

2017 University of the District of Columbia Combined Research and Extension Plan of Work

Status: Accepted

Date Accepted: 09/19/2016

I. Plan Overview

1. Brief Summary about Plan Of Work

Healthy Cities - Healthy People

The University of the District of Columbia (UDC) is an urban land-grant university that offers associate, baccalaureate, and graduate programs, certificate programs and community outreach programs to learners of all ages. The College of Agriculture, Urban Sustainability and Environmental Sciences (CAUSES) embodies the land-grant tradition of UDC. We offer cutting edge academic programs in environmental science, urban sustainability, water resources management, nutrition and food science, urban architecture and community planning. In the fall of 2016 we plan to inaugurate two new concentrations in our Professional Science Masters Program - a concentration in Urban Sustainability and a concentration in Urban Agriculture.

In addition we offer a wide range of non-credit bearing community outreach programs in the tradition of the cooperative extension programs, a term that is not well known in the urban setting of Washington DC. As a result, CAUSES refers to its community extension work as 'community outreach' and 'community education'. programs that serve individuals and organizations in our community and beyond.

With the inauguration of its pioneering Urban Food Hubs concept in 2014, the work of CAUSES has become more collaborative and interdisciplinary in 2015. We expect this trajectory to continue in 2016 and beyond. To date five Urban Food Hubs are in various stages of implementation. Our ultimate goal is to have at least one Urban Food Hub in each of the eight Wards of the District of Columbia.

The Urban Food Hubs clearly advance all of the NIFA objectives in an urban environment and provide a concrete focus of the CAUSES mission to "...offer research based academic and community outreach programs that improve the quality of life and economic opportunity for people and communities in the District of Columbia, the nation and the world."

Local Commitment - Global Reach

In CAUSES the Community is our Classroom, and our research and community education work is shaped by our commitment to be relevant to the needs of the District of Columbia and its residents and organizations. This commitment to relevance also extends to our academic programs and is expressed in the University's strategic plan Vision 2020 that set a clear objective for the University to be a leader in experiential learning. This means that what we teach is steeped not only in sound theory, but also in the knowledge we draw from the community and region around us. We offer a wide range of research programs through our five land-grant centers. The Urban Agriculture Hub is our Agricultural Experiment Station (AES) farm in Beltsville Maryland, the 143-acre Firebird Farm.

Yet urban populations are not likely to seek out our Urban Agriculture work at the Firebird Farm, nor are they interested in urban agriculture in significant numbers. We therefore had to develop and conceptual framework that would meet people where they are, namely through their interest in nutrition, diet and health and in green infrastructure and sustainable development. These are our primary touch points for our urban populations and they have shaped our Urban Food Hubs concept, which brings the farm to the city through

an integrated and comprehensive food systems model that consists of four components (1) urban food production, (2) food preparation (3) food distribution and (4) closing the loop through waste and water management.

Knowledge for a Lifetime

We are deeply committed to being relevant to the residents of the District of Columbia. Given our three-pronged approach of teaching, research and community outreach, we seek to make a measurable, positive difference in the lives of people right where they live and work. As a result, our programs focus on improving economic conditions, social and cultural circumstances, and the health of people and their living environments. Yet our community-based programs are more than local. They also serve as models for relevant learning far beyond our region.

Preparation for a Global Marketplace

CAUSES programs recognize that, like ecosystems, we are connected to people and places right here in our own neighborhoods and to those half way around the world. Pollution travels, resources are not always consumed where they are generated, and job markets are increasingly global and knowledge based. Given these realities, we aspire to teach you to think in systems, work in diverse teams, and focus on connectivity and innovation. We apply these principals to all of our programs including our Master's and Bachelor's degree programs, professional development certificates and community outreach and youth programs.

In March 2012 CAUSES restructured its Land-grant Programs into five integrated land-grant centers that merged AES and CES responsibilities to strengthen research based program offerings and to better serve students as well as community stakeholders, while addressing the priorities established by the National Institute of Food and Agriculture: climate change, food safety, global food security, childhood obesity, sustainable energy, and water safety and management.

The new program model for integrating research and extension is comprised of five Land-grant Centers: the Center for Urban Agriculture and Gardening Education, Center for Nutrition, Diet, and Health, which includes the Institute of Gerontology; the Center for 4-H and Youth Development; the Center for Sustainable Development, which includes the Water Resources Research Institute; and the Architectural Research Institute.

The Center for Nutrition, Diet and Health includes the following programs: Nutrition Education through the EFNEP and SNAP-ED Programs; Food Safety, Food Handlers Training and Certification; Food Demonstrations for Healthy Choices and Lifestyle; and Diet and Wellness Program.

The Center for Urban Agriculture and Gardening Education encompasses those Land-grant programs of CAUSES that are focused on research and community education in urban food production, gardening and forestry in close alignment with related District agencies.

The Center for 4-H and Youth Development will include 4-H clubs in DC Public and Charter School as well as community centers throughout the city; Summer Camp; LifeSmarts; and Operation Military Kids. The unit will also work with extension agents in the Center for Urban Ag Program to establish and maintain school gardens for elementary and middle schools in the District of Columbia.

The Center for Sustainable Development focus on economic, social, and environmental sustainability, green entrepreneurship, small business development, green energy, water technology and green infrastructure.

All five Centers will also continue to pursue the objectives of the Sustainable DC Plan which is to make Washington DC the greenest, healthiest and most livable city in the United States. Planned programs

include the following:

1) Climate Change. This program includes relevant research and extension education and will assess and monitor natural resources and changes in the urban environment with respect to climate changes. Over the next five years, we will expand the program to identify and solve soil, air, and water quality problems as a specific result of urban forestry, gardening, and aging infrastructures activities. Initiatives will include providing extension activities that impart knowledge, demonstrating techniques, and fostering stewardship as a means to reduce the city's carbon and water footprints. Efforts will focus on community education programs that highlight green technologies and infrastructures that improves water and energy conservation workshops, youth leadership, STEM and environmental stewardship activities, and food and crops recycling and composting initiatives.

2) Global Food Security and Eliminating Hunger. Food Security and Hunger is a critical issue that affects people around the globe, including the residents of the District of Columbia. Like most large cities, our nation's capital has an inner city population of underrepresented and underserved families and individuals. There are low income families in several wards in the city. Of the city's eight wards, Ward 8 is the most economically depressed area of the city. There are neighborhoods within Wards 7 and 8 that do not have a food chain or market within a reasonable walking distance or food deserts. Thus, families in these wards are less likely to obtain or replenish fresh fruits and vegetables than families living in more prominent areas of the city. The lack of healthy foods accessibility results in inadequate diets and poor nutrition as many individuals and families will purchase unhealthy foods from convenience stores and fast food restaurants located in their neighborhoods. We have embarked on a new urban food solution called the "Food Hub", This food system includes food production through aquaponics and hydroponics and bio-intensive nutrient dense crop production for healthy food choice and high in cellulose for bio-energy production. The food hub also includes a commercial kitchen for teaching food preparation, handling, safety and storage. Food distribution will encompass farmers markets and food trucks for accessibility and affordability in food desert areas. Food waste recycling and reuse for bio-energy production and composting closes the loop of the hub. A 15 contact hour certificate program in Urban Agriculture will be provided quarterly to train the next generation of local entrepreneurial urban food producers. The Firebirds research farm in Beltsville MD will also serve as the buffer food hub with all aspects to this food system. We intend to install a food hub in each of the eight wards either directly or in collaboration with our local partners.

3) Health, Nutrition and Childhood Obesity Prevention. Obesity is one of the cause factors for chronic illnesses and conditions, i.e. hypertension, hypercholesterolemia, diabetes, cancer, and heart disease. The Agricultural Experiment Station is participating in a multi-state research project aimed to change the health trajectory for older adults. Most often children follow the food consumption patterns of their parents. Thus, it is imperative to extend proper diet and nutrition information to assist parents with proper meal planning and food preparation. Community nutrition education in support of the Supplemental Nutrition Assistance Program and Education (SNAP-ED) and Expanded Food and Nutrition Education Program (EFNEP) is delivered in our Center for Nutrition Diet and Health (CNDH). CNDH also supports the second part of the food hub concept, food preparation, handling, packaging and storage for quality and safety purposes. Training and engaging low income families in nutritionally sound food purchases and preparation practices along with healthy urban life styles such as diet and exercise will serve as health preventative measures. All programs including those of the Center for 4-H and Youth Development encompass a training component of the urban food hub concept to accomplish this task. The consumer education program LifeSmarts is specifically focused on increased knowledge for the next generation to make informed decisions.

4) Sustainable Energy: It is imperative that safe, reliable energy sources are generated so that the environment will be safe and sound for those of us who reside on earth now as well as for future generations. This program involves using green technologies and infrastructures such as green roofs to conserve energy in buildings. Closing the loop of the food hub concept includes food waste recycling and reuse in production of sustainable bio-energy, Research to improve food and crop waste to bio-energy with

an anaerobic digester for easily available and reliable production of sustainable renewable energy will be implemented at the Firebirds research farm. Two 30 KVA backup generators have already been installed and capable of using bio-diesel fuel. Our research will be conducted with a focus on the reduction of methane emissions, the replacement of fossil fuels, and the production of biogas. Composting to grow soils, the use of renewable solar and wind energy to pump water for high tunnel farming irrigation is a model that will continue to be developed and tested as in support of a global food production system.

5) Food Safety. The Center for Disease Control reports that there are an estimated 76 million people who contract food borne illness each year in the United States. As business continues to grow in the U.S., including establishments that prepare and serve foods, it is imperative that food handlers are appropriately trained and certified. The Center for Nutrition, Diet and Health provides training for food handlers in the District of Columbia. The program is designed to equip participants with low literacy food handlers training and certification with the following objectives: 1) to provide information and knowledge on the techniques to handle food; 2) to decrease risk factors associated with food borne illness and to score a minimum of 70% on the post test and national examination to become certified as a food handler in DC. The commercial kitchen in the food hub concept will also be used for research to improve food safety while preparing, handling, package, storing and distributing foods.

The Water Resources Research Institute in the CAUSES Center for Sustainable Development achieved certification through the National Environmental Laboratory Accreditation Center (NELAC) for testing metals in soil and water. CAUSES test results can be submitted as court evidence. We now seek to receive certification for pesticides and organics. CAUSES Programs are committed to our local community yet by modeling our commitment to local relevance, urban food security, water safety, food safety nutritional health and alternative energy, our reach will be national and global.

