



**UNIVERSITY OF GUAM**  
COOPERATIVE EXTENSION  
& OUTREACH

# 2019 Impact Report

Cooperative Extension &  
Outreach

Buenas yan Håfa adai,

*"I think that when the dust settles, we will realize how very little we need, how very much we actually have, and the true value of human connection."*

-Anonymous

Today, more than ever, we are dealing with a pandemic that none of us would have predicted but we have learned the "true value of human connection." The creed of Guam's Cooperative Extension and Outreach exemplifies this human connection, by making lives better for the people we serve. The current 2019 impact report showcases what we were engaged in before the current Covid-19 pandemic. However, I would like to state for the record that 4-H Youth Development, Community Nutrition Education Program, Consumer and Family Sciences, Agriculture and Natural Resources, Community Development and all our administrative staff are currently engaged in all areas listed as we reach out to our community to help them deal with traumatic experiences that our island has not faced since WWII.



Our national Cooperative Extension and Outreach professionals are demonstrating how Smith-Lever funding plays a fundamental role in dealing with both rural and urban community issues. We are in every state and territory and each county within these geographical entities, providing solid research-based knowledge to our clientele, both young and old. I am so thankful that I work with so many wonderful individuals who are dedicated to the land-grant mission and to its outreach component. A special thanks for all the people who helped in this year's report as well.

I want to highlight a few of the stories in our 2019 impact report before I close. As a reader, you will appreciate the breadth of activities we have participated in during this past year. From providing consumers the skills they need to support their families through SNAP-Ed, nutrition education programs, life skills for teens, embracing aging, talking about how to deal with the death of a family member, conducting an agricultural census, exploring forest gardens, 4-H Youth Development activities, to a newly created extension-ship experience.

Geographically, we are a very small island, located a great distance from our mainland counterparts, but we are a proud island community, serving many who live at the poverty threshold. Guam's cost of living is extremely high and most families live from pay check to pay check at the minimum hourly wage. Our understanding of the value of human connection is so vital and how Guam's Cooperative Extension and Outreach mission is more critical today than it's ever been before.

Un dangkulu na si Yu'us ma'åse',

**Lee S. Yudin, PhD**

Dean/Director, Cooperative Extension & Outreach  
University of Guam

Håfa adai!

The mission of Extension is clearly outlined - through education activities, information is delivered to the people to make their lives better. The other half of the Extension model is just as important - take the needs of the people to the university. Extension is a "grass-roots driven" organization that bases activities, education, and engagement on stakeholder needs and issues. "Grass-roots" means that local needs, local perspective, and local influence drive the development of Extension engagement programs. Issues may be identified at the national, regional, or international level, but local level impact is primary for Extension engagement.



Identifying emerging needs was highlighted in the beginning of Fiscal Year 2019 when the federal government experienced a shutdown and federal funding was limited in multiple sectors of Guam and throughout the region. Extension & Outreach professionals identified that the impact of the shutdown would have negative impacts on those needing Supplemental Nutrition Assistance Program (SNAP). CE&O professionals from Agriculture & Natural Resources, Community Development, and 4-H Youth Development volunteered to be trained as educators by the Community Nutrition Education Program to fulfill the potential increased demand for programs. Fortunately, the shutdown resolved, and extra educators were not needed. Central to the situation was the ability of Extension to adapt to needs and their willingness to engage as professionals.

Extension & Outreach materials, workshops, events, and overall engagement are based on reliable, credible information generated from researchers at UOG and throughout the land-grant university system. Throughout our daily lives, we interact with products and processes derived from research activities. Through a variety of education avenues, research is communicated for people to use in their daily lives. Our food system is one example of the integration of research and Extension activities.

Fruit and vegetable production on Guam have benefited from new disease resistant varieties, such as papaya.

Identification of pests and diseases direct treatment allow tomato, cucumbers, avocado, and coconut palms to grow.

Food packages eliminate spoilage to provide a longer, safe shelf life.

Consumer access to food sources and their ability to make nutritious decisions impact long-term health.

Safe food preparation in the home includes avoidance of cross contamination, knife, heat, and equipment safety for consumers of all ages.

All parts of the food system have been influenced and improved by research. UOG Cooperative Extension & Outreach's mission is to make it relevant for all.

**Sereana Howard Dresbach, PhD**

Associate Dean/Director, Cooperative Extension & Outreach  
University of Guam

University of Guam Cooperative Extension & Outreach is an integral part of the land grant mission. Cooperative Extension & Outreach at UOG is the confluence of federal legislation:

1862 Morrill Act provided funding to create land grant universities.

Hatch Act of 1887 provided funding for needed research in agriculture and natural resources.





1914 Smith-Lever Act provided funding for Extension education in all disciplines.

Through partnered funding from USDA, GovGuam, and other sources, Cooperative Extension & Outreach delivers research-based information to the people of Guam and the region. Concurrently, ideas,

needs, concerns, and emerging trends identified by citizens are communicated to the university to address. The continuous interaction between research and citizens is *engagement*. Cooperative Extension & Outreach is the front door to the University of Guam.

