2016 University of Guam Combined Research and Extension Plan of Work

Status: Accepted

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I. Plan Overview

1. Brief Summary about Plan Of Work

Understanding sustainability through the community development approach begins with making the natural connections to inviting the community (residents, businesses, agencies, or other organizations) to engage during the early "brainstorming" planning stage and conversations of program development to ensure citizens and participants engage and control the process. This approach represents an education effort to promote the need to sponsor practical urban natural resources strategies that considers the community's community capitals with emphasis on natural capital (programs that support indigenous trees, plants, parks, landscaping requirements for facilities businesses and open spaces); This proposed plan focuses on assessing the island's natural capital indicators/measures and involves the use of asset mapping to understand the relationships decisions and impacts related to public and private natural resources and the environment.

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

Year	Extension		Research	
	1862	1890	1862	1890
2016	22.0	0.0	24.0	0.0
2017	22.0	0.0	24.0	0.0
2018	22.0	0.0	24.0	0.0
2019	22.0	0.0	24.0	0.0
2020	22.0	0.0	24.0	0.0

II. Merit Review Process

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

- Internal University Panel
- External Non-University Panel
- Combined External and Internal University Panel

2. Brief Explanation

The stakeholders input provide the essential and critical guidance to the priorities of the University of Guam Cooperative Extension during the five year plans of work. The internal panel review includes a two phase process. The first phase involves extension professionals working with stakeholders to identify critical needs and the level of problem solving. Faculty across campus will be invited as a resource professional. The second phase will include the program leaders and extension professionals working closely with other partners who can collaborate to find solutions. The partners will assess what resources and expertise can be provided.

The external partners who will be invited are government and non-government entities who can provide support and critical resources to the plans of work. The external and internal panel will serve as the coalition engaging in the critical and emerging identified issues. Assessment and relevance will be key to prioritizing extension resources to the plans of work.

Because of the small size of WPTRC, review of individual Plans of Work and projects has been conducted mostly by WPTRC administrators (Director and Associate Director). They usually utilize external reviewers as well as their knowledge and experiences to ensure that the planned programs and activities address the critical issues of strategic importance, including those identified by the stakeholders during the development of Strategic Plans. All new research proposals (such as Hatch, McIntire-Stennis, Regional Research etc.) are being submitted to WPTRC Associate Director who checks the proposal for completeness and format. There are very few peers at the university with expertise to review research proposals in agriculture fields. Therefore a draft proposal that is ready for review is being submitted to external ad hoc Peer Review Committee. Committee is comprised of three faculty members from other universities who are familiar with the issues addressed by the project. Based on the review, that includes assessment of (1) significance, (2) need, (3) approach, (4) new knowledge to be generated, (5) potential for impact, and (6) potential for success, WPTRC administrators are making decisions regarding allocation of resources.

III. Evaluation of Multis & Joint Activities

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

Our multi-institution activities in the Pacific Region allows professionals and partners to share information and knowledge that is relevant and to provide solutions affecting individuals, families, communities and environment. The planned programs are inter-disciplinary, multi-institution and multi-partnership that engages on the identified and critical issues. The extension professionals and paraprofessionals are from the core program areas in Agriculture and Natural Resource Unit (ANR), and Communities, Youth, Food, and Nutrition (CYFFN). ANR is the center of agricultural information and technical expertise in the western Pacific Region. The unit employs state of the art technology, interdisciplinary teamwork, collaboration with public and private sectors and interactive education to achieve significant improvements in the agricultural industry, the economy and social environments of Guam and the Pacific Islands. The primary mission of the ANR Unit is to work with its clientele and partners to advance research based knowledge through extension and higher education in the food and agricultural sciences and related environmental and human sciences to benefit people and communities in Guam and the Pacific Islands. The program thrusts of ANR are carried out through Plans of Work designed by ANR faculty to address issues faced by the community as well as other individual/community educational and informational needs. CYFFN unit goals are to help ensure a safe and abundant food supply, to help families, youth and

individuals to become mentally, physically and emotionally healthy and to assist communities in becoming sustainable and resilient to the uncertainties of economics, health and security. The unit achieves these goals through planned programs in food safety, nutrition education, community development, chronic disease prevention, and youth, communities and families.

The crucial issues addressed by WPTRC planned programs fall within the strategic goals of WPTRC adopted by the faculty during Strategic Planning Retreat. It was agreed that all programs must address issues that and relevant to the needs of the region, serve interest of scientific community and are linked to the needs of our stakeholders. Indeed, numerous research projects address environmental issues, integrated plant protection, biocontrol as well as serve ethnic needs of local population. Giving some examples WPTRC scientists in 2015 will work on biological control in pest management systems, food safety education and traditional food modification, plant genetic resources conservation and utilization, carbon sequestration and distribution in eroded soils, ecophysiology of Guam's endemic and indigenous forest species, best management practices for papaya production, production of local seeds and tissue-cultured plants, improvement of vegetable production, shrimp research and economics of aquaculture on Guam soil management practices for agricultural sustainability and environmental quality, integrated pest management of aphids and whiteflies on cucurbits and vegetables, genetic structure of the cycas population in the mariana islands, bionomics of the chromolaena gallfly, biological control of cycad aulacaspis scale semiochemical attractants and trapping systems for monitoring and control of invasive scarab beetles in Micronesia, development of sustainable aquaculture on Guam, research on diseases of traditional pacific island crop plants, development of efficient semiochemical-based control methods for weevil pests, evaluating the influence of ant attendance on natural enemies and their hosts on cycas micronesica, phytochemicals, biological properties, and safety of tropical and subtropical foods, plants, or herbals, a small-scale integrated farming system in an insular urban environment., as well as beneficial and adverse effects of natural, bioactive dietary chemicals on human health and food safety. In addition they will participate in yearly meeting, exchange information and coordinate their multistate activities.

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

The Plans of Work does not discriminate in its activities as it works with the population of Guam. Based on the demographics of the Guam's population, Over 22% of the residents' lives in poverty and ethnicity consisting of 42% Chamorro, 27% Filipino, 7% Caucasian, and 29% others. The Island is a melting pot of ethnicity with no lines drawn between people. The activities of the plans of work are brought into the community and an awareness through publication and notices of workshops, and meetings in newspapers, newsletters, electronic distribution and other electronic media. Collaborations and partnerships with local and federal government agencies and non-government organizations and entities create a coalition and engagement of partners to address the needs of the population on Guam. Every resident has full accessibility to the program activities of the University of Guam Cooperative Extension.

The vast majority of Guam's inhabitants belong to the ethnic groups and cultures that often are not sufficiently served by federal programs. WPTRC (AES) administrators encourage new programs that address specific needs of under-served populations on Guam.

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

Each plan of work and planned program activities will be evaluating and assessing the changes in knowledge, skills, level of awareness, and aspirations of the targeted audiences and stakeholders. The plans of work coordinators will be responsible for reporting and making

the evaluation of outcomes and results of the planned activities. Continuing program support and plans of work will be based on outcomes and results reported.

WPTRC (AES) administrators require annual reports to be submitted for all projects. Reports must contain sections called outputs and outcomes. Reported outcomes are categorized as short, medium and long term. Overall, AES projects produce valuable outcomes and impacts for our stakeholders and represent sound investments of our federal funding. WPTRC (AES) scientists have been able to obtain additional, significant funding from non-federal sources to support some of our programs. These types of funding indicate that conducted research is appreciated and considered to be trustworthy.

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

A follow-up survey and assessment of targeted audiences, partners, traditional and non-traditional stakeholders will be done by each of the core program leaders as to whether the goals and objectives have been met and whether the impacts have been realized. The advisory body will be ask to informally assess Cooperative Extension organizational effectiveness through its collaborations and partners, its reported results and impact, and informal and formal feedback from the individuals, families, and community. The organizational effectiveness and efficiency will be a continual process and its effectiveness will be reported to its key internal and external stakeholders of the University of Guam.

University of Guam organizational structure integrate agricultural research, and agricultural extension. Our faculty established integrated projects that incorporate research, extension and education activities in the college.

IV. Stakeholder Input

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

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

Brief explanation.

To ensure that UOG-CES is responsive to both the needs of the community and the mission of delivering of science-based knowledge to communities, each program unit overseeing the planned programs conduct regular stakeholder input activities. These input activities are reported in the Annual Report of Accomplishments and Results. UOG-CES will conduct another program wide stakeholder activity in 2015. Further, results from stakeholder input was used to develop UOG-CES strategic plan which describes areas of focus, new initiatives, and guiding principles for UOG-CES to ensure that each critical program area and initiative have appropriate stakeholder engagement.

The following actions were taken to gather stakeholder input:

General Public and Traditional Stakeholder Survey (March and April 2006) The UOG Cooperative Extension conducted an island-wide stratified, random telephone survey of the general public (N=140) and targeted clientele (N=98), which asked people's opinions on issues related to families, children, nutrition, quality of life and agriculture. The responses support trends identified in targeted clientele survey collected by the project team - it provided a comparison between the general public and clientele. The sampling method for the general population sample was designed to make it highly representative of family households on Guam, and thus trustworthy for giving estimates of people's awareness and interests in Extension programs. Quota selection was used to weight the number of phone calls made in each village region to match the regional distribution of the general population across island village districts. The target population (N=98) were traditional clientele of CES programs or services - the list was generated by each program unit.

Focus and Listening Group Sessions (May 2006) A total of 90 people participated in the sessions. Invitations to traditional stakeholder groups and individuals were delivered and personal contacts were made to each group and individual to encourage participation. Announcements were published over a four day period in the local media. The results of the sessions centered on economic, social, environmental and cultural issues. From this three major themes were identified: 1)managing the environment; 2)educating individuals and families; and 3) strengthening communities

Advisory Group Session (May 2006)

Issues gleaned from the surveys and focus group sessions were presented to the advisory group.Advisory group members have been identified as key leaders and heads of boards, councils and commissions and have worked closely with CES in major projects.Using "filters" (i.e. critical needs matrix) the group was asked whether the issues were on track, whether anything important was missing and how the issues should be prioritized.

A few groups and organizations represented in the stakeholder input included:

Traditional Stakeholders

4-H Clubs - Volunteers, Leaders and Youth
Northern and Southern Farmers and Producers
Soil Conservation District
Volunteers
Sanctuary Inc. (A home for troubled, abused and runaway youth.)
Guam Public School System - Nutrition Department
EFNEP Clientele
Guam Mayor's Council
NRCS, USDA

Non Traditional Stakeholders

Administrators, Boards, Commissions and staff of government and non-government organizations from Department of Labor, Department of Public Health, Department of Youth,

Guam Community College, Guam Economic Development Commerce Authority, Guam Environmental Protection Agency, Small Business Development Center and Guam Public School System Teachers, Military and Businesses.

WPTRC will employ several of stakeholder input methods including soliciting input from individual farmers, farmers groups and organizations, representatives of the industry and representatives from federal and local agencies. Because of relatively small number of faculty and stakeholders on Guam, it has been a long-lasting practice to invite stakeholders for various functions in the college and give them frequent opportunities to express their needs in informal settings such as personal contact with faculty members. Periodically, stakeholders (farmers, golf

course superintendents, owners of nurseries etc.) are invited to the college to make presentations and express their needs and concerns in more formalized manner. Both methods seem to work well and WPTRC administrators plan to continue with this way of providing stakeholders' input.
Of particular importance is to generate good understanding (between stakeholders and AES) why issues related to the natural environment receive so much of attention and need stakeholders' support. We plan that our future stakeholders will include producers, consumers, decision-makers, students, alumni, and members of the business community.

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

1. Method to identify individuals and groups

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

Brief explanation.

