcome Name
1	(5.1a) Number of youth who demonstrate ability to express their ideas confidently and competently.
2	(5.1b) Number of youth who demonstrate intercultural competence and cultural humility.
3	(5.1c) Number of youth who demonstrate improved college and career-readiness skills.
4	(5.1d) Number of youth who demonstrate Science and Engineering Practices.
5	(5.1e) Number of youth who demonstrate increased knowledge and skills in Animal Science fields.
6	(5.1f) Number of youth who develop environmental literacy.
7	(5.1g) Number of youth who demonstrate a deeper understanding and appreciation of complex food systems and their impact in those systems.
8	(5.2a) Number of youth who applied knowledge and skills in programs, projects, and activities to foster an inclusive and diverse learning environment.
9	(5.2b) Number of youth who lead community service projects in partnership with adults using skills learned in 4-H.
10	(5.2c) Number of youth programs and organizations documented to incorporate youth voice in programming to reflect youth needs, interests, and excitement for learning.
11	(5.3a) Number of 4-H Volunteer Leaders who lead learning experiences in partnership with youth.
12	(5.3b) Number of 4-H Teen Leaders who lead learning experiences in partnership with youth.
13	(5.4a) Number of parents and other adults providing parental care who adopt developmentally appropriate and effective parenting behaviors and methods.
14	(5.4b) Number of parents/ relative caregivers who report experiencing positive changes in parent-child relationships and parenting skills that they attribute to implementing new parenting behaviors and methods learned in parent education programs.
15	(5.5a) Number of participating infant and child caregivers reporting to have applied positive care-giving practices.
16	(5.5b) Number of participating persons with care-requiring dependents reporting to have used childcare quality characteristics in their care selection.
17	(5.5c) Number of participating persons with care-requiring dependents reporting positive change in childcare as a result of participating in educational programs.
18	(5.6a) Number of program participants reporting to have been involved in community level assessments of family care needs.
19	(5.6b) 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.
20	(5.7a) 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.
21	(5.7b) 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.
22	(5.7c) Number of program participants reporting to have reduced debts and/or increased savings.
23	(5.8a) Number of program participants documented to have taken measures to prevent or remediate indoor air quality issues.

Outcome # 1

1. Outcome Target

(5.1a) Number of youth who demonstrate ability to express their ideas confidently and competently.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 2

1. Outcome Target

(5.1b) Number of youth who demonstrate intercultural competence and cultural humility.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 3

1. Outcome Target

(5.1c) Number of youth who demonstrate improved college and career-readiness skills.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 4

1. Outcome Target

(5.1d) Number of youth who demonstrate Science and Engineering Practices.

2. Outcome Type : Change in Condition Outcome Measure

3. Associated Knowledge Area(s)

- 805 - Community Institutions and Social Services
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 5

1. Outcome Target

(5.1e) Number of youth who demonstrate increased knowledge and skills in Animal Science fields.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 6

1. Outcome Target

(5.1f) Number of youth who develop environmental literacy.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 7

1. Outcome Target

(5.1g) Number of youth who demonstrate a deeper understanding and appreciation of complex food systems and their impact in those systems.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 8

1. Outcome Target

(5.2a) Number of youth who applied knowledge and skills in programs, projects, and activities to foster an inclusive and diverse learning environment.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 9

1. Outcome Target

(5.2b) Number of youth who lead community service projects in partnership with adults using skills learned in 4-H.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 10

1. Outcome Target

(5.2c) Number of youth programs and organizations documented to incorporate youth voice in programming to reflect youth needs, interests, and excitement for learning.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 802 - Human Development and Family Well-Being
- 806 - Youth Development
- 805 - Community Institutions and Social Services

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 11

1. Outcome Target

(5.3a) Number of 4-H Volunteer Leaders who lead learning experiences in partnership with youth.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 805 - Community Institutions and Social Services
- 802 - Human Development and Family Well-Being
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 12

1. Outcome Target

(5.3b) Number of 4-H Teen Leaders who lead learning experiences in partnership with youth.

2. Outcome Type : Change in Condition Outcome Measure

3. Associated Knowledge Area(s)

- 805 - Community Institutions and Social Services
- 802 - Human Development and Family Well-Being
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 13

1. Outcome Target

(5.4a) Number of parents and other adults providing parental care who adopt developmentally appropriate and effective parenting behaviors and methods.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 802 - Human Development and Family Well-Being
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 14

1. Outcome Target

(5.4b) Number of parents/ relative caregivers who report experiencing positive changes in parent-child relationships and parenting skills that they attribute to implementing new parenting behaviors and methods learned in parent education programs.

