

# University of Guam Combined Research and Extension Plan of Work 2022-2026

**Status: Final**  
**Date: 05/24/2021**

## I. Plan Overview

### 1. Executive Summary

The University of Guam (UOG) is the only four-year public institution of higher education on Guam. Per the mission of UOG, the university serves not only Guam but also the region of Western Pacific which comprised 2.2 million square miles and island nations that are under the protection of the United States and have two year colleges that also have land grant status.

Agriculture Experiment Stations being a part of UOG since 1975 have had major impact on the agriculture research on Guam as well as many islands in the Western Pacific. The Western Pacific Tropical Research Center (WPTRC) associated with the research division in the Land Grant college accurately reflects our mission and research priorities. WPTRC faculty and administrators formulate clear and attainable goals and adopt the following mission: "Excellence in research in support of the land grant mission of discovery, learning, and engagement. We excel in the areas of tropical agriculture, environmental and life sciences. Our mission is strategically aligned with UOG's mission of responsiveness to the specific needs of Guam and other Western Pacific island communities, thereby, contributing to their economic growth and stability.

The University of Guam Extension & Outreach (UOG C E&O) engages the university community and the public through a multi-disciplinary approach to address the complex issues facing the people of Guam. UOG C E&O works to increase its collaborations with government agencies, private entities, businesses, non-profit agencies, and non-governmental organizations. This approach is important in Guam's interdependent culture and has proven to be one of the strengths to ensure effective education programs are delivered in a timely manner. These partnerships have supported the mission of extending research-based information through multiple education venues to engage individuals, families, youth, and communities.

UOG Extension and research connect to the citizens through various engagement processes, not only in the education arena, but also to gather perspectives of needs, concerns, issues, and emerging trends. This approach represents an education effort to apply research based, unbiased information for daily application in the use and protection of urban natural resources in the urban and rural environments, identifying food security strategies on the micro, mezzo, and macro-levels, youth and family development for leadership, and economic sector enhancement. With the geographic position of Guam, the responsibility for social, economic, environmental, and policy research and application have potential for regional, national, and international implications that directly affect day-to-day living on Guam.

### 2. FTE Estimates

Year	1862 Extension	1862 Research
2022	23.0	24.0
2023	23.0	24.0
2024	23.0	24.0
2025	24.0	24.0
2026	24.0	24.0

## II. Merit / Peer Review Process

Cooperative Extension & Outreach regularly conducts stakeholder information gathering, specifically with economic groups, project audiences, and through evaluations of all education sessions. In addition, stakeholders were identified to respond questions about their needs and perception of assets on Guam. This interview process was summarized, and trends were identified. As a short-term project, four initiatives focusing on transdisciplinary, multi-tiered initiatives are implemented for 2019-2021. These initiatives are supplemental to all extension education programming currently conducted. The four areas are: Harnessing Big Data; Our Youth, Our Future; Reinforce Family Resiliency; and Ensuring Food Security. These initiatives are designed from the research and experience of extension faculty and program professionals.

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 for Hatch, McIntire-Stennis, Regional Research programs) 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 make decisions regarding allocation of resources.

### **III. Stakeholder Input**

#### **1. Actions to Seek**

Continuous dialogue with stakeholders through consumers, families, individuals, businesses, agencies, member organizations, government partners, federal agencies, military, and outer islands representatives. In certain areas, UOG is partner in research and extension with international entities (invasive species research and control) because of Guam's geographic location.

To ensure that UOG CE&O is responsive to both the needs of the community and the mission of delivering of science-based knowledge to communities, each program unit implements standardized evaluation after completing each project that includes asking participants to identify other needs and concerns. This continuous input during education activities are reported in the Annual Report of Accomplishments and Results. Further, results from stakeholder input was used to develop UOG-CE&O strategic plan which describes areas of focus, new initiatives, and guiding principles for UOG-CE&O to ensure that each critical program area and initiative have appropriate stakeholder engagement.

The following actions were taken to gather stakeholder input:

Website development: Online access to all materials is tracked for use as well as describes connection to the research and extension personnel for further questions. A continuous calendar of events is available online with information about where to engage. The website is migrating to the overall university website during 2019-2020.

Extension evaluation for workshop/programs/events: Standardized metrics regarding teaching and information are provided to all participants at the end of sessions. These evaluations are then entered into a statistical program for data and analysis. Aggregate means are shared quarterly with faculty, as well as information is tracked for emerging trends.