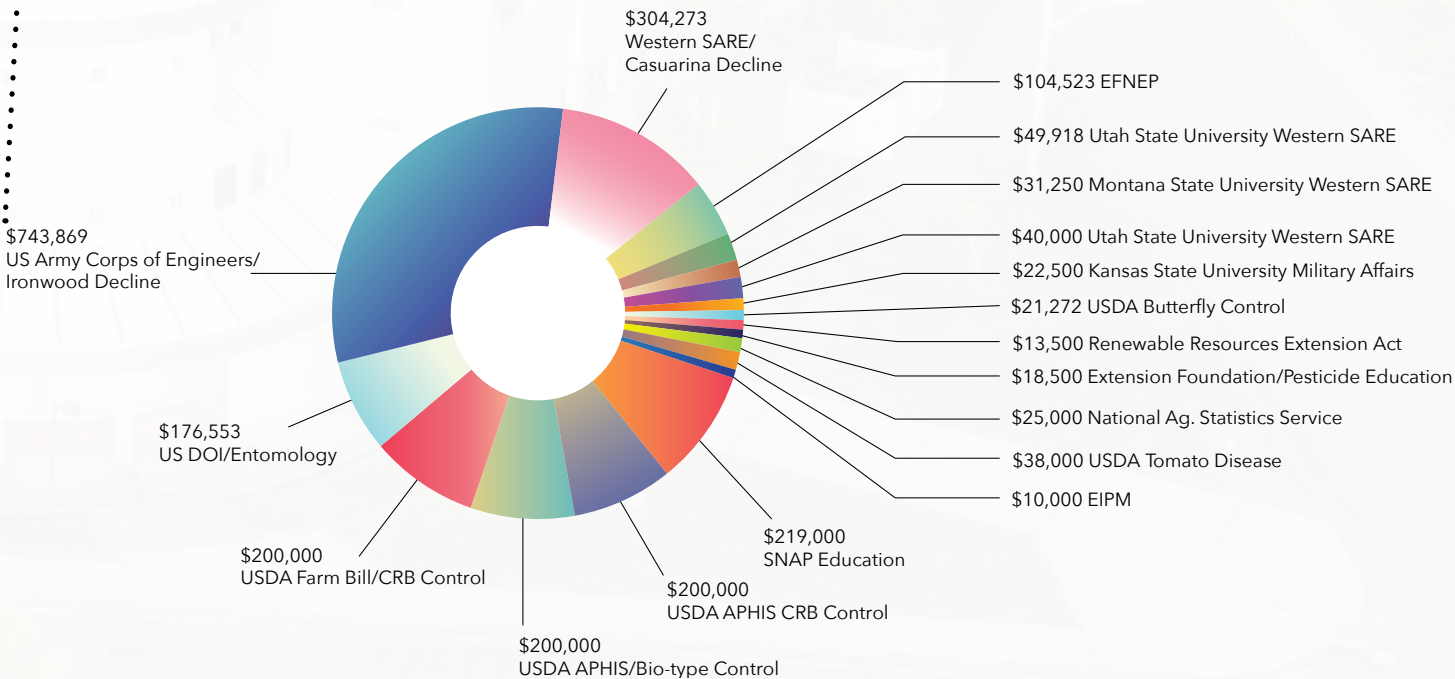
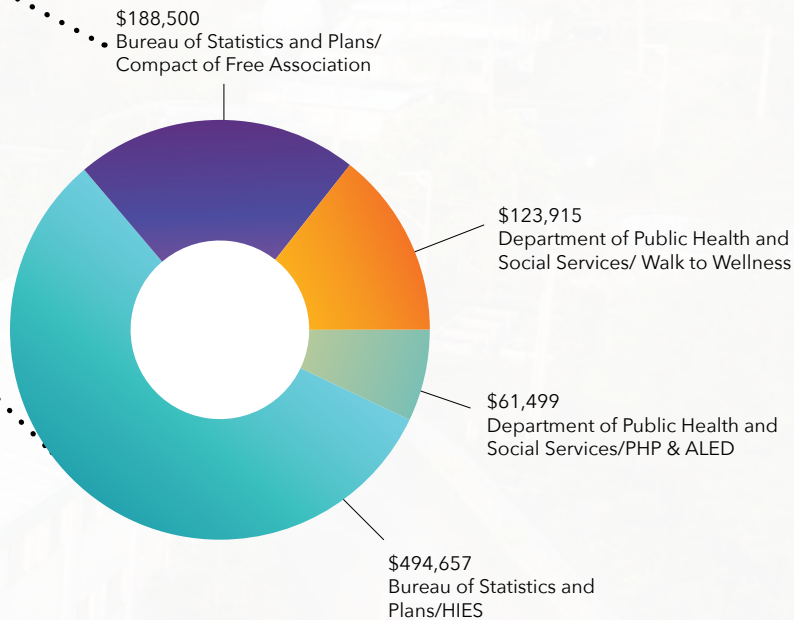
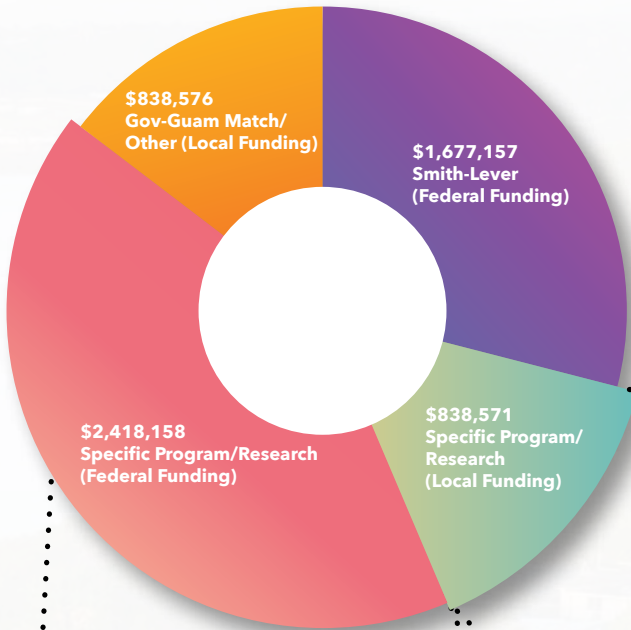
The needs and concerns of citizens drive the mission of Cooperative Extension & Outreach. Through multiple avenues of non-formal education settings, educators engage citizens with information to improve daily living. Workshops, conferences, and one-on-one consultations have been the foundation of Extension education, but embracing new technologies for digital connection to citizens is an example of the evolution of Extension education and outreach.