Where appropriate CES will align related community needs assessment themes and strategic planning efforts related to priority community issues identified by the CES collaboration.

Guam's AES stakeholders are well identified. There are not more than 50 farmers and not more than 200 individuals who supplement their income with some sort of agricultural production. Their participation and input to define agriculture research ranges from substantial (full time farmers) to insignificant. Farmers do not form strong and focused commodity groups. Their associations are rather loose and based on personal contacts, friendships, etc.

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

1. Methods for collecting Stakeholder Input

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

Brief explanation.

Most WPTRC faculty work closely with stakeholders. These include individual farmers, golf course superintendents, homeowners, school teachers, state legislature and government agencies. Informal and formal input is provided to WPTRC on a regular basis during workshops, open houses, telephone calls, and letters. Several faculty members conduct research on stakeholders' farms. Some faculty and administrators are invited for informal or formal meetings such as for example Guam Soil and Water Conservation District where WPTRC receives an input and feedback from stakeholder groups.

3. A statement of how the input will be considered

- To Identify Emerging Issues
- Redirect Extension Programs
- In the Staff Hiring Process
- To Set Priorities

Brief explanation.

Input from stakeholders helps UOG-CES discover needs, understand emerging issues, and evaluate the effectiveness of programming. This insight helps improve the effectiveness of programming and administrative procedures by informing processes that lead to enhancement of program design, allocation of budgets for optimal results, hiring and locating personnel for maximum impact, and effectively communicating with the general public.

Stakeholder input has been used extensively in developing the current WPTRC Strategic Plan. As a result of the received input, WPTRC faculty modify their research plans to improve service and to provide specific opportunities for continued feedback. Information will be disseminated to communities through newsletters, local newspaper coverage, radio and sometimes television programs. Administrators use stakeholders input to prioritize resource allocations. Recommendations from various groups of stakeholders are useful in developing research programs that reach the island community.

V. Planned Program Table of Content

V(A). Planned Program (Summary)

Program # 1

1. Name of the Planned Program

Community Development

2. Brief summary about Planned Program

This Community Development Program is based on the goals of improving decision making in local communities; empowering communities to guide their own decisions; and improving the social and economic well being of Guam residents.

Two major initiatives guide this program: The first initiative is to ensure an abundant safe and food supply by increasing limited-resource families' and communities' access to local, safe, nutritious and affordable foods. The second initiative is assisting communities in becoming sustainable and resilient to the uncertainties of economics, weather, health and security through two objectives: 1) increasing civic and social responsibility among youth and adults in urban and rural communities by developing, and enhancing leadership, citizenship, and public participation skills through partnerships which lead to sustainable communities; and, 2) Improving community economic capacity through retaining and growing wealth opportunities by developing and providing tools in marketing, entrepreneurship, risk analysis, and decision-making for both adults and youth.

Programs under this plan include Community Food Security, Public Issues Education, Leadership Development, Civic and Social Engagement, Youth Entrepreneurship, Disaster Preparedness.

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

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

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

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

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
608	Community Resource Planning and Development	30%		0%	
704	Nutrition and Hunger in the Population	10%		0%	
801	Individual and Family Resource Management	10%		0%	
802	Human Development and Family Well-Being	10%		0%	
803	Sociological and Technological Change Affecting Individuals, Families, and Communities	15%		0%	
805	Community Institutions and Social Services	25%		0%	
	Total	100%		0%	

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

1. Situation and priorities

Guam will experience tremendous social and economic changes in the next few years. The island's cost of living continues to increase and outpace income per household. The unemployment rate remains steady at 7.9%. Information from 38,770 households in 2000 shows a median household income of $39,317.00 from a population of 154,805. Guam's residents face complex economic and social challenges: increased child abuse cases and growing high school dropout rates; increasing costs of commodities and low wages; and disproportionate chronic disease rates. While the United States Department of Defense has reduced movement of U.S. Marines from Japan from 8,000 to 4,700 there will still be strain on infrastructure, resources and social enivornments. How we respond to these changes and factors will largely depend on three priorities: 1) facilitating and providing economic and social data to support decision-making; 2) providing educational programs responsive to the needs of diverse populations; and 3) focusing on economic development strategies that will take Guam beyond the cash infusion associated with the transfer.

As the community faces these major transitions, the island will make critical and complex decisions. Community development empowers stakeholders to play a significant role in shaping its future. Public decision-making on Guam occurs in a concentrated fashion with the Governor of Guam responsible for almost all decision-making policies and actions for Guam. These decisions are heavily influenced by expertise and departmental authority across 28 government agencies and numerous commissions and boards. Each entity must make the important decisions that impact its future and the future of its residents, property owners, local businesses, and others. As a result, agencies operate in a myopic fashion which results in a breakdown of communication and planning. Planned program areas will address leadership deficits by focusing on strengthening leadership and civic engagement, building strong communities and community based organizations through a variety of individual and organizational leadership programs. Extension's role in community development will involve activities that build social capacity for vital and healthy communities; developing informed citizen participation, developing workforce, fostering healthy families, promoting life-long learning, improving community services, protecting natural environment while

increasing economic vitality and promoting sustainable communities.

2. Scope of the Program

- Multistate Extension

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

1. Assumptions made for the Program

Communities will form partnerships to resolve health care and social problems.

Information on socio-economic status, systems and data is required for informed decision-making.

Communities can influence and shape public and market policy.

Working in partnerships with communities, can serve as catalysts for change.

Coalition and collaboration building will lead to successful strategies to fund and sustain programs.

Community assets are an untapped resource.

Disaster preparedness is an integral part of living on Guam

Individuals and organizations have a desire to acquire leadership skills and knowledge to improve their decision
making skills and inspire action.

People require a deep understanding of issues to be engaged.

Individual need for education on health, nutrition, and socio-economic topics will continue to exist.

2. Ultimate goal(s) of this Program

This Community Development Program is based on the goals of improving decision making in local communities; empowering communities to guide their own decisions; and improving the social and economic well being of Guam residents.

Two major initiatives guide this program: The first initiative is to ensure an abundant safe and food supply by increasing limited-resource families' and communities' access to local, safe, nutritious and affordable foods. The second initiative is assisting communities in becoming sustainable and resilient to the uncertainties of economics, weather, health and security through two objectives: 1) increasing civic and social responsibility among youth and adults in urban and rural communities by developing, and enhancing leadership, citizenship, and public participation skills through partnerships which lead to sustainable communities; and, 2) Improving community economic capacity through retaining and growing wealth opportunities by developing and providing tools in marketing, entrepreneurship, risk analysis, and decision-making for both adults and youth.

V(E). Planned Program (Inputs)

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

Year	Extension		Research	
	1862	1890	1862	1890
2016	4.0	0.0	0.0	0.0
2017	4.0	0.0	0.0	0.0
2018	4.0	0.0	0.0	0.0
2019	4.0	0.0	0.0	0.0
2020	4.0	0.0	0.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

Activities for this program include:
1. Conduting community development workshops and trainings that foster more inclusive decisionmaking process and action (to teach policy leaders to interpret and apply economic data to local development decisions)
2. Conducting community asset mapping
3. Poviding provide technical assistance in strategic planning, conducting needs assessments, survey design to help people understand the economic impact of policy changes, and implementation capabilities
4. Accessing, interpreting and applying objective data and conduct assessments (suvey design and field data collection)
5. Establish and maintain collaborations with local and federal government
6. Establish partnership and/or collaborativeMOAs and MOUs
7. establish coalitions for placed based economic development (community-based entreprenuership)

8. Conduct focus groups sessions and provide training on how to conduct community needs assessments

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

Extension

Direct Methods	Indirect Methods
● Education Class ● Workshop ● Group Discussion ● One-on-One Intervention ● Other 1 (Listserves)	● Public Service Announcement ● Newsletters ● eXtension web sites ● Web sites other than eXtension

3. Description of targeted audience

The target audiences in the program include: local government, numerous commissions and boards; non-governmental organizations, youth ages 14-17. Other target audiences also include economic development professionals, small businesses and industries, community groups and the general public, regional collaborators.

V(G). Planned Program (Outputs)

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

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

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

V(H). State Defined Outputs

1. Output Measure

- number of extension articles
- number of workshops
- number of brochures
- number of disseminated research results, new technology and information
- number of surveys
- number of focus groups conducted
- number of popular articles in newsletters, magazines and newspapers
- number of one to one assistance

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

V(I). State Defined Outcome

O. No	Outcome Name
1	Number of organizations individuals increasing leadership skills.
2	Number of individuals and organizations increasing knowledge of program development skills.
3	Number of individuals and organizations increasing knowledge of effective strategies for public decision making
4	Number of individuals and organizations crafting, evaluating, and implementing alternative solutions to address public issues
5	Number of individuals and organizations building skills and identifying opportunities to enhance effective participation in public decision making processes

Outcome # 1

1. Outcome Target

Number of organizations individuals increasing leadership skills.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 608 - Community Resource Planning and Development
- 801 - Individual and Family Resource Management
- 802 - Human Development and Family Well-Being
- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities
- 805 - Community Institutions and Social Services

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 2

1. Outcome Target

Number of individuals and organizations increasing knowledge of program development skills.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

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

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 3

1. Outcome Target

Number of individuals and organizations increasing knowledge of effective strategies for public decision making

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

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

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 4

1. Outcome Target

Number of individuals and organizations crafting, evaluating, and implementing alternative solutions to address public issues

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 608 - Community Resource Planning and Development
- 704 - Nutrition and Hunger in the Population
- 801 - Individual and Family Resource Management
- 802 - Human Development and Family Well-Being
- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities
- 805 - Community Institutions and Social Services

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 5

1. Outcome Target

Number of individuals and organizations building skills and identifying opportunities to enhance effective participation in public decision making processes

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 608 - Community Resource Planning and Development
- 704 - Nutrition and Hunger in the Population
- 801 - Individual and Family Resource Management
- 802 - Human Development and Family Well-Being

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

4. Associated Institute Type(s)

- 1862 Extension

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

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

Description

Competing public priorities will affect direction of the program. Decision-making across the 28 government agencies and competing priorities of each will be an external factor to this planned program. Ability for agencies and other seeking external funding sources (i.e external grants) will be hindered by a lack of social and economic data. The nature of the gubernatorial and senatorial tenure (4 and 2 years respectively), will affect public policy direction, affecting priorities and intended outcomes. To the extent that we can control these external factors, our challenge will be increasing awareness of the continuous need for data regardless of a change in political dynamics.

Population changes due to new cultural groups migrating to the island will pose language and cultural barriers. Integration and assimilation of these groups will be factors that influence the program. Workshops, seminars and training in coping skills in a new environment will help increase awareness of expected social and cultural norms allowing an easier transition into Guam.

The local and regional economy will affect families and residents quality of life and social-psychological well-being. The high cost of living will be a challenge for residents and businesses. In addition, natural disasters are a constant reality on Guam and the region which will interrupt and shift priorities and goals. Increasing awareness and training in disaster preparedness as well as disaster aftermath will reduce injuries, deaths and illnesses.

Other external factors affecting this program will the difficulty of recruiting qualified professionals, lack of background and lack of expertise. UOG CES is currently developing a mentoring program to provide development of current extension professionals.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

We will continue to collect outputs and state defined outputs. We will evaluate number of individuals and numbers of organizations for stated outcomes. Evaluation tools will consist of pre and post, workshop surveys, and follow up surveys, questionairres if needed.

V(A). Planned Program (Summary)

Program # 2

1. Name of the Planned Program

Food Safety

2. Brief summary about Planned Program

The planned program "Food Safety" is to achieve the long term goal to improve the safety of food products processed with regional tropical crops and reduce the incidences of foodborne illness in community on Guam. The program is planned based on the results and suggestions from a community interest survey, stakeholder focus groups, and an advisory group meeting. The foods processed or prepared in the community on Guam must be safe and wholesome for consumers.