2. Outcome Type : Change in Condition Outcome Measure

3. Associated Knowledge Area(s)

- 806 - Youth Development
- 802 - Human Development and Family Well-Being

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 15

1. Outcome Target

(5.5a) Number of participating infant and child caregivers reporting to have applied positive care-giving practices.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 801 - Individual and Family Resource Management
- 607 - Consumer Economics

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 16

1. Outcome Target

(5.5b) Number of participating persons with care-requiring dependents reporting to have used childcare quality characteristics in their care selection.

2. Outcome Type : Change in Condition Outcome Measure

3. Associated Knowledge Area(s)

- 801 - Individual and Family Resource Management
- 607 - Consumer Economics

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 17

1. Outcome Target

(5.5c) Number of participating persons with care-requiring dependents reporting positive change in childcare as a result of participating in educational programs.

2. Outcome Type : Change in Condition Outcome Measure

3. Associated Knowledge Area(s)

- 607 - Consumer Economics
- 801 - Individual and Family Resource Management

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 18

1. Outcome Target

(5.6a) Number of program participants reporting to have been involved in community level assessments of family care needs.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities
- 804 - Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures
- 607 - Consumer Economics

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 19

1. Outcome Target

(5.6b) 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.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 608 - Community Resource Planning and Development
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 20

1. Outcome Target

(5.7a) 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.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 806 - Youth Development
- 608 - Community Resource Planning and Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 21

1. Outcome Target

(5.7b) 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.

2. Outcome Type : Change in Condition Outcome Measure

3. Associated Knowledge Area(s)

- 806 - Youth Development
- 608 - Community Resource Planning and Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 22

1. Outcome Target

(5.7c) Number of program participants reporting to have reduced debts and/or increased savings.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 23

1. Outcome Target

(5.8a) Number of program participants documented to have taken measures to prevent or remediate indoor air quality issues.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

- Economy
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Populations changes (immigration, new cultural groupings, etc.)

Description

Youth

Fiscal pressures internal to Extension and among community organizations influence the scope and quality of programming available to youth. The increasing diversity of our populations creates the need for an array of program materials, strategies, and a dedication to multicultural competencies. Changing educational standards influence the acceptability or credibility of existing curricula. Regional and community demographic differences influence both program strategies and professional development needs.

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.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

This plan is focused on the positive youth development impacts of the NYS 4-H Program, the quality of child caregiving and parenting as a result of training offered, and improving family life by helping families to assess and address money management practices and indoor air quality issues.

In conjunction with the new 4-H Common Measures being piloted nationally, NYS 4-H Youth Development is focused on documenting impact, identifying best practices, and building capacity for more precise evaluation methods within the system. Additionally a more thorough evaluation of the Teen Leadership and workforce development and the public presentation program is expected. Indicators related to this new evaluation effort are emerging.

Plans also include:

- **Regional/Statewide documentation examples.** Many of our regional and statewide programs are receiving federal capacity funds. Documentation of outcomes and evaluation strategies will continue to be a requirement of funding. Results shape future program efforts and impact program design.
- **There is also a requirement for our local and regional programs to report on statewide outcomes/indicators:** Program documentation results are aggregated in a statewide accountability database which includes both qualitative and quantitative data for reporting and helping us to better understand impacts.

In 2017, we will continue to review the national outcome framework and connect it, as possible, to our statewide outcome framework.

V(A). Planned Program (Summary)

Program # 6

1. Name of the Planned Program

Community and Economic Vitality

2. Brief summary about Planned Program

This plan frames the programs aimed at empowering 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.

3. Program existence : Mature (More than five years)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : Yes

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
131	Alternative Uses of Land	25%		17%	
134	Outdoor Recreation	5%		0%	
602	Business Management, Finance, and Taxation	5%		3%	
608	Community Resource Planning and Development	45%		41%	
803	Sociological and Technological Change Affecting Individuals, Families, and Communities	10%		21%	
805	Community Institutions and Social Services	10%		18%	
	Total	100%		100%	

V(C). Planned Program (Situation and Scope)

1. Situation and priorities

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 strive to balance private property rights, community growth, quality of life issues and environmental protection. Partnerships, based on mutual respect and trust, provide a foundation for innovative strategies and informed decision making to create positive and lasting change for communities.

