

2012 University of the District of Columbia Combined Research and Extension Plan of Work

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I. Plan Overview

1. Brief Summary about Plan Of Work

The University of the District of Columbia is the only totally urban land-grant institution in the United States. Considering the needs of our respective state, it is the mission of the DC Agricultural Experiment Station to conduct research, investigations, and experiments relative to critical issues in the urban environment of our nation's capital. The Cooperative Extension Service provides informal education through workshops, demonstrations and technical assistance to enhance life quality by increasing knowledge, changing behaviors and improving conditions.

Today's rising environmental challenges include global warming, climate change, water quality, urban sustainability, sustainable urban design, environmental degradation, watershed restoration, food security and safety, emerging chemical and biological contamination, dwindling energy sources, socio-economic issues, and population growth, just to name a few. To respond to the necessary, ever-present and continuing engagement of an educated humanity as stewards of the earth, the University of the District of Columbia has developed a new college, the College of Agriculture, Urban Sustainability, and Environmental Sciences (CAUSES). Consistent with the land-grant mission of the University, the goals of CAUSES are immersed in learning, research, and extension. Integrating academics, research, and outreach, the new college will offer quality and affordable interdisciplinary bachelor's and graduate degree programs, and conduct research and outreach programs focused on areas of agriculture, environmental sciences, sustainability and architecture for urban areas, especially the District of Columbia. The College will address many of the challenges we face as a growing population requiring the earth's resources and contribute to their solutions. CAUSES is in sync with a movement across the United States and International community that acknowledges a great need for educational programs that will provide our students and future scientists with the knowledge and skills that will preserve and sustain our Planet Earth. The DC Agricultural Experiment Station and the DC Cooperative Extension Service will be housed under the new college.

In accordance with the national priorities for NIFA and guidance for Plans of Work, we have merged activities and revised the title of the Childhood Obesity program to the "Health, Nutrition, and Childhood Obesity Prevention Program." Also, we added the Food Safety Program. Over the next five years, we intend to expand our programs with congruent research and extension projects and program activities in support of the newly established priorities.

Moving forward, AES intends to expand its research, investigations, and activities to address all five national priorities established by the National Institute of Food and Agriculture: climate change, food safety, food security, childhood obesity and sustainable energy. Additionally, AES will continue to promote sustainability as it relates to the natural, built, and social environments. More immediate plans include hiring a Sustainable Environmental Agriculturist to assist with sustainable agriculture research, specialty crops, and new initiatives relating to food security. As these goals are met, residents of the District of Columbia will benefit from the results of research and the University will be steps closer to achieving greater harmony between agriculture and the environment.

CES will continue putting forth efforts to engage, educate and empower District residents by providing free and fee-based, non-credit classes; workshops; demonstrations and technical assistance.

Further, CES will extend beneficial information to residents through the distribution of informative publications including brochures, fact-sheets, bulletins, and newsletters. In terms of continuous improvement, to increase efficiency and effectiveness in CES, the Dean/Director plans to restructure the unit in 2011. The new model for the extension will be comprised of three major entities: Center for Nutrition, Diet, and Health; Center for 4-H and Youth Development; and the Center for Sustainability.

The Center for Nutrition, Diet and Health will include the following programs: EFNEP; SNAP-ED; Food Handlers Training and Certification; and Nutrition Service Delivery.

The Center for 4-H and Youth Leadership will include: 4-H clubs in DC Public and Charter School as well as community centers throughout the city; Summer Camp; Lifesmarts; Operation Military Kids; Health Rocks; and a Soccer Clinic. The unit will also work with extension agents in the Sustainability Program to establish and maintain school gardens for elementary and middle schools in the District of Columbia.

The Center for Sustainability will focus on economic, social, and environmental sustainability. For economic sustainability, the program will include: DC MarketMaker, Financial Planning, Cooperatives, and Entrepreneurship. Social sustainability will include: Farmers' Market and other new initiatives. Environmental sustainability will include: Master Gardeners Training and Certification; Jr. Master Gardeners; Water Education and Rain Gardens; Community and School Gardens; Integrated Pest Management, and Energy Conservation and Home Repair. Plans are underway to hire an Integrated Pest Management Specialist who will assist the Center for Sustainability.

Our planned programs will now 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 footprint. Efforts will focus on home improvement/energy workshops, youth leadership and environmental stewardship activities, and recycling and composting initiatives.