6) Urban Families, Youth and Communities Like most large cities, our nation's capital is dealing with a myriad of public concerns varying from education to housing to economic development. The Land Grant Programs are providing quality program that addresses issues related to sustainable youth, families, and communities in the District of Columbia. The Center for 4-H and Youth Development supports city's youth through leadership and development activities. 4-H program activities will assist young people in developing knowledge, skills, and attitudes that will enable them to become self-directing, responsible, productive, and contributing members of society. Further, parenting classes are offered to assist parents, in particular incarcerated parents and the caregivers of their children in research based parenting education best practices. Due to the rapid change in the economy, many residents are experiencing financial woes. The CES basic financial literacy program provides information to students and residents as an effort to help them start achieving financial self-sufficiency. Housing affordability is also a critical issue in the District of Columbia. As the city is transforming to accommodate its increasing population, mostly middle to high income residents, low to moderate income individuals and families are feeling the effect of gentrification. Job readiness skills are promoted in the Center for Sustainable Development Green Technology and Green Economy programs in support of economic development in the city, We are working with community partners and the Small Business Administration to develop the Green Industry.

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

Year	Extension		Research	
	1862	1890	1862	1890
2017	24.0	0.0	22.0	0.0
2018	24.0	0.0	22.0	0.0

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

Year	Extension		Research	
	1862	1890	1862	1890
2019	24.0	0.0	22.0	0.0
2020	24.0	0.0	22.0	0.0
2021	24.0	0.0	22.0	0.0

II. Merit Review Process

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

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

2. Brief Explanation

The Associate Dean for Landgrant Program and each Center Director will review the progress of each Center's program to ensure that expected outputs and outcomes are accomplished for maximum impact. Productivity and time and effort reports will be completed by program staff and assessed by a Program Review and Assessment Team. Merit Peer Review of all programs will be implemented before approval and will include representatives from Academic Departments, Local Government Agencies and Public and private Organizations. Our merit peer review committee is comprised of at least five (5) members chosen from the internal university, external university, and external non-university to review new research/extension projects and activities. Based on stakeholders input, this committee will review the projects and activities to determine if they address our local urban needs and concerns and overall feasibility of conducting projects and activities. The reviewers will assess program projects and activities per the criteria listed below:

1. Quality of proposed programs and activities
2. Feasibility of accomplishing the goals
3. Scientific and technological understanding of proposed integrated research/extension projects
4. Relevance in addressing local urban needs
5. Familiarity with work of others related to the proposal
6. Student participation
7. Inclusion of underrepresented and/or underserved individuals, groups, or communities
8. Project Inputs
9. Outcomes and Impacts

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?

DC residents have indicated that issues of high priority include health, nutrition, and youth violence. Also, many have expressed interest in safely growing their own fresh fruits and vegetables. The CAUSES Urban Food Hubs address all the identified stakeholder priorities. OUR local priorities are also well aligned with the six NIFA goals, which constitute the primary goals of the Landgrant Centers and the secondary goals of the academic programs in CAUSES.

In 2013 CAUSES established six student learning outcomes goals that cut across all of the academic programs in CAUSES. These six SLO goals constitute the primary goals of the academic programs in CAUSES and the secondary goals for the five landgrant centers.

CAUSES is also engaged in a number of collaborative research projects that are aligned with our primary and secondary objectives. Researchers from our Center for Urban Agriculture, for example, are collaborating with researchers from other universities to address breast cancer and diabetes. The principal investigator for our breast cancer research, Nutrient Modulation of P53-ATF3 Signaling in Breast Cancer, has teamed with a researcher from Georgetown University's Lombardi Cancer Center. The principal investigator for our diabetes project, Developing Fuzzy-set-theory-based Data Mining Methodologies for Diabetes Data Analysis is collaborating with a researcher from Tuskegee University as well as a consultant from Natural Genetics Co., Ltd.

A deterrent to youth violence is the engagement of students in youth development and leadership activities. Our 4-H and Youth Development Program combines leadership and environmental stewardship activities, athletics, team building skills, and community involvement as a means to teach, mentor, and encourage youth to have respect for themselves, their families and communities, and the environment.

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

The CAUSES Urban Food Hubs are designed to address multiple needs of underserved populations in the District of Columbia including improved nutritional health, business development, economic empowerment, education, environmental health, neighborhood safety, and improved storm water management. The Urban Food Hubs are currently in various stages of implementation in Wards 5, 7 and 8. A demonstration hub is also being implemented in Ward 3 on the main campus of the University of the District of Columbia.

In order to meet the needs of under-served and under-represented populations in the District, our Land-grant Programs have developed partnerships and collaborations with government agencies, District of Columbia Public Schools, and other public and private organizations and agencies city-wide.

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

We participate in several multi-state research projects as well as other hatch projects and extension program collaborations. Project outcomes and impacts will be described as specific project goals are reached including changes in behavior, attitudes, and conditions, increased learning skills, adoption of new practice(s), policy changes, dollars saved, value added, and new partnerships development.

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

Our Landgrant Centers are participating in multi-state research projects with other academic institutions in the U.S. to include the University of New Hampshire, University of Maine, University of Rhode Island, University of Vermont, South Carolina State University, Wayne State University, Colorado Cooperative Extension, Nevada Cooperative Extension, and other land-grant institutions in the states of Kentucky, Michigan, Minnesota, New Jersey, New York City, Ohio, Oregon, South Dakota, Texas, Utah, and Washington State. Faculty/researchers at the University of the District of Columbia within the Colleges of Arts and Sciences, the School of Engineering and Applied Science, and the Water Resources Research Institute, have been involved in relevant research addressing the needs of the District. As a result of partnering with other academic institutions to engage in multi-state research, Land Grant Programs have broadened and strengthened its capacity to integrated research/extension projects to be more effective and efficient through assessment for continuous improvement; increased its opportunities for additional funding; contributed to the resolution of national issues in nutrition and health; and maintained relevance and sustainability in serving the residents of our nation's capital.

We have are also partnering with Kansas State, the University of Maryland, and public sector and non governmental organizations to include D.C. Public and Charter Schools, DC Department of Health, U.S. National Arboretum, DC Housing and Community Development, Department of Energy and Environment, and the National Gardening Association. These partnerships have resulted in several benefits including: 1) sharing of information and ideas, some of which have contributed to the formulation and implementation of new and/or improved programs, projects, and activities in support of our urban initiatives; 2) proposal development; 3) greater visibility; 4) improved information transfer; and 5) joint activities. The curricula in CAUSES have been designed to have a synergetic effect on academic, research, and extension programs through good teamwork and collaboration for the common goal of helping one another improve the quality of education, research, and outreach outcomes. Students enrolled in Nutrition and Dietetics participate in the service learning projects provided under the Center for Nutrition, Diet and Health; students in nursing participate in 4H and Youth Development programs; students in the Professional Science Master concentrations in Urban Agriculture, Urban Sustainability and Water Resources Management participate in research and community outreach activities in the Center for Sustainability and the Center for Urban Agriculture. Students from the College of Arts and Sciences, the School of Business and Public Administration, and the School of Engineering and Applied Sciences also participate in activities of the five Landgrant Centers and two Institutes.

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 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
- Other (distribution lists; website)

Brief explanation.

Considering those who have a vested interest in the District of Columbia, we have developed a comprehensive list of stakeholders that we will actively seek for participation to include: residents, university students, local businesses and organizations, the public school system, community groups, youth and faith-based organizations, and local government agencies. Several mechanisms are used to generate participation:

- 1) Press Releases: to share information about program highlights and announce special events and activities to the public
- 2) Invitations: to invite specific groups (internal and external) to events, activities, and seminars related to urban issues, research, and outreach
- 3) Surveys: designed to ascertain the interests and concerns of the general public, stakeholder groups, and individuals as it relates to urban issues, research and extension projects and programs
- 4) Website: to share information and announce workshops and seminars
- 5) Distribution Lists: to share information and announce community events, meetings, and special activities

An important outreach vehicle is also the CAUSES TV show hosted by CAUSES Dean and Director of Landgrant Program, Dr. Sabine O'Hara. The show airs in the UDC Cable network as well as on U-Tube and is structured around interview type conversations that cover topics relevant to the work of the five landgrant centers as well as the CAUSES academic programs.

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
- Use Surveys
- Other (workshops, seminars, Quality of Life Day Event)

Brief explanation.

1) Survey of the general public through the University's website: As many DC residents will visit the University System of the District of Columbia's website to seek information about the Flagship University, School of Law, and Community College, an on-line survey will serve as a viable mechanism to attract site visitors and encourage them to participate, thereby providing valuable input. Posting of the survey remains a work in progress. With the recent approval of a new college, the College of Agriculture, Urban Sustainability and Environmental Sciences (CAUSES), in which Land-grant Programs will be housed, various marketing efforts are underway and we expect to have a mechanism in place for the survey soon.

2) Workshops and Seminars: We organize and host an several research seminars that is open to the public. These present an excellent opportunity for stakeholders to hear about the integrated research/extension projects being conducted to address local and national issues and to share results with an open discussion. Workshops and demonstration trainings

are provided in a variety of areas during the year as technical assistance to increase awareness and knowledge. Stakeholder Input Surveys are also distributed and collected at these events.

3) Community listening sessions and neighborhood meetings are conducted regularly by CAUSES landgrant staff members as well as the Dean of CAUSES. The sessions are expected to continue to focus largely on the Urban Food Hubs and their implementation in various neighborhoods across the District. These sessions provide the opportunity to share capacity building and educational efforts with stakeholders, find out what neighborhoods needs and concerns are, and to disseminate information.

4) Advisory Committee: The Land-grant Programs Advisory Board meets twice a year and provides advice and recommendations on matters relating to urban issues.

5) CAUSES host monthly brownbag lunch meetings and bi-weekly research collaboration meetings to facilitate continuing education and collaboration efforts. I

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 invited selected individuals from the general public

Brief explanation.

The Land-grant Programs continue to disseminate surveys to residents to determine satisfaction with the programs offered and solicit input for future program development and research needs. We have revised our surveys to focus more specifically on critical issues in the District of Columbia. We are not only distributing the survey manually but are working with University technicians to also make it accessible through our University's website, Flashlight, and Blackboard. Posting of the survey remains a work in progress. Input from stakeholders is also provided by informal contact through e-mails, telephone, interviews and neighborhood meetings as well as through community forums and events. The established Advisory Committee, diverse in specialization and experience, will be instrumental in helping us to assess the needs/priorities of DC residents. We will continue to strive to provide activities that are stakeholder customer driven.

3. A statement of how the input will be considered

- To Identify Emerging Issues
- Redirect Extension Programs
- Redirect Research Programs
- To Set Priorities

Brief explanation.

Stakeholders input will be considered in the following ways:

1. To provide insight into identifying critical research and extension needs of the residents of the District of Columbia;
2. To assist and guide in developing the Plan of Work;
3. To assist and guide in reviewing impacts and outcome reports;
4. To assist and guide in developing new strategies based on continuous assessment of impacts and outcomes

Stakeholder information will help to develop a more comprehensive scope of work, setting priorities and redirecting research and extension programs and activities that will ultimately benefit the residents of the District of Columbia. Stakeholders will also be able to provide comments regarding the effectiveness in delivery of programs and activities.

