

# 2014 University of the District of Columbia Combined Research and Extension Annual Report of Accomplishments and Results

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## I. Report Overview

### 1. Executive Summary

The University of the District of Columbia (UDC) is a historically relevant and uniquely progressive, urban land-grant institution located in the heart of our nation's capital. UDC is committed to a broad mission of education, research and community service. With a rich tradition of education and research, stemming from the mid 1800's from predecessor institutions, the University has evolved into an institution of higher learning that focuses on the integration of research, academic, and outreach programs as evidenced in its strategic plan, Vision 2020. The College of Agriculture, Urban Sustainability and Environmental Sciences (CAUSES) embodies the land-grant tradition, offering cutting edge academic programs in urban sustainability, health education, nursing, water resources management, nutrition and dietetics, urban architecture and community planning.

The CAUSES mission aptly summarizes the work of the UDC landgrant college as "offering research-based academic and community outreach programs that improve the quality of life and economic opportunity of people and communities in the District of Columbia, the nation and the world." Three strategic goals are especially relevant to CAUSES: 1) Position the University to be a trusted partner with business and non-profit leaders, residents and public officials; 2) Increase nationally recognized research, scholarship, and creative activities; and 3) Offer effective, flexible, and accessible educational programs that merge classroom and experiential learning to prepare graduates for the 21st century.

With continued focus on our land-grant mandate to serve the citizenry of the District of Columbia, we are guided by our college mantra, "Healthy Cities - Healthy People." Under the leadership of the Dean of CAUSES and Director of Landgrant Programs, Dr. Sabine O'Hara, research and extension activities for the University's landgrant programs have been thoughtfully integrated throughout all five land-grant centers: (1) Center for Urban Agriculture & Gardening Education, (2) Center for Sustainable Development, (3) Center for Nutrition, Diet & Health, (4) Center for 4H & Youth Development and (5) Architectural Research Institute. All five centers are charged with Agricultural Experiment Station and Cooperative Extension Service objectives.

Through an integrative approach, the landgrant programs of CAUSES have created top quality, relevant research and community education programs that facilitate distinction and are well-aligned with USDA priorities and the District of Columbia's objectives. We are currently in the process of integrating our research and community outreach activities around the concept of "Urban Food Hubs" (O'Hara 1996, 1998, 2004, 2012, 2013). This concept, which is now in various stages of implementation, naturally brings the landgrant mission alive in an urban context. It integrates our work in diet, nutrition, and health; urban gardening/food production; food safety; economic development; climate change; and water resources around four components of the urban food hub: food production; food preparation; food distribution; and waste management/recycling.

The land-grant centers also strengthen UDC's academic programs by offering hands-on, practical service learning experience, internships and research opportunities that a) foster relevant learning experiences and b) facilitate employability and skills development.

As we continue to evolve through continuous improvement initiatives and program development, we remain deeply committed to being relevant to the residents of the District of Columbia. Given our three-pronged approach of teaching, research and community outreach, we seek to make a measurable, positive difference in the lives of people right where they live and work. Our vision is to be a world leader in

designing and implementing top quality, research-based academic and community outreach programs that measurably improve the quality of life and economic prosperity of people and communities in the District of Columbia, the nation, and the world.

This report documents our accomplishments and results for research and extension efforts in support of our land-grant mission for Fiscal Year 2014. The joint research and extension report includes six program areas: Climate Change; Global Food Security and Hunger; Health, Nutrition and Childhood Obesity Prevention; Urban Families, Youth and Communities; Sustainable Energy; and Food Safety.

## **1. Climate Change**

### **Research**

Establishment of Computational Infrastructure at UDC to Conduct Climate Change Research for the District of Columbia

In 2014, Dr. Harrison, Special Assistant to the Dean for Academic and Climate Change Initiatives, teamed with a group of colleagues from the School of Engineering and Applied Sciences, Water Resources Research Institute, and the CAUSES Center for Sustainable Development to implement research on the establishment of computational infrastructure at UDC to conduct climate change research for the District of Columbia. This research builds upon previous research conducted by the University on precipitation and the development of analytical tools to be made available for researchers, students, and District of Columbia residents.

To understand and adapt the climate change related issues, a number of federal, state and local government agencies have launched several evaluations of vulnerability of their critical infrastructure to the possible effects of climate change. Climate change has the potential to increase the variability in extreme weather events. Washington DC is very important because the city houses a significant number of federal agencies, several national monuments; international embassies and serves as a major economic center for the Washington Metropolitan area.

The increase in temperature can result in extreme precipitation events which can have significant impacts on the critical infrastructures of the District of Columbia, life and property of residents and on the overall economy of the Metropolitan DC area. There is a need to study the climatic parameter such as precipitation and its trend which would be useful for planners, engineers and water resource professionals in making informed decisions about climate change in planning, designing, operating, and maintaining the water resources systems. In this research, the key inputs, temperature and rainfall, are treated as key natural variables which have significant influence in climate change. Understanding these natural variables will benefit our decision-making in adaptability of climate change.

This project is in its initial phase. Primary activities for the reporting period were the selection and procurement of computational infrastructure which included computer systems and accessories.

Analysis of Watering Devices for the Planting and Survival of Young Urban Canopy Trees

Urban forestry is the art, science and technology of managing trees, forests and natural systems in and around cities, suburbs, and towns for the health and well-being of all people. It is care and management of urban forests, i.e., tree populations in urban settings for the purpose of improving the urban environment. Grey and Deneke describe urban forestry that it is the management of trees for their contributions to the physiological, sociological, and economic well-being of the urban society. It was further stated that urban forestry deals with woodlands, groups of trees, individual trees and where people live. Currently underway by the Director for the Center for Urban Agriculture and Gardening Education is research to analyze watering devices for the planting and survival of young urban canopy trees. Specifically, the project compares various watering methods and their ability to encourage deep taproot growth. The watering methods tested include the Grouses Waterbucks, Gator Bags, and manual watering with a water hose. We are focused on the tree-planting community in the greater Washington Metropolitan area including non-profit environmental groups and for-profit commercial tree-planters. We intend to present preliminary findings to them in 2015.

### **Extension**

#### **Urban Forestry**

Invasive plants are recognized as one of the greatest threats to wildlife and natural ecosystems. They compete with native plants for limited natural resources such as water, sunlight, nutrients and habitat,

crowding out and displacing the desirable native vegetation, thereby reducing overall biodiversity. This upset to the ecological balance is felt throughout the ecosystem as those species that are dependent on those native plants for their diet and habitat are no longer able to survive in the locale without them. This scenario has been occurring all over the country, and the District is not an exception. Some of the long-term implications of altering the ecosystem on such a large scale are forests that aren't able to regenerate (one such example is the forest of Rock Creek Park), pollution of waterways, and the listing of species as endangered or threatened. Unfortunately, many of these non-native invasive plant species are favorites in the horticulture industry, and they continue to be installed in the landscape.

The invasive plant program is funded by the Renewable Resources Extension Act (RREA) to address the impact of invasive plants through education and outreach initiatives. Curriculum is used by extension staff and partners to educate residents about: 1) the overall concept of invasive species; 2) the phenology, ecology and identification of invasive plants that are well established in the District; 3) invasive plant management techniques; 4) Early Detection Rapid Response (EDRR) plant species; and 5) native plant alternatives that can be used in lieu of invasive plants in landscape installations.

In fiscal year 2014, the Cooperative Extension Service at UDC hosted fourteen events in which education and outreach was provided through classes, workshops, and field workdays. Class participants completed an assessment designed to evaluate if the class was able to effect a change of knowledge and predict a change in participants' behavior.

Classes introduced participants to the overarching concept of invasive species, discussing the qualifying criteria established by the National Invasive Species Council, the negative impact invasive plants have on the economy, the environment and human health, and how we aid their spread. The classes focused on approximately 10 invasive plants that are common in the District that can be removed fairly easily and effectively by manual and mechanical means. Participants learned identification and phenology of these plants using photographs and live samples, followed by information about various invasive plant management methods (manual, mechanical, chemical and biological controls). The concept of early detection rapid response (EDRR) was taught, and approximately eight EDRR plants were presented that are either heading towards DC, or that are actively escaping cultivation and naturalizing in DC's parklands. A survey designed to evaluate measurable outcomes as a result of class participation was completed by 78 class participants. The majority of participants surveyed planned to share their learned invasive plant information with others and reported that they wouldn't purposefully install an invasive plant into their landscape. In FY 2014, 105 volunteers donated a total of 19 volunteer hours. In total, invasive plants were managed on 5.56 acres of parkland in the District.

## **2. Global Food Security and Hunger**

CAUSES recognizes Global Food Security and Hunger as one of the most important themes in urban sustainability and urban agriculture. Without securing a steady and dependable supply of highly nutritious food, urban communities cannot claim to attain sustainability. With more than half of the world's population, and over 80 percent of the U.S. population now living in urban communities, food travels over longer distances resulting in declining nutrient density, high energy demand associated with a transport intensive food system, increasing vulnerability of urban food supplies, and growing health disparities due to unequal access to fresh food.

Using the pioneering work of Dr. Sabine O'Hara, CAUSES has begun implementing the concept of Urban Food Systems Hubs that operationalize her work on Sustaining Production (O'Hara 1996, 1998, 2004, 2012, 2013). Sustaining Production expands the traditional success measures of production such as profit maximization and productivity, and gives simultaneous consideration to increasing productivity, reducing emissions (negative externalities) and improving sink capacities. The Urban Food Systems Hubs consist of the following components:

1. Food production through highly efficient small scale aquaponics systems
2. Food preparation through commercial kitchens that serve as business incubators
3. Food distribution through networked farmers markets, grocery stores and restaurants
4. Waste management and recycling through food waste processing, composting, energy generation, and water management.

All four components of the Urban Food Systems Hubs offer business opportunities. To capitalize on these

opportunities, the Hubs serve not only as sustainable production facilities, but also as training sites especially in the food desert areas of Ward 7 and 8 where unemployment is high and food related public health problems including diabetes, hypertension and obesity are prevalent.

Among the eight wards in the District of Columbia, Ward 8 is the most underserved and is located in the southeastern quadrant of Washington, D.C., south of the Anacostia River. The average household income in Ward 8 is \$48,000 and unemployment is 24 percent. This compares to an average household income of \$99,500 across all eight of the DC Wards and to an average \$162,000 per household in Ward 3, which is home to the highest household incomes in the District of Columbia. 20 percent of the population in Ward 8 is under the age of 18; and 91 percent are African American, 1.5 percent are Hispanic, slightly more than 4 percent are Caucasian, and less than 1 percent are Asian. The percentage of college graduates in Ward 8 is 7.6 percent compared to an average 22.5 percent across all eight Wards.

### **Research**

**Promoting Sustainability: Growing Nutrient Dense Rice Using Drip Fertigation and Biodegradable Mulch**  
Rice is a staple crop of many cultures around the world. Traditional methods of growing rice have proven unsustainable in the face of growing water scarcity, environmental degradation, and shifting ecosystems. Flooded rice paddies are a major source of methane from anaerobic organisms. The average size of a rice farm in America is over 450 acres and growing. According to a study by the Lower Colorado River Authority (LCRM), rice growers in Texas used three times the amount of water as the entire city of Austin in 2012 (Henry, Terrence 2012). This research proposal designs an experiment to test sustainable models of rice production involving reduced water usage while promoting small-scale intensive practices that reduce environmental impacts. Developing methods that make growing rice an economically viable option for farmers and consumers is an important component of sustainability. Various drip irrigation and fertigation methods with biodegradable mulch to control weeds will be tested to increase rice nutrient density and profitability while maintaining the environment.