The critical issues identified in community are: (1) high frequency of foodborne illness in the community and (2) lack of locally processed food products. We assume that education and training based on scientific knowledge and findings will help target audiences to perform the best practice to improve the safety and quality of their food products.

In this program, the Smith Level funds and other federal grants will be invested to conduct extension, research, and educational activities. The input activities include: (1) investigating factors associated with foodborne illness and food quality in food processing and preparation; (2) conducting food safety and food processing workshops in the community; (3) providing training and consultant services about food safety and technology in community; (4) exploring and determining the values of tropical and subtropical plants, fruits and vegetables to benefit human health; and (5) disseminating residents scientific-based information and technologies to process and market safe and wholesome food products in the community. The target audiences include entrepreneurs, food workers, and food-safety educators, farmers, general consumers, youth, and school children.

The program activities are expected to change people's knowledge, attitude and behaviors in food handling practices and processing safe and wholesome tropical value-added food products. Such changes will reduce the risk and frequency of foodborne illness and improve the quality of tropical value-added food products in the community of Guam. Although tropical environments and natural disasters such as super Typhoon and others may affect crop productions and consumer's food safety practices, delivering science-based knowledge will help people to overcome obstacles to improve the quality of people's life and promote the economic growth on Guam.

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

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

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

6. Expending other than formula funds or state-matching funds : No

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
501	New and Improved Food Processing Technologies	20%		0%	
502	New and Improved Food Products	15%		0%	
503	Quality Maintenance in Storing and Marketing Food Products	5%		0%	
604	Marketing and Distribution Practices	5%		0%	
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	50%		0%	
806	Youth Development	5%		0%	
	Total	100%		0%	

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

1. Situation and priorities

Guam is a tropical island with an average temperature of 28°C through the year. Based on the data from the Department of Public Health and Social Services on Guam, the estimated number of foodborne illness incidents on Guam is 13,000-152,000 per year. The estimated economic cost is from $5.0 to 40.0 million yearly. Most of foodborne illness occurs in private homes and fast restaurants. The frequency of foodborne illness on Guam is higher than the frequency in the United States. The identified foodborne illnesses occurred on Guam were Salmonellosis, Staphylococcal gastroenteritis, Shigellosis, fish poisoning, Camplylobacteriosis, and Vibrio parahaemolyticus. The vehicles highly associated foodborne illness were fish, seafood, chicken, and ethnic food 'kelaguen'. The identified pathogens and vehicles indicate that the high frequency of foodborne illness on Guam is attributed to the lack of food safety knowledge and poor food handling practice, including temperature/time abuse, inadequately cooking, and the use of unsafe food sources. Based on food safety survey in the community, consumers have good knowledge in personal hygiene and cross contamination, but they do not commit themselves to practice properly. Many local Chomorro families have outdoor kitchens, where hot water is not supplied and sanitation is poor. Foods at parties and fiestas are often served without temperature and time control for safety for more than 4 hours.

On Guam about ninety percent of foods are imported from U.S. and other Asian countries, and few small scale food manufactures use locally agricultural crops to process food products. Seasonal agricultural crops are often saturated in the local markets. The saturation of agricultural produces in the local market results in reduction of agricultural production. To avoid wasting of agricultural produces and balance local fresh produce market, processing food products is needed. In addition, Guam possesses various tropical natural resources, such as plants, fruits, and vegetables. These tropical resources own bioactive components with functions beyond traditional nutrients. Investigation of phytochemicals and health benefits of the tropical crops and plants and processing value-added food products on Guam is of significant.

The above two issues were identified as priorities in the areas of food safety and food processing by

the CES 2006 Awareness and Interest Survey, stakeholder focus group discussions, and advisory group meetings. The Awareness and Interest Survey showed that 48% of households (n = 140)--at least one member--and 62% of CES target clients (n=98) were interested in food safety and processing. Stakeholders in thirteen focus group discussions expressed that educating food safety and processing value-added food products are the needs of community. The participants in advisory group meetings supported to address the selected issues. Setting the priorities on the selected issues will fulfill the mission of the Guam Cooperative Extension Service. Deliverying research-based knowledge to the people through outreach education programs can produce postive impact in the community of Guam.

2. Scope of the Program

- Integrated Research and Extension

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

1. Assumptions made for the Program

Access the knowledge and training is the first step to make changes of a situation. Effective education will help consumers to gain knowledge in food safety and processing and make changes in attitudes and behaviors. Behavior changes will improve situation, reducing foodborne illness and marketing value-added food products in the community.

Education to children and adults in food safety and food processing has significant long-term impact in the community. The education activities can be conducted and supported through major offices and various village centers on Guam. Various community food fairs can provide opportunities for us to deliver the science-based information to consumers. In addition, the local government agencies, the Department of Public School System, the Farm Co-op Organization, and the media can also support activities to change the community situations: reducing foodborne illness and increasing safe and wholesome food products using locally-grown crops.

2. Ultimate goal(s) of this Program

Reduce the risk of foodborne illness in the community. Enhance the use of tropical crops and plants to process and market safe and wholesome value-added food products in the community of Guam and the Western Pacific islands.

V(E). Planned Program (Inputs)

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

Year	Extension		Research	
	1862	1890	1862	1890
2016	1.5	0.0	0.5	0.0
2017	1.5	0.0	0.5	0.0
2018	1.5	0.0	0.5	0.0
2019	1.5	0.0	0.5	0.0
2020	1.5	0.0	0.5	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

The input activities include: (1) investigating factors affecting foodborne illness and food quality in food processing and preparation; (2) providing workshops and training in food safety and food processing in the community; (3) providing consultant services about food safety and food technology in community; (4) identifying phytochemicals and determining the values of tropical and subtropical of plants, fruits, and vegetables to benefit human health; (5) identifying and confirming toxic compounds in tropical crops and plants; (6) developing tropical value-added food products; and (7) disseminating scientific-based information and technologies related to food safety, food processing, and marketing safe and wholesome food products in the community.

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

Extension

Direct Methods	Indirect Methods
● Education Class ● Workshop ● One-on-One Intervention ● Demonstrations ● Other 1 (Conduct reseach experiments)	● Public Service Announcement ● Web sites other than eXtension ● Other 1 (Dissemination of information)

3. Description of targeted audience

The target audiences include entrepreneurs, food manufacturers, food workers, and food-safety educators, farmers, general consumers, college students, youth, and school children.

V(G). Planned Program (Outputs)

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

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

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

V(H). State Defined Outputs

1. Output Measure

- # of peer reviewed publications
- # of non-peer reviewed publications
- # of workshops
- # of dissemination of science-based information
- # of work with media

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

V(I). State Defined Outcome

O. No	Outcome Name
1	Changes of participants (or residents) in gaining knowledge of principles and practices in food safety and food processing
2	Changes of participants (or residents) in improving practices and applying principles in food safety and food processing
3	Changes in magnitude of foodbonre illness and marketing safe and wholesome value-added food products in the community

Outcome # 1

1. Outcome Target

Changes of participants (or residents) in gaining knowledge of principles and practices in food safety and food processing

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 501 - New and Improved Food Processing Technologies
- 502 - New and Improved Food Products
- 503 - Quality Maintenance in Storing and Marketing Food Products
- 604 - Marketing and Distribution Practices
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 2

1. Outcome Target

Changes of participants (or residents) in improving practices and applying principles in food safety and food processing

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 501 - New and Improved Food Processing Technologies
- 502 - New and Improved Food Products
- 503 - Quality Maintenance in Storing and Marketing Food Products
- 604 - Marketing and Distribution Practices
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 3

1. Outcome Target

Changes in magnitude of foodbonre illness and marketing safe and wholesome value-added food products in the community

2. Outcome Type : Change in Condition Outcome Measure

3. Associated Knowledge Area(s)

- 501 - New and Improved Food Processing Technologies
- 502 - New and Improved Food Products
- 503 - Quality Maintenance in Storing and Marketing Food Products
- 604 - Marketing and Distribution Practices
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

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

Description

External factors which may affect the outcomes in reducing the risk of foodborne illness include: (1) the influence of tropical climate on the pathogen growth and sanitation in outdoor fiestas and parties; (2) the challenge of typhoon disaster to consumers and food establishments on handling food properly due to power outrage and water shortage; (3) collaboration among the government agencies, organizations, and media to deliver science-based knowledge in the community; (4) limited financial resources and fundings; and (5) compatitive priorities between research and extension programs (or projects).

External factors which may affect the outcomes in food processing in the community include: (1) the effects of tropical climate, plant diseases, and typhoon disaster on agricultural production; (2) collaboration among farmers, food entrepreneurs, and government organizations; (3) the influence

of tourist industry on on the markets of locally processed food products; (4) the influrence of Chomorro culture changes on activities in planting crops and preserving and processing foods; and (5) limited financial resources and fundings to support the food processing program in the community.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

To evaluate the success of the program outcomes, we plan to conduct studies using pre-and post tests, surveys, direct observatins, case studies, interviews, or/and collecting data from other agencies.

V(A). Planned Program (Summary)

Program # 3

1. Name of the Planned Program

4-H and Youth Development

2. Brief summary about Planned Program

The program is designed to educate and empower families, youth and communities to understand how individuals and families can both obtain and use resources of time, money, and human capital to develop their potential as participative members of society. UOG CES will conduct and facilitate workshops that will help families understand the significance human development and family well-being. To achieve our goal, staff and volunteers will conduct workshops focused in the following emphasis areas: economic preparedness (resource management, time, money and human capital, youth entrepreneurship), interrelationships between society and households to improve family well-being, human development (child, adolescent, adult), and workforce preparation. Staff and volunteers will assist and facilitate targeted youth (5-19) to increase awareness and knowledge through camps, school enrichment youth activities, after school programs, projects and curricula. The programs will focus on increasing knowledge in essential elements in the sense of belonging and sense of safety, self confidence and self esteem, literacy, communication, problem solving, volunteerism and community service for youth, interaction and relationships with adults and peer groups, leadership development and opportunities, youth initiatives in non-formal science, engineering, and technology and civic engagement.

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

4. Program duration : Medium Term (One to five years)

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

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

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
801	Individual and Family Resource Management	10%		0%	
802	Human Development and Family Well-Being	30%		0%	
803	Sociological and Technological Change Affecting Individuals, Families, and Communities	10%		0%	
806	Youth Development	50%		0%	
	Total	100%		0%	

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

1. Situation and priorities

According to data from the local Guam Police Department there has been an increase in family violence that continues to have devastating effects on the island of Guam and its residence. Families no longer feel safe within their homes, neighborhoods and communities. The high school drop out continues to increase at an alarming rate.With the increased drop out rate, teen pregnancy is notable and reported to be reaching middle school. Teenage suicide in Guam is amongst the highest in the nation and teenage alcohol and drug abuse is increasing.Sexual activities are reported to have been increasing among teenager exposing the youth, families and communities to sexually transmitted diseases.In addition, Guam is experiencing a spur in population growth as residents of the Freely Associated States of Micronesia migrate with their families to Guam to seek better quality of life. As a result, social and welfare systems are burdened and the education system must shift its programs to meet the needs of language other then English students.School infrastructure is also impacted as double sessions are implemented to accommodate the increase in student populations.

An anticipated increase in military operations in Guam estimates 5000 US Marines with 5,000 dependents and support personnel will be are arriving over a two year period will be a significant community issue. As we partner with the military, added programs will be needed to support our troops and their families. Issues to be addresses include, labor force preparedness, community safety, cultural understanding of both the military culture and the diversified island communities.