V. Planned Program Table of Content

S. No.	PROGRAM NAME
1	Climate Change
2	Global Food Security and Hunger
3	Health, Nutrition and Childhood Obesity Prevention
4	Urban Families, Youth, and Communities
5	Sustainable Energy
6	Food Safety

V(A). Planned Program (Summary)

Program # 1

1. Name of the Planned Program

Climate Change

2. Brief summary about Planned Program

The natural resources in the District of Columbia are in a totally urban environment with urban forestry and gardening. Soil, air and water quality encompass the three environmental factors that affect the quality of life of the residents with water quality being most significant. Providing the relevant research and extension education that provide a balance among growing local food, maintaining urban forestry, and the impact of gentrification as a result of antiquated storm and waste water infrastructures coupled with emerging concerns of environmental degradation has become a significant challenge. This program will continuously assess and monitor natural resources and changes in the urban environment of the District of Columbia. Research activities and extension education for youth and adults will be implemented to determine new mechanisms to maintain a healthy and friendly ecosystem while educating the residents to appreciate, adopt and maintain these changes.

3. Program existence : Intermediate (One to 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	30%		70%	
111	Conservation and Efficient Use of Water	20%		0%	
112	Watershed Protection and Management	20%		15%	
124	Urban Forestry	10%		15%	
141	Air Resource Protection and Management	10%		0%	
806	Youth Development	10%		0%	
	Total	100%		100%	

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

1. Situation and priorities

We are constantly being made aware of the great damage being affected upon the environment, on future generations and ourselves. While the earth is being impacted by global warming, the relationship among air, soil and water in the District of Columbia Metropolitan Area has a profound impact on natural resources and a clean and healthy environment. The Anacostia River Watershed is a heavily polluted tributary to the Potomac River. Location in this densely populated area and suffering years of environmental neglect has made this Watershed become known as a "degraded urban ecosystem."

Decline in the ecological health of the Watershed has been contributed to by soil erosion, which has caused increased sedimentation resulting in mud flats along the banks of the tidal river; expanding human population; loss of forest and wetland habitat; loss and reduction in vegetation; land runoff; discharge of combined sewer overflow; increase in non-point source pollution; and industrial overflow. An informed citizenry, empowered by the realization of the benefits of healthy rivers and Watersheds, along with the knowledge that they know what to do to improve the river, can provide substantial support in the pursuit of clean rivers.

The sewer system in the District of Columbia is comprised of both combined and separate sewer systems. It has been recognized that these systems contribute significant pollution to the Anacostia and Potomac Rivers and Rock Creek through Combined Sewer Overflows (CSOs) and Storm Sewer discharges during wet-weather (i.e., rainfall and snowmelt) events. These overflows and associated pollutant loads have adverse impact on the quality of the receiving waters, ultimately Chesapeake Bay. In order to address the water quality problem, District of Columbia Water and Sewer Authority (WASA) has developed a Long Term Control Plan (LTCP) that provides the alternative solutions and their implementation costs. However, funds to implement this plan have not been available; hence, alternative mechanisms to reduce pollutant loads into the waterway are being researched and developed.

The priorities of this program are to:

- 1) Maintain an integrated research and extension program that will identify and solve soil, air, and water quality problems as a specific result of urban forestry, gardening, and aging infrastructures activities;
- 2) Provide extension activities that educate residents in the District of Columbia to become environmentally responsible in maintaining a healthy and wholesome environment; and
- 3) Promote the "Green Concept" as a preventive mechanism to environmental degradation

2. Scope of the Program

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

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

1. Assumptions made for the Program

- 1) The way people use the environment on a daily basis goes a long way in determining the upkeep of any new, low impact, development project implemented to clean up the environment;
- 2) Education for the masses has not been introduced into the institutions of learning at the level it will take to overcome the problems;
- 3) While there are massive amounts of curricula, field trips and camps, and experts available to support teachers in the classroom and community, few have had the expertise to use them; and
- 4) Funding will be available and public interest will continue.

2. Ultimate goal(s) of this Program

- 1) Establish collaborative and working partnerships with community residents and Watershed restoration groups that can identify potential environmental research problems and increase public environmental awareness and environmental stewardship of the watersheds in the District of Columbia;
- 2) Enhance personal stewardship in the interest of environmental maintenance and beautification among the residents, including youth; and
- 3) Establish a system of environmental education within DC Public School for the future environmental scientists.

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	3.0	0.0	4.0	0.0
2018	3.0	0.0	4.0	0.0
2019	3.0	0.0	4.0	0.0
2020	3.0	0.0	4.0	0.0
2021	3.0	0.0	4.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

- 1. Research projects on the changes in soil, air and water quality due to environmental decreasing urban forest; urban gardening; aging storm and waste water infrastructures; and effectiveness of low impact development projects as best management practices to reduce non-point source pollution;
- 2. Maintain soil, air, and water quality monitoring programs and testing lab;
- 3. Train and certify DC Public School Teachers as Environmental educators;
- 4. Develop and distribute informational materials such as fact sheets and brochures regarding changes in natural resources and environmental issues in the District;
- 5. Provide workshops, demonstrations and technical assistance on the effect of environmental degradation as it relates to the quality of life for District residents; and
- 6. Involve youth in litter control campaigns and environmental awareness education via education workshops at DC Public and Charter Schools, community events such as "Quality of Life Day" and the Land Grant Programs Urban Agricultural Fair at Muirkirk Research Farm

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

Extension	
Direct Methods	Indirect Methods

- Education Class
- Workshop
- Group Discussion
- Demonstrations

- Newsletters
- TV Media Programs
- Web sites other than eXtension

3. Description of targeted audience

- 1) District of Columbia residents
- 2) DC Public School Teachers
- 3) Youth, Grades K-12
- 4) Urban gardeners
- 5) Storm and waste water operators
- 6) Landscapers
- 7) Nursery Owners

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

- Number of articles published
 - Number of fact sheets published
 - Number of newsletter published
 - Number of workshops, demonstrations and technical assistance implemented.
 - Number of research projects completed
 - Number of soil, air and water samples test results
 - Number of informational materials distributed
 - Number of conference presentations
 - Number of certificate of completion issued
- 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	Percent of program participants that will become more environmentally aware due to new knowledge from informational materials provided and workshop presentations
2	Percent of program participants that will implement new environmental skills to improve natural resources and the environment
3	Percent of soil, air, and water samples meeting EPA standards after implementation of research project.

Outcome # 1

1. Outcome Target

Percent of program participants that will become more environmentally aware due to new knowledge from informational materials provided and workshop presentations

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 806 - Youth Development
- 111 - Conservation and Efficient Use of Water
- 141 - Air Resource Protection and Management
- 112 - Watershed Protection and Management
- 124 - Urban Forestry
- 102 - Soil, Plant, Water, Nutrient Relationships

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 2

1. Outcome Target

Percent of program participants that will implement new environmental skills to improve natural resources and the environment

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 102 - Soil, Plant, Water, Nutrient Relationships
- 112 - Watershed Protection and Management
- 141 - Air Resource Protection and Management
- 124 - Urban Forestry
- 806 - Youth Development
- 111 - Conservation and Efficient Use of Water

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 3

1. Outcome Target

Percent of soil, air, and water samples meeting EPA standards after implementation of research project.

2. Outcome Type : Change in Condition Outcome Measure

3. Associated Knowledge Area(s)

- 124 - Urban Forestry
- 111 - Conservation and Efficient Use of Water
- 102 - Soil, Plant, Water, Nutrient Relationships
- 141 - Air Resource Protection and Management
- 112 - Watershed Protection and Management

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
- Populations changes (immigration, new cultural groupings, etc.)

Description

1. Natural disasters such as hurricanes and tornadoes may impact projects implemented to improve the environment as well as offset the ecosystem balance.

2. Availability of funds to implement programs may change with changes in the National economy and local and federal appropriations.

3. There is an increase in immigrant population in the District of Columbia making extension education more challenging and demanding, but also providing research opportunities.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

1. Pre and post test will be administered to determine change in knowledge.

2. Case studies of research projects to determine changes in conditions through sampling test results as well as observations.

V(A). Planned Program (Summary)

Program # 2

1. Name of the Planned Program

Global Food Security and Hunger

2. Brief summary about Planned Program

Food systems hold the key to sustainability. They transform energy into plant matter through photosynthesis and thus form the very basis for sustaining our human bodies, creations, and cultures. They also hold the key to achieving a net positive energy balance, that is an energy balance where the yields in kilocalories exceed the combined energy needs of the productive inputs and production processes necessary to create it.

Unfortunately, long-term sustainability and a net positive or neutral energy balance seem to be the last thing on our collective minds when it comes to designing the US food system. There are 2 million farms in the United States (U.S.), but half of them are only part-time farms and the people who run them do not produce food for their living; 75% of all US farms are considered very small with 1 to 5 acres in size; less than 150,000 farms produce 80% of all sales in agricultural products; and only a hand full of food processors turn grain into flour, cereal, canned and frozen vegetables and other ready to us food products [1]. Between 1997 and 2002 energy use related to food production increased at more than six times the rate of all other energy use combined.

The top food producing states in the US are Texas for animal products, and California for plant products. Both states are far from my chosen residence of Washington DC. As our food has been traveling ever longer distances to reach the urban population centers on the US east coast, 11% of the greenhouse gas emissions associated with the food supply chain are now attributed to transportation. Global estimates suggest that agriculture is responsible for 25% of CO₂ emissions, 65% of methane emissions, and 90% of nitrous oxide emissions.

Food preparation and distribution are causing food security concerns as well. While some have too much food others do not have enough. According to a January 2013 study, the typical American family throws away 40 percent of the food they buy. The US Department of Agriculture estimates that 133 billion pounds of food are lost every year or 31 percent of the total US food supply worth \$165 billion. The top three losses are in dairy products (19 percent), vegetables (19 percent), and grains (14 percent). In addition to households, waste comes from restaurants and grocery stores, and from un-harvested produce that does not meet aesthetic standards. The perfectly fine apple that has a small blemish, for example, will not make it to the grocery store.