Our goal is to contribute to the momentum of small-scale rice production by increasing viable options for farmers. As small scale processing equipment becomes more accessible, the capability of growing rice and other small grains, which have been the base of humanity's food security, should be in the hands of small farmers to insure a sustainable future. Our future depends on creating models of adaptability. Putting grain production into the hands of the small farmer is a step in the right direction.

We are focused on the small farmers and food producers in the Washington Metropolitan area interested in rice production in urban agriculture. We intend to present preliminary findings to local small farm conferences and workshops.

### **Ethnic and Specialty Crops Development Program**

The Ethnic and Specialty Crops Development Program consists of providing training and technical guidance in sustainable agriculture to the area's growing number of urban farmers, immigrants, beginner farmers, community gardeners whose access to extension services is very limited, especially in the production of Ethnic and Specialty Crops.

The program has two key components: establishment of demonstration plot for sustainable urban agriculture and the production of instructional material on the Ethnic and Specialty Crops, especially from tropical geographic areas. In addition to building infrastructure for effective sustainable urban food production training, the program focuses on outreach and education of the communities of all stakeholders in the food system.

Furthermore, the program represents great opportunities for the practice of sustainable urban agriculture in the Washington Metro Area, particularly for new products such as the African Ethnic and Specialty crops. A demonstration plot for Ethnic and Specialty Crops production constitutes an important part of the infrastructure to serve the growing number of individuals, Ag service providers and institutions interested in ethnic and specialty crops. Lack of access to extension services, especially for new urban farmers and community gardeners constitutes a major constraint in the production of healthy and fresh produce in the Washington Metro Area.

The program also provided hands-on training in ethnic and specialty crop production from land preparation to harvest and post-harvest processes.

From farm to table, these new crops often require special attention in the methods of seedling, planting,

pest management, processing and packaging and seed saving. In addition, a SARE Urban Food Producers Training Manual is under review. We also developed an Ethnic Crops Nutritional Value Information Guide. A survey was conducted to determine the availability of Ethnic foods in the Asian and Latino communities.

A stakeholder's words of appreciation follow:

"I have taken this opportunity on behalf of the Council of Elders and Community Leaders, to express our appreciation to Mr. Yao Afantchao for the excellent and outstanding job. Mr. Yao Afantchao as a Community Educator, Ethnic and Specialty Crops Program, continues to have outreach programs with educative demonstrations of improved ethnic foods production and utilization in our communities in 2014. As leaders and members of the Universal Evangelical Church and the Immigrant Ministry Network we shall work with you and the University of the District of Columbia for education, growth, faith and human development and promote knowledge in nutrition and total well-being of people in the colleges, churches and community.

Accept our profound gratitude and appreciation.

Thank you so much."

Dr. Peter Etse Agbelie, Pastor, Community Counselor, and Director of Mission for Empowerment Aquaponics System and Crop Production at Muirkirk Research Farm

An aquaponics system is a process of growing fish in a tank. Aquaculture is known as fish or shellfish farming that refers to breeding, rearing and harvesting of plants and animals in all types of water environment including ponds, rivers, lakes and ocean. Aquaculture includes the production of seafood from hatchery fish to shellfish which are grown to market size in tanks, ponds, cages and raceways. It also includes productions of ornamental fish for the Aquarian trade and growing plant species used in range of food, and pharmaceutical, nutritional, and biotechnology products. If you connect the fish tank water (fish waste) to water a hydroponics system, plants get an automatic food supply of almost everything they need to grow from the fish water and in turn the plants filter the water for the fish. The fish waste from the tank helps to grow different vegetables and/or crops organically. Plants grow fast because they get rich alive nutrients.

We have implemented aquaponics systems in two greenhouse facilities at the Muirkirk Research Farm. There are two 500 gallon water tanks in each greenhouse. The farm grows Tilapia species. Demonstration activities were conducted with stakeholders to include a crop harvest festival day at the farm where more than 300 pounds of fish were harvested. We will continue investigations and experiments on crop production infrastructure and maintenance on this sustainable method of food production for the District of Columbia and other urban areas.

**Crop Production in Aquaponics System**

Raised beds and pots with rocks/pebbles were prepared in the Aquaponics system in one of our hoop houses. Different crops were planted in raised beds and in pots filled with rocks for demonstration. Fish waste was used to water and grow the crops. Vegetable seedlings planted in the raised bed (soil) performed much better than the vegetables planted in the pots filled with small rock/pebbles. Tomatoes, peppers, huckleberries, and water leaf were planted during the summer season and Mustard Greens, Tatsoi, and Collard Greens were planted in Fall season.

**Beekeeping Trials**

Six beehives were installed for demonstration and research at the farm this year. Among six hives three of them are large, two are medium sized, and one is a small . The focus this year was establish the colony and in the future to use the hives as an educational and research tool.

**Farm Improvements**

During the reporting period, we have worked diligently and purposely to continue to build capacity for expanded research in aquaponics, sustainable agriculture, ethnic crops and specialty crops at our research farm in Beltsville, MD. Specifically, our farm research expansion efforts included the installation of aquaponics facilities, hoop houses, solar well for drip irrigation, trailer for hydroponics, power generators, and refrigeration rooms. At Muirkirk Research Farm, our goal is to research and test techniques in sustainable and organic agriculture and apply them to an urban agricultural setting.

**Extension**

From consuming produce that is tastier and higher in nutritional value to decreasing CO2 emissions by harvesting as locally as your backyard, District residents are all "a buzz" about the many benefits of local food production. Urban agriculture has caught on, and unlike large-scale intensive agriculture operations, urban agriculture utilizes comparatively smaller spaces while focusing on diversified, edible crops. Many residents already subsidize what they buy at the grocery store through community garden plots and by growing in their backyards, yet are in need of technical assistance with issues ranging from cultivar selection and planting dates to fertilizing, soil contamination, and integrated pest management. Alternately, other District residents don't have access to grocery stores, let alone yard space or a nearby community garden in which they can grow their own food.

#### Urban Gardening

The Cooperative Extension Service works with District residents on both ends of the spectrum. We provide technical assistance to the established gardeners, and also help the up and coming gardeners start their own gardens by providing free consultation, connecting them with available resources, providing technical assistance, and--when called for-- by helping them "dig in." Some of the activities for fiscal year 2014 include offering workshops; demonstrations; site visits; presentations and providing technical assistance to District residents through phone, email, and in-person consultations.

In fiscal year 2014, we partnered with the District Department of the Environment to submit a proposal to the Sustainable DC Budget Challenge and were awarded \$121,500 to build a native plant nursery that will provide plants for local habitat restoration following invasive plant management, as well as to provide training and education to the public. The grant will fund a greenhouse and shade structures for native plant propagation and production at UDC's Bertie Backus campus near the Fort Totten Metro stop.

As a result of the soil sampling services offered, a District resident discovered their soil was highly contaminated with lead. With this knowledge, they were able to take the necessary precautions and preventative measures to minimize their chance of lead exposure.

#### DC Master Gardener Program

The DC Master Gardener Program is designed to train volunteer horticultural educators for the University of the District of Columbia Extension, the principal outreach education unit of the University of the District of Columbia. Participants receive 50 hours of basic horticulture training and then agree to work in their communities to teach District of Columbia Residents how to cultivate garden spaces and manage landscapes sustainably using research-based information. This environmental horticulture approach reduces fertilizer and pesticide use resulting in improved soil and water quality. There are several program benefits for communities to include:

- Creating a healthier environment by reducing fertilizer runoff into our watersheds and the Bay
- Saving money and reducing health risks by minimizing use of toxic pesticides
- Improving soils and saving landfill space by composting yard waste
- Reducing water use through horticultural practices
- Creating beautiful and ecologically sound landscapes for local conditions
- Learning ways to provide habitat for native wildlife and beneficial insects
- Teaching the benefits of home food production and developing skills and knowledge in growing food, managing community gardens, or contributing to food banks or kitchens

In FY 14, 276 (which includes 40 trainees) Master Gardeners and Trainees provided 13,000 hours of horticultural expertise to the District of Columbia. The value of volunteer time is \$38.69 per hour according to [www.independentsector.org](http://www.independentsector.org) with a total value of \$502,970 in savings to the District of Columbia. In addition, 73,478 direct contacts were served by the Master Gardeners/Trainees and their Coordinator/Extension Agent. Forty (40) Master Gardener Trainees completed 50 hours of basic horticulture training, a final exam and 50 hours of volunteer hours. Various Master Gardener projects through all eight wards have been established which includes schools, parks, beautification projects, landscape design, youth gardens, local and national botanical gardens, and partnerships with non-profit organizations. Several new projects were initiated and here are the highlights and success stories:

- Through a partnership with Bayer CropScience Bee Care Program and Seed Public Charter School in Ward 8, a pollinator garden was designed and installed. This project cost a total of \$22,000. With the in

kind donations of volunteer hours, discount of plant materials and hard goods totaling 15,000, this brought a significant savings. The total cost was reduced to \$7,000.

- The Masters Gardeners partnered with the organic garden at THEARC. This project operates as a community project of Building Bridges Across the River developed with THEARC partners to serve as a tool to educate THEARC community about nutrition and healthy eating. The market operation develops entrepreneurial skills in the youth of Ward 8, while exposing them to employment opportunities in the fields of agriculture, business and culinary arts.

- 1/3 of Master Gardeners continue their education in horticulture related field and obtain employment.
- 2000 pounds of produce was donated to soup kitchens.

### **3. Health, Nutrition and Childhood Obesity Prevention**

#### **Research**

##### **Changing the Health Trajectory for Older Adults through Effective Diet and Activity**

This multi-state research project was completed in FY 14. The goals of this project were (1) to design and implement intervention strategies that will increase fruit, vegetable, and whole grain consumption in multicultural elderly individuals in the District of Columbia who have been identified as low consumers of these foods; and (2) to publish a culturally based recipe book that contains traditional recipes provided by participants, with modified ingredients where necessary, to increase nutritional density. Specific accomplishments directly related to these goals include: (1) Comparisons of knowledge, priorities, and attitudes of high consumers of fruits, vegetable, and whole grain with low consumers; (2) Design and development of an educational curriculum to increase fruit, vegetable, and whole grain consumption in the elderly of the District of Columbia. This curriculum includes new and innovative fun filled games and activities through which nutrition education can be effectively rendered; and (3) Collection of original recipes that reflect the culture of individual participants; and the analysis and modification of these recipes to increase fruit, vegetable, and whole grain content and nutrient density.

The research provided opportunities to train students in designing fun filled nutrition education activities and Cognitive Complex skills. The Cognitive Complex Skills training presented a four-component instructional design model for the training that strengthened the skills that required variable performance over situations. The students were also provided skills in interviewing, food demonstration, cultural competency and oral communication.

##### **Developing Fuzzy-set-theory-based Data Mining Methodologies for Diabetes Data Analysis**

This research project was completed in FY 14. The overall goal of this interdisciplinary research was to develop a cloud computing based pathway analysis approach, CPA, to identify pathways that are associated with diabetes. This research was an extension of our former project "Developing Fuzzy-set-theory-based Data Mining Methodologies for Diabetes Data Analysis" (Oct. 2008~Sep.2011). Project objectives included: i) Design Cloud-computing based Pathway Analysis (CPA) to identify gene pathways that are significant in diabetes; ii) Implement CPA and test it on both synthetic datasets and real-world diabetes gene expression data; and iii) Compare the performance of CPA with existing approaches. The research is innovative because to the best of our knowledge, a cloud computing platform has not yet been used for gene pathway analysis. Thus, the advantage of using the latest technology to meet the challenges of gene pathway analysis has not yet been examined. The research was collaborative and interdisciplinary. The Principle Investigator, Dr. Liang, is a faculty member in the Department of Computer Science and Information Technology at UDC. She has been working in the field of biomedical data mining for the past few years and has also made many research contributions in the field of artificial intelligence, fuzzy logic and data mining. The PI built a multi-disciplinary team, which included a biologist, students in computer science and professionals in bioinformatics. Accomplishments follow:

1. Designed and implemented Cloud-computing-based Pathway Analysis (CPA)
2. Designed and implemented experiments to prove the effectiveness of CPA, which include:
  1. Experiments that investigate the improvement of performance of CPA over generations of the simulated pollution
  2. Experiments that compare our approach with its non-cloud computing counterpart to demonstrate the benefit of cloud computing

3. Developed a manuscript
4. Identified one gene pathway with 200+ genes. This pathway is currently being verified by a biologist through conducting literature search.