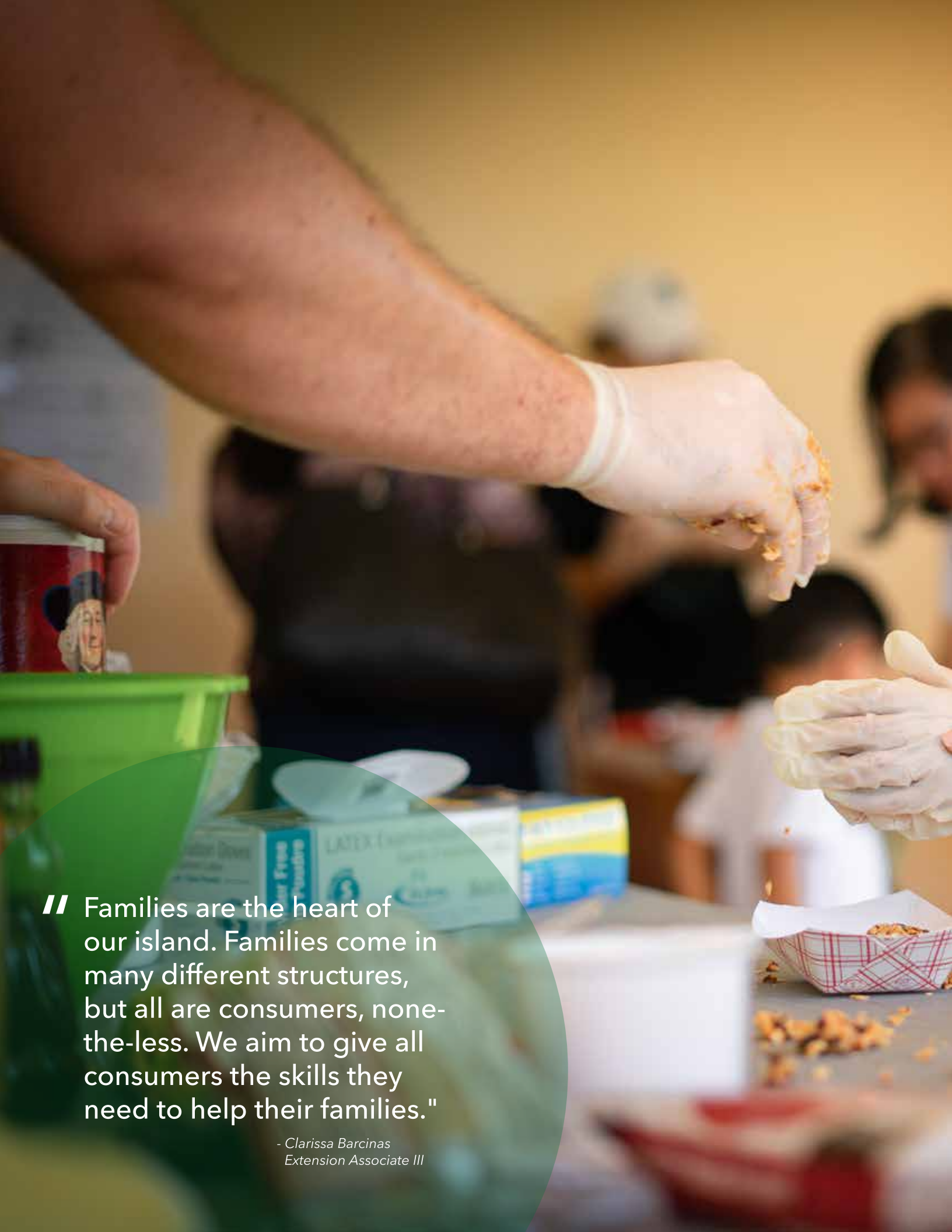
## UOG COOPERATIVE EXTENSION & OUTREACH PROFESSIONALS

-  4-H YOUTH DEVELOPMENT
-  COMMUNITY NUTRITION EDUCATION PROGRAM
-  CONSUMER & FAMILY SCIENCES
-  AGRICULTURE & NATURAL RESOURCES
-  COMMUNITY DEVELOPMENT
-  ADMINISTRATION



# UOG COOPERATIVE EXTENSION & OUTREACH FUNDING SOURCES FISCAL YEAR 2019





**//** Families are the heart of our island. Families come in many different structures, but all are consumers, none-the-less. We aim to give all consumers the skills they need to help their families."