And while almost a third of the US food supply is wasted, some do not have enough food or the right kind of food, even in the nation's capital. The USDA defines Food Security as "access by all people at all times to enough nutritious food for an active, healthy life." Low food security is defined as "...reduced quality, variety, or desirability of diet." National and regional levels of food security are monitored through the annual Household Food Security Survey. The nation's capital, Washington DC, is a prime example of food insecurity. Thirteen percent of DC households are food insecure and struggle with hunger; nineteen percent experience food hardship defined as not having enough money in the past twelve months to buy food for themselves or their family; and 37% of DC households with children indicate that they are unable to afford enough food. This is the highest rate of food insecurity among children. Nearly 200,000 DC residents live in neighborhoods where the closest food retailer is more than three times farther than the closest fringe retailer, which is often a gas station or corner store. Food related illnesses such as obesity, diabetes and hypertension are prevalent in food desert neighborhoods that have a low density of grocery stores. And children are especially hard hit. Among the damaging effects of food insecurity are impaired brain and cognitive development (0-3 yr. olds); lower school readiness (0-5 yr. olds); lower performance and educational attainment (6-17 yr. olds); slower physical, mental, and social development and poorer

health overall (0-17 yr. olds);

And food addresses not only our physical needs, but our social and cultural ones as well. Food creates community, and is associated with cultural and ethnic identity. Food can therefore address both the social/cultural and the environmental/physical aspects of sustainability and may hold important lessons for needed behavioral changes and policy solutions.

With 80% of the U.S. population and over 50% of the world's population now living in urban areas, food security cannot be addressed without urban solutions that tackle (1) urban food production, (2) food preparation, and (3) food distribution. As one of the fastest growing cities in the US, and one of the most bi-furcated ones, Washington DC is also the ideal location to address food security as a key solution to social and environmental sustainability.

CAUSES is now galvanizing its efforts around the idea of Urban Food Hubs intended to form a network of food security islands throughout the District. The overall goal of the Food Hubs is to improve food security by creating a network of resilient food production, preparation and distribution sites that reduce entropy generation, employ highly efficient sustainable production methods, minimize waste, reduce the distance food travels and improve its nutritional value, and improves economic conditions. Each Hub will consist of the following four components:

1. Food production through a highly efficient small scale aquaponics system;
2. Food processing through a commercial kitchen that serves as a business incubator;
3. Food distribution through networked farmers markets, grocery stores and restaurants;
4. Efficiency through composting and alternative energy sources.

The Hubs stand in contrast to the large-scale multi-storied vertical farms often touted as the solution to urban agriculture. These facilities require significant amounts of energy for heat, air conditioning, lighting, irrigation etc. that often exceeds the energy content of the harvested food.

A major objective of the Program along with implementing the "food Hub Concept" is to help our citizens grow food on limited land space which sometimes includes only a small backyard. To achieve this aim, we are conducting variety trials of specialty crops which will grow well in urban areas and produce nutritious food. Urban gardening is an instrumental means for residents of the District of Columbia to raise their own fresh, organic fruits and vegetables for consumption and/or sale. Sustainable agriculture research is a viable method to determine the crops most suitable for production in the northeastern region and to establish the most appropriate techniques to ensure safe crops and high yields. Training urban gardeners on how to successfully develop and protect gardens will enable residents to enjoy the harvest of crops essential to good health and is also an effective means to increase the number of community and educational garden projects in the District of Columbia.

In the past decade the population of the District has shown a remarkable influx of migration from rural areas and foreign countries to live in the District of Columbia. When these immigrants arrive in the District of Columbia, they bring with them the desire to grow and consume certain vegetables, herbs and spices that they are accustomed to in their diets. In order to ascertain that these crops are available they try to grow them in their urban gardens. The problem is that some of these crops have been developed under different environmental conditions than what exist in the District of Columbia.

Land-grant Programs will partner and collaborate to address problems that are associated with the production of these specialty crops in our urban gardens. To make the production of these crops more production friendly we are using sustainable agricultural techniques rather than conventional high input synthetic inorganic fertilizer application for production.

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	30%		40%	
205	Plant Management Systems	20%		30%	
216	Integrated Pest Management Systems	20%		30%	
721	Insects and Other Pests Affecting Humans	20%		0%	
806	Youth Development	10%		0%	
	Total	100%		100%	

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

1. Situation and priorities

The core of the Urban Food Hubs are highly efficient, neighborhood based aquaponics systems that utilize a water aeration device that takes oxygen directly from the atmosphere and eliminates the need for mechanical or compression based water aeration devices. "Aquaponics" refers to a food production system that combines the two fields of aquaculture (fish production) and hydroponics (growing vegetables in water). Aquaponics systems make it possible to raise aquatic organisms such as fish or prawns using the excrement from the organisms as fertilizer for a plant production system that grows vegetables. The fish waste occurs mainly in the form of ammonia and must be broken down into nitrates by bacteria. These bacteria live in various components of the aquaponics systems to supply the vegetable beds and the fish tanks with the nutrients they need. The plants are grown in the nutrient enriched water or in soil that is irrigated with the nutrient rich water. If plants are grown hydroponically, they absorb nutrients from the wastewater and the water can thus be reused. The technique, therefore, creates mutual benefits between fish and plant production while creating both protein and vegetables. Additional benefits of the technique are:

- Efficient water use -- Aquaponics systems use only 10% of the water used to grow plants in soil offering a 90% savings in water use.
- High productivity levels -- Aquaponics systems can produce large amounts of vegetables without the need for ongoing fertilization.
- Reduced growing time -- The consistent nutrient supply of the vegetable plants in the aquaponics system along with the greenhouse conditions speed up growth.
- Reduction of waste -- Because the fish waste is used as fertilizer for the vegetable plants, a minimal amount of waste leaves the facility.

More than 50% of the organic waste produced by fish is in the form of ammonia, excreted through the gills and the urine. The other 50% that is excreted as fecal matter undergoes a process of mineralization that

occurs when heterotrophic bacteria consume fish waste and decaying plant matter. As the plants consume nitrates and ammonium, the water from the fish tanks is filtered through various biofilters and microbial tanks. As nutrients are converted and/or filtered the microorganisms that are an integral part of the aquaponics system assist in processing of nutrients (especially nitrogen) into forms that are useful to the plant system. This is done while maintaining a high level of dissolved oxygen and nutrient levels conducive to aquatic life in the fish tanks.

Most aquaponics systems are designed as a loop. To maximize flexibility, the specific system used for the Urban Food Hubs is configured as two connected loops: a fish loop and a plant loop. The two loops can be connected more or less frequently depending on the amount of water that the selected plant varieties need to thrive. If the two loops are connected continuously then the system can function like a circular flow or clear flow system. Water from a holding tank is pumped through a UV screen to kill bacteria that could be harmful to the fish; through the aeration device to ensure sufficiently high levels of oxygen for the fish to thrive; through a waste filter to separate solid from liquid waste; to a bio-filter that assists in the nitrogen conversion process.

The solid waste that is separated out in the waste filter can be used as fertilizer for soil based vegetable production. Most of the water is filtered through a bio-filter and back into the water tank from where it again flows to the pump, the UV light, the aerator and so forth. Some of the waste from the drum is discharged into the anaerobic bacterial tank, where the fish waste is converted similar to a composting bin. And while the anaerobic tank provides the nutrient rich 'waste water' for the flow beds, it works in tandem with the aerobic tank to circulate back and forth through the beds to maximize the availability of nitrates and ammonium. Plants grown in the nutrient rich flow beds typically grow much faster than those grown in soil conditions. The nutrient enriched water can then be used to fertilize and irrigate adjacent soil based bio-intensive crop production.

The District of Columbia is home to more than 35 farmers' markets. Many DC residents benefit from the variety, quality, and value of fruits, vegetables and other products conveniently available in their neighborhoods. Yet, there are many areas in DC, particularly within the District's most underserved Wards. In 2012, 88% of the over 520 food retailers in DC did not offer fresh food and only 12% offered a variety of foods that support a healthy diet on a regular basis [8]. The correlation between the availability of fresh food and socio-economic data is striking. DC has 646,000 residents, with an additional 1.5 million living in the DC Metro area. The District's eight Wards are remarkably segregated. Ward 8 is 94% African-American with a median household income of \$31,000 compared to Ward 3, with an African-American population of 5% and a median household income of \$101,000. Unemployment rates range from 3.5% in Ward 3 to 18% in Ward 7 and 24% in Ward 8. Wards, 5, 7, and 8, are home to 32% of total population but have the lowest number of grocery stores. Based on the 2010 Census, 7 of the 188 census tracts in DC are considered food deserts, and all are located in Wards 5, 7, and 8, the Wards with the lowest median household income. They also have the highest rates of obesity and heart disease [10].

To help minimize the number of food deserts within the District and provide locally grown, healthy foods to communities with limited resources CAUSES supports several farmers markets in designated "food desert" neighborhoods. However, it has proven to be challenging to interest a sufficient number of farmers and other food vendors to commit to selling at farmers markets in low-income neighborhoods. This presents viable business opportunities to small urban growers who are residents in these underserved food desert neighborhoods and who are committed improving the economic viability of their neighborhoods.

While farmers markets offer one possibility for marketing locally grown produce, other business opportunities can be found in the growing numbers of small food stores and restaurants. Particularly promising are ethnic venues in the ethnically diverse urban neighborhoods of Washington, DC that are interested in a steady supply of ethnic crops. Higher-end restaurants too are increasingly interested in locally grown specialty and ethnic crops. An important function of the Urban Food Hubs is to connect small growers and specialty foods producers with buyers. Yet providing a steady stream of desirable products can be challenging for small producers. The UDC research farm can therefore serve as a market buffer to ensure a steady supply of locally grown food for local restaurants and grocery store while giving priority to small urban growers, if they can fill the local demand.

In addition to offering a network of connections, the Food Hubs also serve as training facilities and support network for new business start-ups. Technical support may include market studies to determine the best product mix, marketing, finance, and business planning, and data collection to ensure a successful proof of concept. Other food distribution related activities include working with local food banks to ensure that their needs are met through such vehicles as gleaning agreements or drop off sites for unused food. Key food distribution activities include:

- Support services and training on hard and soft skills to launch food related business.
- Strategies to support local food retail through local and mobile markets.
- Web-based portal and networking tool linking food producers, processors and buyers.
- Market research to assess opportunities in the food and hospitality industry.
- Focus groups to determine preferences for education delivery esp. among high-risk populations.

The food distribution aspects of the Urban Food Hubs work will advance much needed knowledge on the capacity building necessary to create viable businesses in underserved urban neighborhoods. Revenue generated from fish and produce, value added through food processing and preservation, nutrition and wellness education, horticulture and landscaping, and water management form the core of the prospective business that are launched through the Urban Food Hubs. Since the businesses are neighborhood based and an integral part of the social fabric of the neighborhoods where they are located, we anticipate the performance of the financial networks to be strong and reliable. This also poses ideal conditions for a community based revolving loan fund capable of sustaining growing networks of local businesses. This component of the Urban Food Hubs is all the more relevant since research suggests that by the end of the decade 40% of the U.S. workforce will be independent small business owners and freelancers. The traditional model of work that relies on centralized large-scale businesses will be in sharp decline. The Urban Food Hubs can therefore make a significant contribution to regional, national and global food security, and to the research, product development and educational work that is necessary to create a sustainable food system.