We will not be reporting on outputs and outcomes related to breast cancer under this planned program. The project has concluded and results were previously reported.

### **Extension**

In the District of Columbia, the percentage of low-income and minority children are on the rise. It was estimated in 2008 that 13.3% of low-income children aged 2-4 years was obese. Access to cost-affordable healthy foods and safe places to participate in physical activity are not sufficient in low-income neighborhoods. Therefore, daycare or school settings are efficient locations to reach these children and implement nutrition and physical activity into the curriculum for obesity prevention.

The Center for Nutrition, Diet and Health continues to do excellent work in the community. The Supplemental Nutrition Assistance Program-Education (SNAP-Ed) was reported on to the United States Department of Agriculture, Food and Nutrition Services, and the Expanded Food and Nutrition Education (EFNEP) was reported on to NIFA through the WEBNEERS website. In addition to these valuable services, we have mirrored some aspects of nutrition education under the SNAP-Ed and EFNEP programs, delivering the following programs and services to DC residents during the reporting cycle:

- Grocery Store Tours
- Fruit and Vegetable Prescription Program
- Farmers' Market Nutrition Education Program

### **Grocery Store Tours**

"Cooking Matters at the Store" is a CNDH nutrition education program. A nutrition specialist coordinates the program, conducting outreach in all eight Wards of the District, teaching different age groups how to better understand what they are eating and make smarter decisions. The specialist leads "grocery store tours," teaching participants how to shop healthy on a budget. These tours are conducted over a 12-week period in various grocery stores around the District, with an average of 5-10 participants per class. At the end of each tour, everyone receives a \$10 food shopping gift card to be used towards the purchase of healthy foods.

During these weekly, interactive grocery store classes, participants are taught how to read food labels, identify acceptable levels of salt and sugar in food, and understand if food is really as nutritious as advertised. The participants are part of a diabetes management group where learning how to eat healthy foods is vital for managing their disease. These classes are held in the typical grocery stores where participants would regularly shop for food. The focus is on helping participants to make small life changes that will more likely be sustained rather than a total change in diet that will be more difficult to maintain in the future.

"Cooking Matters at the Store" is funded by a grant from the **Share Our Strength** program, a national nonprofit that aims to end hunger in America by connecting people with the nutritious food they need to lead healthy, active lives. Program participants are organized through CNDH partners: Unity Clinics, DCPS community and parent outreach groups, Transition Housing Corporation, DC libraries, DCPS New Heights program and senior centers.

### **Fruit and Vegetable Prescription Program**

From its inception in 2011 with the pilot program consisting of 380 patients in six sites across four states, the success of the Fruit and Vegetable Prescription Program (FVRx) is quite evident, having expanded to twelve sites in seven states and Washington, D.C. in just one year. The program is a collaborative and integrative program through the "WeCan!" initiative where healthcare providers and farmers markets partner together to provide increased access to fresh fruits and vegetables, measuring the impacts of increased consumption among underserved community members.

Each week, FVRx participants receive prescriptions (that cover the cost) for fresh produce that they can redeem at local farmers markets, some of which can be found on site at the healthcare clinics. The idea is that the weight of a legitimate prescription by a healthcare practitioner, which also covers the cost of \$1 per day per family member (about \$120 per month), would incentivize participants and mitigate some of

the barriers to eating fresh fruits and vegetables.

We joined the partnership with Wholesome Waves, DC Greens and Unity Healthcare. Three members from CAUSES' Center for Nutrition, Diet and Health along with three students in the Nutrition and Food Science Program (NUFS) contribute to the fight against obesity and diet-related chronic disease by conducting monthly nutrition education and food demonstration activities that highlight fruits and vegetables that can be found at the local farmers markets.

With its significant and sustainable impact made visible by the increased consumption of fresh fruits and vegetables and reduction in BMI seen with patients, the FVRx program continues to grow.

#### **Farmers Markets, Nutrition Education and Food Demonstration**

The Center for Sustainable Development operates a local Farmers Market on Connecticut Ave. The market is an organized allocation of space for 10-12 independent farmers/vendors from the DC metro area. The market operated for a total of 27 Saturdays, May-November. Over 20,000 contacts were served through this venue.

Additionally, the Center partnered with Arcadia's mobile market to establish a business environment for two permanent markets in two food desert areas of the District.

UDC selected St. Elizabeth's Gateway Pavilion (Ward 8) and Providence Hospital (Ward 5) as locations for the two additional Mobile Market stops this season under its sponsorship. Both are located in USDA food deserts in predominantly low-income areas. Both are first-time locations for the Arcadia Mobile Market. Outside of the grant responsibilities, Arcadia makes an additional once monthly market stop at St. Elizabeth's Gateway, serving the same population and promoting the weekly UDC-sponsored market stops.

The Center for Nutrition, Diet and Health has a big presence at farmers markets around the District of Columbia. The Farmers Market Nutrition Education Program provides nutrition education at point-of-purchase for market goers. The program also provides on-site food demonstrations using fresh produce from the market, recipes and nutrition data for foods sold at markets. Food demonstrations and cooking activities provide interactive instruction on healthy cooking techniques, modifying favorite recipes to include healthier ingredients by reducing the sugar, sodium, and fat. Classes are open to the general public. This is a seasonal program/activity.

Chef Herb Holden also attends local farmers markets and conducts fresh food demonstrations including fruit and vegetable carvings to get children interested in eating healthier foods. In addition, he informs farmers market customers about that buying fruits and vegetables in season is cheaper and gives them information about how to preserve the produce out of the current season.

Food demonstrations provide interactive instruction on healthy cooking techniques, modifying favorite recipes to include healthier ingredients and a free sample. One of the unique concepts behind the market food demonstrations is that we use ingredients and produce from the market's vendors. Hence, a shopper is more likely to purchase the same ingredients directly from the market after tasting a sample. The chefs and educators also provide food safety education and health tips, and offers nutrition information and cooking tips to market shoppers.

According to USDA Agricultural Marketing Service, farmers markets are becoming fresh food mainstays for people across all socioeconomic, political and ethnic classifications. They serve as community anchors, promoting the regional economy and local farm businesses, increased access to fresh, nutritious food, and stronger social networks that help keep communities healthy. In addition to providing easier access to fresh food, studies show establishing a farmers' market can revitalize a neighborhood, enhance social interaction and provide a supplemental source of farm income for many growers. Farmers markets increase the availability of fresh fruits and vegetables for consumers and play an important role in combating childhood obesity.

There are outputs and outcomes that we will not be reporting on for this reporting period due to 1) project termination/completion in FY 13 for which we previously reported and 2) SNAP-Ed and EFNEP work that we have reported through another federal agency.

#### **4. Urban Families, Youth and Communities**

##### **Research**

The Five Pillars of Economic Development

Many underserved urban neighborhoods have been excluded from economic development success even in times of economic expansion. The challenges are exacerbated by the current economic stagnation. Yet economic development success is possible. The key lies in identifying viable initiatives that strengthen individual and community based assets and meet local needs.

Using a bottom-up approach that enables local residents to define and shape their own future, this research seeks to generate information about local needs and individual and community based assets in two Washington DC neighborhoods.

This research seeks to implement this bottom-up approach by using an innovative story writing process in two DC neighborhoods that represent different histories, economic conditions, and demographics within the greater metro area. The two story writing workshops will be structured around the five-pillar areas and will put on record a collective vision of success and prosperity 25 years into the future. This community based vision of economic development success will yield invaluable information about the aspirations and needs of local residents, demographic sub-groups (especially 16 to 25 year olds), and key stakeholders including the business community, financial institutions and lenders, service providers, the public sector and other relevant groups. Preparatory work for the two workshops will include the collection of indicators in the 'five pillar' areas and an inventory of past initiatives and organizations in the two selected neighborhoods.

The descriptive details that emerge from the story writing workshops will also identify further assessment needs and planning details that can close persistent information gaps and address coordination needs. Such follow-up efforts may include a neighborhood based skills and needs survey and the selection of suitable quality of life indicators that can serve as success measures to track progress toward the expressed vision of economic development success in the two neighborhoods.

The research project had to take a somewhat different direction than planned for this reporting period. Building on previous research using the "Five Pillars" approach, the intent was to address the economic development needs of the most underserved neighborhoods in the District of Columbia by generating micro-level data that can be used to identify viable development strategies that promise success even in lagging, and economically underdeveloped areas.

The proposed approach was to establish a steering committee that would assist the principle investigator in selecting two DC suitable neighborhoods and identify relevant stakeholders in each of the two neighborhoods to engage them in two storytelling workshops that would form the basis for the micro-data collection in each neighborhood. Each steering committee was to consist of five community leaders representing the broad scope of private, public, and non-profit sector organizations to provide guidance on the selection process of workshop participants and on the implementation process of the workshops. Unfortunately, the timing could not have been worse. Following the DC primary elections in the spring of 2014, it became evident that DC would face a change in leadership at the District level. Several community leaders who were approached to consider serving on the steering committee declined citing a high probability of impending changes in key agencies including the District Department of the Environment (DDOE) and the Department of Housing and Community Development (DHCD). The result was reluctance in selecting two suitable neighborhoods. In addition, initial investigations into the availability of disaggregated data at the neighborhood level or even the Ward level revealed a persistent lack of data. As a result, the initial phase of the project was modified to focus on identifying suitable indicators to represent the "five pillar" areas and collecting indicator data at the level of the eight (8) Wards that comprise the District of Columbia. A minimum of five indicators were selected in each of the five pillar categories (1) health, (2) education, (3) environmental quality, (4) social and cultural amenities, and (5) Information and Communication Technology (ICT). The five pillar areas thus focus not only on economic factors, but also on the social and environmental context conditions within which all economic development takes place. Given the lack of data and the lack of consistency in formatting and reporting it, the data collection was a necessary starting point for the research project. We expect to publish a "Five Pillars" report for Washington DC's eight Wards within the next three months. The report will serve as an important reference point for subsequent work on this project and will be patterned after a previous report by the PI (O'Hara and Vasquez 2007).

We anticipate that the selection of the project steering committee and the two underserved DC

neighborhoods will take place later this spring. The new mayor has already made several key appointments and additional ones are expected shortly. The collected data and forthcoming "Five Pillar" report will form an important reference point for the remaining project and the localized information and detailed local knowledge it requires.

The proposed story writing approach, in combination with the forthcoming "Five Pillars" report, can thus create much needed micro-data and qualitative context information that opens the planning and development process up to broad participation and community engagement.

This research was awarded late fiscal year 2014 and, as previously stated, has taken a slight change in direction. Thus, we will not be reporting outputs and outcomes for FY 14.

### **Extension**

#### **4-H and Youth Development**

4-H Clubs engage young people, ages five through nineteen, in developing knowledge, skills and attitudes that will enable them to become self-directing, responsible, productive citizens, and contributing members of society. The 4-H program educates youth in arts and sciences, health and fitness, science, technology, environmental science, math, sewing and fashion design, cooking and healthy eating and a host of other subject areas while encouraging fellowship and service opportunities. 4-H continues to develop new projects for its members to study beyond agriculture and animal husbandry, including photography, conservation, cooking, public speaking, various sports, history, art, and other pursuits.

