

UNIVERSITY OF GUAM  
UNIBETSEDAT GUAHAN

Cooperative Extension Service

2009

2010

**EXTENSION  
IN ACTION**



BIENNIAL REPORT

Issued in furtherance of Cooperative Extension Work, Acts of May 8 and June 30, 1941, in cooperation with the United States Department of Agriculture (USDA). Dr. Lee Yudin, Director, Guam Cooperative Extension, University of Guam, UOG Station, Mangilao, Guam 96923. "The programs of the University of Guam Cooperative Extension Service are open to all regardless of race, age, color, national origin, religion, sex or disability."

This report was produced by the Cooperative Extension Service at the University of Guam, College of Natural and Applied Sciences.

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4-H children participate in a summer class on Entomology.



# *A Message from the Dean*

Buenas yan Hafa Adai!

Nearly a decade ago listening to a Keynote Speaker's address at a National Extension meeting, the speaker pointed out to her audience that if you are not working on the issues that are printed in the first two pages of your local paper then you are not in touch with what is currently taking place in your community. This message was deeply implanted into my memory and its relevance is true today as it was the day it was delivered.

The 2009/10 "Extension In Action" is produced by the faculty and staff of Guam's Cooperative Extension Service. It highlights key issues that our community is facing and provides examples of the outreach our faculty and staff are engaged in throughout our community. We are pleased to share our stories through these highlighted programs and the belief that we are helping our stakeholders help themselves to become more informed citizens in the communities that they live in. Please take the time to review our report and share our unique stories with your own organizations and constituents.

On behalf of the extension and university programs, we would like to thank our community networks, volunteers and stakeholders for their many years of support. Our goal has been and will continue to be to strengthen the lives of those we serve.

Si Yu'os Ma'ase

Lee S. Yudin, Ph.D.  
Dean/Director, CNAS/CES

Your community partner...educating  
communities, transforming lives



# EXTENSION IN ACTION

The University of Guam Cooperative Extension (UOG-CES) serves the people of Guam by providing them with research-based knowledge through innovative community programs that foster positive change. Consistent with the concept of an engaged institution, University of Guam Cooperative Extension is committed to increasing its value to the island and the Western Pacific Region. As the University of Guam's primary public service-oriented unit, Extension actively collaborates with other universities, colleges, schools, regional campuses, and distributed (distance) educational delivery systems to meet the changing lifelong educational needs of our diverse population. UOG-CES has

the unique capability of bringing the University's depth and breadth of knowledge to bear in identifying and solving problems. Our research and programs link different departments and facilitate mutually beneficial collaborations between the University and external organizations, individuals, and businesses. In so doing, UOG-CES makes a vital contribution to the public and to the educational experiences of the University community. Our Extension programs educate a wide variety of citizens, including individuals who make (or have the power to influence) decisions with public consequences. Extension programs seek to promote an understanding of the consequences of various alternatives

and to encourage well-informed policy decisions in order to better serve the public interest.

Our planned programs are concentrated in two unit areas: Agriculture and Natural Resources (ANR), and Communities, Youth, Families, Food and Nutrition (CYFFN). 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 (POW) designed by ANR faculty to address issues faced

by the community as well as other individual/community educational and informational needs. CYFFN planned programs are focused on ensuring a safe and abundant food supply, helping families, youth and individuals to become mentally, physically and emotionally healthier and assisting 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.



# AGRICULTURE & NATURAL RESOURCES

# ANR



Farmers participate in "Taste Guam" Fair in partnership with the Cooperative Extension Service

The Agriculture and Natural Resources (ANR) program is the center of agricultural information and technical expertise in the Western Pacific Region.

The program employs interdisciplinary teamwork and utilizes collaboration with public and private sectors in their outreach education programs to achieve significant improvements in the agricultural industry and the economic and social environments of Guam and the Pacific Islands. The primary mission of the ANR program is to work with its

clientele and partners to advance research-based knowledge through Extension and higher education to benefit individuals and communities of our islands.

Over 20 grants and special projects, worth **\$1.5 million**, are currently ongoing under four POWs: Plant Health and Pest Management; Sustainable Animal Systems for Small Scale Farms on Guam; The New Farmer: Agriculture for the Next Generation; and Home and Urban Landscapes.



## Demonstration of New High Value Crop Enterprises for Guam: Leafy Greens Production in the Tropics



In Guam, lettuce should be grown under at least 50% shade cloth to reduce the bitter taste that is found in lettuce grown under full sun. A low cost hydroponic system (20' x 30') was constructed to demonstrate a simple non-circulating hydroponic system with protective cover.

University of Guam  
Horticulturist Dr. Mari Marutani,  
working with the Farmers'  
Cooperative Association of Guam

conducted a leafy greens demonstration project on farmer Bernard Watson's land. The aim of the project was to support the development of a leafy greens production system. The two goals of the project were: to demonstrate recommended cultivars of leafy lettuce (*Lactuca sativa* L.) adapted to the tropical conditions of Guam; and to provide the Co-Op farmers technical support in piloting a leafy

green production system targeting the local restaurant market.