2. Scope of the Program

- In-State Extension
- In-State Research
- Multistate Research
- Integrated Research and Extension
- Multistate Integrated Research and Extension

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

- 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.
- Building trust and engaging audiences in dialogue is key to being a valued science related information source for citizens.
- Citizens are concerned about the impacts of a variety of decisions on the environment and on quality of life issues, and they are interested in the connections among family, work, and civic life.
- 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.

2. Ultimate goal(s) of this Program

- Ensure that diverse interests and populations in communities are reflected and engaged as stakeholders.
- Provide a framework for communities to navigate conflicts when they occur.
- Help communities to see agriculture/horticulture/natural resource enterprises as contributing and positive elements.
 - Grow community leadership capacity so that community residents experience high quality of life, ecological integrity, effective decision making, and new economic opportunities.
 - Institutionalize sustainable practices so that communities actively manage their financial, leadership practices, human, environmental, and social capitals.
 - Cultivate knowledge, attitudes and skills that support meaningful engagement and contribution to individual, family, community environmental stewardship.

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2017	121.0	0.0	3.0	0.0
2018	121.0	0.0	3.0	0.0
2019	121.0	0.0	3.0	0.0
2020	121.0	0.0	3.0	0.0
2021	121.0	0.0	3.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

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. Educators work with a variety of state and local groups to tackle projects 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
- Community Capacity Building
- Entrepreneurship

- Land Use Education
- Leadership Development
- Master Gardener Volunteer Program
- New York Extension Disaster Education Network (NY EDEN)
- Regional Economic Development
- Sustainable and Resilient Communities
- Training for Local Officials
- Workforce Development

2. Type(s) of methods to be used to reach direct and indirect contacts

Extension

Direct Methods	Indirect Methods
<ul style="list-style-type: none"> • Education Class • Workshop • Group Discussion • One-on-One Intervention • Demonstrations • Other 1 (webinars) • Other 2 (corresp courses/instruction) 	<ul style="list-style-type: none"> • Public Service Announcement • Newsletters • TV Media Programs • eXtension web sites • Web sites other than eXtension • Other 1 (e- news) • Other 2 (webinars)

3. Description of targeted audience

- 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 a 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

V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
 - Direct Adult Contacts
 - Indirect Adult Contacts
 - Direct Youth Contacts
 - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(H). State Defined Outputs

1. Output Measure

Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(I). State Defined Outcome

O. No	Outcome Name
1	(6.1a) 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.
2	(6.1b) Number of residents and/or community leaders, who plan for and initiate steps to enhance facilities, and/or other community resources or services
3	(6.1c) Number of municipalities that were part of an intentional process re: intergovernmental cooperation.
4	(6.1d) 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.
5	(6.1e) Number of communities documenting improvements in facilities and/or other community resources or services.
6	(6.2a) Number of communities instituting new or enhanced participatory processes related to community and economic vitality.
7	(6.2b) Number of local officials who cite LGU research and data as having influenced a decision.
8	(6.2c) 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.
9	(6.3a) Number of communities and municipalities that address the connection between their land base and possible energy scenarios.
10	(6.3b) Number of sustainability initiatives adopted.
11	(6.3c) Number of communities that address climate change and energy issues in an integrated manner.
12	(6.3d) Number of communities that incorporate energy use and development in their comprehensive plans.
13	(6.4a) Number of communities utilizing information of NY-EDEN.
14	(6.4b) Number of community leaders documented to apply community economic development and quality of life indicators to support decision-making.
15	(6.4c) Number of communities who were better prepared to deal with emergencies and disasters.
16	(6.4d) Number of communities implementing projects that enhance community sustainability and/or protect public health and community well-being through sound environmental management.
17	(6.5a) Number 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.
18	(6.5b) Number of communities adopting or updating farmland preservation and/or agricultural economic development plans.
19	(6.6a) Number of residents and/or community leaders, who plan for and initiate steps to enhance public spaces.
20	(6.6b) Number of new or enhanced community organizations or networks linking diverse sub-groups and focused on enhancing community sustainability.
21	(6.6c) Number of communities documenting improvements in public spaces.
22	(6.7a) Number of instances in which producers/ horticulture businesses/ natural resource enterprises, residents and community leaders work together to address issues.
23	(6.7b) Number of agriculture/horticulture/natural resource business persons who are better prepared to deal with disasters and emergencies.
24	(6.7c) 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.