- Clarissa Barcinas  
Extension Associate III

# CONSUMER & FAMILY SCIENCES



## NUTRITION EDUCATION

In 2019, *Guam SNAP-Ed* expanded the *5-2-1-Almost None Social Marketing Project* to seven villages. A total of twenty-five community partners pledged to promote healthy eating and active living where island residents live, learn, work, shop, and play. The healthy messages are: 5 servings of fruits and vegetables per day, less than 2 hours of screen time per day, 1 hour of physical activity per day, and almost no sugar-sweetened beverages

For the first time, a community-based organization signed the *5-2-1-Almost None* pledge. Guma Måmi, Inc. provides support and services to individuals with disabilities and now champions healthy living. The SNAP-Ed team provided nutrition and food resource management lessons, cooking training, and other workshops to the staff and residents throughout 2019. **"This partnership went above and beyond our expectations in promoting and adopting a healthier lifestyle,"** said Chelsea Resurreccion, Guma Måmi Inc. Education Coordinator. **"The physical activity and cooking workshops gave confidence to our staff and, in turn, encouraged the residents to try new healthy habits."**


In 2019, SNAP-Ed renewed existing partnerships with three schools in the villages of Yigo, Agat, and Ordot-Chalan Pago, and added four new schools in Agana Heights, Dededo, Sinajana, and

Talofofo. **"Wettengel Elementary School (WES) is proud to partner with 5-2-1-Almost None in promoting healthy habits and choices,"** stated Evangeline Iglesias, WES Principal. **"WES looks forward to sustaining a community that thinks smart in making healthy choices and lifestyles. Thank you, SNAP-Ed, for making a difference for my students, parents, and staff."**

Sixteen food stores near *5-2-1-Almost None* schools have also taken the pledge by encouraging shoppers to choose Smart Snacks, which are healthy snacks for children to grow and learn. SNAP-Ed professional work with store managers and staff to conduct in-store cooking demonstrations, taste tests, and nutrition education through workshops and posters, banners, and other materials.

**"Our partnership with SNAP-Ed provides interactive opportunities for customers to explore, sample, and ask questions at no cost,"** stated Rosae Calvo, Supermarket Dietitian for Pay-Less markets, Inc. **"By aligning our Health Smart program with SNAP-Ed principles, we can support cohesive messages that are echoed in various areas of the community. There is strength in a unified approach, and we look forward to the positive outcomes for our island community."**





// By having partners in different sectors of the community echoing the same healthy messages, we are creating opportunities for our island residents to make more sustainable food and physical activity choices. The messages we are promoting in schools and at home are also being echoed in other places in the community. This is important in creating lifelong healthy habits."

- Rynette D. Perez,  
SNAP-Ed Assistant Coordinator  
Extension Associate II

## NOURISHING GROWING BODIES AND MINDS

The *Community Nutrition Education Program (CNEP)* positively influences food and physical activity choices of youth of all ages throughout Guam. From classroom lessons supplementing academics, after-school programs, summer camps, advertising, and reinforcing healthy messages through a variety of activities.

Youth are impressionable in the early stages of life, which is the reason that Guam SNAP-Ed has sustained and expanded the *Food Friends & Mighty Moves* lessons. *Food Friends & Mighty Moves* began with four classroom groups in 2015. A total of twenty-six classroom groups participated in 2019. In early 2019, 352 pre-school children completed the lesson series. Later in the year, another 468 children, ages 3-5, completed the *Food Friends & Mighty Moves* curriculum.

Older youth receive lessons from the EFNEP program. In 2019, 407 elementary-

age and 234 middle school-age students completed lessons in food safety, nutrition, physical activity, and food resource management. EFNEP helps expand the *SNAP-Ed 5-2-1-Almost None* messages in the classroom, where 14 teachers from two *5-2-1-Almost None* schools invited EFNEP into their class.

There are 13 outstanding *5-2-1-Almost None* School Champions that transform the healthy messages into action by leading weekly "Fit Days" for all students in the school, supporting fruit and vegetable classroom competitions, and conducting healthy meetings for staff. Village community *5-2-1-Almost None* partners support the youth beyond the classroom, such as in food stores that make approved school snacks available and easy to find. From classroom to neighborhood, the Community Nutrition Education Program helps the community to support growing bodies and developing minds.





## INDIVIDUAL EMPOWERMENT

Extension programs empower individuals to be productive and active members of their communities. Guam SNAP-Ed and EFNEP initiated new partnerships in 2019. The Department of Correction's Residential & Substance Abuse Treatment (DOC-RSAT) and Guam Housing and Urban Renewal Authority's Family Self-Sufficiency (FSS) programs, respectively, engaged CE&O professionals to teach about healthy food choices while on a budget.

RSAT assists clients to build skills for a successful transition out of DOC and become productive members of the island community. SNAP-Ed educated over 15+ RSAT participants in 2019 in various village settings. Participants learned to budget their food dollars, plan healthy meals, and prepare healthy versions of local recipes, as each return to independent living. "When the next RSAT cycle begins, we look forward

to having SNAP-Ed come in to continue their nutrition education lessons," said Robert Dames, RSAT Specialist from DOC. RSAT participants learned to select lean proteins, nutrition influences strong bone health, and the creation of healthy living goals. EFNEP lessons influenced 56 family members, including 16 adults and 40 children in their homes.

FSS assisted families in reaching financial independence. "Instituting family-friendly activities and planning nutritious meals, being able to do so on a limited budget will be received enthusiastically!" reports Sandrina Cepeda, FSS Program Coordinator. She adds, "We are excited to provide our FSS participants with more information on how they can incorporate healthier lifestyle choices into their daily routines, and successfully establish important lifestyle changes."