This demonstration effort grew four lettuce cultivars which included: 'Tropicana,' 'Green Sail,' 'Cherokee,' and 'Vulcan,' petsai, and bunching green onions.

As a result of extension expertise, this effort has opened the door to the production of a very high value crop (leafy greens) which has long been desired by local chefs.

## **Agricultural Marketing: Seasonality Calendars & “What’s Fresh Now”**

In every needs assessment of the agricultural community conducted over the past 20 years, agricultural marketing has always ranked as one of the top three concerns of farmers. Given this, it is ironic that the number one objective of Guam Hotel and Restaurant Association (GHRA), Food and Beverage Committee is “to support the local economy by working with the local farmers to grow products in sufficient numbers that can be used by all hotels and restaurants.”

Sadly, few local products are used by Guam’s largest industry - tourism. In Hawaii when chefs use local produce in their menus they become the most vocal advocates for buying island produce. In buying local produce Guam chefs use fresher, higher quality fruits and vegetables and truly give visitors “a taste of Guam”.

Working with farmers, chefs and purchasing agents, UOG CES/ANR identified the need for educational

materials and communication between farmers and the tourist industry to usher in a new paradigm shift: **What's Fresh Now**. Menu planning for chefs would move from seeking year-round availability of a product (regardless of seasonality) to knowing and using what's available based on a firm understanding of the availability of local fruit and vegetables.

ANA extension associate Jesse Bamba coordinated the effort to create seasonality calendars for Guam. In collaboration with ANR extensions agents, local farmers and the members of the Farmers Cooperative Association of Guam, Bamba put together a list of fruits and vegetables that are important or hold potential to contribute to the local agriculture economy. The experts, with the help from available literature, identified the months of the year in which the products would likely be in season. The list was crosschecked every month for 2 years in order to insure the validity of the seasonality calendars.

Outreach to the tourism industry included providing GHRA and chefs copies of the calendars. But even more effective were presentations made by a team composed of the ANR Program faculty and staff and the members of the Farmers Co-Op at four meetings of the Micronesian Chefs Association. Multi-table displays of fruits and vegetables available during that month on Guam made the chefs aware of products that they did not previously know about and gave them the opportunity to interact with the farmers in discussions on the availability of each product.

These two seasonality calendars represent and document the knowledge of many local agricultural professionals and farmers on local produce availability. This has created a common set of conventional wisdom on seasonality of our agricultural products for use in educating local restaurant owners and chefs of the abundance of fresh fruit and produce grown on Guam.



Seasonality Chart available, contact ANR  
at 735-2080 for more information.

# Land Lease Education Program

**IN A PUBLIC** session held by the Northern Soil and Water Conservation District (NSWCD) of Guam, the agricultural community's most frequent complaints were difficulties with access to land and the problems and misuse of vast tracts of agricultural land under the Chamorro Land Trust Commission (CLTC). In a joint planning session with the UOG/CES Agriculture and Natural Resources Program (ANR) the NSWCD requested that ANR assist the CLTC in assessing and addressing these issues. In response to this farmer-initiated request, a MOA was developed and signed between UOG Cooperative Extension Service, Chamorro Land Trust Commission and Guam Department of Agriculture, to train and assign a multi-agency field team to the CLTC for one year. The CLTC provided \$98,000 to support this effort.

This team, including ANR faculty, spent one month studying the laws pertaining to the Chamorro Land Trust Commission, CLTC lease terms as well as training in field production monitoring, writing of inspection reports and inspection protocols.

From these multi-agency inspections and analysis of the reports five compliance issues were identified as significant problems for the CLTC agriculture lease holders.

Three of these five issues:

1. not meeting the minimum tree planting requirements
2. not meeting minimum production requirement
3. proper permitting of livestock operations

were determined as ideal for addressing through Extension education programs. UOG CES/ANR's New Farmer Education Program adapted existing and developed new materials to meet the needs of this large clientele base (over 1,000 agriculture lease holders). An analysis was conducted of the issues the agricultural lease holders identified as barriers to agricultural production. This analysis led to the development and delivery of 50 hours of New Farmer Training curriculum through workshops to CLTC agriculture lease holders and the public. Island agricultural professionals from partner agencies were solicited to assist in conducting training

sessions and were cross trained in the utilization of the curriculum.

This effort served to leverage the human, information and fiscal resources of UOG CES/ANR, Natural Resources Conservation Service (NRCS), Western Region Sustainable Agriculture Research and Education program, Guam Department of Agriculture, Farm Services Agency, and the Chamorro Land Trust Commission.

This workshop series included the following topics: Guam Labor Laws for Farmers, Realistic Farm Plan Development, Fruit Trees as Windbreaks and Barrier Plantings for Farms, Organic Nutrient Management and Soil Fertility, Livestock Dry Litter Waste Management Systems and Guam Livestock Permits and Local Feed Production. The record number of attendees at these workshops is an indicator of the relevance of the material presented.