In 2014, the Center for 4-H and Youth Development maintained 51 4-H clubs around the city. Clubs met weekly in schools and community settings. Sixteen clubs worked on STEM related projects. 9,695 youth were involved in our UDC 4-H program and 9,237 youth were reached through direct contact. We also implemented club activities with the 4-H LIFE Program, a family strengthening program for children with incarcerated parents. The Operation Military Kids program, a program to serve our children from military families, the Health Rocks program, a drug and tobacco use prevention program, and the LifeSmarts program, a program of the National Consumers League that teaches consumer preparedness and DC EnvironMentors Environmental Education program also served our 4-H population.

During the reporting period, there were activities through partnerships that included 100 4-Hers attending the 4-H 2014 National Youth Science Day & Activities, a Bully Prevention Summit hosting 240 youth lead by our DC 4-H Teen Council and monthly drill 4-H activities with our military youth on two installations.

A 4-H Pre-Deployment Event was held for children whose parents were being deployed from the District of Columbia National Guard. Parents were given registration packets for summer camp that would allow their children to attend free of charge and 4-Hers presented military children with Hero Packs. Hero Packs are book bags with gifts from the business community; handmade gifts from 4-Hers are placed inside. 400 youth participated in 4-H club activities and clubs in FY 2014. Participants attended the Samsung Summit at the National 4-H Council and the National Youth Science Day events. Also, they visited National Geographic and participated in weekly clubs and monthly activities while their parents attended drill programs. The clovers enjoyed projects around animal science and visited a petting farm where they fed and held animals.

During our spring break program, we hosted 29 4-H STEM campers for an overnight, four day, all tent camping program. The 4-Hers from Walker Jones Elementary school and our team of volunteers learned about a myriad of STEM topics that included making and setting off rockets, beekeeping and honey tasting, sustainability in agriculture, GIS/GPS technology from USDA 4-H leader Jim Kahler, nutrition and healthy eating, solar panels, and vertical gardens to name a few.

April is designated as "the month of the military child" and our 4-Hers in our military programs traveled to New York City where they visited the 911 memorial, Times Square, Statue of Liberty, museums, art galleries and many educational sites in and around the city. 4-H Film Spring Break Week at Brightwood hosted 12 youth for five days of program review and filming around the city. Through a partnership with the National Council for Science and the Environment, we partnered to host the EnvironMentors program and State Competition. Forty (40) youth were recruited for programming with a mentor that worked in the field of science. Participants were engaged in research and completing projects about the environment. They attended workshops and UDC professors provided information and guidance regarding the scientific method. 10 youth were in the final competition.

Through our LifeSmarts Competition, 17 teams of five youth (85) participated in the consumer education program. Teams met weekly learning about the environment, technology, legal rights and responsibilities, personal finance and health and safety. 11 teams moved forward to the state competition and five youth from McKinley Technical School represented us at the National LifeSmarts Competition in Orlando, Florida. During the summer camp day program, we hosted 40 4-Hers in the Marvin Gaye park area for four weeks of 4-H programming using 4-H curriculum.

Also, we partnered with First Tee, a golfing program for youth to provide golf lessons for our campers. Our USDA program leader, Jim Kahler came to the camp to impart GPS technology on our youth. With the mission of preparing youth to be leaders in the 4-H program, we hosted 20 youth for eight weeks of training about 4-H programs and engaged them in four weeks of work with our summer campers. In the fall of the year, we made back to school night presentations to schools and our homeschool youth resulting in 400 new youth signing up for 4-H. Our homeschool population at Joint Base Anacostia consists of 82 families.

Through our partnership with the Upward Bound program, we hosted 30 high school students for three science related workshops that included visits to both our water quality education lab and the UDC Muirkirk Farm. Youth in the 4-H International Program interacted with 4-Hers from Argentina, Liberia and Uruguay. They focused on learning about recycling; a topic area described by Liberia's 4-Hers as a major social issue for their country.

Students in the United States visited recycling centers and researched the recycling practices of China. This program is implemented through our partnership with the Microsoft Store in Arlington, Virginia. Microsoft provided technology training for the countries and they hosted the international session in their store. This partnership is so effective because SKYPE is owned by Microsoft and they were able to resolve connection concerns for our African 4-Hers. 60 youth participated in the UDC 4-H international program during the school day, logging 152 hours of training and communication last year. 40 4-Hers from other programs also received technology and animation training from the Microsoft Center.

In September of 2014, a Health Rocks volunteer training was held hosting 24 participants. Those participants assisted us in educating 637 youth about the dangers of drugs and tobacco.

## **5. Sustainable Energy**

### **Research**

#### **Solar Wells as Alternative Source of Water Supply for Sustainable Food Production**

As the global population is increasing and climate change is threatening our environment as well as our economy, sufficient food production is the challenge of mankind in the 21st Century. The traditional fossil fuel based agriculture does not address climate change nor is sufficient to feed the future generation. In this project, we will assess the application of a solar system to access groundwater for food production uses, including irrigation, aquaponics, and hydroponic systems at the Muirkirk Agriculture Research Farm the University of the District of Columbia. An Integrated Distributive Utilities Network (IDUN) is currently being installed at the Research Farm.

The project involves combining renewable energy sources (solar) to produce power (electricity), extract groundwater and store into a cistern reservoir at above ground for further uses. The reservoir will be connected to "smart" irrigation systems that will be powered by solar energy. The effectiveness of the proposed technology to the sustainable urban agriculture research programs of the University of DC at the Muirkirk Research Farm will be assessed. Current sustainable agriculture projects include hydroponic, aquaponics, specialty and ethnic vegetables and fruits production and urban forestry. Data will be collected for feasibility study of the IDUN that will support the design and installation of similar Solar Well Systems (SWS) as alternative source of Water Supply for irrigation and other purposes, including drinking water during emergency in the event of a catastrophic contamination of the current sources of surface water for potable supply.

The current project provides a solar-powered "smart" irrigation system using groundwater from a well. The objective of this project was to develop a system that will minimize the waste of water and use the exact water required by a given crop and the moisture of the soil. The project allows collecting data from a humidity, temperature and flow sensor, and soiling moisture sensor which will be sent wirelessly to a hub. The solar power system was successfully designed and built to satisfy the requirements of all the

equipment included in the project.

We will not report on outputs and outcomes pertaining to the Anaerobic Digester project under this planned program. The research has concluded and outcomes were previously reported.

**6. Food Safety**

**Research**

Soil Analysis for Trace Elements and Urban Gardening in the District of Columbia: Food Safety

As food security and global warming induces local food movement, urban gardening becomes popular in the densely populated cities like the District of Columbia. More neighborhoods start integrating urban gardens into their communities as well as their home yards. The available space for gardening in the urban set includes vacant lot and abandoned properties, which are potentially contaminated. As urban gardening become popular, the concern of food safety is also raised. Growing edible crops in a contaminated growing medium or soil with a high level of heavy metals such as Pb and Cd may pose risks to human health.

The goal of this study is to identify and quantify trace elements (Pb, As, Cd, Cr, Cu, Ni, Se and Zn) in the soil and products of home and community gardens, to include idle places that can potentially be used for urban gardening in the District. The objectives of this work are five-folds: (1) a background study for soil contamination and urban gardening in DC, (2) testing trace elements in the soil of home and community gardens, (3) geocoding soil test results, (4) assessment of potential accumulation of trace elements in different products that might grow on the contaminated sites, and (5) development of guidelines for best practices that reduce human exposure to high levels of metals.

During this reporting period, objective 1 through 3 were completed. Soil samples from home and community gardens in DC were collected and analyzed for nutrients and trace metals in the new UDC Environmental Quality Testing Laboratory. Trace metals were analyzed using Inductive Couple Plasma and Mass Spectrophotometer (ICP-MS). The soil test results were geo-mapped using ArcInfo 10.3. About 400 gardens received free soil quality testing services. Significant number of samples exceeded the EPA guidelines on Arsenic level, and excess in phosphorus level in both home and community gardens. The lab is currently in the process of seeking certificatoin gthrought the EPA. The site visit is scheduled April 21 and 22, 2015.

This research project is interdisciplinary as it encompasses soil chemistry, plant sciences, nutrition, food safety, computer science, agronomy, soil sciences and geographic information system, and as such it will benefit the DC urban gardeners in proving free soil quality testing services, the UDC's students and researchers in training them on state-of-the-art sample collection, preparation and analysis using high-end lab technologies, as well as providing support to the mission of sustainable DC. Furthermore, the outcome of this work will also be applied to write a bigger grant proposal.

**Extension**

The Center for Nutrition, Diet and Health continues its work of educating and certifying food handlers from government and industry in the District of Columbia. Program outcomes and statistics have been previously reported to designated grantor agency.

**Total Actual Amount of professional FTEs/SYs for this State**

Year: 2014	Extension		Research	
	1862	1890	1862	1890
Plan	43.0	0.0	10.0	0.0
Actual	23.7	0.0	15.1	0.0

## **II. Merit Review Process**

### **1. The Merit Review Process that was Employed for this year**

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

### **2. Brief Explanation**

We have established a Merit Review Process for research/extension in Land Grant Programs that continues to work well at ensuring that research proposals are judged fairly and on their merit. For Hatch and Mini-grants offered through the Station, the process includes: the Development of a RFP; Solicitation of RFP; Receipt of Proposals; Review of Proposal Packets for Completion of Requirements; Peer Review; Director's Review; Completion of Required Forms for submission to USDA; Electronic Submission to USDA for expert panel review; USDA Approval; and Issuance of Award. The Peer Review panel includes representatives from various departments/schools across the University. Research projects are often joint ventures, conducted by faculty as well as qualified research and extension staff.

The Peer Review Committee assesses our program's proposed research/extension projects and activities based on the following criteria:

- 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

All research/extension projects are monitored by the Director and Associate Director to ensure that objectives and timelines are being met. An annual progress report is required and is reviewed by the Station Director prior to electronic submission to USDA. All projects must include student learning experiences. Findings are published in refereed journals, posters are developed and presented at conferences, and fact sheets or Information Documents are prepared and distributed to stakeholders. Students participate in conference presentations as well as research seminars.

CAUSES has an Advisory Board comprised of community stakeholders from various industry and public sector areas including environmental science, business/finance, public administration, counseling, water resources management, marine science, engineering, and computer science.

## **III. Stakeholder Input**

### **1. Actions taken to seek stakeholder input that encouraged 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.**

Stakeholder input was sought from program and group participants, individuals, community partners, and faith-based organizations. Particular focus continues on the underrepresented wards of the city, Wards 7 and 8. These are largely low income communities, characterized by extensive food desserts, high unemployment, high school dropout rates and other significant challenges. We have reached out to seniors, youth, single mothers, ministers, community advocates, working class and middle class residents. Additionally, stakeholder input is sought at both research and extension activities such as the Farmers' Market, workshops, seminars, and demonstrations throughout the eight wards of the District. We let our stakeholders know that their input is essential to the research conducted and outreach services provided to benefit them, their families, and communities within the District of Columbia. We encourage their input via stakeholder surveys; follow up interviews, and one on one dialogue.

**2(A). A brief statement of the process that was 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.**

Our objective is to meet with residents and organizations across the eight wards of the District. Currently, our focus is on the underserved population of the city, residents residing in Wards 7 and 8. A large segment of this population is low income residents with many households lead by a single parent or, in some cases, a grandparent(s). Research and Extension, separately as well as jointly, host a number of activities during the year to include workshops, seminars, demonstrations, training sessions, and an annual Farmer's Market on the University's main campus. At these events, stakeholder surveys are administered to willing participants and collected for assessment.