25	(6.7d) 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.
26	(6.7e) Number of documented instances in which agriculture/community conflicts are resolved locally.
27	(6.7f) Number of communities documented to adopt, maintain, or expand policies supportive of appropriate agriculture/horticulture/ natural resource enterprise development and/or community agriculture.
28	(6.8a) Number of residents practicing management tactics in homes, lawns, gardens and landscapes that support environmental stewardship and a sustainable community.
29	(6.8b) Number of residents who plan for and initiate steps to enhance homes, lawns, gardens and landscapes that support environmental stewardship and a sustainable community.
30	(6.1f) Number of new shared services among municipalities.

Outcome # 1

1. Outcome Target

(6.1a) 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.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 805 - Community Institutions and Social Services
- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities
- 602 - Business Management, Finance, and Taxation
- 608 - Community Resource Planning and Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 2

1. Outcome Target

(6.1b) Number of residents and/or community leaders, who plan for and initiate steps to enhance facilities, and/or other community resources or services

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 608 - Community Resource Planning and Development
- 805 - Community Institutions and Social Services

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 3

1. Outcome Target

(6.1c) Number of municipalities that were part of an intentional process re: intergovernmental cooperation.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 608 - Community Resource Planning and Development
- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities
- 602 - Business Management, Finance, and Taxation
- 805 - Community Institutions and Social Services

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 4

1. Outcome Target

(6.1d) 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.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 608 - Community Resource Planning and Development
- 805 - Community Institutions and Social Services

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 5

1. Outcome Target

(6.1e) Number of communities documenting improvements in facilities and/or other community resources or services.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 608 - Community Resource Planning and Development
- 805 - Community Institutions and Social Services

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 6

1. Outcome Target

(6.2a) Number of communities instituting new or enhanced participatory processes related to community and economic vitality.

2. Outcome Type : Change in Condition Outcome Measure

3. Associated Knowledge Area(s)

- 805 - Community Institutions and Social Services
- 608 - Community Resource Planning and Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 7

1. Outcome Target

(6.2b) Number of local officials who cite LGU research and data as having influenced a decision.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 131 - Alternative Uses of Land
- 608 - Community Resource Planning and Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 8

1. Outcome Target

(6.2c) 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.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 608 - Community Resource Planning and Development
- 134 - Outdoor Recreation
- 805 - Community Institutions and Social Services
- 131 - Alternative Uses of Land

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 9

1. Outcome Target

(6.3a) Number of communities and municipalities that address the connection between their land base and possible energy scenarios.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 805 - Community Institutions and Social Services
- 608 - Community Resource Planning and Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 10

1. Outcome Target

(6.3b) Number of sustainability initiatives adopted.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 805 - Community Institutions and Social Services
- 608 - Community Resource Planning and Development
- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 11

1. Outcome Target

(6.3c) Number of communities that address climate change and energy issues in an integrated manner.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 608 - Community Resource Planning and Development
- 805 - Community Institutions and Social Services
- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 12

1. Outcome Target

(6.3d) Number of communities that incorporate energy use and development in their comprehensive plans.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 805 - Community Institutions and Social Services
- 608 - Community Resource Planning and Development
- 131 - Alternative Uses of Land
- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 13

1. Outcome Target

(6.4a) Number of communities utilizing information of NY-EDEN.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 608 - Community Resource Planning and Development
- 131 - Alternative Uses of Land

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 14

1. Outcome Target

(6.4b) Number of community leaders documented to apply community economic development and quality of life indicators to support decision-making.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 608 - Community Resource Planning and Development
- 131 - Alternative Uses of Land
- 134 - Outdoor Recreation

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 15

1. Outcome Target

(6.4c) Number of communities who were better prepared to deal with emergencies and disasters.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 608 - Community Resource Planning and Development
- 805 - Community Institutions and Social Services
- 131 - Alternative Uses of Land
- 134 - Outdoor Recreation

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 16

1. Outcome Target

(6.4d) Number of communities implementing projects that enhance community sustainability and/or protect public health and community well-being through sound environmental management.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 131 - Alternative Uses of Land
- 134 - Outdoor Recreation
- 805 - Community Institutions and Social Services

- 608 - Community Resource Planning and Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 17

1. Outcome Target

(6.5a) Number 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.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 131 - Alternative Uses of Land
- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities
- 608 - Community Resource Planning and Development
- 602 - Business Management, Finance, and Taxation
- 805 - Community Institutions and Social Services