Extension professionals with First Lady Joanne Camacho during Arbor Day tree planting at the Governor's Complex in Adulup





# Local Feed for Livestock Nutrition

**TRADITIONAL** ways of feeding local feedstuff to livestock and poultry were practiced prior to the availability of commercial feed. Such feeding practices have sustained the livestock production on Guam for many years.

Producers fed their pigs available local feed such as ripe bananas, breadfruit, coconuts and root crops finding variable results in terms of animal performance and growth. These variable results led producers to conclude that local feed was not good enough to provide a well-balanced diet. But these negative results were actually brought about from using the wrong materials (cooking banana trunks and swamp cabbage), improper processing (using the whole coconut or raw taro), or

one plant in excessive amounts (*Leucaena* sp.) being fed to livestock.

There was no consistency in the daily feed ration because livestock were fed whatever was available on the farm. Producers spent a lot of time and effort gathering locally grown plants that were high in fiber that some animals cannot digest. There was a lack of information on the nutrient values of the most commonly used non-traditional feed materials.

#### Activities and Results:

Twenty-one (21) local feed materials from Guam were sent to a feed laboratory for nutrient analysis. Ranchers and extension agents can now formulate feed rations that are appropriate for the kind of livestock

being raised based on the analysis. The nutrients from these local plants do satisfy the feed requirements with proper formulation for the quality of swine and other livestock being raised in the island.

Feeding trials conducted on farms and at experiment stations showed that local feed materials, when properly processed and formulated, resulted in good animal performance.

Local feed resources can be stored for 3-4 months if dried properly. Other methods, such as the fermentation of breadfruit, can also be used effectively. Workshops on local feed processing and formulation were conducted in the region by ANR personnel.

***Feeding trials conducted on farms and at experiment station sites showed that local feed materials, when properly processed and formulated, resulted in good animal performance.***



# Saving the *Gago* trees



**EXTENSION** scientist Robert Schlub and extension assistant Roger Brown currently have projects underway to educate the public about the importance and care of Guam's *Gago* or ironwood tree (*Casuarina equisetifolia*). Indigenous to the region, the ironwood tree is one of the dominate forest and agroforest species in the Pacific. The tree plays an important role in island life by providing firewood, wind protection, needles for crop mulching, soil erosion protection, and habitats for Guam's fairy tern, Mariana fruit bat, and other species.

Outreach activities for the general public included a presentation and training on Ironwood tree decline for advanced biology students on Saipan, and interactive displays at the University of Guam's Charter Day and the Environmental Protection Agency's Earth Day activities.

In addition to promoting the ironwood tree through various outreach activities, Dr. Schlub and others scientists from Guam and around the world are activity engaged in research to stop ironwood tree decline (IWTD). Local farmer Bernard Watson first brought this (cont'd)



***“If left unchecked, healthy stands of Gago trees such as those that now occur on Guam at Ritidian Point and Cocos Island may become a thing of the past, “ says Schlub.***

perplexing problem to the attention of Dr. Schlub and now retired Ext. Agent Frank J. Cruz in 2002, at which time he observed many of his young ironwood windrow trees doing poorly. Since then, IWTD has decimated trees stands in windrows on other farms, as well as trees in parks, golf courses, and housing developments. Through the use of various statistical methods, the factors most related to ironwood decline were the presence of a

particular mushroom on the tree, termites, and the level of human management.

Outreach activities for the scientific community included posters presented at three international professional meetings, a thesis from Louisiana State University Experimental Statistics Department, and a visit and review of the Ironwood tree project by the USDA Region 5 Forest Pathologist, Dr. Phil Cannon. In addition to

UOG extension funding, funding was provided by the Western Pacific Tropical Research Center as well as various United States Department of Agriculture programs including: WSARE, EIPM, RREA, WIPM, and WPDN.

# CYFFN

COMMUNITIES, YOUTH, FAMILIES, FOOD & NUTRITION (CYFFN)



# 4H Youth Development

The 4-H Program planned, organized and conducted curriculum based life skills activities that included: 16 newly chartered community 4H Clubs, 20 4H school enrichment programs that resulted in requests to be chartered, 17 special interest/ short-term programs and day camps and 5 overnight camp. 4H trained and conducted training for 12 School-Age Child Care Education Programs on stages and ages of youth development and

conducted 5 science, energy and technology related workshops. Five 4H individual study/ mentoring activities were implemented.

Participants learned, practiced and mastered the targeted life skills in all the activities including: teamwork, managing feelings, healthy lifestyle choices, goal setting, resiliency, cooperation/ collaboration, communication, social skills, leadership, wise use of resources, decision making, critical thinking, self-

esteem/ motivation, marketable skills, responsible citizenship, and learning to learn.

A Monsanto sponsored "Salute to Excellence: The Pacific Volunteerism" conference attracted over 126 4H Club members and Volunteer Leaders. This year the launching of the SET H2O was our feature presentation.

*4H empowers youth to reach their full potential, working and learning in partnership with caring adults.*

## Positively impacting communities...

**2,751** youths have **gained skills and knowledge in leadership and interpersonal skills**, helping them become tomorrow's leaders.