## LIFE SKILLS FOR TEENS

*Life Skills for Teens* is a mentorship program that strengthens life and work readiness skills of teens age 13-19. A core aspect of the program is to assist teen transition to adulthood, set career goals, and prepare for employment while in school or after graduation. Utilizing various curricula across Extension, workshop lessons are fun, relevant, and interactive, offered through school-based and community-based settings. In total, 76 teens participated in workshop sessions held in the summer of

2019, amounting to 387 contact hours. Workshop activities included: mock job interviews, resume creation, job search, professional conduct, and effective communication. Teens reported overall satisfaction with the program. Participants found activities to be informative, impactful, and worthwhile. Participants acknowledged the information and activities had impact on their daily lives. Further, participants indicated the activities were a worthy investment of their time.





## **EMBRACING AGING FOR ALL**

*Keys to Embracing Aging* is an interactive, evidence-based program that highlights twelve strategies to assist participants in learning strategies to age gracefully, successfully, and increase your longevity. Based on research from centenarian studies and best practices, strategies are aimed at senior citizens, but applied to all ages.

*Keys to Embracing Aging* curriculum was adapted from the University of Arkansas, University of Kentucky, and Kansas State Research and Extension. The aging curriculum is a one-hour community-based workshop over ten weeks. Topics include a variety of aging concerns and issues, such as positive attitude, nutrition, physical activity, brain health, social activity,

technology, safety, medical literacy, stress management, financial security, sleep, and time management.

Although aging programs typically focus on senior populations, *Keys to Embracing Aging* has been adapted and engages people of all ages and professions. For adolescents and young adults, it has been a powerful educational tool for age simulation that reinforces healthy behaviors and lifestyles. For middle-aged adults, the program shares valuable information and skills, as many are primary caregivers to aging parents. Middle-aged adults also discuss the changes and challenges associated with their aging process.



// Community conversations drive how residents define their version of quality of life. These projects reflect evidence-based research and programming that represents the interests of our community. Extension Community Development processes allow transdisciplinary interests and collaborative partnerships."

- Peter R. Barcinas  
Extension Agent III

# COMMUNITY DEVELOPMENT



## THE END OF LIFE: DIALOGUE & DECISIONS

Gena A. Rojas and Peter R. Barcinas from Cooperative Extension and Outreach-Community Development developed *Decisions at the End of Life* guidebook. This compilation guide provides basic information and suggestions to help individuals, family, and friends sort through multiple tasks in preparation of honoring a loved one at the end of life. Using common practices for reference, the guide helps discussion and decision-making. Arranged in three sections to assist the users: Prior to Death, After Death, and Settling the Estate. The book also includes checklists, tips, and tables to quickly access information needed for different situations.

**//** When someone is in despair and grieving, the last thing they want to do is make decisions, and yet, these decisions have to be made - there is no way around it. We wanted to help reduce the stress of decision-making by providing practical information before and after your loved one has died, and so in a way this book is an extension of our ina'famolek philosophy, our interdependence, to help others as they face the trauma of losing of a loved one."

- Gena A. Rojas PhD  
Extension Agent III

*Decisions at the End-of-life* Extension publication was one of the resources for the *Let's Talk: Decision-making at the End of Life* workshop. The workshop was tailored to increase comfort levels for participants to identify and discuss their end of life decisions. Four pilot workshops were conducted with fifty-one individuals. Participation was solicited through organizations involved with caregiving and hospice care, along with the general public. Evaluations were designed to measure specific topics around four areas: Comfort level, Communication, Awareness, and Intention to make decisions. Evaluations were stratified to identify participants who had experience with hospice care, caregiving, and social services.

Overall, thirty-six individuals increased their comfort level around topics such as

identifying and communicating wishes and values, as well as documenting those desires for family members. While fifteen participants indicated no change, these participants had high levels of comfort in these areas as they were experienced in hospice, caregiving, and social services. Thirty-seven participants increased their comprehension of communicating wishes to family members to ensure desires are followed, stress reduction, and how to ease the anxiety of making end-of-life decisions. Thirty-two individuals indicated increased awareness of living wills, do-not-resuscitate (DNR) orders, in-home hospice care, and decisions and obligations that must be made for funeral planning. Participants that indicated no change in awareness were already connected to organizations that are engaged in end-of-life care. A section of the evaluation was designed to gauge intent to



make end-of-life decisions, documentation of decisions, identification of people to share decisions with, and communication with people responsible for actions. Thirty-five participants indicated that they had made decisions on the day of the workshop. Thirty-five individuals documented their decisions and identified individuals who would be engaged to carry out actions. Overall, 65% of participants increased their comfort levels of topics, awareness of breadth of decisions, and communication skills for end of life decisions. As well,

the same percentage of individuals made decisions at the workshop and intended to share with individuals who would be instrumental in honoring their end of life wishes.

While the end-of-life decisions are not easy or comfortable, family communication strategies are important for many life events. Families are essential to quality Guam communities.





## **2018 GUAM HOUSEHOLD INCOME EXPENDITURE SURVEY**

The 2018 Guam Household Income Expenditure Survey (HIES) was made possible through a Technical Assistance Program (TAP) grant from the U.S. Department of Interior to the Government of Guam Bureau of Statistics and Plans. The HIES survey contributes to the rebasing of Guam's Consumer Price Index (CPI) measuring inflation, and the development of Guam's Gross Domestic Product as well as other key economic indicators. The last HIES survey was done in 2005. Results of the study will assist Guam residents directly by calculation of accurate costs to various parts of their lives. The survey collected costs for food, housing, schooling, recreation, travel, and other daily expenses as well as income. Data from the survey is currently being analyzed to characterize the economic life on Guam. In addition, survey data will assist agencies, village operations, investment in utilities and roads, education

systems, housing, and many other entities that affect Guam.