2) Global Food Security and 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. 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 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. AES and CES will promote urban gardening as an instrumental means for residents to raise their own fresh, organic fruits and vegetables for consumption and/or sale while protecting the environment. Additionally, residents will be educated in viable urban sustainable agricultural practices for crop production in an urban setting with a reduction in disease and insect infestation and utilization of composting of leaf and food waste as soil amendments.

3) Health, Nutrition and Childhood Obesity Prevention. AES and CES are working together to address obesity. Research indicates that obese and overweight children tend to retain these conditions as adults. Obesity is one of the causing factors for chronic illnesses and conditions, i.e. hypertension, hypercholesterolemia, diabetes, cancer, and heart disease. The Agricultural Experiment Station is

conducting a study in breast cancer. Additionally, the 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. Included under this program is the Expanded Food and Nutrition Education Program (EFNEP) that will provide nutrition education to low income families and engage them in nutritionally sound food purchases and preparation practices. Additionally, the program focus is on nutrition and healthy urban life styles for DC residents, including improving diet and exercise behaviors in older adults. Other relevant projects include food handler's training and certification and teacher education in nutrition and agriculture.

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 biomass energy production via the development of an organic digester for organic waste processing to demonstrate that using the resources that are easily available makes the production of energy efficient and reliable. Our research will be conducted with a focus on the reduction of methane emissions, the replacement of fossil fuels, and the production of biogas.

5) Urban Families, Youth, and Communities. The Cooperative Extensive Service is working to enhance the quality of life for our city's youth, families, and communities. Sustainability efforts include: youth leadership and development, economic development, and cooperatives. Specific CES programs in support of these initiatives are the National 4-H Program; Basic Financial Literacy Project (in partnership with FDIC); Home and Maintenance Repair; and the Center for Cooperatives.

6) Food Safety. The Center for Disease Control reports that there are an estimated 76 million people who contract foodborne 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 Cooperative Extension Service's Center for Nutrition, Diet and Health provides training for food handlers in the District of Columbia. The program is designed to equip participants for low literacy food handlers with the following objectives: 1) to provide information and knowledge on the techniques to handle food; 2) to decrease risk factors associated with foodborne illness and to score a minimum of 70% on the post test and national examination to become certified as a food handler in DC. Additionally, the Agriculture Experiment Station intends to add research that address this critical issue for the residents in nation's capital as well as those across our country.

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

Year	Extension		Research	
	1862	1890	1862	1890
2012	31.8	0.0	3.5	0.0
2013	31.8	0.0	3.5	0.0
2014	31.8	0.0	3.5	0.0
2015	40.0	0.0	3.5	0.0
2016	40.0	0.0	3.5	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

Each year the Director reviews the progress of each research project to ensure that researchers are accomplishing their objectives. Modifications were made to move in the direction of implementing research and integrated activities based on issues germane to an urban environment. The Peer Review has expanded to include not only representatives from the Department of Biological and Environmental Sciences, the Department of Chemistry, the Department of Physics, the Cooperative Extension Service, the community, state, and local government, but also the Departments of Sociology, Urban Affairs, Criminal Justice, Psychology, and the Water Resources Research Institute. The Peer Review criteria remains, but not limited to:

Knowledge base of the research

Adequacy of procedures and experiment to meet the objectives

Feasibility of accomplishing the objectives

Scientific merit of the proposed research

Familiarity with work of others related to the proposal

Outcomes and Impacts

Appropriate budget for proposed research

Budget justification

The Experiment Station has changed the format of the proposal submission to require information pertaining to the logic model to be incorporated in the proposal. The Peer Review Evaluation has been updated to reflect this.

Our merit 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 research
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. Currently, we have planned programs that address these germane issues: Childhood Obesity; Global Food Security and Hunger; Food Safety; and Climate Change. The Agricultural Experiment Station has joined forces with several academic institutions in the U.S. to address issues related to obesity and nutrition via two multi-state research projects: 1) Changing the Health Trajectory of Older Adults through Effective Diet and Activity Modifications; and 2) An Integrated Approach to Prevention of Obesity in High Risk Families.

Chronic diseases affect citizens on a local and national level. AES researchers 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.

The Agricultural Experiment Station, DC Water Resources Research Institute, and the Cooperative Extension Services continue to work together to impart safe food production practices to DC residents through sustainable agricultural research techniques, demonstrations, gardening workshops, presentations, and the development of informational materials.