**518** youth increased self efficacy in **public speaking, presentations, visual and performing arts.**

**2,257** youth increased knowledge in **environmental awareness** and conservation practice.

**75** youth increased knowledge and skills in **economic education** and **entrepreneurship.**

## CYFFN

The CYFFN planned programs focus on ensuring a safe and abundant food supply, helping families, youth and individuals become mentally, physically and emotionally healthy and assisting in building sustainable and resilient communities.

In the past year, CYFFN programs focused on food safety, nutrition education, economic and community development, capacity building, chronic disease prevention and youth development that targeted a wide range of clients from diverse demographics.

CYFFN has made direct contact with over **6,000** youth; and thousands of individuals and families have benefited from our services. Extension professionals have served on numerous government and community boards, coalitions and workgroups.

This section highlights projects and programs that have transformed the lives of our stakeholders. It includes a report on the impact, outcomes and activity highlights of each respective planned program.



Children participate in the EFNEP Summer Camp and learn how to budget and shop for healthy food items.

The Expanded Food and Nutrition Education Program (EFNEP), has been on Guam for almost 30 years and has been helping local families and children acquire the knowledge, skills and behaviors necessary to choose nutritionally sound diets and to contribute to their personal development and the improvement of the total family diet and nutritional well-being. Guam EFNEP has two components, the Adult Program and the Youth Program.

In the Guam Adult Program, EFNEP participants learn to make food choices which can improve the

nutritional quality of the meals they serve their families. They increase their ability to select and buy food that meets the nutritional needs of their family. They gain new skills in food production, preparation, storage, safety and sanitation, and they learn to better manage their food budgets and related resources from federal and local food assistance agencies and organizations, such as WIC and SNAP. They also learn about related topics such as physical activity and health. The Guam Adult Program has adapted the **“Eating Smart - Being Active”** EFNEP curriculum from Colorado State University Extension

Service. The curriculum is delivered as a series of 8 lessons, over several weeks, by local paraprofessionals. This hands-on, learn-by-doing approach allows participants to gain the practical skills necessary to make positive behavior changes. Through EFNEP, participants also experience increased self-worth, recognizing that they have something to offer their families and the local community.

For the Guam Youth Program, the EFNEP curriculum is delivered primarily to Guam DOE Elementary School students. These youth participants are taught, over the

## Expanded Food & Nutrition Education Program



The EFNEP programs provides free 8 week nutrition and fitness education classes to parents with small children.

course of 5 lessons, about nutrition, food safety, and physical activity. One of the special programs of the Guam Youth EFNEP Program is the Annual **“Fitness, Food and Fun Summer Camp”**.

The high prevalence of child obesity and other chronic diseases on Guam gave rise to the incorporation of the Annual “Fitness, Food and Fun Summer Camp” into the list of the already long list of EFNEP activities here on Guam. This camp is an intense 4-week long, 4 hours/day infusion of nutrition,

# CAMP SUCCESS

When the 7-11 year-old participants arrive at the Annual EFNEP “Food, Fitness and Fun” Summer Camp, they are given several “pre” tests. These tests include nutrition knowledge, dietary intake, body size (weight and BMI), and several physical fitness measures such as a timed half-mile run/walk, maximum number of sit-ups and push-ups, and a step-test. These same tests are performed again at the end of the Summer Camp so that the kids can see their improvement.

By the end of the 4-week Summer Camp, our evaluations showed that every participant had improvements in their nutrition knowledge scores and physical fitness measures — their half-mile run times all improved greatly. They were issued a food journal for them to target the food groups they need to eat more of every day as a guide for healthier eating. Data collected from their food journals indicated that they were making better food choices. On completion, campers expressed just how much fun they had and how much they learned. They also shared how they looked forward to attending future EFNEP summer camps, wishing their camp experience to never end.



Children participate in the EFNEP Summer Camp, which includes fitness and outdoor activities.

health, and physical activity training. The title of the camp says it all — participants do physically challenging activities daily, they learn about food and nutrition through hands-on activities; and through all of this, the focus is on having fun. The participants learned about nutrition in a fun way by dividing up the day with nutrition/food lessons, cooking demonstrations, exercise/physical activity time and field trips. The “Fitness, Food and Fun Summer Camp” tackled

issues related to child obesity head-on. Camp participants, ranging from ages 7-12 years, were taught the concept of the “My Pyramid” (a guide for food group servings) for healthy eating, proper portion sizes, importance of eating from the different food groups, choosing healthy beverages, preparing healthy snacks, and the importance of physical activity for staying healthy. Camp participants also learned that they have a role in taking care of their own bodies by

eating healthy and exercising. Being empowered with the knowledge and skills on how to make healthier choices resulted in enhanced self-esteem among camp participants.

Physical activity time included: jogging around the campus, calisthenics, on-campus hiking, swimming, volleyball, obstacle course relays, water-balloon activities, slip-and-slide, relay races, kick-boxing, yoga, karate demonstration, tug-o-war,

soccer, Wii-Fit games, and even free play. Off campus field trips included: bowling, kayaking, rock climbing, kite flying, off-campus hikes, and Onward Water Park. Camp participants learned throughout the summer that adopting healthy life-style habits is not boring, but is rather fun, easy and even exciting. EFNEP looks forward to having summer camp for many years to come.



