

# Guam (University of Guam)

## Plan of Work for 2023-2027

Status: Final (Approved 9/20/2022)

### Executive Summary Overview

The University of Guam (UOG) is the only 4-year public institution of higher education in Guam. Per the mission of UOG, the university serves not only Guam but also the region of the Western Pacific (2.2 million square miles). These island nations are under the protection of the United States and have two-year colleges that also have land grant status. The University of Guam College of Natural and Applied Sciences (CNAS) includes the Western Pacific Tropical Research Center (WPTRC) and Cooperative Extension and Outreach (CE&O). WPTRC oversees capacity funds within the Hatch, Multistate Hatch, and McIntire Stennis programs for projects related to five of the seven critical issues defined for CNAS; i.e., Food Safety and Security, Human Nutrition and Childhood Obesity, Production Systems, Protect Resources of Guam, and Plant/Pest efforts. Projects are carried out by CNAS faculty, associate/assistant researchers, and field technicians in three experiment stations, the Guam Aquaculture Development and Training Center, farms, military lands, and other locations. WPTRC maintains a fleet of about 40 vehicles, nine research laboratories, an insect repository, and other facilities to support capacity grant projects. Projects encompass insect pollinators, aquaponic systems, mycorrhiza in forest trees, shrimp coculturing, biocontrol of pests, calamansi, sustainable agriculture, plant genetic resource conservation, and little fire ant control. All CNAS faculty in research, extension, and instruction are entitled to apply for capacity grants. The University of Guam Extension & Outreach (UOG-CE&O) engages the University Community through a multi-disciplinary approach to address the complex issues facing the people of Guam. UOG-CE&O works to increase its collaborations with government agencies, private entities, businesses, non-profit agencies, and non-governmental organizations. This approach is essential in Guam's interdependent culture and has proven to be one of the strengths in ensuring timely, practical education programs. These partnerships have supported the mission of extending research-based information through sponsored research programs and initiatives delivered through multiple education venues to engage individuals, families, youth, and communities. UOG connects to the citizens through various engagement processes, not only in the education arena but also to gather perspectives on 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 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 has the potential for regional, national, and international implications that directly affect day-to-day living in Guam. With the geographic position of Guam, the responsibility for social, economic, environmental, and policy research and application presents a unique collaborative opportunity to explore continued integration of research and extension in developing innovative and timely research and programming support to key stakeholders and cooperators. We will continue to build on the current critical issue areas which incorporates all facets of our agriculture and food systems, sustained agricultural production systems, plant/pest protection efforts and protection of resources of Guam. Human and environmental health, Youth, family and community development. WPTRC research projects and CE&O

project undergo their periodic review and evaluation for progress toward the goals and objectives in the approved plans of work aligned both to the SEAs and approved plans of work.

## Merit and Scientific Peer Review Processes

Proposals turned to the Associate Director for Research to apply for Hatch, Multistate Hatch, and McIntire Stennis projects are evaluated by outside reviewers whenever possible. Funds are then allocated by CNAS Dean and Associate Director for Research. Several criteria are used to rank the proposals, such as scientific quality, relevance, feasibility, collaboration among faculty, student involvement, and potential positive impact. A balance between research topics, project scope is sought. The number of projects depends mainly on overall fund availability. Programming decisions are driven by stakeholder input, fund availability, logistics, and comprehensive inclusion into UOG strategic goals. Peer review of Extension Plans of Work components includes both faculty and administrator internal and external reviews.

## Stakeholder input: Action Taken to Seek Stakeholder Input

The engagement of stakeholders in Guam's agriculture and natural resource management is complex because of cultural, educational, and geographic barriers. Local and federal agencies maintain lists of farmers and other stakeholders, but the information is not shared because of confidentiality issues. Direct contact or contact through third parties are some of the most common ways to engage stakeholders. Only some of them belong to organized groups. CNAS C-E&O and WPTRC employed several stakeholder input methods, including gathering input from local community groups, individual farmers, farmer's groups and organizations, representatives of the industry and representatives, and 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. The collaboration between WPTRC and CE&O allows access to many participants in Guam's agriculture and natural resource sectors. WPTRC continues to make good progress in reaching community leaders and builds on the solid CE&O community and collaborator connections with stakeholder groups. Several interns funded by the USDA Beginner Farmer and Rancher Development projects were placed on farms and gained hands-on experience in farming practices. Methods for collecting stakeholder input include from long-standing traditional stakeholder and non-traditional groups and individuals, surveys of traditional and non-traditional groups, public meetings, and general public surveys.