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

In order to meet the needs of under-served and under-represented populations in the District, CES has developed partnerships and collaborations with government agencies,

District of Columbia Public Schools, and other public and private organizations and agencies city-wide. The partnerships developed with the DC Department of Parks and Recreation provides 8 sites for program offerings, one in each of the eight wards. This allows CES to meet the needs of the "at risk" groups including children, youth and the elderly and provide activities in areas where clusters of different ethnic groups live and work. The Gentrification process has isolated areas where different population groups live and work; however, these sites allow us to take programs to those neighborhoods.

Studies conducted in AES address health and nutrition issues that benefit all residents. Research conducted in health and nutrition include multi-state collaborations, as well as research partnering with consortium universities, and science organizations.

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

For multi-state research projects in the Agricultural Experiment Station, as well as other hatch projects and extension program collaborations, outcomes and impacts will be described as changes in behavior, attitudes, and conditions, increased learning skills, adoption of a new practice(s), policy changes, dollars saved, value added, and new partnership development.

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

The Agricultural Experiment Station is 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, AES has broadened and strengthened its research program; 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.

CES is currently partnering with other academic institutions such as Kansas State, the University of Maryland, and government and non government organizations to include D.C. Public and Charter Schools, DC Department of Health, U.S. National Arboretum, DC Housing and Finance, DC Energy, and the National Gardening Association. For CES, these partnerships have resulted in several benefits to include: 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.

Within the new college, College of Agriculture, Urban Sustainability and Environmental Sciences (CAUSES), the curricula has been designed to have a synergetic effect on academic, research, and extension and outreach 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 the B.S. degrees in Environmental Science will participate in the research and laboratory activities conducted in the Agricultural Experiment Station. Students enrolled in the Department of Nutrition and Food Science will participate in the service learning projects provided under the Center for Nutrition, Diet and

Health in the Cooperative Extension Service. The staff members of the Center for Sustainability in CES will be able to collaborate and work on projects within the College of Arts and Sciences and the School of Business and Public Administration. Also, the Center for Sustainability will be able to work with the Department of Environmental Sciences and the Agricultural Experiment Station to implement projects and activities.

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.

As an effort to include a broader audience for stakeholder input and to encourage participation, AES and CES are working with the designated marketing specialist and EEO representative. 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

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 AES and CES 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: AES has an annual research seminar that is open to the public. This presents an excellent opportunity for stakeholder to hear about the research that is being conducted to address local and national issues and to personally speak to individuals and obtain their input. CES offers a number of workshops in a variety of areas during the year, again providing a viable means to share information, talk with stakeholders and obtain valuable input. Stakeholder Input Surveys are distributed and collected at these events.

3) Open Listening Sessions: Plans are underway to begin community listening session in each of the eight wards in the city. These sessions will afford us an opportunity to share our research and extension efforts and findings with stakeholders, find out what their needs/concerns, and to disseminate beneficial information/literature in health, nutrition, natural resources, urban gardening, etc. to participants. Surveys will be disseminated and collected.

4) Advisory Committee: The AES/CES Advisory Board meets quarterly and provides advice and recommendations on matters relating to urban issues, research, and outreach.

5) Quality of Life Day Events: Community events held in a designated ward in the city each summer to share research and extension program and project information, initiate dialogue with residents and to provide beneficial literature in health, nutrition, sustainable agriculture, urban gardening, water quality, youth leadership and development, natural resources, etc. Residents are engaged in fun and interesting activities.

6) Research Seminar: The Agricultural Experiment Station presents an annual research seminar which is open to the public. Research problems and findings are presented, open dialogue, and literature is distributed.

7) Internal Focus Groups: Brown Bag Series are held for students to discuss an array of urban issues from water quality to financial management.

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 Agricultural Experiment Station and Cooperative Extension Service continue to disseminate surveys to residents to determine critical 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. However, with the recent approval of a new college, the College of Agriculture, Urban Sustainability and Environmental Sciences (CAUSES), in which AES and CES will be housed, various marketing efforts are underway and we expect to have a mechanism in place for the survey soon. 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 AES/CES Advisory Committee, diverse in specialization and experience, will be instrumental in helping AES/CES to assess the needs/priorities of DC residents. We will continue to strive to always 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; and
- 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 : 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%		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 environmentists.