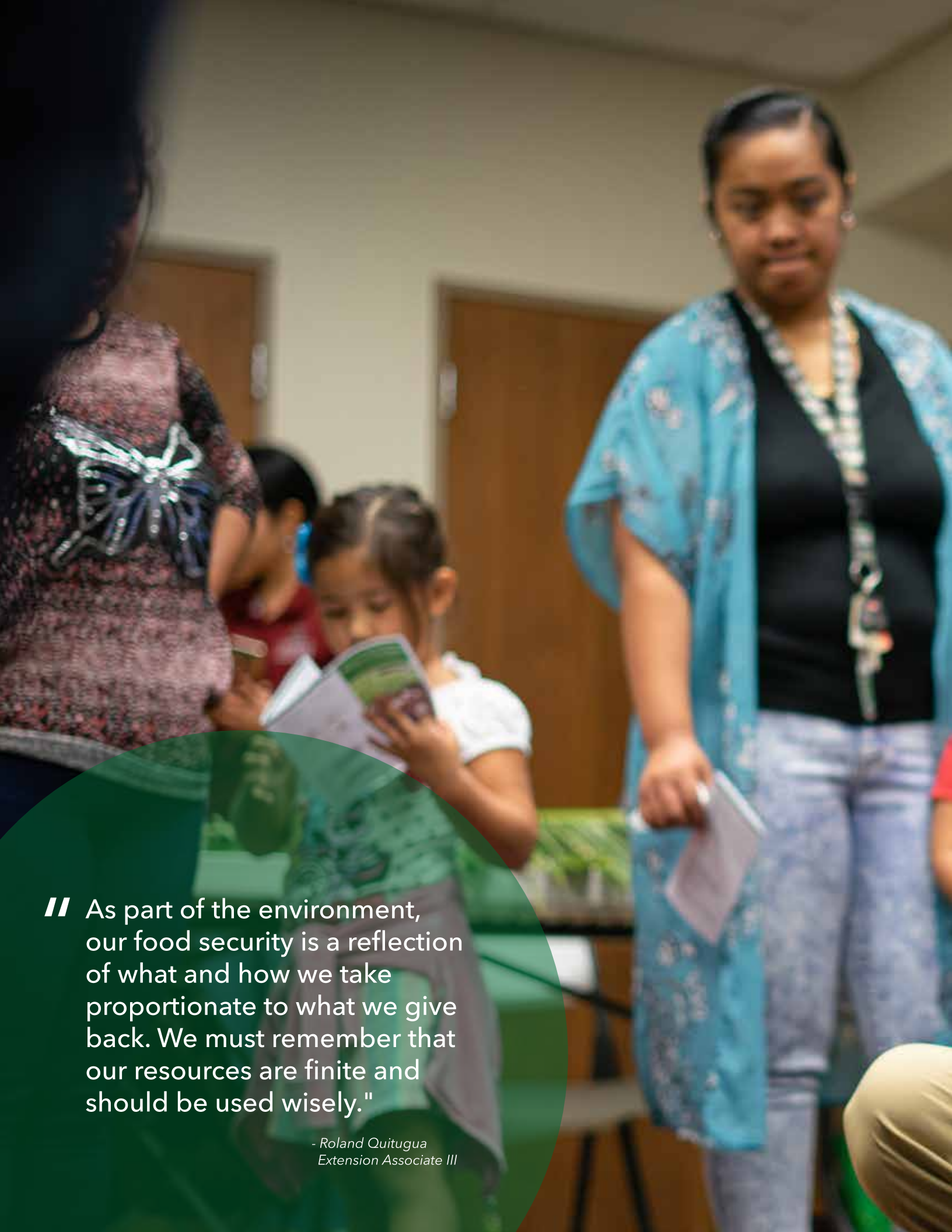
Other ways this information is used include the relationship between average income compared to what consumers buy. Survey results will also be used to meet the challenges of the future by showing changes in our local population, labor force, and other aspects of our community. Other benefits include distributing federal and local funds for education, housing, health services, transportation planning, job training, public works, and other essential programs. Government agencies can build effective policy planning, as well as community and economic development programs. The HIES activities include enumerator training, enumeration fieldwork, community outreach, and public relations activities.

## 2018 GUAM CENSUS OF AGRICULTURE

The 2018 Guam Census of Agriculture was conducted by the U.S. Department of Agriculture National Agricultural Statistics Service (NASS), and University of Guam Cooperative Extension and Outreach. Occurring every five years, the National Agriculture Census is conducted in every state and territory. While conducted in 2019, the data for the Agriculture Census is 2018 income and expenses. The Census of Agriculture data is used to create official agricultural statistics for Guam because agricultural production identifies new trends in agriculture and can be used for damage assessment by federal and local government agencies. Guam's agriculture

statistic compilation began in 1920, and the 2018 Census represents the fifteenth Census of Agriculture. Recruitment and identification of production agriculture is part of the methodology to develop a NASS Farmer Listing. Other cooperators in the Census included the Governor's office, Guam Mayors Council, Guam Department of Agriculture, farm groups such as the Farmers' Cooperative, and agriculture-affiliated organizations. Census of Agriculture fieldwork resulted in the completion of two-hundred census forms. The conservative estimated direct production value for Guam agricultural products was \$3.02 million.





**//** As part of the environment, our food security is a reflection of what and how we take proportionate to what we give back. We must remember that our resources are finite and should be used wisely."