The Food Hubs also have the potential of changing urban landscapes worldwide by facilitating the creation of urban food based businesses that improve food security, economic security and the quality of life of urban residents.

2. Scope of the Program

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

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

1. Assumptions made for the Program

1. The demand for urban locally produced foods and gardening products will increase due to increase in food price and increased farmers market access to healthy nutrient dense and affordable foods ;
2. Many of the food producers and gardeners in the District of Columbia are reluctant to use chemical pesticides to control insects and diseases;
3. Community gardens as food production systems will continue to be increasingly popular, serving as a means of improving social consciousness and productive citizenry; and
4. Funding is available and public interest will continue while building the Food Hubs..

2. Ultimate goal(s) of this Program

1. Increase the number of food production and gardening skills and knowledge of residents the District of Columbia through the Urban Ag Certification Training and the Master Master Gardeners Program;
2. Expand the Food Hub concept of bio-intensive gardening from local community garden plots to green rooftops, balconies, vacant lots and other areas for food production and beautification;
3. Continue sustainable agriculture research in urban food production, preparation, distribution and food waste recycling/reuse on cool and warm season specialty crops;
4. Change behavior of urban food producers and gardeners by promoting the use of the bio-intensive crop production method that utilizes compost verses inorganic fertilizers to increase amount of nutrient dense crop for food and bioenergy production while decreasing non point source pollution and degradation of DC environment; and
5. Increase the number of certified and/or licensed pesticide applicators in the District of Columbia.

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	4.0	0.0	4.0	0.0
2018	4.0	0.0	4.0	0.0
2019	4.0	0.0	4.0	0.0
2020	4.0	0.0	4.0	0.0
2021	4.0	0.0	4.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

- 1) Conduct bio-intensive field and hoop house experiments in the use of composted waste as a soil amendment for growing nutrient dense vegetables in urban gardens; their impact on the environment will be conducted at Muirkirk Research Farm in Beltsville, MD;
- 2) Facilitate workshops, training sessions, demonstrations, field activities, and farm tours at for program participants to teach and update knowledge of sustainable agricultural techniques at each the Food Hub to establish, maintain, protect, and market both food crops and flower gardens;
- 3) Develop and distribute informational fact sheets, brochures, and newsletters related to production and protection of urban gardens;
- 4) Participate in local, National, and international conferences and meetings on sustainable agriculture and urban gardening;
- 5) Provide pesticide safety education and certification for monitoring insect and disease infestations and recommendations for control while preventing environmental degradation;
- 6) Maintain Urban Ag and Master Gardening certifications; trained food producers and gardeners will participate in making nutrient dense food crops accessible and affordable in food desert areas of the

District while beautifying the city through volunteer hours; and
 7) Strengthen Ethnic and Specialty Crop 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 ● Demonstrations 	<ul style="list-style-type: none"> ● Newsletters ● Web sites other than eXtension

3. Description of targeted audience

- 1) District of Columbia residents
- 2) DC Public School Teachers
- 3) Youth - Grades 3-8
- 4) Urban community gardeners
- 5) Urban food producers and farmers markets
- 6) Landscapers
- 7) Nursery owners

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

- Number of articles published
 - Number of fact sheets published
 - Number of Newsletters published
 - Number of workshops, demonstrations and technical assistance implemented.
 - Number of research projects completed
 - Number of soil, plant and water samples test results
 - Number of informational materials distributed
 - Number of conference presentations
 - Number of certificate of completion issued
- 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	Percent of program participants that will adopt urban gardening techniques learned from informational materials provided and workshop presentations
2	Percent increase in urban gardens using some compost material as a soil amendment
3	Percent of soil, plant and water sample results within acceptable crop production range
4	Percent increase in the growth of a variety of ethnic crops in home, school, and community gardens in the District of Columbia.
5	Percent of new food producers that will adopt the bio-intensive method of urban agriculture production

Outcome # 1

1. Outcome Target

Percent of program participants that will adopt urban gardening techniques learned from informational materials provided and workshop presentations

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 102 - Soil, Plant, Water, Nutrient Relationships
- 216 - Integrated Pest Management Systems
- 721 - Insects and Other Pests Affecting Humans
- 205 - Plant Management Systems

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 2

1. Outcome Target

Percent increase in urban gardens using some compost material as a soil amendment

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 205 - Plant Management Systems
- 102 - Soil, Plant, Water, Nutrient Relationships

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 3

1. Outcome Target

Percent of soil, plant and water sample results within acceptable crop production range

2. Outcome Type : Change in Condition Outcome Measure

3. Associated Knowledge Area(s)

- 216 - Integrated Pest Management Systems
- 102 - Soil, Plant, Water, Nutrient Relationships
- 721 - Insects and Other Pests Affecting Humans
- 205 - Plant Management Systems

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 4

1. Outcome Target

Percent increase in the growth of a variety of ethnic crops in home, school, and community gardens in the District of Columbia.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 205 - Plant Management Systems
- 102 - Soil, Plant, Water, Nutrient Relationships

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 5

1. Outcome Target

Percent of new food producers that will adopt the bio-intensive method of urban agriculture production

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 102 - Soil, Plant, Water, Nutrient Relationships

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
- Populations changes (immigration, new cultural groupings, etc.)

Description

1. Natural disasters such as hurricanes and tornadoes may impact or destroy urban gardens.
2. Availability of funds to implement programs may vary with changes in the National economy and local and federal appropriations.
3. There is an increase in the immigrant population in the District of Columbia. As a result, extension education has become more challenging and demanding. There are research opportunities for ethnic vegetables.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

1. Pre and post test will be administered at workshops and demonstrations to determine change in knowledge.
2. Case studies of research projects will be conducted to determine changes in conditions through sampling test results as well as observations.

V(A). Planned Program (Summary)

Program # 3

1. Name of the Planned Program

Health, Nutrition and Childhood Obesity Prevention

2. Brief summary about Planned Program

The Center for Nutrition Diet and Health (CNDH) will provide quality programs that addresses childhood and adult obesity and major health issues for District of Columbia (DC) residents. Additionally, the program focus is on nutrition and healthy urban life style for DC residents. Other relevant programs include Grocery Store Tours, Fruit and Vegetable Prescription Program, Farmers' Market Nutrition Education Program and Nutrition education. The programs assist recipients with making healthy food choices. The programs are designed to improve the food choices of residents as an effort to aid in the reduction of overweight and obese among low income families and individuals. Other CNDH programs not included in this Plan of Work are the Supplemental Nutrition Assistance Program-Education (SNAP-Ed) and the Expanded Food and Nutrition Education Program (EFNEP). The two programs will be reported on in EARS and WebNEERS respectively.

Despite the importance of fruit, vegetable and whole grain intake and exercise in maintaining health and functional status, older adults are not meeting minimum dietary and activity recommendations. AES is a participant in a multi-state research project aimed to change the health trajectory for older adults through effective diet and activity modifications.

According to the American Cancer Society, breast cancer is the second leading cause of cancer death in women and the chance of breast cancer will be responsible for a woman's death is about 1 in 35 (about 3%). The National Cancer Institute indicates that obesity increases the risk of cancers of the breast (postmenopausal). AES is conducting a study that involves nutrient modulation of P53-ATF3 signaling in breast cancer to investigate the molecular mechanism whereby g--T3 inhibits the growth of breast cancer cells.

3. Program existence : New (One year or less)

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 : No

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
703	Nutrition Education and Behavior	30%		20%	
704	Nutrition and Hunger in the Population	10%		0%	
723	Hazards to Human Health and Safety	0%		10%	
724	Healthy Lifestyle	20%		10%	
806	Youth Development	20%		0%	
901	Program and Project Design, and Statistics	0%		30%	
903	Communication, Education, and Information Delivery	20%		30%	
	Total	100%		100%	

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

1. Situation and priorities

The national overweight and obesity epidemic is creating major public health concerns. Recent studies have found that nearly two-thirds of U.S. adults are overweight or obese, and both youth and adults are consuming significantly more calories than expenditures. The personal costs of the epidemic include reduced longevity, heart disease, hypertension, stroke, and certain types of cancer. The societal costs in the U.S. are estimated at excess of \$125 billion dollars. The Nutrition Education Program (EFNEP) will assist low-income individuals and families gain the skills they need to improve their diets and become more physically active.

Nutrition education programs are needed in the District of Columbia to assist residents with making healthy food choices consistent with the most recent dietary advice as reflected in the Dietary Guidelines for Americans and MyPlate. The Center for Nutrition, Diet and Health (CNDH) will provide nutritional education for District residents.

The Center for Nutrition, Diet and Health (CDNH) promotes personal responsibility for practicing food safety and enhances the community's access to information and services. The District of Columbia has over 21,000 registered commercial and non commercial food operations that are required to employ certified and to re-certify supervisory food handlers in food sanitation every three years. The CDNH will offer Food Handler education to small non-commercial service agencies in the city to increase the food handler's compliance with food safety principles and hazard analysis and critical control points.

Older adults fall short of meeting both nutrition (fruit, vegetable and whole grain) and physical activity goals of Healthy People 2010. Only 6% of older adults consume at least three daily servings of vegetables and only 4% of older women and 11% of older men consume at least six daily servings of grain products. There is clearly a need for additional research that will lead to improvements in both diet and exercise behaviors in older Americans.

In recent years, overweight and obesity have reached epidemic proportions in the United States. The

proportion of adults who are overweight increased substantially between 1980 and 2002. By 2002, 65% of U.S. adults (20-74 yrs of age) were overweight and 31% were obese. Likewise, obesity has become the most prevalent nutritional disease of children and adolescents. Children from low socio economic status (SES) and racial/ethnic minority groups tend to have higher rates of obesity in comparison to other groups. Among adults, obesity rates are about 28% for men regardless of racial/ethnic group membership. Adult women have higher rates of obesity than males. Obesity rates are higher among Hispanic women (39%) than White women (31%) and even higher (50%) among African-American women. It is well known that chronic disease risks increase with increasing body weight. It is also clear that overweight and obese children are likely to remain overweight and obese adults and to develop chronic diseases at younger ages.

Breast cancer is a critical issue or concern for women, in particular, nationally. The National Cancer Institute has estimated that new cases from breast cancer in the United States in 2009 are 192,370 for females and 1,910 for males. Deaths statistics are 40,170 for females and 440 for males. The Agricultural Experiment Station is conducting research in the nutrient modulation of P53-ATF3 signaling in breast cancer. The goal of the study is to understand the molecular basis of the action of γ-T3. Vitamin E includes a family of micronutrients consisting of four tocopherols and four tocotrienols (alpha, beta, gamma and delta) both of which are present in various components of the human diet. Tocotrienols are minor constituents of vitamin E but possess several more powerful anti-cancer, cholesterol lowering, natriuretic (prevent hypertension and cardiovascular diseases caused by salt intake) and neuroprotective properties that are often lacking in tocopherols. Despite possessing these preventive/therapeutic advantages, tocotrienols have not been extensively studied compared to tocopherols. γ-Tocotrienol (γ-T3) induces apoptosis in a variety of cancer cell lines including estrogen receptor (ER) + and ER- breast cancer cells but, do not affect the proliferation of normal mammary cells. AES's study holds promise in identifying γ-T3 as a chemo-preventative in breast cancer and/or its role in inhibiting the progression of breast cancer.