**2(B). A brief statement of the process that was 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.**

Our objective is to meet with residents and organizations across the eight wards of the District. Currently, our focus is on the underserved population of the city, residents residing in Wards 7 and 8. A large segment of this population is low income residents with many households lead by a single parent or, in some cases, a grandparent(s). Research and Extension, separately as well as jointly, host a number of activities during the year to include workshops, seminars, demonstrations, training sessions, and an annual Farmer's Market on the University's main campus. At these events, stakeholder surveys are administered to willing participants and collected for assessment.

**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.**

The input that we received from our stakeholders was reviewed and assessed by research and extension administrators. We determined that we are addressing many of the issues/concerns identified by stakeholders. However, there are areas that we have not yet tapped. Program modifications will be considered and are contingent upon budget and personnel allocations. We are keenly aware of our responsibility to address critical issues relating to social, economic and environmental conditions of our stakeholders. Administrators are carefully reviewing and thoughtfully updating our Plan of Work. Our objective is to serve our residents to the best of our ability based on resources available to support our programs.

**Brief Explanation of what you learned from your Stakeholders**

We find that stakeholders concerns remain pretty consistent. Most want to have a good health and improved quality of life for themselves and families. Issues and topics of concern include the following:

- Safety of Foods: Growth, storage, and preparation of foods
- Economic Development: Jobs, training, sustainable neighborhoods
- Obesity: Healthy children and adults; Prevention of Chronic Illnesses; Healthy Eating; Activities for Children
- Urban Gardening: Growing their own food; exposure to different types of food, including ethnic crops and organic foods
- Healthy Food Choices: Eating better for better health and longevity
- Healthy Lifestyles: youth activities related to physical fitness and proper nutrition
- Sustainable energy: continued availability of resources for themselves, their children and generations to come

**IV. Expenditure Summary**

<b>1. Total Actual Formula dollars Allocated (prepopulated from C-REEMS)</b>			
<b>Extension</b>		<b>Research</b>	
<b>Smith-Lever 3b &amp; 3c</b>	<b>1890 Extension</b>	<b>Hatch</b>	<b>Evans-Allen</b>
1180960	0	908844	0

<b>2. Totaled Actual dollars from Planned Programs Inputs</b>				
	<b>Extension</b>		<b>Research</b>	
	<b>Smith-Lever 3b &amp; 3c</b>	<b>1890 Extension</b>	<b>Hatch</b>	<b>Evans-Allen</b>
<b>Actual Formula</b>	839536	0	651931	0
<b>Actual Matching</b>	752399	0	790931	0
<b>Actual All Other</b>	348948	0	15000	0
<b>Total Actual Expended</b>	1940883	0	1457862	0

<b>3. Amount of Above Actual Formula Dollars Expended which comes from Carryover funds from previous</b>				
<b>Carryover</b>	87137	0	68944	0

**V. Planned Program Table of Content**

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

**V(A). Planned Program (Summary)**

**Program # 1**

**1. Name of the Planned Program**

Climate Change

Reporting on this Program

**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%		70%	
111	Conservation and Efficient Use of Water	20%		0%	
112	Watershed Protection and Management	20%		15%	
124	Urban Forestry	20%		15%	
141	Air Resource Protection and Management	10%		0%	
806	Youth Development	10%		0%	
	<b>Total</b>	100%		100%	

**V(C). Planned Program (Inputs)**

1. Actual amount of FTE/SYs expended this Program

Year: 2014	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	3.0	0.0	1.0	0.0
<b>Actual Paid</b>	2.9	0.0	4.0	0.0
<b>Actual Volunteer</b>	141.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
107887	0	155518	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
107887	0	211446	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

**V(D). Planned Program (Activity)**

**1. Brief description of the Activity**

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

**2. Brief description of the target 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

**3. How was eXtension used?**

eXtension was not used in this program.

**V(E). Planned Program (Outputs)**

**1. Standard output measures**

2014	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	25286	52198	30	0

**2. Number of Patent Applications Submitted (Standard Research Output)**

**Patent Applications Submitted**

Year: 2014  
 Actual: 0

**Patents listed**

**3. Publications (Standard General Output Measure)**

**Number of Peer Reviewed Publications**

<b>2014</b>	<b>Extension</b>	<b>Research</b>	<b>Total</b>
<b>Actual</b>	0	0	0

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- Number of articles published

<b>Year</b>	<b>Actual</b>
2014	16

**Output #2**

**Output Measure**

- Number of fact sheets published

<b>Year</b>	<b>Actual</b>
2014	43

**Output #3**

**Output Measure**

- Number of newsletter published

<b>Year</b>	<b>Actual</b>
2014	10

**Output #4**

**Output Measure**

- Number of workshops, demonstrations and technical assistance implemented.

<b>Year</b>	<b>Actual</b>
2014	107

**Output #5**

**Output Measure**

- Number of research projects completed  
Not reporting on this Output for this Annual Report

**Output #6**

**Output Measure**

- Number of soil, air and water samples test results

<b>Year</b>	<b>Actual</b>
2014	93

**Output #7**

**Output Measure**

- Number of informational materials distributed

<b>Year</b>	<b>Actual</b>
2014	49836

**Output #8**

**Output Measure**

- Number of conference presentations

<b>Year</b>	<b>Actual</b>
2014	0

**V(G). State Defined Outcomes**

**V. State Defined Outcomes Table of Content**

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 Measures**

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

### **2. Associated Institution Types**

- 1862 Extension

### **3a. Outcome Type:**

Change in Knowledge Outcome Measure

### **3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2014	75

### **3c. Qualitative Outcome or Impact Statement**

#### **Issue (Who cares and Why)**

Invasive species plants are recognized as one of the greatest threats to wildlife and natural ecosystems. They compete with native plants for limited natural resources such as water, sunlight, nutrients and habitat, crowding out and displacing the desirable native vegetation, thereby reducing overall biodiversity. This upset to the ecological balance is felt throughout the ecosystem as those species who are dependent on those native plants for their diet and habitat are no longer able to survive in the locale without them.

#### **What has been done**

Classes were conducted to introduce participants with the overarching concept of invasive species, discussing the qualifying criteria established by the National Invasive Species Council, the negative impact invasive plants have on the economy, the environment and human health, and how we aid their spread. The classes focused on approximately 10 invasive plants that are common in the District that can be removed fairly easily and effectively by manual and mechanical means. Participants learned identification and phenology of these plants using photographs and live samples, followed by information about various invasive plant management methods (manual, mechanical, chemical and biological controls). The concept of early detection rapid response (EDRR) was taught, and approximately eight EDRR plants were presented that are either heading towards DC, or that are actively escaping cultivation and naturalizing in DC parklands.

#### **Results**

A survey designed to evaluate measurable outcomes as a result of class participation was completed by 78 class participants. 96% reported that the class successfully explained what made species invasive and had a better understanding of why invasives are a problem as a result of the class, while 85% learned that a species they were already familiar with was actually invasive. Ninety-five percent of participants planned to share their learned invasive plant

information with others, 94% reported they would not purposefully install an invasive plant into their landscape, and 96% stated they would actively remove invasive plants if given the chance.

#### 4. Associated Knowledge Areas

<b>KA Code</b>	<b>Knowledge Area</b>
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

#### Outcome #2

##### 1. Outcome Measures

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

##### 2. Associated Institution Types

- 1862 Extension

##### 3a. Outcome Type:

Change in Action Outcome Measure

##### 3b. Quantitative Outcome

<b>Year</b>	<b>Actual</b>
2014	105

##### 3c. Qualitative Outcome or Impact Statement

###### **Issue (Who cares and Why)**

There is a need to restore natural habitats and ecosystems and to protect biodiversity by working to eliminate invasive plants in DC through a coordinated effort across political and ecological boundaries.

###### **What has been done**

Six invasive plant management events were held to assist with invasive species removal on District of Columbia public land spaces.

###### **Results**

105 volunteers attended six invasive plant management work days, donating a total of 19

volunteer hours, demonstrating a change in behavior, and resulting in a corresponding change of condition in the parklands in which volunteering took place. The volunteer hours are valued at \$77,186, according to independentsector.org. In total, invasive plants were managed on 5.56 acres of parkland in the District.

#### 4. Associated Knowledge Areas

KA Code	Knowledge Area
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

#### Outcome #3

##### 1. Outcome Measures

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

Not Reporting on this Outcome Measure

#### V(H). Planned Program (External Factors)

##### External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Populations changes (immigration, new cultural groupings, etc.)

##### Brief Explanation

#### V(I). Planned Program (Evaluation Studies)

##### Evaluation Results

Two research projects were added in late fiscal year 2014. Preliminary work was completed. We expect to report impacts for the FY 15 report. Our work with invasive species continues to produce positive impacts. With an increase in knowledge, participants have taken action to volunteer efforts to remove invasive species in the District of Columbia. This action has improved the environment in DC parklands and resulted in labor savings for the city.

##### Key Items of Evaluation

**V(A). Planned Program (Summary)**

**Program # 2**

**1. Name of the Planned Program**

Health, Nutrition and Childhood Obesity Prevention

Reporting on this Program

**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	100%		50%	
901	Program and Project Design, and Statistics	0%		50%	
	<b>Total</b>	100%		100%	

**V(C). Planned Program (Inputs)**

1. Actual amount of FTE/SYs expended this Program

Year: 2014	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	12.0	0.0	3.0	0.0
<b>Actual Paid</b>	2.7	0.0	3.8	0.0
<b>Actual Volunteer</b>	0.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
112948	0	221708	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
112948	0	196447	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

**V(D). Planned Program (Activity)**

1. Brief description of the Activity

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.

Extension:

- Grocery Store Tours
- Famers Market Education
- Food Demonstrations

**2. Brief description of the target audience**

- 1) Adult men and women over the age of 65 who live in Metropolitan Washington, DC
- 2) Children 2 -5 years of age
- 3) Researchers/Biologists
- 4) Adults who are responsible for planning and preparing the family's food with emphasis on households with young children
- 5) General public - Youth, individuals, and families

**3. How was eXtension used?**

eXtension was not used in this program

**V(E). Planned Program (Outputs)**

**1. Standard output measures**

2014	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	2773	0	0	0

**2. Number of Patent Applications Submitted (Standard Research Output)**

**Patent Applications Submitted**

Year: 2014  
 Actual: 0

**Patents listed**

**3. Publications (Standard General Output Measure)**

**Number of Peer Reviewed Publications**

2014	Extension	Research	Total
Actual	0	1	0

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- Curriculum developed for various workshops, fact sheets for nutrition education for teachers.  
Not reporting on this Output for this Annual Report

**Output #2**

**Output Measure**

- 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  
Not reporting on this Output for this Annual Report

**Output #3**

**Output Measure**

- Assess four day food diary data for the number of portions of fruits and vegetables for registered participants  
Not reporting on this Output for this Annual Report

**Output #4**

**Output Measure**

- 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.  
Not reporting on this Output for this Annual Report

**Output #5**

**Output Measure**

- Design and implement educational classes to assist registered participants with improving consumption of fruits and vegetables  
Not reporting on this Output for this Annual Report

**Output #6**

**Output Measure**

- Youth and adults will receive direct basic nutrition and food safety education

<b>Year</b>	<b>Actual</b>
2014	7500

**Output #7**

**Output Measure**

- Youth and adults will receive direct education on health issues and direct education and demonstration on physical activity  
Not reporting on this Output for this Annual Report

**Output #8**

**Output Measure**

- Development of a manuscript for the publication of data on the mechanisms of action of g-T3 on MCF-7 breast cancer cells.  
Not reporting on this Output for this Annual Report

**Output #9**

**Output Measure**

- Employ microarray experiments and a range of cellular and molecular biological techniques to determine the molecular basis of the action of y-T3.  
Not reporting on this Output for this Annual Report

**Output #10**

**Output Measure**

- Design and completion of recipe book for participants, seniors over the age of 60, with original and modified versions

<b>Year</b>	<b>Actual</b>
2014	1

**V(G). State Defined Outcomes**

**V. State Defined Outcomes Table of Content**

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 Measures**

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

Not Reporting on this Outcome Measure

**Outcome #2**

**1. Outcome Measures**

Percentage of participants who improved eating habits.