Emergency Tool Kits help save lives in times of man-made or natural disasters. Through Guam EDEN residents are encouraged to have a home emergency tool kit tailored to meet their families unique needs.

## Disaster Preparedness

Extension Disaster Education Network (EDEN) is a collaborative multi-state effort that links extension educators from across the US and various disciplines, enabling them to use and share resources to reduce the impact of disasters. Disaster preparedness can save and preserve lives in times of emergency and help reduce the impact of disasters among populations.

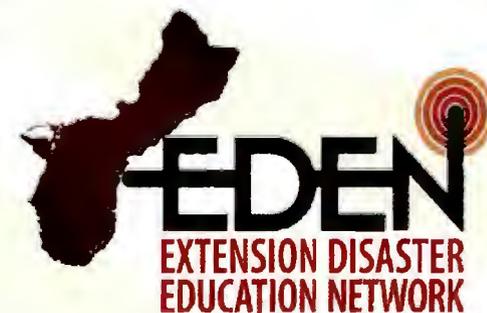
We collaborated with government, community agencies and faith based organizations to

provide informational materials and tips on disaster preparedness.

Extension educators provided expertise and participated in community planning groups both nationally and locally helping to set the agenda on disaster strategic and exigency plans. EDEN participated in the annual National Disaster Preparedness Month expo. EDEN was showcased in numerous community fairs. We provided over 100 youth and adults with personalized In Case of Emergency Cards, disaster preparedness tips and information

on assembling a home emergency tool kit. Outreach efforts have specifically targeted senior citizens and youth who may become vulnerable during disaster situations.

Approximately 100 adults and youth have increased their knowledge of creating a home emergency tool kit. In addition, individuals have personalized In Case of Emergency Cards and understand the importance of these cards in life threatening situations.



CES was a critical player in engaging key stakeholders in regional community food security. In early 2010, the first Food Security Focus Group was conducted.

# Community Food Security



Community Food Security means that people have access, at all times, to enough food for an active and healthy life.

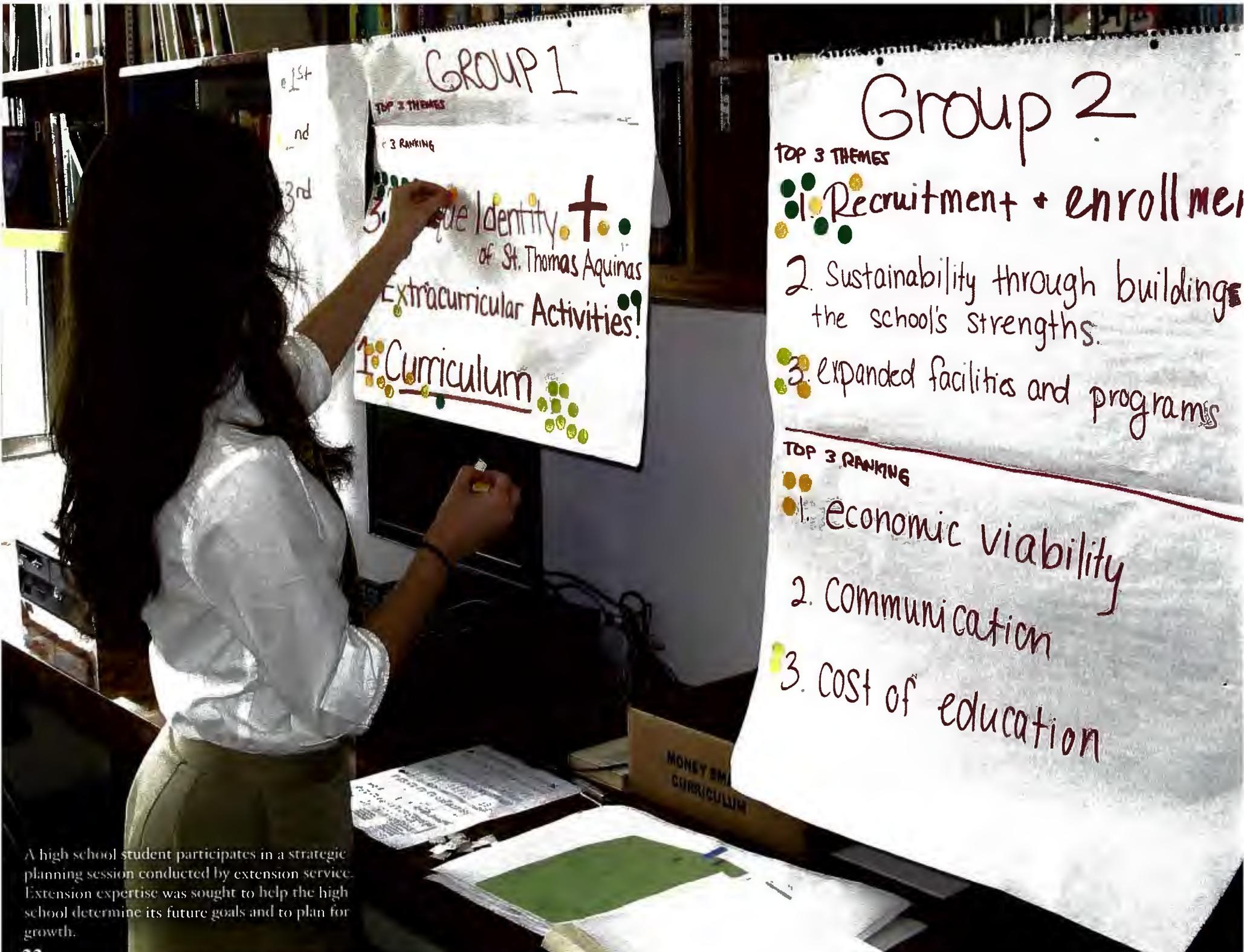
CES conducted a series of Community Food Security focus groups in January and Sept. 2010 to assess the current state of Guam's food system and food security needs. The focus groups convened key stakeholders from industries that included food production, agriculture, government and nonprofit agencies. Information collected in the focus groups helped to determine the underlying social, economic and institutional factors