Program priorities are to create an environment where opportunities for youth to gain and increase their sense of belonging, independence, master and generosity to enable them and master the skills needed to make positive life choices, become civically engaged, act responsibly and be a positive influence in their communities.

2. Scope of the Program

- In-State Extension

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

1. Assumptions made for the Program

1) Guam multi ethnic communities pose a challenge to program planning and development.
2) Extension has had extensive researched based programming experiences in the areas of youth, family and community.
3) Extension research based curricula and the resources of the Land Grant Institutions will allow us to develop partnership with local and federal agencies to address these issues.
4) Research have shown that youth who participate in activities which promote hands on experience are more likely to increase their self esteem, feel secure and take responsibility for their action and having good decision making skills.
5) Youth assets is an untapped resource
6) Global warming and sea level rising
7) Incorporating research and extension program in Agroforestry to youth

2. Ultimate goal(s) of this Program

The Program goal is to provide education, programs and experiences that provide prospects and opportunities to master learning of essential life skills that allows young people to be trustworthy, respectful, responsible, fair and caring citizens.The program aims to help youth, adults and families integrate these principles into their everyday lives.

V(E). Planned Program (Inputs)

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

Year	Extension		Research	
	1862	1890	1862	1890
2016	3.2	0.0	0.0	0.0
2017	3.2	0.0	0.0	0.0
2018	3.2	0.0	0.0	0.0
2019	3.2	0.0	0.0	0.0
2020	3.2	0.0	0.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

To achieve the 4-H program ultimate goals the following activities will be conducted based research proven and curriculum adopted Experiential Learning Model promoting life skills.

2 new 4-H Clubs will be organized and supported annually,

2 4-H school enrichment programs will be established and later chartered as 4-H Clubs,

10 special interest/short-term programs/Day Camps and 5 overnight camps will be conducted,

10 School-Aged Child Care Education Programs will be offered yearly,

10 technology related workshops will be conducted and

6 planned workshops for 4-H individual study/mentoring/family learning activities will be implemented.

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

Extension

Direct Methods	Indirect Methods
● Workshop	● Public Service Announcement
● Group Discussion	● Newsletters
● Demonstrations	● TV Media Programs
● Other 1 (4-H Clubs will be formed)	● Web sites other than eXtension

3. Description of targeted audience

Primary target audience includes: children, youth, and families in the community, and schools including military establishments and their families including teachers, educators, and organizations that may request our services in a collaborative manner. Efforts will be made to reach targeted population who are underserved.

V(G). Planned Program (Outputs)

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

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

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

V(H). State Defined Outputs

1. Output Measure

- (1) # of club members
- (2) # of volunteer leaders
- (3) # of workshops
- (4) # of brochures
- (5) # of surveys
- (6) # of media articles and promotions
- (7) # of focus group
- (8) # of volunteers trained
- (9) # of extension staff trained
- (10)# of collaboration established

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

V(I). State Defined Outcome

O. No	Outcome Name
1	(1) Number of youth through communication and expressive arts programming demonstrate increased self efficacy in public speaking, presentations, visual arts and performing arts
2	(2) Number of youth participants in 4H natural resouces and environmental education programs demonstrate environmentally responsible behavior
3	(3) Number of youth participants who study plant, soil and entomology learn the interconnectedness of organisms and their environment
4	(4) Number of youth reporting positive attitude change and/or aspirations about learning and careers in a 4-H project area
5	(5) Number of youth increasing participation in science and technology educational programming/clubs
6	(6) Number of volunteers completing a training program and successfully leading a program, activity, event or club
7	(7) Number of youth indicating increased knowledge/skills related to economic education and/or entrepreneurship
8	(8) Number of youth indicating knowledge and/or skills related to leadership
9	(9) Number of youth reporting positive attitude change and/or aspiration related to volunteering and community service

Outcome # 1

1. Outcome Target

(1) Number of youth through communication and expressive arts programming demonstrate increased self efficacy in public speaking, presentations, visual arts and performing arts

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 801 - Individual and Family Resource Management
- 802 - Human Development and Family Well-Being
- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 2

1. Outcome Target

(2) Number of youth participants in 4H natural resouces and environmental education programs demonstrate environmentally responsible behavior

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 801 - Individual and Family Resource Management
- 802 - Human Development and Family Well-Being
- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 3

1. Outcome Target

(3) Number of youth participants who study plant, soil and entomology learn the interconnectedness of organisms and their environment

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 801 - Individual and Family Resource Management
- 802 - Human Development and Family Well-Being
- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 4

1. Outcome Target

(4) Number of youth reporting positive attitude change and/or aspirations about learning and careers in a 4-H project area

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 801 - Individual and Family Resource Management
- 802 - Human Development and Family Well-Being
- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 5

1. Outcome Target

(5) Number of youth increasing participation in science and technology educational programming/clubs

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 801 - Individual and Family Resource Management
- 802 - Human Development and Family Well-Being
- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 6

1. Outcome Target

(6) Number of volunteers completing a training program and successfully leading a program, activity, event or club

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 801 - Individual and Family Resource Management
- 802 - Human Development and Family Well-Being
- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 7

1. Outcome Target

(7) Number of youth indicating increased knowledge/skills related to economic education and/or entrepreneurship

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 801 - Individual and Family Resource Management
- 802 - Human Development and Family Well-Being
- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 8

1. Outcome Target

(8) Number of youth indicating knowledge and/or skills related to leadership

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 801 - Individual and Family Resource Management
- 802 - Human Development and Family Well-Being
- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 9

1. Outcome Target

(9) Number of youth reporting positive attitude change and/or aspiration related to volunteering and community service

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 801 - Individual and Family Resource Management
- 802 - Human Development and Family Well-Being
- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

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

- Public Policy changes
- Competing Programmatic Challenges

Description

Given the frequency of typhoons on Guam, natural disasters will definitely cause a shift in priority programming to that of immediate recovery.

There are external factors such as the economic environment and political dynamics could shift priorities play a major role in the communities as Guam depends on tourism and federal dollars.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

The Targeting Life Skill curriculum has a built in pre and post evaluation instrument that will be modified and used to measure participant knowledge and understanding of the planned activity.4-H club members involved in curriculum based activities will be given a survey before and after participating in selected program activities.A direct observation will be compiled along with a program survey for all the families, 4-H and community participants.

V(A). Planned Program (Summary)

Program # 4

1. Name of the Planned Program

Childhood Obesity

2. Brief summary about Planned Program

The College of Natural & Applied Sciences at the University of Guam's child obesity focus is embedded in many activities. First and foremost are our EFNEP and SNAP-ED programs that serve the nutrition-education needs of limited resource families. These programs focus on nutrition and health educational activities designed to help families and children make informed, science-based decisions about their health and well-being. A variety of nutrition and health education lessons are offered to children, individuals, and families designed to meet their individual needs. The program focuses on skill areas for practical everyday choices with an emphasis on incorporating this knowledge into their everyday lives. Activities are also designed to increase knowledge and understanding in preventing chronic diseases. The program includes: MyPlate, food safety, importance of regular physical activity and exercise, increased consumption of fruits and vegetables, increase water intake, decrease of sugar-sweetened beverages, shopping tips, budgeting, meal planning, reading food labels, chronic disease awareness and obesity prevention.

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

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

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

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

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
134	Outdoor Recreation	5%		5%	
701	Nutrient Composition of Food	10%		5%	
702	Requirements and Function of Nutrients and Other Food Components	10%		5%	
703	Nutrition Education and Behavior	20%		35%	
704	Nutrition and Hunger in the Population	10%		0%	
724	Healthy Lifestyle	25%		50%	
802	Human Development and Family Well-Being	15%		0%	
805	Community Institutions and Social Services	5%		0%	
	Total	100%		100%	

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

1. Situation and priorities

Like the Nation, childhood obesity continues to be a health concern on Guam. The most recent available data collected from students attending schools within Guam Department of Education indicated that 38% of children and 43.7% of adolescents on Guam are either "overweight" or "at risk for overweight". These prevalence rates are higher than the U.S. Mainland. In addition, current data from the Guam Department of Public Health and Social Services Vital Statistics office continues to show high numbers of chronic and preventable diseases such as diabetes, cardiovascular disease and cancer as primary causes of deaths. There is a continuing need for nutrition and health educational programs and services due to the high prevalence of obesity and chronic diseases. Our efforts will offer a wide array of nutritional programs to our community designed to promote healthy lifestyles in relation to exercise and food/beverages and nutrition as the main objective. Cooperative Extension on Guam will endeavor to provide the community with a variety of nutrition and health education programs directly to leading healthier lifestyles, better food choices, and increasing physical activity. CNAS researchers will collaborate with extension educators to make sure they are teaching the best science.

2. Scope of the Program

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

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

1. Assumptions made for the Program

An assumption is that obesity rates and associated medical complications and chronic on Guam are high, yet preventable. Through nutrition education the people of Guam would be informed of the many health benefits of proper dietary intake of foods and the importance of regular exercise. Obesity rates on Guam are best addressed through education programs targeting both adults and youths. Furthermore, Guam has one of the highest rates of smoking per capita. If obesity and smoking rates continue to increase, there will be an increase in the number of people on Guam who develop type 2 diabetes, cancer, and heart disease. There will be an increase in the number of diabetics on Island due to the lack of proper nutrition and exercise.

2. Ultimate goal(s) of this Program

Our goal is to reduce and/or prevent childhood obesity on Guam. To do accomplish this goal, the following actions will take place: Help families, children, and adults learn to choose and prepare foods that protect their overall health. Provide education that leads to better dietary choices and a healthier lifestyle for all members of the community. Increase knowledge of nutrition and health. Improve ability to manage resources that relate to food. Educate on food storage, safety and sanitation practices. The program strives to create, in the minds of our participants, an awareness linking what we eat to our health - in order to ultimately change dietary behaviors.

V(E). Planned Program (Inputs)

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

Year	Extension		Research	
	1862	1890	1862	1890
2016	4.0	0.0	0.5	0.0
2017	4.0	0.0	0.5	0.0
2018	4.0	0.0	0.5	0.0
2019	4.0	0.0	0.5	0.0
2020	4.0	0.0	0.5	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

(1) Provide basic nutrition education classes on topics that relate to nutrition and food which include: 'MyPlate'; Food Safety (Kitchen & Safe Food Handling); Importance of Exercise; Fruits & Vegetables (Vitamins); Shopping Tips; Budgeting; meal Planning; Reading Food labels; promoting use of herbs and spices to help reduce the intake of salts, fats and sugars; and chronic disease prevention. (2) Conduct nutrition workshops to target population. (3) Develop culturally relevant curriculum for promoting physical activity; education to prevent obesity; localized general nutrition education materials (brochures/pamphlets) and also develop a curriculum on food portion control and over-eating. (4) Develop recipe books that feature favorite local recipes with healthful modifications. (5) Conduct food demonstrations on local dishes that incorporate healthful modifications. (6) Develop booklet and/or calendar that identifies locally grown fruits and vegetables with high nutritive value and suggest ways to healthful ways to prepare the local produce. (7) Conduct workshops promoting locally grown fruits and vegetables with healthful recipes for both farmers and experienced cooks (marketing healthful recipes with locally grown produce). (8) Maintain partnership with local food sources businesses to promote a greater variety of healthful foods and education awareness within food source facilities. (9) Develop and disseminate fact sheets on foods/beverages and of common causes of preventable chronic diseases that are prevalent on Guam and show how related to poor lifestyle choices. (10) Develop and disseminate health and nutrition education curriculum for chronic disease prevention along with educational materials.