**2. Associated Institution Types**

- 1862 Extension

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2014	7500

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

According to the National Health and Nutrition Examination Survey (NHANES), one in two adults and one in three children are considered overweight or obese. When examining just the 2-5 year olds, about 11% of children ages 2-5 years of age are considered overweight or obese. These numbers reflect the obesity epidemic which affects millions of Americans on a daily basis. By utilizing qualified registered dietitians and nutritionists, the District of Columbia Cooperative Extension Service, Center for Nutrition, Diet and Health is effective in providing ongoing nutrition education to the residents of the District of Columbia.

**What has been done**

Several programs were implemented: Cooking Matters at the Store teaches different age groups how to better understand what they are eating and make smarter decisions. Grocery Store Tours teaches participants how to shop healthy on a budget. The Fruits and Vegetable Prescription (FVRx) Program is a collaborative and integrative program through the WeCan! initiative where healthcare providers and farmers markets partner together to provide increased access to fresh fruits and vegetables, measuring the impacts of increased consumption among underserved community members.

**Results**

Approximately 300 individuals participated in the grocery Store Tours. One stakeholder/participant commented: I really like coming to these classes. They are educational but also fun. And, I like learning about food! A retrospective survey revealed that the farmers had a significant increase in sales of fresh fruits and vegetables when the chef conducted the food demonstrations at point of purchase at the markets. The recipes became very popular and market goers purchased the ingredients to prepare the recipes at home. The FVRx program's significant and sustainable impact was made visible by the increased consumption of fresh fruits and vegetables and reduction in BMI seen with patients at the clinics. The FVRx program continues to grow.

#### 4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior

#### Outcome #3

##### 1. Outcome Measures

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

Not Reporting on this Outcome Measure

#### Outcome #4

##### 1. Outcome Measures

Number of participants who increased physical activity and experienced weightloss

Not Reporting on this Outcome Measure

#### Outcome #5

##### 1. Outcome Measures

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

Not Reporting on this Outcome Measure

#### Outcome #6

##### 1. Outcome Measures

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

Not Reporting on this Outcome Measure

## **Outcome #7**

### **1. Outcome Measures**

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

Not Reporting on this Outcome Measure

### **V(H). Planned Program (External Factors)**

#### **External factors which affected outcomes**

- Other (Family and Social Support)

#### **Brief Explanation**

The goals of the programs were met. However, a greater number of low-income, limited resource individuals and families need the programs. The programs results are limited by lack of additional financial resources.

### **V(I). Planned Program (Evaluation Studies)**

#### **Evaluation Results**

Increased consumption of fruits and vegetables.  
Increase knowledge in food safety  
Reduction in BMI  
Greater collaboration through partnerships.  
Two research projects under this planned program concluded this fiscal year.

#### **Key Items of Evaluation**

Increase in consumption of fruits and vegetables.  
Greater interest in healthy cooking.  
Interest in fresh local foods.

**V(A). Planned Program (Summary)**

**Program # 3**

**1. Name of the Planned Program**

Global Food Security and Hunger

Reporting on this Program

**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	100%		100%	
	<b>Total</b>	100%		100%	

**V(C). Planned Program (Inputs)**

1. Actual amount of FTE/SYs expended this Program

Year: 2014	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	5.0	0.0	2.0	0.0
<b>Actual Paid</b>	6.0	0.0	2.0	0.0
<b>Actual Volunteer</b>	2526.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
337622	0	72605	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
250485	0	94342	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
87798	0	15000	0

**V(D). Planned Program (Activity)**

1. Brief description of the Activity

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;
6. Maintain Junior and Master Gardening certification; trained gardeners will participate in beautifying the city through volunteer hours; and
7. Strengthen Ethnic and Specialty Crop Program.

**2. Brief description of the target 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

**3. How was eXtension used?**

eXtension was not used in this program

**V(E). Planned Program (Outputs)**

**1. Standard output measures**

2014	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	67890	130803	193	0

**2. Number of Patent Applications Submitted (Standard Research Output)**

**Patent Applications Submitted**

Year: 2014  
 Actual: 0

**Patents listed**

**3. Publications (Standard General Output Measure)**

**Number of Peer Reviewed Publications**

<b>2014</b>	<b>Extension</b>	<b>Research</b>	<b>Total</b>
<b>Actual</b>	0	0	0

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- Number of articles published

<b>Year</b>	<b>Actual</b>
2014	3

**Output #2**

**Output Measure**

- Number of fact sheets published

<b>Year</b>	<b>Actual</b>
2014	1

**Output #3**

**Output Measure**

- Number of Newsletters published

<b>Year</b>	<b>Actual</b>
2014	0

**Output #4**

**Output Measure**

- Number of workshops, demonstrations and technical assistance implemented.

<b>Year</b>	<b>Actual</b>
2014	64

**Output #5**

**Output Measure**

- Number of research projects completed  
Not reporting on this Output for this Annual Report

**Output #6**

**Output Measure**

- Number of soil, plant and water samples test results

<b>Year</b>	<b>Actual</b>
2014	307

**Output #7**

**Output Measure**

- Number of informational materials distributed

<b>Year</b>	<b>Actual</b>
2014	13174

**Output #8**

**Output Measure**

- Number of conference presentations

<b>Year</b>	<b>Actual</b>
2014	4

**V(G). State Defined Outcomes**

**V. State Defined Outcomes Table of Content**

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 Measures**

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

### **2. Associated Institution Types**

- 1862 Extension
- 1862 Research

### **3a. Outcome Type:**

Change in Action Outcome Measure

### **3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2014	40

### **3c. Qualitative Outcome or Impact Statement**

#### **Issue (Who cares and Why)**

There is a public demand for unbiased horticultural and IPM education for sustainable landscapes and gardens and conservation of natural resources.

#### **What has been done**

The DC Master Gardener Program is designed to train volunteer horticultural educators for the University of the District of Columbia Extension- the principal outreach education unit of the University of the District of Columbia. Participants receive 50 hours of basic horticulture training and then agree to work in their communities to teach District of Columbia Residents how to cultivate garden spaces and manage landscapes sustainably using research-based information. This environmental horticulture approach reduces fertilizer and pesticide use resulting in improved soil and water quality.

#### **Results**

276 (which includes 40 trainees) Master Gardeners and Trainees provided 13,000 hours of horticultural expertise to the District of Columbia. The value of volunteer time is \$38.69 per hour according to [www.independentsector.org](http://www.independentsector.org) with a total value of \$502,970 in savings to the District of Columbia. In addition, 73,478 direct contacts were served by the Master Gardeners/Trainees and their Coordinator/Extension Agent. Forty (40) Master Gardener Trainees completed 50 hours of basic horticulture training, a final exam and 50 hours of volunteer hours. Various Master Gardener projects through all eight wards have been established which includes schools, parks, beautification projects, landscape design, youth gardens, local and national botanical gardens, and partnerships with non-profit organizations.

#### 4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships

##### Outcome #2

###### 1. Outcome Measures

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

Not Reporting on this Outcome Measure

##### Outcome #3

###### 1. Outcome Measures

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

Not Reporting on this Outcome Measure

##### Outcome #4

###### 1. Outcome Measures

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

###### 2. Associated Institution Types

- 1862 Extension

###### 3a. Outcome Type:

Change in Knowledge Outcome Measure

###### 3b. Quantitative Outcome

Year	Actual
2014	40

###### 3c. Qualitative Outcome or Impact Statement

###### **Issue (Who cares and Why)**

The Washington National Capital Area is home to 1.2 million foreign-born residents including up to 160,000 African born residents. This segment of the population shows great interest and demand for distinct dietary and culinary preferences, especially for ethnic and specialty crops.

The market for healthy vegetables and fruits remains characterized by low supply and high cost

for these home foods and fruits. There is a growing interest in the production of healthy foods by local area small farmers, immigrant farmers, community gardeners and other players in the supply chain.

#### **What has been done**

The Ethnic and Specialty Crops Development Program provided training and technical guidance in sustainable agriculture to urban farmers, immigrants, beginner farmers, and community gardeners in the area whose access to extension services is very limited, especially in the production of Ethnic and Specialty Crops. 40 trainees were provided with demonstration on various sustainable techniques and methods in ground preparation by plastic mulch to keep the moisture, compost production, seed germination, seedling production, best planting techniques and more. Trainees included urban farmers, community gardeners and agricultural service providers. They were introduced to best practices and innovative approaches on how to effectively use limited space in the food production by using farming processes such as hydroponic, aquaponics, tabletop container growing. An estimated 3500 lbs of food produced on the Sustainable Agriculture Research and Education demo plot was donated to institutions such as Bread for the City, D.C Central Kitchen and local immigrant churches.

#### **Results**

40 participants completed training. As a result of the training from the UDC-SARE project, trainers were able to share knowledge and information with more stakeholders. For example, John Manirakiza, who coordinates a Burundian immigrants farming project in Fredericksburg, Virginia, indicated that farmers plan to increase farm acreage from 2 to 5 acres, and raise the number of plant species from 5 to 15 in the coming season. Margaret Bidi, another trainee, who specializes in the distribution of Ethnic and Specialty foods, submitted a summary of her distribution activities which were strengthened by her participation in the SARE training program.

#### **4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
102	Soil, Plant, Water, Nutrient Relationships

#### **V(H). Planned Program (External Factors)**

##### **External factors which affected outcomes**

- Other (Wet conditions; insects)

##### **Brief Explanation**

Despite the prolonged wet season, the planting season began in June and most plants developed slowly with abundant fruit load but little off-shoot. Furthermore, insects such Colorado potato beetles, flea beetles, Japanese beetles created significant challenges to eggplant, hibiscus and jute leaf crops, but were finally managed with organic pest control measures. As a result, harvest was done relatively late, in September. For the future, an early planning period shall be considered on many of the specialty and ethnic crops. Finally, after harvest residues were chopped in and a winter cover of rye clover were planted. In 2015, the SARE plot will be expanded to a one acre plot.

#### **V(I). Planned Program (Evaluation Studies)**

## **Evaluation Results**

The research project added late fiscal year 2014 completed preliminary initiatives. We expect to report impacts in the next fiscal year report. Despite a late planting season, major milestones have been achieved and the SARE project has accomplished significant progress and promise to bring new opportunities for local communities.

## **Key Items of Evaluation**

**V(A). Planned Program (Summary)**

**Program # 4**

**1. Name of the Planned Program**

Sustainable Energy

Reporting on this Program

**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%		100%	
	<b>Total</b>	0%		100%	

**V(C). Planned Program (Inputs)**

1. Actual amount of FTE/SYs expended this Program

Year: 2014	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	3.0	0.0	2.0	0.0
<b>Actual Paid</b>	0.0	0.0	2.1	0.0
<b>Actual Volunteer</b>	0.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	0	77605	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	106342	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

**V(D). Planned Program (Activity)**

1. Brief description of the Activity

1) Assess the application of a solar system to access groundwater for food production uses, including

irrigation, aquaponics, and hydroponic systems at the Muirkirk Agriculture Research Farm, the University of the District of Columbia.

- 2) Install an Integrated Distributive Utilities Network (IDUN) at the Research Farm. T
- 3) Combine renewable energy sources (solar) to produce power (electricity), extract groundwater and store into a cistern reservoir at above ground for further uses.
- 4) Data collection for feasibility study of the IDUN that will support the design and installation of similar Solar Well Systems (SWS) as alternative source of Water Supply for irrigation and other purposes, including drinking water during emergency in the event of a catastrophic contamination of the current sources of surface water for potable supply.