that affect the quantity and quality of food available.

CES continues to engage in critical discussions in community food security. Efforts in community food security have led to greater public awareness of local and regional food systems and the lack of a comprehensive policy in addressing unsustainable practices and food insufficiency on Guam. In addition, data models have been adopted for decision making in community food security.



A resident shares his thoughts about community food security concerns at a focus group series conducted by CES.



# GROUP 1

## TOP 3 THEMES

### 3 RANKING

- 3. School Identity of St. Thomas Aquinas Extracurricular Activities!
- 1. Curriculum
- 2. Sustainability through building the school's strengths.

# Group 2

## TOP 3 THEMES

- 1. Recruitment + enrollment
- 2. Sustainability through building the school's strengths.
- 3. Expanded facilities and programs

## TOP 3 RANKING

- 1. Economic viability
- 2. Communication
- 3. Cost of education

A high school student participates in a strategic planning session conducted by extension service. Extension expertise was sought to help the high school determine its future goals and to plan for growth.

# Community Development

**COMMUNITY** development practice cultivates mutual aid, expands local networks and builds communal coherence. In 2009-2010, CES continued to provide government and non-profit entities with capacity building and technical assistance services aimed at optimizing positive change and growth. We have promoted the adoption of community development practices among key partners.

Our team of community development professionals have provided participants with critical decision making and problem solving skills that strengthen commitment to workforce & regional economic development, eliminating chronic

disease and reducing health disparities, promoting quality education, ensuring quality of life for senior citizens, and strengthening regional food systems.

Community development practices encourage individuals and entities to self-represent and promote collective action. CES has partnered with the Guam Workforce Investment Board, Serve Guam Commission, Guam Judicial Court, Department of Public Health and Social Services, St. Thomas Aquinas High School, Division of Senior Citizens, Salvation Army, the Guam Homeless Coalition, the Guam Comprehensive Cancer Control Coalition. Partnering opportunities included strategic planning and capacity building as a

means of engaging community action by adopting evidence based practices and applying social change theories.

As a result of these efforts, agencies have implemented strategic plans, utilized stakeholder input processes and accessed data collection instruments. CES continues to employ the Appreciative Inquiry (AI) qualitative method for planning and key decision making purposes. Partners were trained on the plan of work model helping them focus on outcomes and impacts. Agencies adopted the logic model for decision making, identifying funding opportunities and developing programs and policies.

*Change will not come if we wait for some other person or some other time.  
We are the ones we've been waiting for. We are the change that we seek*

*President Barack Obama*

## Social Planning and Community Action...

Increased knowledge and understanding of **community development practices** among gov't & civic leaders.

Increased knowledge, understanding and awareness of **data set models**.

5 agencies have **adopted data models** for decision making

Helped agencies and organizations develop **strategic plans**.

## COFA: \$19 million for Guam

Every five years, the US Census Bureau in partnership with the Governor's Office, Bureau of Statistics and Plans conducts a survey of immigrants from the Compact of Free Association (COFA) living on Guam to determine the island's share of compact impact funds.

Cooperative Extension Service and the Department of Labor partnered with the Office of the Gov. and the Census Bureau to provide technical and administrative support for the project.

Forty-four enumerators were hired and trained through CES-ECS. Enumerators surveyed 4,051 households. The survey asked residents six questions: name, age, gender, place of birth, year of entry to Guam and relationship to other members of the household.

As a result of extension and partner efforts, the survey found an 86% increase among immigrants from the freely associated states living on Guam, totaling 18,305 people. As a result of the census, **\$19 million** in compact impact aid was identified for Guam.



Participants of the CYFAR project gains skills in entrepreneurship and small business development.



The CYFAR Project provides participants with the basics of business planning from learning how to start and run a business to product development and marketing.