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

Extension

Direct Methods	Indirect Methods
● Education Class	● Public Service Announcement
● Workshop	● Newsletters
● Group Discussion	● Web sites other than eXtension
● One-on-One Intervention	● Other 1 (Static Displays)
● Other 1 (Food Demonstrations)	● Other 2 (Disseminating education handouts)

3. Description of targeted audience

The target audiences of the program include: (1) school-aged children (elementary through high school level); (2) families in public assistance programs; (3) families with young children; (4) general consumers; (5) military families; (6) health educators; (7) school teachers; (8) local farmers; (9) working professionals; (10) other groups requesting services.

V(G). Planned Program (Outputs)

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

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

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

V(H). State Defined Outputs

1. Output Measure

- # of workshops
- # of brochures
- # of dissemination of research results and new technology and information
- # of one to one intervention
- # of focus group
- # of work with media
- # of articles in newsletter, magazines, and newspapers

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

V(I). State Defined Outcome

O. No	Outcome Name
1	# of participants exposed to nutrition, exercise, and obesity prevention information
2	# of participants gaining an increase in physical activity knowledge and skills, especially as it pertains to maintaining mental and physical well-being, prevention of chronic disease, and improving overall health
3	# of participants who have been exposed to health and nutrition education for chronic disease prevention

Outcome # 1

1. Outcome Target

# of participants exposed to nutrition, exercise, and obesity prevention information

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 134 - Outdoor Recreation
- 701 - Nutrient Composition of Food
- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population
- 724 - Healthy Lifestyle
- 802 - Human Development and Family Well-Being
- 805 - Community Institutions and Social Services

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 2

1. Outcome Target

# of participants gaining an increase in physical activity knowledge and skills, especially as it pertains to maintaining mental and physical well-being, prevention of chronic disease, and improving overall health

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 134 - Outdoor Recreation
- 701 - Nutrient Composition of Food
- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population
- 724 - Healthy Lifestyle
- 802 - Human Development and Family Well-Being
- 805 - Community Institutions and Social Services

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 3

1. Outcome Target

# of participants who have been exposed to health and nutrition education for chronic disease prevention

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 134 - Outdoor Recreation
- 703 - Nutrition Education and Behavior
- 724 - Healthy Lifestyle
- 802 - Human Development and Family Well-Being
- 805 - Community Institutions and Social Services

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

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

Description

CNAS CES is in the process of hiring a 1 FTE Nutrition faculty. This person will be new and will need to concentrate on their required institutional activities, but will be able to provide at least 0.5 FTE to obesity-related work. Even with that person, however, we still need another 0.5 FTE in the area of nutrition to increase the impact we could make. Right now, the university will not allow a second nutrition hire. Given our internal constraints, we face barriers to entry - to youth - in Guam Department of Education classrooms. In the past years, the Direct Instruction (reading) Program (DI) in the Guam Department of Education (GDOE) negatively impacted our ability to reach school-aged children

because there were not enough "free" hours to add our information. DI consumed most of the instruction day, and minimized the time set aside for instruction outside of the daily curricula; therefore severely limiting our ability to deliver our science-based information to local school children. Fortunately, many schools within GDOE are decreasing or eliminating DI from the curriculum. As instruction hours for DI decrease, our ability to reach school-aged children within schools will increase; we just need to be patient.

Time constraints of working families also impact our ability to reach this target audience. Because of the high cost of living on Guam, as well as the most recent economic downturn, some adults in families work 2 or even 3 jobs to make ends meet. Therefore, less time is available for nutrition education at the household level. In addition, strong ties of extended family and cultural obligations demand much of the spare time of local residents. Language barriers of the different cultures on Guam are a factor in the distribution and delivery of nutrition education.

Another factor that may affect our outcomes would be significant population changes (immigration, new cultural groupings, etc.) on Guam. Also, Guam is a U.S. Territory that has experienced an increase in immigration from other Micronesian islands and may eventually experience a large US Military build-up.

Our main challenge is making the community more aware of the importance of a healthy diet, physical activity and other lifestyle choices that can prevent obesity and other chronic diseases - with all the other competing "things" in their lives.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

Within our main Community Nutrition Education Programs, EFNEP and SNAP-Ed, we have built-in measurement tools and requirements. Assessment tools will continue to be used to evaluate the successes in achieving the program outcomes throughout the variety of nutrition activities. Behavioral change will be monitored after the contact and compared with the knowledge at entry. Studies of assessments would be done to provide data on behavioral change.

V(A). Planned Program (Summary)

Program # 5

1. Name of the Planned Program

Plant Health and Pest Management

2. Brief summary about Planned Program

The Plant Health and Pest Management Program is an outreach education program that informs clientele of issues that deal with plants and pests. The information and its delivery are designed to reduce the environmental and economic impact of plant cultivation, plant importation, and pest control activities. This is accomplished through education and research projects conducted by Guam Cooperative Extension and other federal and local agencies.

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

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

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

6. Expending other than formula funds or state-matching funds : No

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
102	Soil, Plant, Water, Nutrient Relationships	5%		0%	
205	Plant Management Systems	10%		0%	
211	Insects, Mites, and Other Arthropods Affecting Plants	10%		0%	
212	Diseases and Nematodes Affecting Plants	20%		0%	
213	Weeds Affecting Plants	5%		0%	
214	Vertebrates, Mollusks, and Other Pests Affecting Plants	5%		0%	
215	Biological Control of Pests Affecting Plants	5%		0%	
216	Integrated Pest Management Systems	40%		0%	
	Total	100%		0%	

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

1. Situation and priorities

UOG-CES is charged with providing the best possible advice for dealing with current and new immerging pests and diseases. In a 2002 farmer survey report, from the Eggplant, Pepper, and Tomato

Production Guide for Guam, 48% of the farmers reported pests as their number one farm problem followed by plant diseases at 22%. There are several steps that can be taken to reduce the impact of pests, weeds, and diseases. The first is identification. There have been no comprehensive insect surveys in Micronesia for many years nor a record of plant diseases on Guam. As a result, pest records do not accurately reflect the fauna, nor describe the animal/plant arthropod relationship existing within Micronesia. UOG-CES most remain vigilant in is pest and disease identification efforts to detect new introductions to the island.

Since all of Guam's new pests are the result of accidental introductions of invasive species, Guam will continue to get new pests as long as people travel to Guam and plants are imported. UOG-CES must cooperative with other agencies with similar goals. The Guam Invasive Species Advisory Committee (GISAC) was formed to provide technical expertise in management of organisms that are already here and prevention of further introductions. The Committee has established a website at http://gisac.guam.net as a repository for information on Guam's invasive species. The University of Guam is also part of the Western Plant Diagnostic Network (WPDN) (http://www.wpdn.org/) which is a part of a larger network: National Plant Diagnostic Network (NPDN). The NPDN enhances United States agricultural security through a functional nationwide network of public agricultural institutions with a cohesive, distributed system to quickly detect deliberately introduced, high consequence, biological pests and pathogens into our agricultural and natural ecosystems by providing means for quick identifications and establishing protocols for immediate reporting to appropriate responders and decision makers.

Since Guam's is limited in its animal and plant diversity, invasive species quickly establish themselves due to the lack of natural predators. One of the best ways to reduce the impact of such pests is through bio-control, which is a method of pest control that uses natural predators to reduce pests as contrasted by chemicals. Bio-control agents are routinely introduced to Guam by researchers in the Agriculture Experiment Station, with follow up efforts and distribution of the agents to farmers and homeowners, UOG-CES can improve the effectiveness of this pest control method and its acceptance. The key components that make up any IPM program include pest identification, efficacy of control practices (chemical, biological, and cultural) and environmental impact. Of the key components, the first and foremost is plant diagnostics. Only with good diagnostic protocols can the cause of a plant problem be determined and only then can effective and safe control methods be advised. Licensing of pesticide applicator, through the Pesticide Applicator Training program, insures that applicators know how to handle pesticides safely. Proper handling of pesticides is of paramount importance for the safety of agricultural workers, farmers, the islands water supply, and the environment.

Whenever people cultivate plants they disturb the environment: soil, plant and animal species. Through proper management practices many pests, weeds, and plant disease problems can be eliminated or reduced. If proper management practices are not followed soil will be washed away, plant pathogens will multiply, and insects will become resistant to insecticides. The Cooperative Extension Service through education awareness programs needs to get the farmers and homeowners to adopt low environmental impact plant cultivation practices.

2. Scope of the Program

- In-State Extension

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

1. Assumptions made for the Program

There are four main causes for an unhealthy plant: plant pathogens, animal pests, weeds, and unfavorable factors. The cornerstone to solving plant problems is proper identification of the causal agent. Once a causal agent is properly identified, there is a greater chance that it can be eliminated before it gets

out of control and causes substantial damage. The use of IPM (Integrated Pest Management) principles offers an economical way to control pathogens, pests, and weeds using minimal amounts of chemicals. Biocontrol offers the ideal means of controlling these organisms but often take years to develop and become established. For the average citizen of Guam, the greatest exposure to toxic chemicals comes from pesticides used in the home and in the garden. Through education and public awareness the risk of pesticide exposure can be reduced.

2. Ultimate goal(s) of this Program

Identification of all pests, weeds, and plant diseases on Guam. Establishment on Guam of all known suitable biocontrol agents. Full adoption of IPM practices by farmers and homeowners. Full adoption of low environmental impact cultivation plant practices by farmers and homeowners.

V(E). Planned Program (Inputs)

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

Year	Extension		Research	
	1862	1890	1862	1890
2016	2.0	0.0	0.0	0.0
2017	2.0	0.0	0.0	0.0
2018	2.0	0.0	0.0	0.0
2019	2.0	0.0	0.0	0.0
2020	2.0	0.0	0.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

The establishment of a comprehensive insect pest survey list for Micronesia, with continuous updating. Provide one-on-one consulting on IPM to individuals who have problems with crops, weed and/or pests. The establishment of a plant diagnostic clinic that will take a lead role in diagnosing plant problems and will provide outreach by providing space, equipment, and expertise for publications, courses and workshops.

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

Extension

Direct Methods	Indirect Methods
● Education Class	● Public Service Announcement
● Workshop	● Newsletters
● Group Discussion	● TV Media Programs
● One-on-One Intervention	● eXtension web sites
● Demonstrations	● Web sites other than eXtension

3. Description of targeted audience

The target audience for this program includes local farmers, homeowners, nurseries, landscapers and golf course superintendents and their crews, teachers, school children, and government agencies.