2. Scope of the Program

- In-State Extension
- In-State Research
- Multistate Research

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

1. Assumptions made for the Program

- 1) Genetics, environment and behavior are factors in obesity.
- 2) Parent-Child interaction can be a major factor responsible for influence of children with obese parents more likely to be obese.
- 3) Nutrition is an important determinant of health in elderly adults.
- 4) Target population will be available and willing to participate in obesity studies.
- 5) Formula funding will continue.
- 6) New partnerships can be created based on funding availability.
- 7) Teachers will continue to volunteer for programs.
- 8) Non-Fee based services contingent upon other CNDH program participation by partnering organizations.
- 9) Vitamin E includes a family of lipophilic micronutrients consisting of four tocopherols and four tocotrienols both of which are present in the human diet.
- 10) Direct nutrition education will improve the health status of individuals and families.

11) Healthy food choices will aid in the reduction of overweight and obesity among low-income individual and families.

2. Ultimate goal(s) of this Program

- 1) Decrease the incidence of childhood obesity in the District of Columbia.
- 2) Reduce nutritional causes of morbidity and mortality in the elderly population.
- 3) Decrease risk factors for chronic disease, better management of conditions, weight maintenance and overall improved health.
- 4) Increase agriculture literacy for teachers and students, grades Pre-K - 12.
- 5) Identify nutrients that may be chemo-preventative in breast cancer and/or its role in inhibiting the progression of breast cancer.
- 6) To employ and train paraprofessional aids (peer educators) to engage in direct nutrition education to low income families to engage in nutritionally sound food purchase preparation practices.
- 7) Decrease illnesses due to food contamination in non-commercial agencies.

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	3.0	0.0	4.0	0.0
2018	3.0	0.0	4.0	0.0
2019	3.0	0.0	4.0	0.0
2020	3.0	0.0	4.0	0.0
2021	3.0	0.0	4.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

Nutrition Education:

- 1) Train-the-trainer
- 2) FFNews
- 3) Creative Curriculum
- 4) Color Me Healthy
- 5) Tickle Your Appetite
- 6) 5 A Day
- 7) DCPS Nutrition Curriculum
- 8) 45 -Food Safety & Dietary Quality Lessons Developed

Food Handlers Training and Certification

Instruction on food handler certification regulations
DC Code Examination

Changing the Health Trajectory for Older Adults through Effective Diet and Activity Modifications:

- 1) Investigate and compare priorities of high fruit and vegetable consumers with the low fruit and vegetable consumers;
- 2) Design new and innovative activities through which nutrition education can be effectively rendered; and
- 3) Collect and modify traditional recipes to improve the nutrition density and to increase the vegetable content and publish the recipe book.

EFNEP Program:

- 1) Basic nutrition
- 2) Financial management related to food budgeting and shopping
- 3) Food selection and preparation
- 4) Food safety and sanitation practices
- 5) Health and physical activity
- 6) Referrals to other resources and assistance programs

Nutrient Modulation of P53-ATF3 Signaling in Breast Cancer

- 1) Investigate the molecular mechanism whereby g-T3 inhibits the growth of breast cancer cells: 1) determine if y-T3 induces apoptosis in MCF-7 breast cancer cells is ATF-3 dependent; and 2) Determine whether y-T3 stabilizes p53 pathway via ATF3.

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 (Conference Presentations) ● Other 2 (Train-the-Trainer) 	<ul style="list-style-type: none"> ● Public Service Announcement ● Newsletters ● TV Media Programs ● Web sites other than eXtension

3. Description of targeted audience

- 1) Adult men and women over the age of 65 who live in Metropolitan Washington, DC
- 2) DC Public School teachers
- 3) Students, grades Pre-K through 9
- 4) Children 2 -5 years of age
- 5) Pre-School/Headstart and Daycare teacher volunteers
- 6) Non-commercial agency staff members
- 7) Non-profits
- 8) Residential Homes
- 9) Overweight individuals and non overweight individuals from the same environment
- 10) Obese individuals and non obese individuals from the same environment
- 11) Low income residents living in multi-family housing
- 12) Researchers/Biologists
- 13) Low-income adults who are responsible for planning and preparing the family's food with emphasis on households with young children

- 14) Low-income youth
- 15) Non-commercial agency staff members
- 16) On-going participating food handlers

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

- Youth and adults will receive direct basic nutrition and food safety education
 - Youth and adults will receive direct education on health issues and direct education and demonstration on physical activity
 - Development of a manuscript for the publication of data on the mechanisms of action of g-T3 on MCF-7 breast cancer cells.
 - Employ microarray experiments and a range of cellular and molecular biological techniques to determine the molecular basis of the action of y-T3.
 - Number of articles published
 - Number of fact sheets published
 - Number of newsletters published
 - Number of workshops implemented
 - Number of research projects completed
 - Number of informational materials distributed
 - Number of certificate of completion issued
 - Number of conference presentations
- 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	Percentage of parent participants who make better food choices (fruits/vegetables).
2	Percentage of participants who improved eating habits.
3	Development of broad applications for the inhibition of breast cancer cell proliferation and possibly cell transformation
4	Number of participants who improved their dietary intake, including an increase in fruits and vegetables
5	Percentage of participants, who through information and interactive approaches, have adopted better eating habits thereby increasing their daily intake of fresh fruit and vegetables.

Outcome # 1

1. Outcome Target

Percentage of parent participants who make better food choices (fruits/vegetables).

2. Outcome Type : Change in Condition Outcome Measure

3. Associated Knowledge Area(s)

- 703 - Nutrition Education and Behavior

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 2

1. Outcome Target

Percentage of participants who improved eating habits.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 724 - Healthy Lifestyle
- 703 - Nutrition Education and Behavior

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 3

1. Outcome Target

Development of broad applications for the inhibition of breast cancer cell proliferation and possibly cell transformation

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 723 - Hazards to Human Health and Safety
- 703 - Nutrition Education and Behavior

4. Associated Institute Type(s)

- 1862 Research

Outcome # 4

1. Outcome Target

Number of participants who improved their dietary intake, including an increase in fruits and vegetables

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 703 - Nutrition Education and Behavior

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 5

1. Outcome Target

Percentage of participants, who through information and interactive approaches, have adopted better eating habits thereby increasing their daily intake of fresh fruit and vegetables.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 703 - Nutrition Education and Behavior

4. Associated Institute Type(s)

- 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.)
- Other (Family and Social Support)

Description

Family and Social Support:

Once elderly adults are aware of optimal nutritional choices, food preparation, and eating behavior, it will be necessary for them to have: easy access to nutritious foods and means of preparation; public health and social support; and family support. Changes in nutrition policy, new data and results from research may affect the outcomes of this research project.

Appropriation Changes:

Continued funding is imperative to the effort of this important research.

Other Issues that may affect certain aspects of the program include: 1) space acquisition; 2) interest of teachers; 3) unstable homes; 4) drug and alcohol abuse; 5) partnerships; 6) support of community organizations; 7) parental involvement; and 8) scheduling of participants for participation.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

- 1) In changing the health trajectory for older adults, participants will be administered pre and post-test/questionnaires.
- 2) Molecular mechanisms will be investigated in breast cancer cells.

The Nutrition Education program will be evaluated using the following tools: Pretest, posttest, 24-hour recall, food frequency check list, demonstrations, and observations.

V(A). Planned Program (Summary)

Program # 4

1. Name of the Planned Program

Urban Families, Youth, and Communities

2. Brief summary about Planned Program

Like most large cities, our nation's capital is dealing with a myriad of public concerns varying from education to housing to economic development. The Land Grant Programs are providing quality program that addresses issues related to sustainable youth, families, and communities in the District of Columbia.

The Center for 4-H and Youth Development supports city's youth through leadership and development activities. 4-H program activities will assist young people in developing knowledge, skills, and attitudes that will enable them to become self-directing, responsible, productive, and contributing members of society. Further, parenting classes are offered to assist parents, in particular incarcerated parents and the caregivers of their children in research based parenting education best practices.

Due to the rapid change in the economy, many residents are experiencing financial woes. The CES basic financial literacy program provides information to students and residents as an effort to help them start achieving financial self-sufficiency. Housing affordability is also a critical issue in the District of Columbia. As the city is transforming to accommodate its increasing population, mostly middle to high income residents, low to moderate income individuals and families are feeling the effect of gentrification. Job readiness skills are promoted in the Center for Sustainable Development Green Technology and Green Economy programs in support of economic development in the city, We are working with community partners and the Small Business Administration to develop the Green Industry.

The Land Grant Programs continue to sponsor community events in support of urban agriculture and urban sustainability such as the Quality of Life Day Festival and the Urban Agricultural Fair. The Urban Agroecology Day is hosted at the Station's Muirkirk Research Farm in Beltsville, MD and is attended by participating DC Public Schools, grades nine through twelve. Students, along with teachers and parents, spend a day at the farm to learn more about their natural, built, and social environment. Various Stations are provided, including but not limited to: Wetlands on Wheels; Horticulture; Sustainable Agriculture; Water Quality and Research; Weather Station; Sustainable Communities; Youth Leadership; Nutrition and Health; ; Marine Science; Basic Soils; and Junior Master Gardeners. The fair is held each year in mid-May.

Programs that will be offered through the Center for 4-H and youth development include:

The 4-H Volunteer Leaders Training prepares adults to assist youth in managing 4-H clubs and activities. The training is offered to volunteers six times a year with a program overview and required paperwork on the online UDC 4-H site to be completed for background checks to Human Resources.

4-H Military Program will involve children with parents somewhere in the deployment process also 4-H club programs will be provided to children on military post in the District of Columbia. We will serve 50 families and 600 youth through our military partnerships.

4-H Clubs engage young people, ages five through nineteen, in developing knowledge, skills and attitudes that will enable them to become self-directing, responsible, productive citizens, and contributing members of society. The 4-H program educates youth in arts and sciences, health and fitness, science, technology, environmental science, math, sewing and fashion design, cooking and healthy eating and a host of other subject areas while encouraging fellowship and service opportunities. 4-H continues to

develop new projects for its members to study beyond agriculture and animal husbandry, including photography, conservation, cooking, public speaking, various sports, history, art, and other pursuits. We will have 60 active 4-H clubs in the District of Columbia at the end of the next reporting year.