- Roland Quitugua  
Extension Associate III

# AGRICULTURE & NATURAL RESOURCES





## GROWING TOGETHER

Extension Professional Phoebe Wall was a guest speaker for AL 389 (Extension Planning and Programming). She taught the students about Container Gardening. While it piqued the interest of several students, one student, Sky Lee, took it to a new level.

During the summer of 2019, Cooperative Extension and Outreach began offering the *E<sup>2</sup> program*, an Extension internship program for college students. Sky was able to work with the Consumer and Family Sciences program. She and three other interns participated in education programs that taught life skills to youth. One of the sessions was on "*Gardening Basics at Home*" lead by

Phoebe Wall. With Sky's interest in growing vegetables, herbs, and flowers she found, "**It helps to relieve stress and clear my mind.**"

In multiple learning environments research-based information on horticulture, micro-plot agriculture, and the consumer sciences is useful. The application of knowledge through engagement can make positive changes in many lives.

She learned that she could impact the community through education. Her long-term goal is to assist those with mental health issues. She is an engaged member of the community and hopes to inspire others.

## SEVEN TREES, SEVEN PRACTICES

*Seven Trees, Seven Practices* is an Extension education program focused on forest gardens. Forest gardens are seven fast-to-fruit trees (breadfruit, key lime, fig, calamansi, soursop, mulberry, pomegranate) planted on 2,000 square foot plots. In addition, seven conservation practices (fruit tree windbreaks, nitrogen-fixing hedgerows, sheet mulching/mulching, vegetative filter strips, cover crops, contour farming practices, and drip irrigation) were also demonstrated as to optimize the return on investment. For individuals and families, fast-to-fruit trees are a food source that contributes to food security. Ultimately, forest gardens are a potential revenue source for families as these fruits are regularly in demand by the restaurant industry on Guam.

Over one hundred forty individuals participated in an Extension education series that shared information on the specific trees, planting and harvest practices, conservation practices, water and pest management. Five farmers participated as demonstration sites, each with varying conditions and a combination of methods. Information was shared at the UOG campus, utilizing the on-campus demonstration plot. Then, participants visited all five farms throughout the island to experience different combinations of practices, depending on the production site needs.





// As we set sail into the future, our youth will be our elected leaders, our business owners, our teachers, our researchers, our future stewards. 4-H Youth Development program provides active learning of life skills, as well as subject matter information to spark and nurture positive youth development through all stages. All of these skills are essential for empowering people to reach their full potential."

- Cliff Kyota  
4-H State Program Leader  
Extension Associate III





# 4-H YOUTH DEVELOPMENT



In 2019, Guam 4-H Youth Development conducted four hundred and thirty-six (436) workshops that reached 9,560 youth through public and private school classrooms, 4-H community clubs, and after-school programs.

UOG 4-H College and Career Path project expanded and connected STEM knowledge and applied life skills to support academic achievement, college readiness, and career aspirations for all youth. The project targeted at-risk youth populations to discover successful pathways through hands-on learning activities, strategies to apply science concepts to daily living, and interactions with adult mentors. Participants were able to connect with researched-based curriculum materials, life skill activities, experiential learning models, college learning environment, and practical experiences such as successful high school completion and career aspirations. 94% of participants' reported increased knowledge of STEM-related fields in college and career options. 68% of the

participants' reported increased knowledge of specific STEM subject matter from workshop participation.

With a competitive market, island youth must possess marketable and in-demand skills. They also must be able to think in innovative and creative ways. Guam 4-H Youth Development provided workshop opportunities for youth to meet diverse employers and engage with professionals from a variety of fields. Guam 4H Youth Development professionals continually provide a range of activities for all youth to engage and explore the changing job market, collaborate with community partners, and interview tradesman passionate about their work. 4-H Youth Development engagement also demonstrates service-learning in the community. In these activities, adult volunteers give their time and talent to their community as philanthropic gifts. 4-H youth members see the opportunities in front of them, but experience civic and service learning opportunities that enable their active leadership in communities.





Life skill development through "hands-on" learning is a key component to 4-H Youth Development. In 2019, Guam 4-H focused on Mastery and Generosity.

Mastery was defined as building the skills to address everyday life challenges, such as self-esteem and self-confidence in decision making. In 4-H Youth Development activities, youth discovered career options, but also focused on responsibility, positive choices, and skill exploration that lead the individual toward future goals - "mastery of self."

Generosity, or the philanthropic giving of time and talent to the community, is an integral part of citizenship. Meaningful giving of time and talent to family, neighborhoods, and community is a foundation piece of 4-H Youth Development programs. Within 4-H Youth Development activities and engagement opportunities, adult mentors demonstrate the act of giving time and

talent through actions, advice, and assistance. Enabling youth to become experts in citizenship skills is equally important as subject matter knowledge. 92% of participants indicated increased awareness of life skills and willingness to apply those skills within the month. 89% of participants indicated their willingness to share learned skills with friends and family.





**CONNECTING EXTENSION PROFESSIONALS AND BUILDING ALLIANCES**





University of Guam Cooperative Extension & Outreach partners on multiple levels with other Extension systems in the region. With 2.4 million square miles to serve in the Western Pacific Region, partnerships are essential and critical to delivering research-based information to citizens. During fiscal year 2019, UOG CE&O faculty and professionals partnered with other Extension systems to deliver information and research to assist primarily agriculture production, pest and disease management, and invasive species control, but the potential for further partnerships continues to evolve.