V(G). Planned Program (Outputs)

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

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

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

V(H). State Defined Outputs

1. Output Measure

- # of research papers
- # of research citations
- # of extension fact sheets or articles
- # of workshops/trainings/classes
- # of brochures
- # of research or new technology reports
- # of one-on-one interventions
- # of surveys
- # of focus groups
- # of news media activities (TV and radio)

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

V(I). State Defined Outcome

O. No	Outcome Name
1	% of participants gaining skills in identification of insects and related pests
2	% of participants gaining skills in identification of plant diseases
3	% of participants gaining skills in identification of weeds
4	% of participants gaining knowledge about pesticides and their application
5	% of participants reducing indiscriminate use of chemical pesticides
6	% of participants adopting some established IPM practices

Outcome # 1

1. Outcome Target

% of participants gaining skills in identification of insects and related pests

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 205 - Plant Management Systems
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 214 - Vertebrates, Mollusks, and Other Pests Affecting Plants
- 216 - Integrated Pest Management Systems

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 2

1. Outcome Target

% of participants gaining skills in identification of plant diseases

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 205 - Plant Management Systems
- 212 - Diseases and Nematodes Affecting Plants
- 216 - Integrated Pest Management Systems

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 3

1. Outcome Target

% of participants gaining skills in identification of weeds

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 102 - Soil, Plant, Water, Nutrient Relationships
- 205 - Plant Management Systems
- 213 - Weeds Affecting Plants
- 216 - Integrated Pest Management Systems

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 4

1. Outcome Target

% of participants gaining knowledge about pesticides and their application

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 205 - Plant Management Systems
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Diseases and Nematodes Affecting Plants
- 213 - Weeds Affecting Plants
- 214 - Vertebrates, Mollusks, and Other Pests Affecting Plants
- 216 - Integrated Pest Management Systems

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 5

1. Outcome Target

% of participants reducing indiscriminate use of chemical pesticides

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 205 - Plant Management Systems
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Diseases and Nematodes Affecting Plants
- 213 - Weeds Affecting Plants
- 214 - Vertebrates, Mollusks, and Other Pests Affecting Plants

- 215 - Biological Control of Pests Affecting Plants
- 216 - Integrated Pest Management Systems

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 6

1. Outcome Target

% of participants adopting some established IPM practices

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 102 - Soil, Plant, Water, Nutrient Relationships
- 205 - Plant Management Systems
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Diseases and Nematodes Affecting Plants
- 213 - Weeds Affecting Plants
- 214 - Vertebrates, Mollusks, and Other Pests Affecting Plants
- 215 - Biological Control of Pests Affecting Plants
- 216 - Integrated Pest Management Systems

4. Associated Institute Type(s)

- 1862 Extension

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

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

Description

Guam's horticulture and agricultural activities are constantly being reshaped by the availability of imports, frequency of damaging typhoons, number of tourists and proliferation of exotic pests and

diseases. Guam's agricultural land is being replaced with housing, golf courses, hotels, parks, and landscaping. With each shift in land use new pests, diseases and weed problems arise. Typhoons have a major impact on the outcome of our program because of its impact on plants ,pests, insect and insect-like pests, diseases, weeds, biological control agents, and cultural practices. Immediately after a typhoon, client concerns shift from garden and farm production to home and farm clean up and restoration. After a typhoon, several months often pass before home gardens and farms are back into productions. Extension services such as the operation of a diagnostic center depends heavily on personnel and support staff for daily operations. When cutbacks occur, adjustments must be made in program delivery to keep the center's doors open.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

1. We will evaluate to insure quantitative target numbers are met for Outputs and State Defined Outputs.
2. We will evaluate percentage increases in knowledge and action outcome measures for State Defined Outcomes numbers one through six.

V(A). Planned Program (Summary)

Program # 6

1. Name of the Planned Program

Global Food Security and Hunger

2. Brief summary about Planned Program

On an island like Guam, Food Security and Hunger are critical issues, if supplies to the island are interrupted only local resources can be relied on. This plan of work is about developing local food production capacity for our island communities. We address the food production issues by networking with; the agricultural industry supply (producers), professional support (government and private), and demand sectors (wholesale, retail, restaurant, and end consumers) through collaborative; needs assessments, program planning efforts, curriculum development, demonstrations and public trainings/workshops/conferences. We take the approach that true food security in an island context involves engaging both small subsistence and home plots as well as developing a vigorous import substitution effort in terms of our food supply, and agriculture industry inputs with our commercial producers and distributors. So we work to develop home and community produced food as alternatives to imported food through farm, home, farming/gardening, animal production, and aquaculture programs thus increasing local food diversity and self-reliance. Beginning with this program year we are joining UOG's Cooperative Extension, and Agriculture Experiment Station plan of work under Global Food Security.
Import substitution plays a key role in our efforts to develop our agriculture industry both in terms production inputs and through produce import substitution through market education efforts like "buy local, buy the best" in cooperation with local farmers, chefs and education programs on food preservation and value added products.
As part of our import substitution effort we will work to identify and develop agricultural inputs. This includes local livestock feedstocks (grated coconut, Luecana and other NFTs, bananas, breadfruit, and aquaculture/fish waste) through workshops and publications. We will also continue to identify local sources/waste products to utilize in building our soil organic matter to replace imported soil amendments.
Education/ promotional materials, workshops, and demonstrations will be developed and utilized to support these efforts. Outreach on building and conserving our soils as a sustainable local input to production will demonstrate and promote key practices like composting , mulching, sheet mulching cover crops, nitrogen fixing trees and green manures, etc.
Collaboration and multi-agency leveraging of efforts is integral to strengthening our efforts to build our island's agriculture industry. In these times of limited federal and local budgets, cooperative partnerships can leverage the efficiency of local agencies supporting the agricultural industry and increase the chance for meeting each agency's mission. Partnerships will continue between the University of Guam Cooperative Extension & Agricultural Experiment Station, (UOG CES) the Guam Department of Agriculture (DoAG), USDA NRCS, the Chamorro Land Trust Commission (CLTC), the Guam Farmers' Cooperative Association, Micronesian Chefs Association (MCA), Guam Community College (GCC) Culinary program and the Guam Soil and Water Conservation Districts to address common concerns in the agricultural industry and increase the effectiveness of outreach efforts.

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

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

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

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

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
102	Soil, Plant, Water, Nutrient Relationships	5%		15%	
104	Protect Soil from Harmful Effects of Natural Elements	5%		10%	
125	Agroforestry	5%		5%	
205	Plant Management Systems	15%		20%	
302	Nutrient Utilization in Animals	10%		5%	
307	Animal Management Systems	15%		10%	
403	Waste Disposal, Recycling, and Reuse	10%		10%	
601	Economics of Agricultural Production and Farm Management	5%		10%	
608	Community Resource Planning and Development	10%		5%	
703	Nutrition Education and Behavior	10%		5%	
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources	5%		0%	
806	Youth Development	5%		5%	
	Total	100%		100%	

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

1. Situation and priorities

The traditional way of CES educating and disseminating information is mostly through individual contacts, workshops and publications. Often stateside reading materials were given out for farmers. The information is difficult for the farmers to relate to because of the wide difference of operations between stateside and Guam farms; there is a need for local demonstrations of best management practices.

University of Guam Cooperative Extension (UOG CES) and other agricultural support agencies (Guam Department of Agriculture), the Guam Farmers' Cooperative Association, and the Guam Soil and Water Conservation Districts on Guam identified several issues common to the industry. The first is that agriculture support agencies on Guam are small and lack the breadth of expertise that would be found in analogous agencies on the mainland. Island-wide the expertise pool is probably adequate to meet the island's needs but fragmented among several agencies. Consequently, farmers have difficulty accessing the information they need or finding the expertise to explain key concepts to them when they seek advice. This plan of work will partner with other local agencies and organizations whenever possible in order to leverage the outreach efforts of these agencies. Many of Guam's farmers have limited farm experience. The educational needs are overwhelming for any single agency's staff, but in a coordinated partnership several agencies may effectively address these needs. This plan of work provides this coordinated effort.

This plan of work addresses the island's food security by increasing the number and success of commercial farming operations as well as increasing the number and diversity of subsistence home producers, market farmers and community/school gardens through a multi-agency collaborative outreach efforts. A goal of these collaborations is to identify under-served farms and families, conduct need assessments and leverage local agencies' educational and service efforts for increased impact. Guided by need assessments, programs and policy interventions will be developed to grow the small scale urban agricultural sector of our island's economy.

The survival of small-scale animal farms on Guam is threatened by several factors. These factors include: 1) Geographical distance between Guam and US mainland/Hawaii and strict USDA quarantine regulations being imposed on Guam make regular broodstock replacement very costly and difficult for animal producers, 2) Natural disasters such as super typhoons, 3) High feed costs, 4) Heavy importation of animal products, 5) Decreasing numbers of animal producers as the current generation retires, 6) No slaughterhouse with USDA inspectors.

Focus group members mentioned that agriculture must be taught at elementary schools for young people to know where agriculture produce come from. This program is providing technical assistance to groups (4H, Nutrition, Public Health, Guam DOE, and NGO's) working with teachers to bring agriculture into the school systems.

In focus group sessions, it was clearly pointed out that the community wants fresh eggs and fresh poultry meat and pork. The education and training of livestock producers on key sustainable management practices needs educational programs and tools linked to demonstrations which actually show them these practices in production in a local and regional situation.

Members of farmer advisory boards suggest that this program be expanded to accommodate subsistence producers for consumption and those who may want to go on commercial scale. For a few years now we have worked to expand our outreach to subsistence producers. In addition to working with commercial existing and new farmers this program will identify the information needs of the small (1/10 acre to 1 acre) island subsistence producers/home gardeners and develop outreach efforts to address these educational needs. These efforts will utilize workshops and extension publications in order to increase the substitution of local production for the current imported produce. This plan of work will develop home and community grown food as alternatives to store bought food through home, school and community gardening programs, thus increasing local food diversity and self reliance.

Guam's food security program will focus on conservation practices and environmental awareness while using local inputs and minimizing labor. This component will promote home/community grown fruits and vegetables as substitute for purchased produce. Key to this will be an economic focus on import substitution for both agricultural production inputs and produce through a market educational effort on "buy local, buy the best" and "What's Fresh Now" in cooperation with local farmers and chefs.

The need for outreach programs on traditional and innovative conservation and production practices is highlighted by the number of new farming/gardening efforts on Guam with limited farming experience. Recent regional needs assessment on the sustainability of agriculture identified other areas needing collaborative program development these include:

1. Education programs for farmers and agricultural professionals on agricultural marketing with a focus on building farmer chef linkages given our islands large tourism industry.
2. More work on variety trials and education on alternative crops like herbs and fruits.
3. Alternative methods of handling animal waste.
4. A farmer desire for education and certification programs in Organic agriculture or Certified Naturally Grown.

5. Research and Extension Education in food preservation and value added agriculture product development for and home food preservation and small enterprise development.

6. The need for collaborative grant(s) funding to work on these issues and other emerging issues.

2. Scope of the Program

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

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

1. Assumptions made for the Program

Farmers learn best through observation of successful demonstrations and through peer-to-peer sharing of information. Outreach efforts of agencies supporting development of the agricultural industry will be strengthened through common goal setting, sharing of resources and collaboration in outreach and demonstration efforts. This POW will evolve and expand each year as new needs are identified and partnerships form to pursue and mobilize resources to address these needs.

Many of the CLTC agricultural leases are not being developed due to lack of knowledge both technical production and identification and acquiring the necessary resources. The assumption is that education programs and demonstrations can make an impact on this under utilization of land resources by providing small producers with this information.

Over 80% of the food consumed on Guam comes from off island. We have the capability of significantly increasing food security by increasing local production and consumption so that these imports are replaced by local grown food. Three efforts should promote increase use of local fruits and vegetable: 1) Increasing market awareness of the "buy local buy the best" and "What's Fresh NOW" concepts, 2) Increasing local production through education and demonstration programs, for both livestock and plants, on sustainable production methods/practices, 3) Increasing home substitution of local garden (home and community) produce and small livestock (chicken tractors for fertilizer, meat and eggs) for store bought products to reduce imports and increase food security.

In ancient times many of the traditional tree crops provided food reserves. The food reserve stocks for our island can be increased by programs that promote traditional (and new) tree crops in conservation and ornamental plantings (fruit tree windbreaks for ex.) and through the development of the "Edible Landscapes" concept. The availability of the seasonal fruits can be expanded by education programs on traditional and western food preservation and value added products.

Issues concerning the sustainability of agriculture on small farms and its impact on the environment are shared across the Pacific islands. Curriculum developed for one island is often appropriate for other islands. There is a need for sharing of these curriculum materials. There is also a need to plan more collaborative programs that address these issues.