## Sustainable Teen Entrepreneurial Programs

The Pacific Island Communities: Sustainable Teen Entrepreneurial Programs (STEPS) include Pacific regional partners from Guam, American Samoa and Kosrae (Federated States of Micronesia). Funded by a **\$947,000** grant from the USDA, Children, Youth and Families at Risk (CYFAR) Program, the project's experiential courses teach youth, ages 13-18, the knowledge and skills necessary to become entrepreneurial thinkers and contributors to their local economies. These courses introduce teenagers to the idea of creating work for themselves and others by starting their own business in a field of their interest. In the last three years, 276 teenagers have participated in these courses and increased their understanding of entrepreneurial concepts in the following areas: ability to identify entrepreneurial interest, financial management, marketing, product development, and budget projections. In 2009-2010, 82 participants completed the program.

An established partnership with the Superior Court of Guam's Juvenile Probation Office has contributed to increased participation at the Guam Site. Building on the success of this partnership, the site established new ties with Sanctuary Guam, Inc. (a shelter for at-risk youth) and Guam Department of Youth Affairs and have begun implementing programs in early 2011. The most successful teen venture on Guam is "Pacific Jams", a group of students who developed a value-added product by using calamansi (local sweet lemon) and mangoes to produce a tropical flavored jam. The students were taught the process of preserving local fruit using a recipe developed by Cooperative Extension Service. They applied the entrepreneurial concepts taught in class to develop a plan for increasing production, marketing and distributing the jam. With guidance from their instructors, the teen group did the majority of the work themselves: from picking the calamansi at the Extension Farm, to preparing the

ingredients, cooking, canning, pricing their product, designing their labels, and developing the marketing plan. A popular local restaurant tested the jam as a marinade in their protein entrees, salads and appetizers and found that the combination of calamansi and mangoes reflected their Chamorro fusion theme and purchased 30 jars earning \$210.00 for the group. Due to the success of Pacific Jams, fruit preservation and distribution have been integrated into subsequent entrepreneurial courses as an educational business model.

The Kosrae site accomplished a long-term goal by securing \$25,000 from the Federated States of Micronesia Congress for the site's Youth Entrepreneurship Start-Up (YES) Program to fund youth entrepreneurial ventures. The FSM Congress stated they were impressed by the success of the program and encouraged by the aspiring teen entrepreneurs.

The YES program allows students who complete a business plan during the STEPs entrepreneurial courses to access start-up funds to finance their business' initial push into the market. This is a significant accomplishment for the program demonstrating community and government support by providing opportunities for youth to generate income and contribute to their local economy.

The extraordinary support from local entrepreneurs from each island continues to strengthen entrepreneurial workshops igniting classes with the life and energy that can only be found through an entrepreneur's first-hand account of risk and reward. Passionate entrepreneurs captivate, inspire and introduce participants to the many wonderful opportunities the world of business can offer. Through the support of the land-grant institutions and the community, Pacific STEPs has established a presence as a legitimate entrepreneurial program for youth at-risk.

**“Pacific STEPs has established a presence as a legitimate entrepreneurial program for youth at-risk; our partnership with the Superior Court of Guam’s Juvenile Probation Office has led to establishing new ties with Sanctuary Guam, Inc. (a shelter for at-risk youth) and Guam Department of Youth Affairs with programs scheduled to begin in early 2011.”**

## *Entrepreneurial Youth making a difference...*

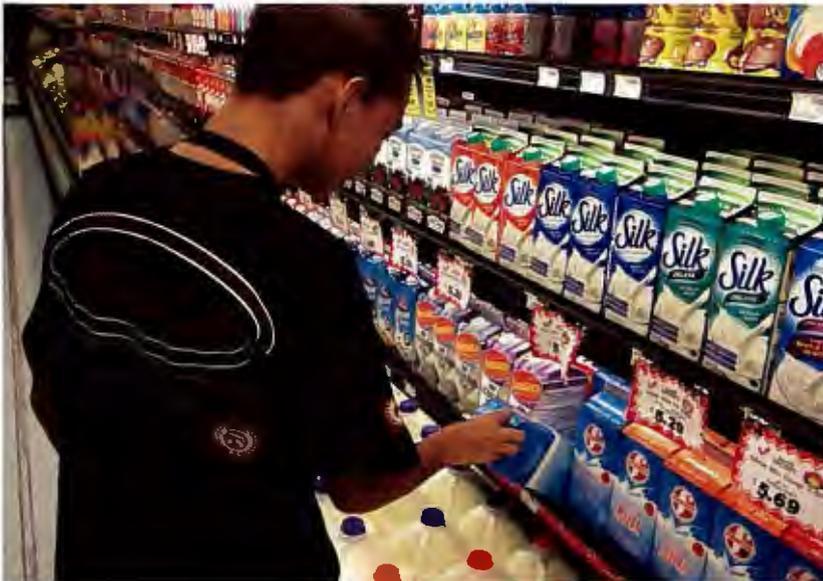
358 youth **increased** their **knowledge** and **skills** in identifying entrepreneurial interests.