## Stakeholder input: Methods to Identify Individuals and Groups

Methods used to identify individuals and groups include the use of advisory committees, internal/external focus groups, listening sessions, needs assessments, and surveys from long-standing traditional stakeholder and non-traditional groups and individuals, public meetings, general public surveys. WPTRC stakeholders include farmers, NGOs, the Guam landscaping industry, natural resource managers, and local and federal government agencies. WPTRC has a long-standing collaboration with APHIS, the Guam Department of Agriculture, colleges in Micronesia, US Land-grant universities, and other stakeholders. Listings of stakeholders are checked periodically, and they are contacted to obtain feedback on existing and incoming research projects. CE&O engage with advisory committees,

government and non-government boards and commissions as additional methods of identifying groups and individuals from whom to collect input. Past participants and members from the public who have participated in CE&O programs and projects represent an important network of stakeholders who can be considered to offer feedback on program areas for future programming and improvements. Other channels of communications include email, phone calls, public service announcements, workshops are also part of profiling individuals and groups for generating interest in future CE&O programs and initiatives.

## Stakeholder input: Methods for Collecting Stakeholder Input

Input from groups and individuals is collected using surveys, face-to-face contacts, interaction with community groups, and contacts with agencies dealing with agriculture, soil conservation, small-scale farms, agricultural statistics, environmental protection, and other topics. CNAS faculty play different roles in organizations like the Guam Farm Cooperative, Chinese Farmer Association, Northern and Southern Guam Conservation Districts, Invasive Species Council, Guam Bee keepers Association, Veteran Farmer Association, Green Conservation Corps, and other groups, and Center for Island Sustainability-Grow Guam Green Initiatives which includes the UN 17 Sustainable Development Goal areas contribute to obtaining stakeholder input. Conferences, meetings and workshops are scheduled around themes relevant to stakeholder concerns, and post-conference surveys will establish how well information needs are addressed. Meeting minutes, videoconference archives and other records of stakeholder engagement and input will be used in planning of research and Extension programs.

## Stakeholder input: A Statement of How the Input Will Be Considered

Stakeholder inputs are periodically reviewed during mid-term and final project assessments and used to guide subsequent proposal submission and evaluation rounds. They are also received in confidential evaluations of workshops, field days, and other activities. They are tabulated, compiled, and analyzed. The information is used to define programmatic lines and develop projects relevant to stakeholders' needs.

## Critical Issues

### **Community Development**

Initiated on: Nov 26, 2019

State: Guam

Term Length: Intermediate (1-5 years)

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.

Science Emphasis Area

Bioeconomy, Bioenergy, and Bioproducts, Education and Multicultural Alliances, Family & Consumer Sciences, Youth Development

## **Family and Consumer Science**

Initiated on: Nov 26, 2019

State: Guam

Term Length: Intermediate (1-5 years)

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.

Science Emphasis Area

Education and Multicultural Alliances, Family & Consumer Sciences, Human Nutrition

## **Food Safety and Security**

Initiated on: Nov 26, 2019

State: Guam

Term Length: Intermediate (1-5 years)

Access 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 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.

Science Emphasis Area

Family & Consumer Sciences, Food Safety, Human Nutrition

### **Human Nutrition and Childhood obesity**

Initiated on: Nov 26, 2019

State: Guam

Term Length: Intermediate (1-5 years)

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.

Science Emphasis Area

Education and Multicultural Alliances, Family & Consumer Sciences, Human Nutrition, Youth Development

### **Sustainable Agricultural Production Systems - Global Food Security**

Initiated on: Nov 26, 2019

State: Guam

Term Length: Intermediate (1-5 years)

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.

Science Emphasis Area

Agroclimate Science, Bioeconomy, Bioenergy, and Bioproducts, Education and Multicultural Alliances, Environmental Systems, Sustainable Agricultural Production Systems

## **Sustainable Agricultural Production Systems - Protect Resources of Guam**

Initiated on: Nov 26, 2019

State: Guam

Term Length: Intermediate (1-5 years)

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.

Science Emphasis Area

Agroclimate Science, Bioeconomy, Bioenergy, and Bioproducts, Environmental Systems, Sustainable Agricultural Production Systems

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

Initiated on: Apr 01, 2021

State: Guam

Term Length: Intermediate (1-5 years)

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.

Science Emphasis Area

Sustainable Agricultural Production Systems

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

Initiated on: Nov 26, 2019

State: Guam

Term Length: Intermediate (1-5 years)

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. 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.

Science Emphasis Area

Education and Multicultural Alliances, Youth Development