2. Ultimate goal(s) of this Program

Economic development of the island through expansion of the island's plant and animal agriculture industries and building the capacity of local agricultural organizational entities by:

1. Identifying where local inputs can be substituted for imported inputs in agricultural production of all types. This includes a systems approach to integrating animal and plant production.

2. Small-scale farms continue to contribute to the local economy of Guam by providing animal and plant products for import substitution. Small-scale farms will be the main source of protein through increase in fresh eggs, fresh chicken, goat meat and fresh pork.

3. Sustain collaborative demonstration and education programs to enhance economic viability of new and existing farm operations through participatory research and demonstrations. Food security will be established in case of closure of imports due to outbreaks of zoonotic diseases in the region or worldwide.

4. Increase the effectiveness of local agencies supporting agriculture in their demonstration and outreach efforts by developing collaborative partnerships. Bring program clients and partner agencies together to identify priorities and obtain resources to address these priorities through collaboratively developed programs.

5. Include Extension and other professionals from the America-affiliated Pacific islands in these programs through distance education or regional outreach and workshops.

6. Increase Guam's Farmers' access to local markets through a) Market awareness programs stressing "Buy Local Buy the Best" and"What is Fresh Now" monthly market baskets, b) Outreach on the importance of buying local grown food to increase island food security, and c) Education/outreach programs.

Ultimately substitution of farm/home/community grown plant and animal products will increase through this program's efforts. Also the substitution of local production inputs (nitrogen fixing tree, manure, and fodder, mulch, etc.) for imported production inputs (fertilizer, bagged compost, feeds, etc.) will increase.

V(E). Planned Program (Inputs)

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

Year	Extension		Research	
	1862	1890	1862	1890
2016	3.3	0.0	3.0	0.0
2017	3.3	0.0	3.0	0.0
2018	3.3	0.0	3.0	0.0
2019	3.3	0.0	3.0	0.0
2020	3.3	0.0	3.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

This program will address such areas such as:

1. Each year hold planning meetings between the cooperating agencies to identify priorities for grant funding to address these priorities. Funded grants and collaborative projects are a planned output of this POW, demonstrating capacity building through training, collaborative planning and presentation of needs.
2. Conduct applied research and field experiments at program demonstration sites, at both institutional and private (farmer) sites. Best management conservation and sustainable agricultural practices will be demonstrated on multi-agency, University, and farmer demonstration areas. New enterprises, varieties and production methods will also be demonstrated. Variety trials and potential new production enterprise identification are an ongoing effort.

3. Conduct workshops, trainings, field tours, conferences and other educational activities to local and regional producers, students, teachers and youth groups on program topics.

4. Identify producers on island and reach out on educational programs, also target farmers with agricultural land leases who are not utilizing the land for agricultural or under utilizing the land, for recruitment into the education and demonstration activities and survey them on barriers to their agriculture implementation.

5. Target home gardeners and community groups starting school and community gardens for recruitment into these programs and programs on promoting edible landscapes.

6. Increase the skills of island agricultural and food professionals by holding train the trainer workshops on program curriculum prior to holding workshops for the general public.

7. Improve watershed management and use of Vetiver and other plant based contour technologies for trapping sediment to control soil erosion on slopping lands and to slow storm water flow and trap sediment and nutrients for improving water quality downstream.

8. Promote waste management, mulching and composting as an alternative to land filling of solid organic waste and use of compost for soil quality enhancement as an alternative to synthetic fertilizers for crop production and for environmental integrity of natural resources. We will study the use of composted organic waste to increase organic matter content for improving soil physical properties in order to reduce soil erosion.

9. At least one workshop each year will be held on government (USDA) support and incentive programs and funding opportunities for farmers.

10. For the subsistence/home/community garden portions of this program will identify gardners/small farmers and their information needs on small (1/4 acre to 1 acre) production systems and develop outreach efforts to address these educational needs through workshops and extension publications, in order to increase the substitution of local production for the current imported produce and home grown produce for purchased produce.

11. This plan of work will develop home and community produced food as alternatives to store bought food through farm, home, community gardening, and animal production programs, thus increasing local food diversity and self reliance.

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

Extension

Direct Methods	Indirect Methods

● Education Class	● Public Service Announcement
● Workshop	● Newsletters
● Group Discussion	● TV Media Programs
● One-on-One Intervention	● eXtension web sites
● Demonstrations	● Web sites other than eXtension
● Other 1 (Field days, farm tours)	● Other 1 (Posters)
● Other 2 (Distance education workshops)	● Other 2 (Conferences)

3. Description of targeted audience

Primary local clients will include former, existing and potential new plant and animal producers including home, small-scale and subsistence level garden/micro farm plots. Over the past decade, the Chamorro Land Trust Commission signed 1,000+ new agriculture land leases and the DoAg idenified 300+ existing full and part time commercial and subsistence agricultural producers. Many producers possess limited resources and desperately need education and technical support programs. Additionally, new village based needs assessments indicate that there are hundreds if not thousands of local homeowners and community groups that want training in sustainable food production practices so this effort is being adapted to include them. Also identified is a strong desire among many of our communities to start community gardens so this will be a new target group.

The secondary target audience is the agricultural professional (both plant and animal) community on Guam. This program is a collaborative effort to build capacity and enhance performance of Guam's Cooperative Extension Ag professionals and partner agencies so they can better identify issues and mobilize resources to provide broader technical assistance. Many non agricultural professionals are now promoting gardening and food production these professionals need agricultural training and materials to utilized in their outreach efforts. The Micronesian Chefs Association and Guam Community College Culinary program faculty have also become strong supporters of this program's efforts. Ag professionals with partner land grant programs throughout the American Affiliated Pacific have requested assistance. Regional workshops will address these requests.

The tertiary target group is island youth. The youth target population includes students, youth interested in entrepreneurial agricultural activities, and clients of mayors' offices interested in small scale and community agricultural activities.

A fourth audience is the University of Guam agricultural student cohort. The demonstration farm will be utilized as laboratory classroom for students enrolled in agriculture courses (Introduction to Agriculture and Introduction to Animal Science).

V(G). Planned Program (Outputs)

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

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

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

V(H). State Defined Outputs

1. Output Measure

- # of workshops or conferences
- # of best management practice demonstrations conducted on private or institutional sites
- # of popular articles in newsletters, magazines and newspapers, or TV and Radio presentations.
- # of extension publications (fact sheets, white papers, web-based learning modules, etc.)
- # of research and extension advisory councils and boards consulted in program planning and implementation.
- # of new educational/workshop curriculum developed and/or piloted with program partners
- # of either: Memorandums of Understanding, cooperative agreements, partnerships, or shared demonstrations initiated or continued
- Number of Poster presentations.

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

V(I). State Defined Outcome

O. No	Outcome Name
1	# of program participants indicating intent to adopt recommended program practices, activities, and technology
2	# of producers indicating decreased imported ag production inputs
3	# of program participants indicating improved knowledge and skills of recommended practices
4	# of community strategic plans and policies implemented as a result of this program
5	# of cooperating agency and organization personnel adopting and utilizing curriculum materials developed under this POW (both Guam and Distance Education)
6	# of producers indicating intent to utilize recommended new varieties/species in production.

Outcome # 1

1. Outcome Target

# of program participants indicating intent to adopt recommended program practices, activities, and technology

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 104 - Protect Soil from Harmful Effects of Natural Elements
- 125 - Agroforestry
- 205 - Plant Management Systems
- 302 - Nutrient Utilization in Animals
- 307 - Animal Management Systems
- 403 - Waste Disposal, Recycling, and Reuse
- 601 - Economics of Agricultural Production and Farm Management
- 703 - Nutrition Education and Behavior
- 711 - Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 2

1. Outcome Target

# of producers indicating decreased imported ag production inputs

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 102 - Soil, Plant, Water, Nutrient Relationships
- 125 - Agroforestry
- 205 - Plant Management Systems
- 302 - Nutrient Utilization in Animals
- 307 - Animal Management Systems
- 403 - Waste Disposal, Recycling, and Reuse
- 601 - Economics of Agricultural Production and Farm Management

- 711 - Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 3

1. Outcome Target

# of program participants indicating improved knowledge and skills of recommended practices

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 102 - Soil, Plant, Water, Nutrient Relationships
- 104 - Protect Soil from Harmful Effects of Natural Elements
- 125 - Agroforestry
- 205 - Plant Management Systems
- 302 - Nutrient Utilization in Animals
- 307 - Animal Management Systems
- 403 - Waste Disposal, Recycling, and Reuse
- 601 - Economics of Agricultural Production and Farm Management
- 703 - Nutrition Education and Behavior
- 711 - Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 4

1. Outcome Target

# of community strategic plans and policies implemented as a result of this program

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 102 - Soil, Plant, Water, Nutrient Relationships
- 104 - Protect Soil from Harmful Effects of Natural Elements
- 125 - Agroforestry
- 205 - Plant Management Systems
- 307 - Animal Management Systems
- 403 - Waste Disposal, Recycling, and Reuse
- 601 - Economics of Agricultural Production and Farm Management
- 608 - Community Resource Planning and Development
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 5

1. Outcome Target

# of cooperating agency and organization personnel adopting and utilizing curriculum materials developed under this POW (both Guam and Distance Education)

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 102 - Soil, Plant, Water, Nutrient Relationships
- 104 - Protect Soil from Harmful Effects of Natural Elements
- 125 - Agroforestry
- 205 - Plant Management Systems
- 302 - Nutrient Utilization in Animals
- 307 - Animal Management Systems
- 403 - Waste Disposal, Recycling, and Reuse
- 601 - Economics of Agricultural Production and Farm Management
- 608 - Community Resource Planning and Development
- 703 - Nutrition Education and Behavior
- 711 - Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 6

1. Outcome Target

# of producers indicating intent to utilize recommended new varieties/species in production.

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 125 - Agroforestry
- 205 - Plant Management Systems
- 307 - Animal Management Systems

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Other (Change in government leaders)

Description

1. In any collaboration with local government agencies there is the potential for a complete change over or the upper level of administrative partners every four years. In selecting priorities and conducting needs assessments we work with both the classified staff as well as the administration to provide continuity and sustainability to the POW's programs. Additionally, attempts are made to enter into long term MOU's that may span administrations.

2. Local funds for program activities are subject to fluctuations in the local economy. Funding priorities change part of this POW's objective is to monitor these changes and develop collaborative multi-agency strategies to adapt and take best advantage of these changes.

3. In many of our field level projects there frequent (every 5-7 years) occurrence of super typhoons impacts long term demonstrations and projects. The possibility of these typhoons must be accounted for in planning of activities of the demonstrations.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

1. Post learning event evaluations of perceptions of each educational activity.

2. Follow up farm visits and phone calls to participants to determine level of adoption of demonstrated or recommended practice.

3. Focus groups will be used to determine farmers perceptions of the outreach efforts of the program activities.

4. Structured interviews of agricultural professionals in local agencies and follow up interviews to see if there is a perceived increase in number of participants and in the quality of their participation (application submission and follow through) after targeted educational programs on these government initiatives.

V(A). Planned Program (Summary)

Program # 7

1. Name of the Planned Program

Sustain, Protect, and Manage Guam's Natural Environment and Resources.

2. Brief summary about Planned Program

With less than 1% of arable land on Guam and just a handful of truly commercial farms, WPTRC research efforts concentrate on the protection of natural environment. Major areas addressed by research include: agricultural waste management, soil erosion, soil quality, and carbon sequestration in eroded soils. Research efforts into preserving, protecting, and renewing Guam's natural resources continue to be an area of focus. This planned program will strengthen our capabilities in management of agricultural and natural resources, and to manage the impacts of human activities in ecosystems and mitigate natural environment.