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
2012	7.2	0.0	1.0	0.0
2013	7.2	0.0	1.0	0.0
2014	7.2	0.0	1.5	0.0
2015	7.2	0.0	1.5	0.0
2016	7.2	0.0	1.5	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 AES/CES 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
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- 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
- 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

2012:50 2013:50 2014:50 2015:50 2016:50

3. Associated Knowledge Area(s)

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

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

2012:25 2013:25 2014:25 2015:25 2016:25

3. Associated Knowledge Area(s)

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

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

2012:50	2013:50	2014:50	2015:50	2016:50
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3. Associated Knowledge Area(s)

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

A major objective of the DC Agricultural Experiment Station 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.

AES and CES are working together 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	20%		50%	
205	Plant Management Systems	20%		50%	
216	Integrated Pest Management Systems	20%		0%	
721	Insects and Other Pests Affecting Humans	20%		0%	
806	Youth Development	20%		0%	
	Total	100%		100%	

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

1. Situation and priorities

The recent dramatic increase in energy prices has had an associated effect on food prices, especially vegetables. This has created an even greater demand and opportunity for home and community based gardens and urban sustainable agriculture. Though yard space is limited in the District of Columbia, fruits and vegetables are easy to grow in small home gardens as well as in containers. Other options include rooftops, side walk plots, government owned unused lots, hanging baskets, and window boxes. With the correct amount of water, sunlight, healthy soil, and proper planting techniques, residents can enjoy fresh fruits and vegetables from their own garden while reducing our impact on the environment. Community gardens are on the rise and the benefits are countless. Residents enjoy working together and sharing fresh fruits, vegetables, and herbs with the members of their community. And these gardens help people to reclaim their neighborhoods, turning unattractive areas into beautiful sites. Further, community gardens reflect the cultural identify of the people who create them.

The Master Gardener Program and the Junior Master Gardener Program (JMG) expose adults and youth to the principles of horticulture to increase awareness and educational opportunities through the study of sustainable agriculture. The Junior Master Gardener Program provides inner-city youth with hands-on horticultural skills and environmental experiences that instill a sense of empowerment and accomplishment.

Priorities of this program are:

- 1) To increase the number of urban gardeners who understand the value of using low-input sustainable vegetable gardening to grow and protect their crops;
- 2) To increase the amount of composted waste being used as a soil amendment in the urban gardens of the District of Columbia;
- 3) To increase the collaborative efforts between researchers of the Agricultural Experiment Station and extension agents in getting gardeners to adopt sustainable agricultural practices;
- 4) To increase the number of publications that communicate technical information on sustainable agricultural practices to urban gardeners, agricultural science technicians and any other interested individuals in garden production and other allied agricultural sciences; and

5) To provide a Pesticide Safety Education Program which will provide initial applicator training for the in-demand pesticide applicator categories that qualify students for the applicator license exam as well as integrated pest management for urban gardening.

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 gardening will increase due to increase in food price;
2. Many of the gardeners in the District of Columbia are reluctant to use chemical pesticides to control insects and diseases;
3. Community gardens will become increasingly popular, serving as a means of improving social consciousness and productive citizenry; and
4. Funding is available and public interest will continue.

2. Ultimate goal(s) of this Program

1. Increase the number of skills and knowledge in urban community and home gardeners in the District of Columbia through the Master and Junior Master Gardeners Program;
2. Expand the concept of gardening from local plots to rooftop, balcony, vacant lots and other areas for food production and beautification;
3. Continue sustainable agriculture research in urban gardening on cool and warm season crops to determine more efficient mechanisms for production and protection;
4. Change behavior of urban gardeners by promoting the use of compost verses inorganic fertilizers to decrease 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
2012	4.0	0.0	1.0	0.0
2013	4.0	0.0	1.0	0.0
2014	4.0	0.0	1.0	0.0
2015	4.0	0.0	1.0	0.0

Year	Extension		Research	
	1862	1890	1862	1890
2016	4.0	0.0	1.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

- 1) Conduct field experiments in the use of composted waste as a soil amendment for growing 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 for program participants to teach and update knowledge of sustainable agricultural techniques to establish, maintain, and protect both vegetable 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; and
- 6) Maintain Junior and Master Gardening certification; trained gardeners will participate in beautifying the city through volunteer hours.

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) Small rural farmers
- 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
- 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.