**2. Brief description of the target audience**

DC Department of the Environment  
 Researchers  
 DC Public School students and teachers (Grades 9 and above)  
 UDC faculty and students  
 Community Stakeholders

**3. How was eXtension used?**

eXtension was not used in this program

**V(E). Planned Program (Outputs)**

**1. Standard output measures**

2014	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	0	0	0	0

**2. Number of Patent Applications Submitted (Standard Research Output)**

**Patent Applications Submitted**

Year: 2014  
 Actual: 0

**Patents listed**

**3. Publications (Standard General Output Measure)**

**Number of Peer Reviewed Publications**

2014	Extension	Research	Total
Actual	0	0	0

**V(F). State Defined Outputs**

**Output Target**

**Output #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.  
Not reporting on this Output for this Annual Report

**Output #2**

**Output Measure**

- 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.  
Not reporting on this Output for this Annual Report

**Output #3**

**Output Measure**

- Design and build of a solar power system required for research project.

Year	Actual
2014	1

**V(G). State Defined Outcomes**

**V. State Defined Outcomes Table of Content**

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 Measures**

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

Not Reporting on this Outcome Measure

### **Outcome #2**

#### **1. Outcome Measures**

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

Not Reporting on this Outcome Measure

### **V(H). Planned Program (External Factors)**

#### **External factors which affected outcomes**

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Government Regulations

#### **Brief Explanation**

### **V(I). Planned Program (Evaluation Studies)**

#### **Evaluation Results**

At the farm, the solar power system was successfully built and has given an innovative solution to the problems of water conservation and crop productivity. Therefore, the system will help the farm to expand itself, so more crops can be grown in different fields. The project can be considered as a model water delivery system which could be duplicated in various parts of the world where water scarcity is acute.

#### **Key Items of Evaluation**

**V(A). Planned Program (Summary)**

**Program # 5**

**1. Name of the Planned Program**

Urban Families, Youth, and Communities

Reporting on this Program

**V(B). Program Knowledge Area(s)**

**1. Program Knowledge Areas and Percentage**

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
607	Consumer Economics	0%		100%	
802	Human Development and Family Well-Being	25%		0%	
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures	15%		0%	
806	Youth Development	60%		0%	
	<b>Total</b>	100%		100%	

**V(C). Planned Program (Inputs)**

**1. Actual amount of FTE/SYs expended this Program**

Year: 2014	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	16.0	0.0	2.0	0.0
<b>Actual Paid</b>	12.0	0.0	0.6	0.0
<b>Actual Volunteer</b>	403.0	0.0	0.0	0.0

**2. Actual dollars expended in this Program (includes Carryover Funds from previous years)**

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
281079	0	39525	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
281079	0	62249	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
261150	0	0	0

**V(D). Planned Program (Activity)**

**1. Brief description of the Activity**

- 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. Brief description of the target 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

**3. How was eXtension used?**

eXtension was not used.

**V(E). Planned Program (Outputs)**

**1. Standard output measures**

2014	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	1576	1879	9237	9695

**2. Number of Patent Applications Submitted (Standard Research Output)**

**Patent Applications Submitted**

Year: 2014  
 Actual: 0

**Patents listed**

**3. Publications (Standard General Output Measure)**

**Number of Peer Reviewed Publications**

2014	Extension	Research	Total
Actual	0	0	0

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- Curriculum developed for various parenting workshops, seminars, support groups, fact sheets, and newsletters.

Year	Actual
2014	12

**Output #2**

**Output Measure**

- Number of participants in parenting workshops.

Year	Actual
2014	349

**Output #3**

**Output Measure**

- Number of parenting support groups formed.

Year	Actual
2014	8

**Output #4**

**Output Measure**

- Conduct a minimum of 50 sessions in the area of financial literacy.  
 Not reporting on this Output for this Annual Report

**Output #5**

**Output Measure**

- Conduct 15 sessions per year for junior and senior high schools in the District of Columbia on financial planning.  
Not reporting on this Output for this Annual Report

**Output #6**

**Output Measure**

- Develop newsletter and/or fact sheets for District residents so they can perform basic/advanced repairs in and around their home.

<b>Year</b>	<b>Actual</b>
2014	23

**Output #7**

**Output Measure**

- Conduct hands-on workshops for District residents in basic and advanced home repair.  
Not reporting on this Output for this Annual Report

**Output #8**

**Output Measure**

- Percent increase in the number of 4-H clubs throughout the city.

<b>Year</b>	<b>Actual</b>
2014	10

**Output #9**

**Output Measure**

- Youth will receive training in the areas of sewing, computer technology, and geospatial technology.

<b>Year</b>	<b>Actual</b>
2014	9000

**Output #10**

**Output Measure**

- Youth will receive leadership development training through conferences and special programs.

<b>Year</b>	<b>Actual</b>
2014	9237

**V(G). State Defined Outcomes**

**V. State Defined Outcomes Table of Content**

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 Measures**

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

### **2. Associated Institution Types**

- 1862 Extension

### **3a. Outcome Type:**

Change in Knowledge Outcome Measure

### **3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2014	9137

### **3c. Qualitative Outcome or Impact Statement**

#### **Issue (Who cares and Why)**

Children from Brightwood Education Campus are from diverse communities but they are not learning about cultural differences or about the rich history of Washington, DC. Their parents are not native of America. They lack leadership skills and are very shy and introverted in settings with their peers. They struggle to ask questions to gain information they want about various topics. Brightwood Education Campus requested technology education for their 4-H participants. They reported having antiquated film equipment that did not promote the children's interest in film and modern technology.

#### **What has been done**

Seven (7) youth from Brightwood Educational Center participated in the 4-H film club meeting twice weekly to learn about film making. We met in the classroom to review film techniques and proper use of the equipment. On Saturdays, they went into the community to film. Following the 4-H curriculum and experiential learning model process, youth made several projects, talked about what they learned and how they would apply their new knowledge for future projects. They researched monuments in the District of Columbia and learned the history after which they made a video about the monuments. They learned to adjust lens and interview techniques that would give them the best information for their presentations. Additionally, they learned how to use the GoPro cameras and the HD Digital cameras as well. They also learned about lighting and audio techniques and visited the UDC television station to learn how to use equipment in filming a show. They were given responsibilities and guidance in filming a CAUSES presentation 4-H Citizenship curriculum was used with this project as was materials from their civics books. They children also conducted online information searches about local buildings and monuments.

#### **Results**

Parents of youth from Brightwood Educational Center who participated in the film program were very excited about the progress of their children. 100 % of the parents report that the children are

more confident and outspoken and are proud of the things they know about film making. 88% of parents report learning things about the nation's capital they did not know before their children joined the 4-H program. These youth will participate in a national competition in May 2015 in Minnesota. They hosted the National 4-H Council's Board of Directors. As a result of their participation in the 4-H program, they have mastered several film techniques that they can apply not only for film but also in other programs. They are more willing to share their projects with their classmates and parents.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
806	Youth Development

**Outcome #2**

**1. Outcome Measures**

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

**2. Associated Institution Types**

- 1862 Extension

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2014	9230

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

Children in DC 4-H have working parents that cannot afford summer camp, winter break or spring break camping fees. Consequently, children spend the summer in the house watching TV or playing video games. In the District of Columbia, particularly, East of the River in Wards 7 and 8, there are no inexpensive or free martial arts programs.

DC 4-Hers need to work on self-expression to cope with issues they do not talk about that are affecting their confidence and self-esteem.

17 pregnant teens at the Barbara Chambers Community Center were in conflict with their parents and needed to help reduce cost for the new babies coming into their families. In Washington, DC, ridership jumped 80 percent from 2007 to 2010. According to the Bureau of Labor Statistics, bicycle repair jobs will increase by 37.6 percent between 2010 and 2020, making it one of the top 30 occupations with the fastest projected employment growth. With the projected job growth of bicycle repairers and the city being ranked 4th in the nation there is a need to train the future employees and business owners.

### **What has been done**

157 youth participated in the 4-H camping to include a 4 night overnight STEM camping program, a 4 night educational trip to New York's 911 site and NYC sites for our military youth, a school lock-in hosting the media clubs at Brightwood Educational campus and a 4 week day camp program implemented in the Riverside neighborhood of DC. Agents and partners recruited a certified martial arts instructor to volunteer to teach Tae Kwon Do and Self Defense classes weekly. 10 youth participated and 4 adults joined the program to receive training.

57 4-Hers from Calvary Christian Academy, Brightwood Educational Center and Joint Base Anacostia participated in Arts and Crafts programming that included instructions from the volunteer leader, during the class day and presentations for parents and the community.

25 youth and 8 parents participated in the 4-H sewing program using 4-H curriculum and help from our volunteer leaders. The 4-H Riverside Center Bike Corps club partnered with Washington Parks and People, Metropolitan Police Department, Gearing-Up Bicycles, Phoenix Bikes and various community members to assist with the program. There were a total of 15 youth from Ward 7 who participated in the Bike Corp Program. The club received a donation of 25 bicycles from Metropolitan Police Department. The youth spent 4 hours of the day learning the parts of the bicycle, how to make various repairs and went riding to different locations throughout the ward to explore and learn safe riding techniques.

### **Results**

Participants in 4-H STEM camp indicated a 78% increase in their knowledge about Rocketry; 100% increase about STEM careers; 81% increase in knowledge about building projects; 93% increase general knowledge about STEM education; 97% enjoyed the overnight camping experience; 100% increase in knowledge about 911. 40% of the students are now orange belts; 10% of participants are yellow belts; and 50% are white belts. 50% of the participants find an increased feeling of peace and balance. 80% of participants stated that they have increased their physical fitness, have improved their concentration and enjoy participation in the program. As a result of participating in 4-H Bike Corp, 100% report knowing how to select safe equipment, compared to 17% reporting not knowing and 67% only somewhat knowing how to select equipment. 83% know how to fit a helmet properly, compared to 67% report knowing somewhat how to fit a helmet. 83% know how to identify bike parts and purpose, compared to 84% not knowing or only knowing somewhat how to identify and name bike parts. 100% know how to check tires, brakes and chains, and replace bike cables compared to 50% not knowing and 50% only somewhat knowing. 83% know how to remove, clean and lubricate a bike chain compared to 67% not knowing at all and 33% only knowing somewhat. 100% know how to fix a flat tire compared to 50% not at all knowing and 33% somewhat knowing how to. 100% know how to plan a bike trip, compared to 33% not at all knowing and 33% somewhat knowing. 67% know how to demonstrate how to stop and observe before entering traffic and ride safely, compared to 33% not knowing at all and 33% somewhat knowing.

## **4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
806	Youth Development

### **Outcome #3**

#### **1. Outcome Measures**

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. Associated Institution Types**

- 1862 Extension

#### **3a. Outcome Type:**

Change in Action Outcome Measure

#### **3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2014	349

#### **3c. Qualitative Outcome or Impact Statement**

##### **Issue (Who cares and Why)**

Over one million persons incarcerated in U.S. jails and prisons as well as those on probation or paroled are parents. There are approximately 10 million children in the U.S. who have had one or both parents incarcerated. These children and youth have little or no voice about who, in the absence of the parent who is the primary caregiver, will take care of them, or if they will be allowed to visit or communicate with the incarcerated parent. Parents are often at a loss about how to best reconnect with their children and how they will be a part of parenting their children from inside of a correctional facility. The majority of these children are from high risk communities and have parents with lower levels of education. Many of the parents were spanked themselves, and they use spanking as their only form of discipline. They lack adequate education about financial planning, domestic violence, HIV/AIDS education, navigating the school system to benefit their child, and effective communication for families.