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

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

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

6. Expending other than formula funds or state-matching funds : No

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
102	Soil, Plant, Water, Nutrient Relationships	0%		100%	
	Total	0%		100%	

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

1. Situation and priorities

Guam is a home for 180,000 inhabitants as well as tourist destination, mostly from Asia. The sustainability of natural resources, its use and management is vital for maintaining prosperity of the island. Water erosion is the most severe form of soil degradation on Guam. Eroded sediment carries away valuable soil nutrients and poses a serious threat to humans, resources, and environments downstream. The badlands of southern Guam are a prime example. Transport of sediment out of a badland basin and into a new sedimentary system promotes a spectrum of environmental and ecological changes ranging from wetlands formation and river turbidity to coastal modification and habitat destruction. The natural areas affected are integral parts of both the quality of life for residents and the viability of the tourism industry. Both are severely altered by unchecked badlands formation. WPTRC soil scientist is developing an integrated approach to control the accelerated soil erosion and restoration of the land resources in southern Guam. In his research, he and his colleagues evaluated a variety of options, including the effects of Vetiver Systems on the watershed areas for controlling the sedimentation and preventing water pollution downstream, hence protecting the coral reefs.

Increased tourism as well as systematic increase of consumption on the island resulted in some harm to the environment as well as increased production of waste. For example, parts of coral reef around Guam are severely damaged and existing landfill is overloaded. A new landfill construction is on the way regardless of strong opposition from nearby residents. Effective management of the environment and natural resources must balance competing interests. Developing and applying sound management strategies, combined with thorough understanding of complex interdependences of natural systems, can yield sustainable benefits from land resources and urban development.WPTRCwill focus on development of knowledge base that achieves maximum benefits from natural resources. Through advances in scientific knowledge and effective application of that knowledge WPTRC can help in achieving harmony between economic growth and preservation of Guam's precious natural resources.

2. Scope of the Program

- In-State Research
- Multistate Research

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

1. Assumptions made for the Program

At least one qualified researcher and supporting staff is available. Additional external funds and other resources are available.

Partnerships with other agencies such as NRCS and other universities will continue, will coordinate efforts and share resources.

Basic Information on best management practices exists for the management of natural resources.

Government and other stakeholders are willing to implement best management practices.

2. Ultimate goal(s) of this Program

To achieve the balance between urban development and sustainability of natural resources.

V(E). Planned Program (Inputs)

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

Year	Extension		Research	
	1862	1890	1862	1890
2016	0.0	0.0	6.0	0.0
2017	0.0	0.0	6.0	0.0
2018	0.0	0.0	6.0	0.0
2019	0.0	0.0	6.0	0.0
2020	0.0	0.0	6.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

We will develop various techniques, methodology and soil management practices to maimtain Agricultural sustainibility and environmental quality under different farming practices.

We will study the effects of surface crop residues and subsurface macroporosity on water infiltration into the soil profile.Effect of crop residue on soil quality improvement for agricultural sustainability.

We will improve watershed management and use of Vetiver Technology for trapping sediment to control soil erosion on slopping lands and to slow storm water flow and trap sediment and nutrients for improving water quality downstream.

We will study the dynamic relationship between soil and water and chemical transport within the soil matrix.

We will conduct various experimentations by employing innovative techniques such as cat-scan tommography and dyes and tracers to measure the parameters of solute transport and chemical movement throughout the soil profile.

We will attempt to develop management techniques to slow and/or retard preferential macropore flow as a preventive technique for reducing the risk of groundwater contamination under no-tillage production system.

We will attempt to develop techniques to evaluate the effects of nutrient distribution under conservation management practices as an alternative to a sustainable production system.

We will attempt to develop techniques to evaluate the effects of no-till management and inter cropping on chemical, physical and biological properties of the soil.

We will study the effect of composted organic wastes on soil quality, crop production and agricultural sustainability.

We will promote waste management and composting as an alternative to land filling of solid organic waste and use of compost for soil quality enhancement as an alternative to synthetic fertilizers for crop production and for environmental integrity of natural resources.

We will study bio-remediation of contaminated soils by using organic material for the enhancement of biological activities in the contaminated soils.

We will investigate the use of Vetiver System (VS) for the bio-remediation of sewage water and drainage from storm water for water quality improvement and the restoration of water reservoirs and marine environments near the seashores.

We will study the use of composted organic waste to increase organic matter content for improving soil physical properties in order to reduce soil erosion.

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

Extension

Direct Methods	Indirect Methods
● Workshop ● One-on-One Intervention ● Demonstrations	● TV Media Programs ● Web sites other than eXtension

3. Description of targeted audience

Farmers, landscapers, students, general public, other government agencies.

V(G). Planned Program (Outputs)

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

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

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

V(H). State Defined Outputs

1. Output Measure

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

V(I). State Defined Outcome

O. No	Outcome Name
1	# participants indicating improved knowledge and skills or recommended practices

Outcome # 1

1. Outcome Target

participants indicating improved knowledge and skills or recommended practices

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 102 - Soil, Plant, Water, Nutrient Relationships

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

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

Description

Natural disasters such as typhoons do occur on Guam frequently. Damage to research plots, and equipment can be very extensive. When the economy is poor, funding decreases. Small units sych as WPTRC (AES) feels impact of financial difficulties very suddenly.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

Program is long term. Journal and other types of publications measure its success.

V(A). Planned Program (Summary)

Program # 8

1. Name of the Planned Program

Development and Protection of Diverse Natural Resources on Guam and Throughout Micronesia

2. Brief summary about Planned Program

Guam's fragile insular ecosystems are subject to severe abiotic and biotic stresses including: typhoons, drought, fire, invasive plant and animals, and human induced habitat destruction.The planned research program will address development of specialty crops produced on Guam, ornamental plants in our landscapes, as well as protect a diversified flora in natural environments. Through basic and applied research, host-pathogen interactions can be identified; control measures can be developed and researched. An important component of ecosystems management is mitigation of alien invasive species. Invasive species threaten Guam's native plants and damage economically important ornamental species.

The invasion of new pests and pathogens, including insects, and disease causing organisms, can devastate the expensive niche crops that Guam's farmers produce thereby destroying their limited economic opportunities. All programs must address issues that are relevant to the needs of the region, serve interest of scientific community and are linked to the needs of our stakeholders. Indeed, numerous research projects address environmental issues, integrated plant protection, biocontrol as well as serve ethnic needs of local population. Giving some examples in 2011 we will work on biological control in pest management systems, plant genetic resources conservation, production of local seeds and tissue-cultured plants, identifying local species for landscape purposes, integrated pest management, genetic structure of the cycas population, biological control of cycad pests, trapping systems for monitoring and control of invasive scarab beetles, research on diseases of traditional Pacific island plants, biological properties, and safety of tropical and subtropical foods, plants, or herbs.

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

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

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

6. Expending other than formula funds or state-matching funds : No

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
136	Conservation of Biological Diversity	15%		15%	
202	Plant Genetic Resources	10%		10%	
205	Plant Management Systems	25%		25%	
211	Insects, Mites, and Other Arthropods Affecting Plants	25%		25%	
215	Biological Control of Pests Affecting Plants	10%		10%	
216	Integrated Pest Management Systems	10%		10%	
723	Hazards to Human Health and Safety	5%		5%	
	Total	100%		100%	

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

1. Situation and priorities

The physical isolation of the island and its humid tropical environment have created unique ecosystems, extremely susceptible to invasion by undesirable plants, insects, microbes, and other invasive species. Invasive species, especially insects and weeds are considered the greatest threat to Guam's natural environment. Invasive species sometimes result in the loss , native species, the destruction of native forests and the degradation of the quality of life in general. Despite federal and state quarantine regulations, many species are accidentally imported. Some are harmless but some cause a significant impact on Guam's economy. Research and Extension activities will be aimed at the identification of and eradication of invasive species, and when this is not possible, mitigation of damage using biological control and integrated pest management.

2. Scope of the Program

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

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

1. Assumptions made for the Program

We will cooperate and collaborate with other local, federal, and regional agencies.
We will seek external funds and resources
Faculty will collaborate on IPM projects.

2. Ultimate goal(s) of this Program

Eradicate or mitigate the damage from specific invasive species.
Reduce introductions of invasive species to Guam.
Quickly detect new introductions and eradicate them as soon as possible.
Increase collaboration with USDA Services and other territorial, NGO, and federal agencies.

V(E). Planned Program (Inputs)

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

Year	Extension		Research	
	1862	1890	1862	1890
2016	2.0	0.0	12.0	0.0
2017	2.0	0.0	12.0	0.0
2018	2.0	0.0	12.0	0.0
2019	2.0	0.0	12.0	0.0
2020	2.0	0.0	12.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

Here is an outline of the major research thrusts over the next 5 years.
- biological control in pest management systems,
-improvement in integrated pest management of natural resource systems
- monitoring and control of invasive pests
- research on diseases of traditional Pacific island crop plants,
-develop environmentally safe control and detection methods for invasive species by integrating semiochemicals and biocontrol agents.
-study cycad pollination biology, cycad toxicology, and cycad biochemistry
- maintenance and improvement of biological collections and biodiversity information systems

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

Extension

Direct Methods	Indirect Methods
● Education Class	● Public Service Announcement
● Workshop	● TV Media Programs
● One-on-One Intervention	● Web sites other than eXtension
● Demonstrations	● Other 1 (Insects of Guam Website)

3. Description of targeted audience

Our target audience is the general public, farmers, landscapers, the research community at large, and federal, territorial, and regional government agencies and NGO's

V(G). Planned Program (Outputs)

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

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

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

V(H). State Defined Outputs

1. Output Measure

- # of workshops
- # of one-to-one contacts
- # of popular articles in newsletters, magazines and newspapers
- # of Extension publications (fact sheets, white papers, web-based learning modules, etc)
- # of research or extension advisory boards and councils
- # of participants in IPM training or workshops
- # of peer-reviewed research publications
- # of patents
- # of presentations at professional international, national, or regional conference

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

V(I). State Defined Outcome

O. No	Outcome Name
1	# participants indicating improved knowledge and skills or recommended practices
2	# of strategic plans and policies implemented as a result of this program
3	# of cooperative agreements/partnerships initiated or continued as a result of this program

Outcome # 1

1. Outcome Target

participants indicating improved knowledge and skills or recommended practices

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 136 - Conservation of Biological Diversity
- 202 - Plant Genetic Resources
- 205 - Plant Management Systems
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 215 - Biological Control of Pests Affecting Plants
- 216 - Integrated Pest Management Systems
- 723 - Hazards to Human Health and Safety

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 2

1. Outcome Target

# of strategic plans and policies implemented as a result of this program

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 136 - Conservation of Biological Diversity
- 202 - Plant Genetic Resources
- 205 - Plant Management Systems
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 215 - Biological Control of Pests Affecting Plants
- 216 - Integrated Pest Management Systems
- 723 - Hazards to Human Health and Safety

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 3

1. Outcome Target

# of cooperative agreements/partnerships initiated or continued as a result of this program

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 136 - Conservation of Biological Diversity
- 202 - Plant Genetic Resources
- 205 - Plant Management Systems
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 215 - Biological Control of Pests Affecting Plants
- 216 - Integrated Pest Management Systems
- 723 - Hazards to Human Health and Safety

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

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

Description

Typhoons are always possible on Guam and may delay advances of research and extension services

Lack of funding (cuts in formula funds and unsuccessful efforts for competitive funds) may reduce the scope of research and extension services

Limited and declining number of highly trained individuals in disciplines critical to natural resource management on Guam and Micronesia.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

Research and Extension evaluations will be conducted based on reports as required by funding agencies, and internal annual faculty evaluations by university administrators.