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

2012:50 2013:50 2014:50 2015:50 2016:50

3. Associated Knowledge Area(s)

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

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

2012:25 2013:25 2014:25 2015:25 2016:25

3. Associated Knowledge Area(s)

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

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

2012:50 2013:50 2014:50 2015:50 2016:50

3. Associated Knowledge Area(s)

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

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

2012:25 2013:25 2014:40 2015:40 2016:50

3. Associated Knowledge Area(s)

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

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
- 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 Agricultural Experiment Station (AES) and the Cooperative Extension Service (CES) are working together to provide a quality program 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 teacher education in nutrition and agriculture and the Expanded Food Nutrition Education Program (EFNEP).

The Cooperative Extension Service is conducting studies in obesity relating to preschoolers, adolescents, children and youth, and adults. The Center for Nutrition, Diet and Health (CNDH) provides educational programs to assist food stamp recipients with making healthy food choices. Additionally, CES will provide nutrition education through the Expanded Food and Nutrition Education Program. The program is 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.

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 : Short-Term (One year or less)

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 Expanded Food 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 the Food Guide Pyramid. The Center for Nutrition, Diet and Health (CNDH) will provide nutritional education for food stamp recipients/eligibles.

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
2012	11.7	0.0	1.5	0.0
2013	11.7	0.0	1.5	0.0
2014	11.7	0.0	1.5	0.0
2015	11.7	0.0	1.5	0.0
2016	11.7	0.0	1.5	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

Food Stamp 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 γ -T3 inhibits the growth of breast cancer cells: 1) determine if γ -T3 induces apoptosis in MCF-7 breast cancer cells is ATF-3 dependent; and 2) Determine whether γ -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

- Curriculum developed for various workshops, fact sheets for nutrition education for teachers.
- Train the Trainer Food Stamp Educational Workshops: 2 hours a week by teacher volunteers; FFNews; Creative Curriculum; Color Me Healthy; Tickle Your Appetite; 5 A Day; DCPS Nutrition Curriculums; and Development of Food Safety and Dietary Quality Lessons
- Assess four day food diary data for the number of portions of fruits and vegetables for registered participants
- Establish intervention/focus groups for registered participants consuming less than 5 servings of fruits and vegetables per day and identify the determinants of low consumption of fruits and vegetables.
- Design and implement educational classes to assist registered participants with improving consumption of fruits and vegetables
- 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 γ -T3.
- 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 increased physical activity and experienced weightloss
5	Number of participants who improved their dietary intake, including an increase in fruits and vegetables
6	Number of participants who improved food resource management practices such as menu planning and food shopping
7	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

2012:50 2013:50 2014:50 2015:50 2016:50

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

2012:50 2013:50 2014:50 2015:50 2016:50

3. Associated Knowledge Area(s)

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

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

2012:1 2013:0 2014:0 2015:0 2016:0

3. Associated Knowledge Area(s)

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

4. Associated Institute Type(s)

- 1862 Research

Outcome # 4

1. Outcome Target

Number of participants who increased physical activity and experienced weightloss

2. Outcome Type : Change in Condition Outcome Measure

2012:175 2013:200 2014:225 2015:275 2016:275

3. Associated Knowledge Area(s)

- 703 - Nutrition Education and Behavior

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 5

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

2012:175 2013:200 2014:225 2015:250 2016:250

3. Associated Knowledge Area(s)

- 703 - Nutrition Education and Behavior

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 6

1. Outcome Target

Number of participants who improved food resource management practices such as menu planning and food shopping

2. Outcome Type : Change in Action Outcome Measure

2012:150 2013:175 2014:200 2015:225 2016:225

3. Associated Knowledge Area(s)

- 703 - Nutrition Education and Behavior

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 7

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

2012:0 2013:1 2014:1 2015:0 2016:0

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.)
- 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 EFNEP 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 Agricultural Experiment Station (AES) and the Cooperative Extension Service (CES) are teaming efforts to provide a quality program that addresses issues related to sustainable youth, families, and communities in the District of Columbia.

CES is helping to shape the city's youth through leadership and development activities in the national 4-H program. 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 grandparents, who often find themselves raising their grandchildren.

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. The CES Center for Cooperatives is working to promote affordable housing for lower income residents in the city. Along those lines, the Home and Maintenance Repair project in CES provides District residents with basic to advanced knowledge and skills to perform interior and exterior repairs. And in support of economic development in the city, CES is working with community partners and the Small Business Administration.