##### **What has been done**

A partnership was developed and sustained with the Correctional Treatment Facility in the District of Columbia where inmates formally incarcerated at Lorton Prison are incarcerated. Working with the prison, 300 parents, including 117 male and 187 females, were identified to participate in the program. Caregivers were contacted to see if they would allow the children to come to 4-H meetings and to participate in the visits that would take place monthly. Children attended weekly 4-H club activities in the community while their parents participated in 4-H activities in the correctional facility. Also, eight weeks of workshops were conducted that included parenting classes for parents in the Fairview Halfway House in topics such as HIV/AIDS, Women's Health, Domestic Violence, Health Rocks and Small Business Management. Children in the program participated in other 4-H programs not connected to the 4-H LIFE Program.

##### **Results**

Participant surveys indicate that 100% of the parents report learning something about using spanking as a primary form of discipline that they did not know. 76% of the parents in the program report having better communication with both their caregivers and their children. 100% report they would refer others to the class because they believe the class would benefit other families. 80% report that their participation in the program caused them to have better relationships with correctional staff. 70% of caregivers report improved communication with parents and children as a result of participation in the program. 63% report improved behavior of children after visits. 77% of caregivers report seeing more confidence from children participating in the program. 100% of the children visiting their fathers report an improved relationship; some of the children did not have any relationship before the program. 100% of the youth participants became involved with other 4-H programs and activities.

Both the correctional facility and the halfway house report interest in continuing the partnership and expanding the program through shared grant proposals.

#### **4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
802	Human Development and Family Well-Being

##### **Outcome #4**

###### **1. Outcome Measures**

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.

Not Reporting on this Outcome Measure

##### **Outcome #5**

###### **1. Outcome Measures**

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

Not Reporting on this Outcome Measure

##### **Outcome #6**

###### **1. Outcome Measures**

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

###### **2. Associated Institution Types**

- 1862 Extension

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

Year	Actual
2014	9230

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

Recent statistics show that nearly 32% of youth in the District of Columbia are bullied and over 20% of children ages 10- 18 are victims of cyber bullying. Children with deployed parents are confronted with many social, emotional and economic problems that require the support of the community.

**What has been done**

240 4-H Youth attended a day long 4-H Bully prevention summit on the campus of UDC. 482 youth with parents connected to the military were provided 4-H programming through our Operation Military Kids program. The programming included helping them understand the deployment cycle and resilience when a parent has multiple deployments and returns home with Post Traumatic Stress Disorder. A group of 35 traveled to New York City during their spring break from school to learn about the events that took place on September 11, 2001. They also participated in monthly 4-H club activities that included learning about cultures where their parents might travel, tasting the food, learning about the government and family practices. 200 youth participated in the technology training provided by the Microsoft Company held monthly at their Virginia store location. They received advanced computing classes from Microsoft educators. Home schooled military youth at Joint Base Anacostia attended the four night Samsung Summit at the National 4-H Council where they learned more advance technology. They also participated in weekly educational 4-H programs about using film and cameras. Monthly programming was provided to the military youth with parents attending their required military drill programs. As parents attended drill, 4-H staff provided programming monthly for the OMK youth. 45 youth from the D.C. National Guard participated in the Youth Symposium at Williamsburg, VA. The youth were divided into two groups based on their ages. The older kids, ages 13-18, participated in the Health Rocks program which encouraged them to share the experiences and issues they face in school and daily life. By participating in various hands-on activities, they increased the knowledge of alcohol, tobacco and drug. The younger group, ages 6-12, participated in nutrition, fitness and technology activities to prepare them to become positive team players and understand the nutritious facts pertaining to their daily intake. 15 youth from Joint Base Anacostia Bolling Air Force Base Home School Education participated in the 4-H Chinese Club to explore the culture, food and language through speakers, field trips to Chinese supermarkets, games, and cooking. The Ready Set Go training of the OMK program was offered to 29 school counselors throughout the D.C. Public School system, working with youth directly. The Hero Packs project of OMK program was delivered to almost 200 military youth in D.C.

**Results**

OMK and 4-H activities and programs brought 100% of the youth who had the same background together to share the issues they face, and to build support with each other. Throughout this mission, overall stats from surveys reflect that 80% of our military youth were able to develop leadership skills, public speaking skills, and confidence. 100% experienced an increase in technology knowledge and the perception of being a responsible citizen.

#### 4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

#### V(H). Planned Program (External Factors)

##### External factors which affected outcomes

- Other (Community Support)

##### Brief Explanation

The most pressing issues that impacts 4-H programs in the District of Columbia is a lack of consistent staff and volunteers. As we plan events we are constantly unsure about the number of staff that will be on hand to assist with programs. We are relying very heavily on volunteers. However, this year we have identified more volunteers in the city with previous experience with the 4-H program.

Additionally, the university is in the process of repairing some internal problems that have plagued grant funding in a negative manner. We have often failed to invoice for purchases and we are slow to bring on new staff, which has a negative impact on maintaining grants with one year funding cycles. These problems also impact reporting on time for positive outcomes.

#### V(I). Planned Program (Evaluation Studies)

##### Evaluation Results

Our evaluation data from the prospective of our youth and adults in the 4-H programs during this reporting period were very encouraging and positive. Request for 4-H clubs to continue at designated sites increased as did request for new 4-H programming. The number of new community volunteers and 4-H club teachers increased by 30.71% as a result of the programming offered the previous program year. Old partnerships connected to 4-H clubs and specialized programs continue at a rate of 90%. The overall satisfaction of youth participants is 92%. 100% of parents report that the 4-H camping programs are affordable enough to allow their children to return to camp and they believe that the programs are of superior quality.

##### Key Items of Evaluation

- An increase in 4-H clubs and activities - from 34 in FY 2013 to 48 in FY 14..
- CAUSES employed a new marketing team to work with the five land grant units. Through the efforts of that marketing team, and an increase in the number of partnerships and 4-H agents supported through grants more volunteers were identified and joined the 4-H program to work with our youth.

- As a result of new partnerships for specialized programs i.e., Department of Justice, Department of Defense, First Tee, Joint Based Anacostia's Homeschool Education Program, new charter school programs, NOAA, DC Water Shed Society, etc. new partnerships around the city were formed increasing visability of the 4-H program and creating new oportunites for funding and cross programing for youth.
- An increase in interactions at the National 4-H Council Center resulted in new opportunities for youth in the city for training and education that went beyond the planned 4-H programs. 125 4-Hers from the DC attended National Youth Science Day. Nine teachers, two staff persons and one student were allowed to attend STEM education training. 10 youth participating in the Microsoft Opening at Bethesda recieved free tablets before Christmas and the UDC 4-H program received four tablets and two new laptops for the program activites through the National 4-H Council.
- With the cooperation of DC public and charter schools, an increase in STEM education programming was requested and provided resulting in greater interest in STEM diciplines.

**V(A). Planned Program (Summary)**

**Program # 6**

**1. Name of the Planned Program**

Food Safety

Reporting on this Program

**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	0%		100%	
	<b>Total</b>	0%		100%	

**V(C). Planned Program (Inputs)**

1. Actual amount of FTE/SYs expended this Program

Year: 2014	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	4.0	0.0	1.0	0.0
<b>Actual Paid</b>	0.0	0.0	2.6	0.0
<b>Actual Volunteer</b>	0.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	0	84970	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	120105	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

**V(D). Planned Program (Activity)**

1. Brief description of the Activity

The main output of the reporting period was providing free soil service to about 400 DC residents which otherwise cost thousands of lab fee to the residents. Most important parts of the finding are accepted for the national and international conferences. Here are abstracts approved for the presentation:

1. Yapuwa, Harold, Rahil Fofana, Mulenga Chileshe and Tolessa Deksissa (2015) Analysis of trace metal contamination in urban gardens in the District of Columbia, Emerging Researchers National (ERN) Conference in STEM, Washington DC, February 19-21, 2015.
2. Bazemo, Ulrich and Tolessa Deksissa (2015) Analysis of Arsenic contamination in Urban Gardens. 2015, Emerging Researchers National (ERN) Conference in STEM, Washington DC, February 19-21, 2015.
3. Nuah, Siaka, Rahil Fofana, Harold Yapuwa and Tolessa Deksissa (2015). Analysis of trace metal contamination and nutrient loading in urban gardens, 2015 3<sup>rd</sup> Annual North Capitol Region American Water Resources Association, Washington DC, April 10, 2015.
4. Deksissa, Tolessa, Sibhat Tefera and Yacov Assa (2015). 2015. Integrating soil health and urban water quality, 2015 UCOWR/NIWR/CUASHI Annual Conference, Water is Not for Gambling: Utilizing Science to Reduce Uncertainty, to be held June 16-18, 2015 at the Green Valley Ranch Resort, Las Vegas, NV.

**2. Brief description of the target audience**

DC residents who currently garden or planning to garden, home gardeners and community gardeners, DC Department of Environment, Environmental Protection Authority, and sustainable DC affiliates

**3. How was eXtension used?**

eXtension was not used in this program

**V(E). Planned Program (Outputs)**

**1. Standard output measures**

2014	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	0	0	0	0

**2. Number of Patent Applications Submitted (Standard Research Output)**

**Patent Applications Submitted**

Year: 2014  
 Actual: 0

**Patents listed**

**3. Publications (Standard General Output Measure)**

**Number of Peer Reviewed Publications**

<b>2014</b>	<b>Extension</b>	<b>Research</b>	<b>Total</b>
<b>Actual</b>	0	1	0

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- Classroom instruction/workshops on Food Handler Certification Regulations to include DC Code Examination or Serve Safe National Examination, and Practice Examinations  
Not reporting on this Output for this Annual Report

**Output #2**

**Output Measure**

- Free soil samples tested for urban gardeners.

<b>Year</b>	<b>Actual</b>
2014	400

**V(G). State Defined Outcomes**

**V. State Defined Outcomes Table of Content**

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 Measures**

Percentage decrease in the risk of factors of foodborne illness.

**2. Associated Institution Types**

- 1862 Extension

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2014	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

**Outcome #2**

**1. Outcome Measures**

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

**2. Associated Institution Types**

- 1862 Extension

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2014	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

**Outcome #3**

**1. Outcome Measures**

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

**2. Associated Institution Types**

- 1862 Extension

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2014	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

## Results

### 4. Associated Knowledge Areas

KA Code	Knowledge Area
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

#### V(H). Planned Program (External Factors)

##### External factors which affected outcomes

- Appropriations changes
- Government Regulations

##### Brief Explanation

#### V(I). Planned Program (Evaluation Studies)

##### Evaluation Results

We began a research project under this program in late fiscal year 2014. We expect to report impacts for FY 2015. We are no longer reporting on extension activities related to food handling certification. We continue this service but our statistics and outcomes are reported through another federal agency. We are working to important program area.

##### Key Items of Evaluation

## VI. National Outcomes and Indicators

### 1. NIFA Selected Outcomes and Indicators

<b>Childhood Obesity (Outcome 1, Indicator 1.c)</b>	
0	Number of children and youth who reported eating more of healthy foods.
<b>Climate Change (Outcome 1, Indicator 4)</b>	
0	Number of new crop varieties, animal breeds, and genotypes with climate adaptive traits.
<b>Global Food Security and Hunger (Outcome 1, Indicator 4.a)</b>	
0	Number of participants adopting best practices and technologies resulting in increased yield, reduced inputs, increased efficiency, increased economic return, and/or conservation of resources.
<b>Global Food Security and Hunger (Outcome 2, Indicator 1)</b>	
0	Number of new or improved innovations developed for food enterprises.
<b>Food Safety (Outcome 1, Indicator 1)</b>	
0	Number of viable technologies developed or modified for the detection and
<b>Sustainable Energy (Outcome 3, Indicator 2)</b>	
0	Number of farmers who adopted a dedicated bioenergy crop
<b>Sustainable Energy (Outcome 3, Indicator 4)</b>	
0	Tons of feedstocks delivered.