Continuous dialogue: Extension faculty and professionals have regular, structured, and continuous conversations with stakeholder audiences that include government agencies (territorial and federal), non-profit agencies, member organizations, and private business with the specific goal to identify emerging issues for the region in social, economic, environment and policy related areas.

WPTRC will employ several stakeholder input methods including soliciting input from individual farmers, farmers groups and organizations, representatives of the industry and representatives from federal and local agencies.

## 2. Methods to Identify

Multiple methods to breadth of stakeholder groups are used:

-Web based interaction via metrics of use of materials, and random sample evaluation of materials

-Survey methods with non-traditional stakeholders and non-users - identification of non-users to determine needs (individuals, groups, agencies, and other)

Person to person dialogue for in depth exploration of issues for families, consumers, agriculture producers, and non-traditional stakeholders.

### Traditional Stakeholders

- 4-H Clubs - Volunteers, Leaders and Youth
- Northern and Southern Guam Farmers and Producers
- Soil Conservation Districts
- Volunteers
- Sanctuary Inc. (A home for troubled, abused ,and runaway youth)
- Guam Public School System and other Gov Guam agencies
- 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, Guam Public School System teachers, military and businesses.

WPTRC will employ several stakeholder input methods including soliciting input from individual farmers, farmers groups and organizations, representatives of the industry and from federal and local agencies. Because of the relatively small number of faculty and stakeholders in 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) 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. We plan that our future stakeholders will include producers, consumers, decision-makers, students, alumni, and members of the business community.

In light of world events, identification of process, system, and response issues related to all issues will be examined and identification of rapid response avenues. For UOG CE&O, specific issues of food security and family resource managment during crises are identified by stakeholder audiences, as well as by faculty and professionals.

## 3. Methods to Collect

In person dialogues

In person session evaluations

In person interviews

Web based dialoguse

Web based metric analysis

Web based surveys

Literature reviews

Literature searches

Research partnerships - internal and external

Other methods include:

Meet with stakeholder groups regularly.

Meet with stakeholder individuals.

Consultation with educational institutions on island in region.

Meet with non-traditional groups.

#### **4. How Considered**

Where appropriate Cooperative Extension will align community needs assessment themes and strategic planning efforts related to priority community issues identified by the UOG CE&O collaboration. World events have changed the dialogue, but not the needs of individuals, youth, and families on Guam. The intensity of needed education and delivery of research based information is more essential now than ever because of the uncertainty of economic, social, political, and environmental structures. Changing the delivery mechanisms will influence the process, but not the need for research-based information.

Guam's WPTRC 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, and other interactions.

### **IV. Critical Issues**

#### **1 Youth Development - 4H Youth Development**

##### **Description:**

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 CE&O will conduct and facilitate learning environments (in person and digital) that will help families understand the significance of human development and family wellbeing. Specific to youth development in Guam, the in-migrant population under the Compact of Free Association (COFA) has had impact to agencies, organizations, neighborhoods, and families as the outer island residents in-migrate to Guam. Positive youth development is recognized as skill development in variety of areas, such as philanthropy, community responsibility, leadership, and mentorship, as well acknowledge in STEM, arts, and other project areas.

To achieve this goal, staff and volunteers will conduct learning sessions 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 wellbeing, 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.

**Term:** Short

##### **Science Emphasis Areas**

Education and Multicultural Alliances

## 2 Family and Consumer Sciences

### Description:

The intersection of health and agriculture focuses on consumer and family decision making regarding nutrition, consumer decision making, health literacy, and responsibility. Guam morbidity rank is in the top ten in the world for diabetes and obesity. Extending the impact of nutrition education and outcomes to the breadth of consumer factors that influence this health issue will be the focus of Extension education.

Family resource management and communication amongst family members for all levels of decision-making are essential. Family relationships that contribute to positive youth development are identified as needed to assist youth to develop workforce skills and create lifelong learning environments in the home.

**Term:** Intermediate

### Science Emphasis Areas

Education and Multicultural Alliances  
Family & Consumer Sciences  
Human Nutrition

## 3 Food Safety/Security

### Description:

Access to the knowledge and training is the first step to make changes to 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 the situation, reducing foodborne illness and marketing value-added food products in the community. Specific to the islands of the Pacific, is food safety for long-term food preservation to reduce food insecurities. With environmental factors, transportation issues, and growing populations, food security is a different matter than in areas of the mainland.

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 in 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.

World events have reinforced the underlying issues of food security. While production of food products is necessary for an import-dependent island, securing food in the home within the family structure is essential for short-term events (typhoon aftermath) and long-term events (worldwide pandemic) to ensure that all individuals and families have access to nutritious food sources.