4-H Living Interactive Family Education (4-H LIFE) is a youth development program that addresses the needs of children with incarcerated parents. The goal of the 4-H LIFE program is to provide a strong, healthy, and nurturing family environment while helping the incarcerated parents become positive role models. The program consists of five components, including parenting skills classes inside the correctional facility for incarcerated parents, 4-H club activities for the children in their communities, monthly planning meetings with partners, and 4-H family club meetings inside the correctional facility and six programs designed specifically for caregivers offered in the community. We will serve 120 youth and 300 parents in this program.

4-H STEM consists of specialized programs designed to introduce and encourage participation in Science, Technology, Engineering, and Math disciplines among youth in the District of Columbia. We have partnered with 16 DC public and charter schools to provide programming in the STEM Disciplines. We will reach 750 youth in this program.

4-H Summer Camp consists of hands-on learning projects designed for enrichment during the summer months. Located on the campus of the University of the District of Columbia, the camp includes opportunities for youth to explore new learning projects, develop new friendships, practice healthy eating and exercise, and have plenty of fun. We will engage 50 youth in 4-H programming and 10 youth as camp counselors. The **Health Rocks Program** is a healthy living program that strives to reduce tobacco, alcohol and drug use among youth in the District of Columbia and to develop life skills that lead to healthy lifestyle choices. It is our goal to engage youth and adults in a partnership to develop and implement community strategies that help youth understand influences and health consequences of tobacco, alcohol and drug use. It is an interactive program that is adaptable to multiple teaching situations, uses interactive hands on learning and meets National Health Education Standards. We will reach 300 youth through this program using the train the trainer program.

LifeSmarts Consumer Education for Teenagers creates savvy consumers and develops marketplace skills among teens in a fun and engaging format. Complementing high school curricula, Lifesmarts is run as a game-show style competition for 9th through 12th grade students. Because this will be our first year of having a volunteer implement the program we will reach 40 youth through the program .

3. Program existence : Intermediate (One to 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
602	Business Management, Finance, and Taxation	10%		0%	
608	Community Resource Planning and Development	10%		0%	
801	Individual and Family Resource Management	10%		0%	
802	Human Development and Family Well-Being	10%		50%	
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures	10%		0%	
806	Youth Development	50%		50%	
	Total	100%		100%	

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

1. Situation and priorities

Studies show that at-risk youth need intervening programs to strengthen and promote positive youth development which prevents risky and unhealthy behaviors. As in many urban areas, Washington, DC has a youth population struggling to overcome high crime and gang violence, poverty, illiteracy, teen pregnancy, drug abuse, behaviors resulting in sexually transmitted diseases, inadequate employment opportunities, unsafe school environments, and high risk behaviors that have long term impacts on their self-confidence. 4-H is the intervention that is needed to overcome many of these barriers to success. Leadership development through 4-H and Youth Development community clubs, special projects, competitions and community events will be used to give youth a sense that they can achieve their goals.

Approximately 8,100 District grandparents are responsible for providing basic care to children residing in their homes. Grandparent caregivers are highly in need of accurate, easily accessible, timely information and assistance on issues such as legal, financial, support services and health education. The CES Parenting Project priorities include implementing a navigator program, providing practical information and guidance to inter-generational families, and general parenting classes.

The Green Economy Program assists city residents in need to acquire the knowledge and skills to achieve financial security, in an effort to create prosperous communities, nurturing neighborhoods, and strong families in the District. The priority of the project is to focus on behavioral change in an effort to help residents obtain self-sufficiency leading to future stability. As a result of the affordable housing crisis in the city, the Center for Sustainable Development is working with the community to train and promote green jobs related to affordable housing for low to moderate income residents.

The Land-grant Programs will continue to plan and implement youth urban environmental education projects and develop research projects to assist in addressing critical issues related to urban families, youth, and communities in the District of Columbia.

2. Scope of the Program

- In-State Extension
- In-State Research

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

1. Assumptions made for the Program

- 1) 4-H will continue to receive grant support.
- 2) 4-H activities will maintain and develop new partnerships to service youth.
- 3) 4-H will expand services to youth across the city.
- 4) Parental participation, as well as that of volunteers, will increase in the 4-H LIFE program .
- 5) College students will take a more active role in assisting with the implementation of the activities of the 4-H program
- 6) Military youth will continue to be served through the 4-H program across the city and in areas of Maryland and Virginia where parents that serve the District of Columbia are found
- 7) Volunteer leaders training will be offered to adults interested in working as volunteer leaders six time a year for the next reporting period

2. Ultimate goal(s) of this Program

- 1) To assist youth with gaining confidence in themselves and their abilities as they learn to work with others and explore new horizons and possibilities for their lives;
- 2) To increase positive parenting and stronger family bonds among children with incarcerated parents
- 3) To increase the number of opportunities for youth to visit a college campus and explore careers in a variety of disciplines
- 4) To allow young people to express themselves and their interest safely in a variety of different platforms
- 5) To ensure that children in the District of Columbia have up to date drug and tobacco prevention tools to keep themselves safe from addictions that can interrupt their progress and negatively impact their families
- 6) to engage the youth as stewards of positive change their communities and the world

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	8.0	0.0	2.0	0.0
2018	8.0	0.0	2.0	0.0
2019	8.0	0.0	2.0	0.0
2020	8.0	0.0	2.0	0.0

2021	8.0	0.0	2.0	0.0
------	-----	-----	-----	-----

V(F). Planned Program (Activity)

1. Activity for the Program

- 1) Leadership Development Meetings
- 2) Woodworking Projects
- 3) Language Program - Spanish
- 4) Gardening Projects
- 5) Computer Labs
- 6) Water Quality and GIS Technology
- 7) Curriculum Development
- 8) Fact Sheets
- 9) Newsletters
- 10) High School Financial Planning Program
- 11) Videotape series
- 12) Community Business entry-level training

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 (udc.edu) ● Other 2 (District of Columbia Facebook)

3. Description of targeted audience

- 1) Youth
- 2) Adults
- 3) Seniors
- 4) Military Personnel
- 5) DC residents
- 6) College students
- 7) Ex-offenders
- 8) Low to moderate income residents
- 10) Low income families with youth in high risk communities
- 11) Small, new start, home based businesses

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

- Number of participants in parenting workshops.
 - Conduct 15 sessions per year for junior and senior high schools in the District of Columbia on financial planning.
 - Percent increase in the number of 4-H clubs throughout the city.
 - Youth will receive training in the areas of STEM education, and sewing, health and fitness, and camping.
 - Youth will receive leadership development training through conferences and special programs.
 - Youth that are members of a military family will receive 4-H programming as members of the 4-H program and as a separate group of military participants through the 4-H military partners program.
 - Number of youth participating in 4-H club activities that have a parent/s that is/are incarcerated.
 - Number of articles published
 - Number of fact sheets published
 - Number of newsletters published
 - Number of workshops implemented
 - Number of research projects completed
 - Number of informational materials distributed
 - Number of conference presentations
 - Number of certificate of completion
- 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	Number of children who have increased their knowledge of the essential elements of team work through participation in 4-H club activities.
2	Number of children who demonstrate responsibility as a result of participation in 4-H Program activities. participation.
3	Number of parenting workshop participants who have used their knowledge of support services available to apply for assistance in an effort to meet some of their parenting needs.
4	Number of Youth demonstrating an immediate and long-term commitment to civic engagement.

Outcome # 1

1. Outcome Target

Number of children who have increased their knowledge of the essential elements of team work through participation in 4-H club activities.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 2

1. Outcome Target

Number of children who demonstrate responsibility as a result of participation in 4-H Program activities. participation.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 3

1. Outcome Target

Number of parenting workshop participants who have used their knowledge of support services available to apply for assistance in an effort to meet some of their parenting needs.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 802 - Human Development and Family Well-Being

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 4

1. Outcome Target

Number of Youth demonstrating an immediate and long-term commitment to civic engagement.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension

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.)
- Other (Community Support)

Description

1) Funding restraints, unstable budget or lack of increase in funding, will not allow the program to increase the number of staff members serving in the Center for 4-H and Youth Development without external dollars

2) The District of Columbia is transforming with a plan for bringing in 100,000 new middle to high income residents resulting in changes in housing, transportation, education, and the government.

3) Community support is needed in the District of Columbia for financial literacy.

4) Changes in government policies and/or public priorities could alter the course of programming, negatively or positively.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

- 1) Each 4-H club leader and secretary will collect data (4H Secretary's Record Book) to be used in annual reporting of activities and events.
- 2) For the 4-H LIFE Parenting Program, pre and posttest, survey, telephone follow-ups, and one-on-one interviews will be conducted.
- 3) DC 4-H will use clickers, surveys, pre-post testing, art expression projects, poster contest, essay contest and short video interview to evaluate 4-H programs effectiveness.

V(A). Planned Program (Summary)

Program # 5

1. Name of the Planned Program

Sustainable Energy

2. Brief summary about Planned Program

It is imperative that safe, reliable energy sources are generated so that the environment will be safe and sound for those of us who reside on earth now as well as for future generations. This program involves using green technologies and infrastructures such as green roofs to conserve energy in buildings. Closing the loop of the food hub concept includes food waste recycling and reuse in production of sustainable bio-energy, Research to improve food and crop waste to bio-energy with an anaerobic digester for easily available and reliable production of sustainable renewable energy will be implemented at the Muirkirk research farm. Two 30 KVA backup generators have already been install and capable of using bio-diesel fuel. Our research will be conducted with a focus on the reduction of methane emissions, the replacement of fossil fuels, and the production of biogas. Composting to grow soils, the use of renewable solar and wind energy to pump water for high tunnel farming irrigation is a model that will continue to be developed and tested as in support of a global food production system.

3. Program existence : Intermediate (One to five years)

4. Program duration : Medium Term (One to 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
402	Engineering Systems and Equipment	50%		50%	
403	Waste Disposal, Recycling, and Reuse	50%		50%	
	Total	100%		100%	

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

1. Situation and priorities

Biogas is produced when organic matter is degraded in the absence of oxygen. The process, from degradation to gas production, is called anaerobic digestion. This anaerobic digestion occurs naturally in wetlands, lake bottoms and deep landfills. An experimental digester was built that converts cow manure and agricultural waste into methane-rich biogas that can be used as alternate energy resources to

generate electricity or thermal energy. The research in this study focuses on the feasibility of the design of an operational digester; the monitoring and control of the different biodegradation process variables and experiments to boost or maximize the gas production; and the analysis of the biogas produced, using a Gas Chromatograph (CG) with Flame Ionization Detector (FID) to separate the methane from carbon dioxide. The economic viability of this technology, advantages, and the production cost compared to other renewable energy resources are also compared. Technology will be promoted for community based sustainable energy projects in the District of Columbia.