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 18

1. Outcome Target

(6.5b) Number of communities adopting or updating farmland preservation and/or agricultural economic development plans.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities
- 608 - Community Resource Planning and Development
- 805 - Community Institutions and Social Services

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 19

1. Outcome Target

(6.6a) Number of residents and/or community leaders, who plan for and initiate steps to enhance public spaces.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 805 - Community Institutions and Social Services
- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities
- 608 - Community Resource Planning and Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 20

1. Outcome Target

(6.6b) Number of new or enhanced community organizations or networks linking diverse sub-groups and focused on enhancing community sustainability.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 602 - Business Management, Finance, and Taxation
- 805 - Community Institutions and Social Services
- 608 - Community Resource Planning and Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 21

1. Outcome Target

(6.6c) Number of communities documenting improvements in public spaces.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities
- 805 - Community Institutions and Social Services
- 608 - Community Resource Planning and Development
- 602 - Business Management, Finance, and Taxation

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 22

1. Outcome Target

(6.7a) Number of instances in which producers/ horticulture businesses/ natural resource enterprises, residents and community leaders work together to address issues.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 134 - Outdoor Recreation
- 805 - Community Institutions and Social Services
- 608 - Community Resource Planning and Development
- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities
- 131 - Alternative Uses of Land

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 23

1. Outcome Target

(6.7b) Number of agriculture/horticulture/natural resource business persons who are better prepared to deal with disasters and emergencies.

2. Outcome Type : Change in Condition Outcome Measure

3. Associated Knowledge Area(s)

- 805 - Community Institutions and Social Services
- 134 - Outdoor Recreation
- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 24

1. Outcome Target

(6.7c) 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.

2. Outcome Type : Change in Condition Outcome Measure

3. Associated Knowledge Area(s)

- 134 - Outdoor Recreation
- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities
- 608 - Community Resource Planning and Development
- 805 - Community Institutions and Social Services
- 131 - Alternative Uses of Land

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 25

1. Outcome Target

(6.7d) 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.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 131 - Alternative Uses of Land
- 608 - Community Resource Planning and Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 26

1. Outcome Target

(6.7e) Number of documented instances in which agriculture/community conflicts are resolved locally.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 805 - Community Institutions and Social Services
- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities
- 608 - Community Resource Planning and Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 27

1. Outcome Target

(6.7f) Number of communities documented to adopt, maintain, or expand policies supportive of appropriate agriculture/horticulture/ natural resource enterprise development and/or community agriculture.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 608 - Community Resource Planning and Development
- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities
- 805 - Community Institutions and Social Services

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 28

1. Outcome Target

(6.8a) Number of residents practicing management tactics in homes, lawns, gardens and landscapes that support environmental stewardship and a sustainable community.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities
- 805 - Community Institutions and Social Services
- 131 - Alternative Uses of Land
- 608 - Community Resource Planning and Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 29

1. Outcome Target

(6.8b) Number of residents who plan for and initiate steps to enhance homes, lawns, gardens and landscapes that support environmental stewardship and a sustainable community.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities

- 608 - Community Resource Planning and Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 30

1. Outcome Target

(6.1f) Number of new shared services among municipalities.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 602 - Business Management, Finance, and Taxation
- 608 - Community Resource Planning and Development
- 805 - Community Institutions and Social Services

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Populations changes (immigration, new cultural groupings, etc.)

Description

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.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

The Community and Economic Vitality plan concentrates on helping communities to use the community development process to support and sustain community growth and economic wellbeing. This plan aims to help decision makers and community members seeking to make well thought out decisions as they relate to energy, land use and agriculture/community conflicts. This plan also includes the Master Gardener Volunteer program as a community development/sustainability centered volunteer force. Continued general efforts on evaluation capacity are expected.

Plans also include:

- **Regional/Statewide documentation examples.** Many of our regional and statewide programs are receiving federal capacity funds. Documentation of outcomes and evaluation strategies will continue to be a requirement of funding. Results shape future program efforts and impact program design.
- **There is also a requirement for our local and regional programs to report on statewide outcomes/indicators:** Program documentation results are aggregated in a statewide accountability database which includes both qualitative and quantitative data for reporting and helping us to better understand impacts.

In 2017, we will continue to review the national outcome framework and connect it, as possible, to our statewide outcome framework.