**Term:** Intermediate

### Science Emphasis Areas

Food Safety  
Human Nutrition

## 4 Human Nutrition - Childhood Obesity

### Description:

The College of Natural & Applied Sciences at the University of Guam's child obesity focus is embedded in many activities. In addition to the established EFNEP and SNAP-ED programs that serve the nutrition-education needs of limited resource families, research and outreach activities targeting sustained behavioral change is the focus

for making generational change regarding children and young adults. Research findings and activities that are designed to engage and change perceptions and values, not just information sharing, is essential for sustained change now that childhood obesity has reached critical levels on Guam. All programs will 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 daily lives. Activities are also designed to increase knowledge and understanding in preventing chronic diseases.

**Term:** Intermediate

**Science Emphasis Areas**

Human Nutrition

**5 Sustained Agricultural Production Systems - Plant/Pest Efforts**

**Description:**

Sustainable production systems utilize knowledge from research for plant/pest diagnostics, soil conservation, water capture/use, aquaculture development, product supply chains, economic viability, and other topics. Environmental and introduced threats to agricultural production systems are common in Guam. High pest pressure, invasive species, soil erosion, and land degradation challenge sustainable agriculture and horticulture production in the island. Adapting current research findings to production is essential to create a food, fiber, and fuel product line to serve the island and region. The Western Pacific Tropical Research Center generates science-based information which is delivered in collaboration with UGO Cooperative Extension to improve crop yields, economics, integrated pest management, and farm/family incomes.

**Term:** Intermediate

**Science Emphasis Areas**

Agroclimate Science

Environmental Systems

Sustainable Agricultural Production Systems

**6 Sustained Agricultural Production Systems - Global Food Security**

**Description:**

In Guam, food security and hunger are critical issues. World events have brought the issue to the forefront and enhancing production systems through present and emerging techniques is critical to security of food sources for island residents throughout the Western Pacific. Included in food security, is access to bio stock (plant cultivars, improved genotypes) that are appropriate for tropical production, but do not negatively impact ecosystems. Development of local food production capacity is at a micro-plot scale, as commercial production on Guam is limited. From "farm to fork", there are significant threats to the agricultural production capacities on the island that research and extension address. Food security is a major issue with multiple approaches that all must be explored in research and application for secure food supply.

**Term:** Intermediate

**Science Emphasis Areas**

Agroclimate Science

Environmental Systems

Sustainable Agricultural Production Systems

**7 Sustained Agricultural Production Systems - Protect Resources of Guam**

**Description:**

Guam and Micronesia fragile insular ecosystems are subjected to severe abiotic and biotic stresses including typhoons, drought, fire, invasive plant and animals, and human-induced habitat destruction. A new invasive species (animal, plant, insect, virus) is identified every week in Guam. Research and outreach are addressing identification and control as fast as possible, and time is of the essence for these efforts. As Guam is the front door for US agriculture, it is essential and critical that efforts in invasive species control be a main thrust of research. Basic and applied research to control invasive species such as fire ants, coconut rhinoceros beetles, and several plant vascular species is carried out at the three UOG experiment stations, the Guam Aquaculture Research and Training Center, laboratories, greenhouses, and other facilities. A wide research and outreach program on protecting Guam's endangered plant species is being carried out. This and other programs address issues that are relevant to the needs of the region and of relevant stakeholders.

**Term:** Intermediate

**Science Emphasis Areas**

Agroclimate Science  
Environmental Systems  
Sustainable Agricultural Production Systems

**8 Community Development**

**Description:**

With changing population through in migration, accurate data gathering and analysis for future decisions is critical. Development of community capacity for decision-making is essential for social, economic, environment, and policy strategies. Data collection and infrastructure creation to maintain data for analysis is the focus for the next year plan of work. Additionally, the outreach efforts are directed at data users (decision makers) to help them to appropriately use the information. Based on the goals of improving decision making in local communities, this effort will empower communities to guide their own decisions and improving the social and economic wellbeing of Guam residents.

Building and bridging the digital divide for all residents (permanent, temporary, in-migrant) will be critical to the formal and non-formal education structures in response to current world issues. To ensure that all citizens of all ages have access, leadership capacity for all villages will be the focus for efforts to understand, interpret, and apply data findings.

**Term:** Intermediate

**Science Emphasis Areas**

Education and Multicultural Alliances  
Family & Consumer Sciences  
Youth Development