2. Scope of the Program

- In-State Extension
- In-State Research

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

1. Assumptions made for the Program

1) Biogas is produced when organic matter is degraded in the absence of oxygen. The process, from degradation to gas production, is called anaerobic digestion. This anaerobic digestion occurs naturally in wetlands, lake bottoms and deep landfills.

2) Renewable energy such as solar, wind, geothermal, biomass and alternative fuels are promising clean energy resources of the future that are environmentally friendly with sources that replenish themselves or cannot be exhausted.

3) Biomass energy is derived from waste of various human and natural activities, including municipal solid waste, manufacturing waste, agricultural crops waste, woodchips, dead trees, leaves, livestock manure etc., which are abundant anywhere and everywhere, at any time.

4) Reducing water footprint into the storm water system through water reuse will conserve energy.

2. Ultimate goal(s) of this Program

To design and engineer an efficient, reliable, and low cost anaerobic digester for waste processing for the production of biomass and demonstrate that using the resources that are easily available makes the production of energy efficient and reliable. Develop a solar and wind energy system that generates energy to pump water for sanitation and irrigation to a high tunnel food production system. Construct an ecosystem wetland for recycling black and grey water for reuse at UDC campus to be used as a demonstration site for research, training and community engagement.

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	3.0	0.0	4.0	0.0
2018	3.0	0.0	4.0	0.0
2019	3.0	0.0	4.0	0.0
2020	3.0	0.0	4.0	0.0
2021	3.0	0.0	4.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

This research will build a pilot waste anaerobic digester at the Agricultural Experiment Station's Research Farm in Beltsville, Maryland for the production of biomass and demonstrate that using the resources that are easily available makes the production of energy efficient and reliable. The energy producing potential of the different types of waste products will be studied through continuous monitoring of the digestion biochemical processes, operating parameters, the energy content, and the analysis of the biogas products. A Fuzzy Logic Controller of the Anaerobic Digester System will be designed in parallel with the physical digester to enable us to model mathematically or simulate certain aspects of the digester processes for increased efficiencies and process stability.

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 ● Demonstrations 	<ul style="list-style-type: none"> ● TV Media Programs

3. Description of targeted audience

DC Department of the Environment
 DC Department of Transportation
 DC Department of Public Works
 Researchers

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

- Number of workshops completed
- Number of fact sheets published
- Number of articles published
- Number of informational material distributed
- Number of conference presentations
- Number of certificate of completion issued
- Number of research projects completed
- Number of newsletters published

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	Percent increase in renewable energy production use due to green infrastructure
2	Percent increase in water reuse and conservation due to green infrastructure
3	Percent increase in energy conservation due to green infrastructures

Outcome # 1

1. Outcome Target

Percent increase in renewable energy production use due to green infrastructure

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 402 - Engineering Systems and Equipment

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 2

1. Outcome Target

Percent increase in water reuse and conservation due to green infrastructure

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 403 - Waste Disposal, Recycling, and Reuse
- 402 - Engineering Systems and Equipment

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 3

1. Outcome Target

Percent increase in energy conservation due to green infrastructures

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 403 - Waste Disposal, Recycling, and Reuse

- 402 - Engineering Systems and Equipment

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
- Government Regulations

Description

This projects will be conducted on the grounds of the Muirkirk Research Farm facility located in Beltsville, MD. Weather extremes could affect the project. Further, changes in government environmental regulations may preclude continuance of the project. If the current funding allocated for the life of the project is decreased, it will impact the progress and magnitude of the research.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

Evaluation of simulation tools and simulation benchmarks used to evaluate and compare differences in water conservation and renewable energy production and conservation at each food hub will be implemented. Determine change in crop yield and nutrient density due to irrigated water from solar/wind well water system and aquaponics systems at each food hub.

V(A). Planned Program (Summary)

Program # 6

1. Name of the Planned Program

Food Safety

2. Brief summary about Planned Program

The safety of the foods that we ingest is paramount to our health and quality of life. The Centers for Disease Control and Prevention estimates that every year about 76 million people in the United States become ill from pathogens in food and that about 5,000 of this number die as a result (NDDIC). In particular, young children, expectant mothers and their unborn children and older adults are at the greatest risk. Contamination can occur during the growth, harvesting, processing, storage, and shipping of food. Yet, the poisoning of foods also can occur during food preparation in restaurants or in our home kitchens.

The Center for Diet, Nutrition, and Health is working to reduce the incidence of food poisoning for the residents of the District of Columbia through Food Handlers training and certification for small commercial businesses as well as providing safety tips for elder residents. The training program promotes personal responsibility for practicing food safety and enhances the community's access to information and services. Food Handler education is also offered to small non-commercial service agencies in the city to increase the food handler's compliance with food safety principles, hazard analysis, and critical control points.

CNDH will also contribute to the Food Hub concept by managing the commercial kitchen used to prepare, safely handle, add value, package and store in support healthy eating choices..

3. Program existence : New (One year or less)

4. Program duration : Medium Term (One to 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
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	100%		100%	
	Total	100%		100%	

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

1. Situation and priorities

Each Urban Food Hub will be equipped with a commercial kitchen that can serve as training facilities to improve information about healthy eating, healthy food preparation, and age appropriate diets through cooking classes, nutrition classes, and food demonstrations. The impact of community nutrition education programs will be maximized through the train-the-trainer model, that has been successfully implemented in other CAUSES programs, will be used whenever possible. This means that the proposed Hubs will focus first and foremost on developing the technical, organizational, and didactic skills of on-the-ground community partners, so they can in turn provide the education and training needed with the support of CAUSES staff and training materials.

In addition to serving as teaching facilities, the kitchens will also serve as business incubators. Individuals and neighborhood based organizations will be able to use the kitchens to clean, process and preserve the locally grown produce for sale to local restaurants, grocery stores, food processors and farmers markets. Staff at each of the Hubs will be trained to efficiently operate the kitchen facilities. The kitchens are designed to be functional, energy efficient, and effective, ensuring smooth traffic flow and workstations that do not overlap. The layout of the kitchen facilities features demonstration areas that provide easy visible work spaces, and well defined workstations including food receiving, cold and dry storage, food preparation, cleaning and recycling. This makes it possible to use the kitchens for instructional purposes, and for direct producer to consumer marketing activities that are an important focus of the Food Hubs given the low density of grocery stores in the selected locations.

Interest in locally produced food and food related businesses is growing rapidly. Of particular interest are food-processing businesses that prepare and market ethnic foods including smoked fish, condiments, baked goods etc. Yet those interested in food preparation and the added value it can offer, often lack access to commercial kitchens. The kitchen components of the Urban Food Hubs will provide both access and the necessary training to ensure proper food handling and food safety standards.

The Urban Food Hubs will also be able to advance much needed information about strategies to combat food insecurity, especially among children, and to improve the nutritional health of all ages. While it is relatively easy to improve information about healthy diets and food preparation options, there is no guarantee that this kind of information will actually lead to the needed behavioral changes in eating habits. Successful strategies must focus on skills, awareness, social pressures, cultural traditions, soft skills and diets. Food preparation related activities at the Urban Food Hubs will therefore include the following:

- Nutrition counseling incl. data on consumption habits, Body Mass Index (BMI), weight, and health histories.
- Cooking classes, food demonstrations, and nutrition education workshops.
- Food handler certification, food safety certifications, advanced food certification, and HCCAP.
- Entrepreneurship classes and technical support to launch food preparation related business.
- Focus groups to identify determinants of safe food handling behaviors, risk perception, and beliefs

that impede the adoption of safe food handling standards.

- Focus groups to assess human behavior changes (eating and purchasing habits etc.) in Food Hub neighborhoods.

Food handlers in the District of Columbia are required to be certified, passing a national examination with a score of 70%. The Center for Nutrition, Diet, and Health will provide the following training and services:

- 20-hours of classroom instructions on safe food handling and food borne illness
- Instruction on DC Code and Examination
- Administer the national Professional Food handler Examination to participants who successfully complete the classroom instructions
 - Pretest, Post test, food code exam, and national exam administered
 - Follow up to determine if improvements in food inspection score as a result of the training and certification activities

2. Scope of the Program

- In-State Extension
- In-State Research

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

1. Assumptions made for the Program

Foodborne illness affects nearly 80 million people per year nationwide. Even more people will be affected if adequate training and certification is not conducted for foodhandlers and if valuable information on the safe handling and storage of foods is not distributed to seniors, individual, and families.

2. Ultimate goal(s) of this Program

The ultimate goal of this program is to support value added process and preparation of healthy foods while decreasing the incidence of foodborne illness in the District of Columbia via proper education, training, and dissemination of valuable information on the safe handling and storage of foods to seniors, individuals, families, and businesses.

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	3.0	0.0	4.0	0.0
2018	3.0	0.0	4.0	0.0
2019	3.0	0.0	4.0	0.0
2020	3.0	0.0	4.0	0.0
2021	3.0	0.0	4.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

Food Handler Certification will include:

- 1) Pretest
- 2) Post Test
- 3) National Examination
- 4) DC Code Examination
- 5) Ability of agencies to pass DC inspections
- 6) Measure of knowledge acquired from food handler certification messages include in the national examination
- 7) Data Collection
- 8) Data Analysis
- 9) Reporting

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 ● Demonstrations 	<ul style="list-style-type: none"> ● Newsletters ● Web sites other than eXtension ● Other 1 (Fact Sheets)

3. Description of targeted audience

- Catering and other small food preparation industries as well as non-commercial agency food handling staff members
- Ongoing participating food handlers
- Non-profits

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

- Classroom instruction/workshops on Food Handler Certification Regulations to include DC Code Examination or Serve Safe National Examination, and Practice Examinations
- Number of articles published
- Number of fact sheets published
- Number of newsletters published
- Number of workshops implemented
- Number of research projects completed
- Number of informational materials distributed
- Number of conference presentations
- Number of certificate of completion

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	Percentage decrease in the risk of factors of foodborne illness.
2	Number of participants gaining awareness, knowledge and skills in Food Handling techniques.
3	Number of participants scoring a required minimum of 70% on post test and national examination.

Outcome # 1

1. Outcome Target

Percentage decrease in the risk of factors of foodborne illness.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 2

1. Outcome Target

Number of participants gaining awareness, knowledge and skills in Food Handling techniques.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 3

1. Outcome Target

Number of participants scoring a required minimum of 70% on post test and national examination.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

4. Associated Institute Type(s)

- 1862 Extension

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

- Appropriations changes
- Government Regulations

Description

The major external factor that may affect the outcome of this planned program is lack of matching funds due to budget cuts..

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

Assessment of the National Foodhandlers Certification Examination results on occurrence of food-borne illness in the District of Columbia.