AES has conducted research in youth violence and plans to continue studies in areas related to urban families, youth, and communities. AES and CES continue to jointly 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 Quality of Life Day Festival is held in various wards of the city and is a day long activity that includes demonstrations, presentations, hands-on experiences, handouts, food, and fun for city residents. CES programs are featured as well as AES sustainable agriculture/urban gardening research and information. The Urban Agricultural Fair is hosted at the Station's Muirkirk Research Farm in Beltsville, MD and is attended by participating DC Public Schools, grades four through seven. 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; Arts and Crafts; Marine Science; Basic Soils; and Junior Master Gardeners. The fair is held each year in mid-May.

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%		0%	
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures	10%		0%	
806	Youth Development	50%		100%	
	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 CES Financial Literacy project 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 Cooperatives is working with the community to promote affordable housing for low to moderate income residents. And with the number of first time buyers and senior increasing in our city, CES provides Home Maintenance and Repair for residents to help reduce high costs associated with home repairs.

AES will continue to team with CES 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 DC Reads Project .
- 5) New partnerships will continue to be developed for the Parenting Project.
- 6) Funding will be available for the Parenting Project.
- 7) District residents will find it more difficult to use the courts to wipe out consumer and business debt.
- 8) The effect of gentrification serves to undermine the poor.
- 9) District resident completing the Home Maintenance and Repair workshops will save an average of \$25 - \$35 per repair.
- 10) The gap between the rich and the poor is widening in the District of Columbia.

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 as well as the number of parenting groups;
- 3) To increase the annual number of DC residents purchasing homes through some form of financial assistance;
- 4) To slow the conversion rate and foreclosure rate for coops by 20%;
- 5) To train residents to be able to perform repairs and to become more educated about the process when dealing with contractors; and
- 6) To assist businesses to remain in the District.

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
2012	11.9	0.0	0.0	0.0
2013	11.9	0.0	1.0	0.0

Year	Extension		Research	
	1862	1890	1862	1890
2014	11.9	0.0	1.0	0.0
2015	11.9	0.0	1.0	0.0
2016	11.9	0.0	1.0	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) Nutrition Program
- 7) Water Quality and GIS Technology
- 8) Tutoring: Tutors assigned to after-school program
- 9) Curriculum Development
- 10) Fact Sheets
- 11) Newsletters
- 12) Financial Literacy Sessions/Workshops
- 13) High School Financial Planning Program
- 14) Videotape series with Co-op Information
- 15) Co-op Groups
- 16) Demonstrations for Home Repair
- 17) 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"> ● Workshop ● Group Discussion ● One-on-One Intervention ● Demonstrations 	<ul style="list-style-type: none"> ● Public Service Announcement ● Newsletters ● TV Media Programs ● Web sites other than eXtension

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
- 9) First-time buyers
- 10) Low income homeowners
- 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

- Curriculum developed for various parenting workshops, seminars, support groups, fact sheets, and newsletters.
 - Number of participants in parenting workshops.
 - Number of parenting support groups formed.
 - Conduct a minimum of 50 sessions in the area of financial literacy.
 - Conduct 15 sessions per year for junior and senior high schools in the District of Columbia on financial planning.
 - Develop newsletter and/or fact sheets for District residents so they can perform basic/advanced repairs in and around their home.
 - Conduct hands-on workshops for District residents in basic and advanced home repair.
 - Percent increase in the number of 4-H clubs throughout the city.
 - Youth will receive training in the areas of sewing, computer technology, and geospatial technology.
 - Youth will receive leadership development training through conferences and special programs.
- 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 DC residents who participated in a Financial Literacy workshop who have improved their financial situation via establishing a household budget, personal savings and/or a checking account; purchase of savings bonds; establishment of a money market account or Certificate of Deposit.
5	Number of participants able to make repairs as well as communicate with contractors in a professional manner.
6	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

2012:250 2013:250 2014:300 2015:300 2016:350

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

2012:100 2013:100 2014:100 2015:100 2016:100

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

2012:100 2013:100 2014:100 2015:100 2016:100

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 DC residents who participated in a Financial Literacy workshop who have improved their financial situation via establishing a household budget, personal savings and/or a checking account; purchase of savings bonds; establishment of a money market account or Certificate of Deposit.

2. Outcome Type : Change in Condition Outcome Measure

2012:50 2013:50 2014:50 2015:50 2016:50

3. Associated Knowledge Area(s)

- 801 - Individual and Family Resource Management

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 5

1. Outcome Target

Number of participants able to make repairs as well as communicate with contractors in a professional manner.