Jesse Bamba, CE&O Agriculture & Natural Resources, conducted workshops in Kosrae (Federated States of Micronesia) for tropical fruit and vegetable production techniques for home and commercial farms. Working

with local Extension professionals and the local farmer association, research on pest pressure, new crop options, and production strategies were provided directly to farmers of Kosrae.

Joseph Tuquero, CE&O Agriculture & Natural Resources, led a team to Northern Marianas College (Saipan), to conduct a two-day training for professionals in agricultural experiment planning, field preparation, experimental design, data collection, data analysis software, field maintenance, and scientific and technical writing to support research and Extension processes. As the basis for all Extension education and reporting systems, valid research processes were emphasized. Accurate reporting of research to funding sources, as well as the public, is essential to the credibility of all Extension programs.

For Extension professionals, participation in national association meetings has been an effective means to develop partnerships for program funding, delivery, and evaluation. As a result of attending national conferences, UOG CE&O professionals have developed working partnerships, formulated potential research groups, and identified effective programs to be implemented on Guam and in the region.

UOG CE&O also invited partner institutions to share their expertise, knowledge, and skills for program development, education practices, and material development. By invitation, Robert Horton, PhD, Ohio State University 4-H Youth Development program specialist, engaged with Cliff Kyota and Guam 4-H Youth Development professionals to discuss and formulate program options to engage youth through non-formal science education in the community and school clubs. In addition, Dr. Horton conducted a workshop for over fifty K-12 science teachers to experience effective classroom engagement strategies for facilitating STEM programs.

Community Development specialist Peter R. Barcinas invited Joseph E. Heimlich, PhD, from the Center of Science and Industry/Ohio State University, to facilitate discussions with the Guam Museum Foundation. Together, Drs. Horton and Heimlich conducted professional development training on innovative teaching approaches for UOG CE&O professionals.

Guam 4-H Youth Development invited the perspective of nationally recognized 4-H educators, Joy Sharp and Lisa McCutcheon, from Ohio State University Extension, to provide strategies for development of new 4-H activities and education programs. The partnership between UOG CE&O and other Extension programs utilizes the best experiences and opportunities to evolve and create impactful programs for Guam.





In May 2019, the University of Guam Cooperative Extension and Outreach hosted the Western Sustainable Agriculture Research and Education (WSARE) Professional Development Program (PDP) summer meeting for the first time. WSARE State Coordinators, Administrative Council members, and agricultural professionals from the region attended several workshops on Agroforestry, Grant Writing, and Farm to School. Farm tours showcased agricultural practices on subsistence and commercial farms on Guam. Other activities showcased the interdependence of producers, food services, and the consumer. To highlight the linkage, a Farmer-Chef Grill-Off competition was held to feature local produce prepared by island chefs.

After the Guam meeting concluded, twenty-seven facilitators from WSARE traveled to the Commonwealth of the Northern Marianas, Chuuk, Yap, Kosrae, Pohnpei, and the Marshall Islands. Each team met and provided training to over 200 farmers, agricultural professionals, local officials, and teachers. Workshops were designed to meet locally identified needs:

SARE grant writing assistance, soil health/building (including tropical cover crops), nutrient management, plant propagation, pest management, seed-saving, swine production, specifically artificial insemination, alternative livestock and livestock feeds, and small-scale irrigation.

Through an engaged process, facilitators identified issues and assets of local producers and professionals, as well as strategies for success. Agriculture production issues and opportunities are similar across the Western Region, but distinct perspectives of Western Pacific agriculture emerged. Climate-driven impacts, lack of soil, lack of crop diversity, scarcity of local markets, and food accessibility were common concerns found in the islands. While a large portion of the agriculture production is small-scale or micro-plot production, a growing interest in scaling up to commercial agriculture was identified throughout the region.

## EXTENSION-SHIP EXPERIENCE (E<sup>2</sup>)

Internship programs are common among all academic programs and range from simple observation to engaged service-learning. Specifically for Extension, internship programs create a “pipeline” of future employees. In 2019, the Extension-ship Experience (E<sup>2</sup>) was created as an experiential learning program for undergraduate students to comprehend the link between research and Extension. The format linked undergraduate students with Extension and research professionals to showcase the variety of activities necessary to develop, implement, evaluate, and communicate research to intended

audiences. Eleven undergraduates from University of Guam and Ohio State University, interned in programs throughout the Cooperative Extension & Outreach, research initiatives, and laboratory operations. As outcomes, fact sheets were generated, education programs were implemented, laboratory and field research projects were analyzed, as well as career and education options were explored. All participants indicated substantial and meaningful experiences during their internship.





## E<sup>2</sup> Participants

Kiersten Cavender  
Ohio State University

Anita Cruz  
University of Guam

Kenton Dresbach  
Ohio State University

Chloe Gamble  
Ohio State University

Laura Gombar  
University of Guam

Nicole Imamura  
University of Guam

Sky Lee  
University of Guam

Victoria Lopez  
University of Guam

Rebecca Menge  
University of Guam

Tiara Rogers  
University of Guam

Alyssa Taitano  
University of Guam

## E<sup>2</sup> Mentors

Roland Quitigua, Agriculture & Natural Resources

Phoebe Wall, Agriculture & Natural Resources

Jesse Bamba, Agriculture & Natural Resources

Dr. Aubrey Moore, Agriculture & Natural Resources

Mark Acosta, Agriculture & Natural Resources

Dr. LaJoy Spears, Consumer & Family Sciences

Clarissa Barcinas, Consumer & Family Sciences

Jasmine Bassett, Consumer & Family Sciences

Dr. Andrea Blas, Plant Pest Diagnostics

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