2. Outcome Type : Change in Condition Outcome Measure

2012:25 2013:25 2014:35 2015:45 2016:50

3. Associated Knowledge Area(s)

- 801 - Individual and Family Resource Management
- 804 - Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 6

1. Outcome Target

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

2. Outcome Type : Change in Action Outcome Measure

2012:75 2013:75 2014:85 2015:90 2016:100

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.)
- 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 children being served in 4-H and youth development.
- 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 Parenting project, pre and post test, survey, telephone follow-ups, and one-on-one interviews will be conducted.

3) Surveys will be used in the financial literacy and cooperatives projects as well as pre and post tests to determine the increased awareness of participants.

4) A follow-up questionnaire will be issued to assess whether participants have used skills learned in the home maintenance and repair project.

V(A). Planned Program (Summary)

Program # 5

1. Name of the Planned Program

Sustainable Energy

2. Brief summary about Planned Program

The ever growing demand for energy world-wide can only be met by considering the possible range of energy solutions and the technology to produce emerging sources of energy to reduce our dependence on oil, a non renewable fossil fuel. Renewable energy such as solar, wind, geothermal, biomass and alternative fuels are promising clean energy resources of the future, which are environmentally friendly and which sources replenish itself or cannot be exhausted. 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. Any of these sources can be used to fuel biomass energy production with the design of an efficient digester or processing plant to harness the energy from the biological mass. In the Greater Washington area, it is estimated that several million tons of energy sources for biomass energy are collected each year. If all these sources were used to create biomass energy, this could make up to hundreds of megawatts of electricity that can be used to power several homes.

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 : 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
402	Engineering Systems and Equipment	0%		50%	
403	Waste Disposal, Recycling, and Reuse	0%		50%	
	Total	0%		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.

2. Scope of the Program

- 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.

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.

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
2012	0.0	0.0	1.0	0.0
2013	0.0	0.0	0.0	0.0
2014	0.0	0.0	0.0	0.0
2015	0.0	0.0	0.0	0.0

Year	Extension		Research	
	1862	1890	1862	1890
2016	0.0	0.0	0.0	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 ● 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

- Design of a fuzzy-logic based controller system to optimize the operation of the anaerobic digestion System in terms of operational cost, the produce energy, and the quality of the residual organic matter.
 - Creation of a set of fuzzy rules to control the input flow rate and to control the concentration of VFA, the concentration of chemical oxygen demand (COD), and digester operating temperatures.
- 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	Development of better designs for digestion reactor and its data acquisition sensors
2	Control of the concentration of VFA in the digester system through the manipulation of the input flow rate.

Outcome # 1

1. Outcome Target

Development of better designs for digestion reactor and its data acquisition sensors

2. Outcome Type : Change in Knowledge Outcome Measure

2012:1 2013:0 2014:0 2015:0 2016:0

3. Associated Knowledge Area(s)

- 402 - Engineering Systems and Equipment

4. Associated Institute Type(s)

- 1862 Research

Outcome # 2

1. Outcome Target

Control of the concentration of VFA in the digester system through the manipulation of the input flow rate.

2. Outcome Type : Change in Knowledge Outcome Measure

2012:1 2013:0 2014:0 2015:0 2016:0

3. Associated Knowledge Area(s)

- 402 - Engineering Systems and Equipment

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.)
- Appropriations changes
- Government Regulations

Description

This project 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 different sludge control strategies.

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 Cooperative Extension Service's 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 Cooperative Extension Services' Center for Nutrition, Diet, and Health promotes personal responsibility for practicing food safety and enhances the community's access to information and services. CES offers Food Handler education 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.

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
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	100%		0%	
	Total	100%		0%	

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

1. Situation and priorities

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

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 decrease 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
2012	1.0	0.0	0.0	0.0
2013	1.0	0.0	1.0	0.0
2014	1.0	0.0	1.0	0.0
2015	1.0	0.0	0.0	0.0
2016	1.0	0.0	0.0	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

- Non-commercial agency 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
- 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

2012:100 2013:100 2014:100 2015:100 2016:100

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

2012:400 2013:400 2014:400 2015:400 2016:400

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

2012:365

2013:365

2014:365

2015:365

2016:365

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

{NO DATA ENTERED}

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

National Foodhandlers Certification Examination