358 youth **increased** their **knowledge** and **skills** in financial management, marketing, product development and budget projections.

Youth earned critical **community service** hours and learned the values of community engagement.

**2 teen groups** have developed & sold value added products.

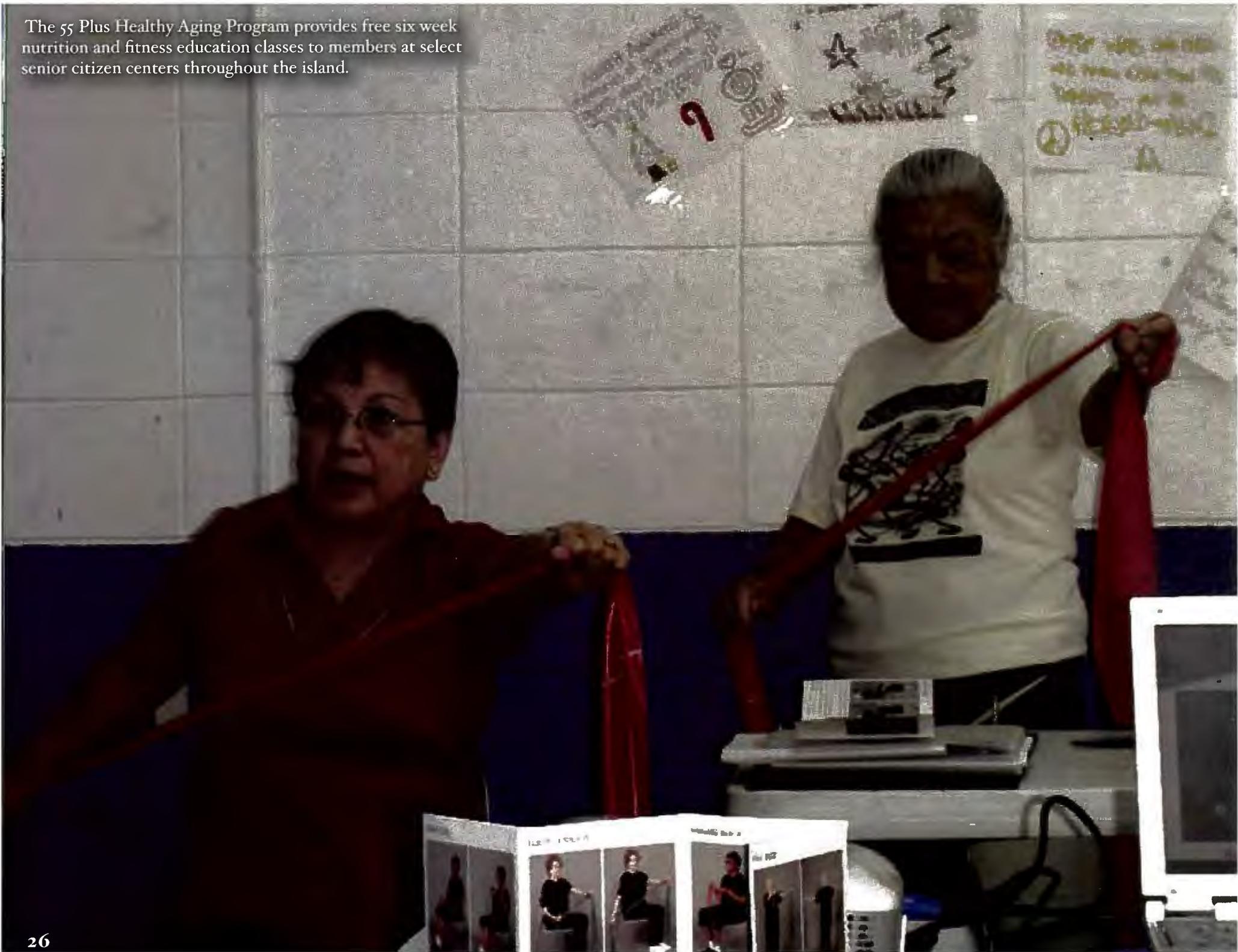
A participant learns the values of budgeting.



Students are recruited from federally sponsored after-school programs.



The 55 Plus Healthy Aging Program provides free six week nutrition and fitness education classes to members at select senior citizen centers throughout the island.



# 55 Plus Healthy Aging Program

**55 PLUS**, Guam's approach to healthy aging, addressed access to health care and lack of services by providing information and activities on healthy aging to older adults on Guam. The program was funded by a \$114K grant from the USDA, Rural Health & Safety Education.

The project promoted healthy living and aging of Guam's elderly through nutrition and fitness by providing timely and practical information on the value of good nutritional health and access to health promotion activities.

Partnering with the Guam Department of Public Health and Social Services, the project leveraged resources such as infrastructure, services, expertise, and core capacities by partnering with local public health agencies, non-profit organizations and the Senior Executive Council on Aging.

Activities took place at three senior citizen centers in the villages of Yigo, Merizo and Sinajana administering six week programs on nutrition and fitness to individuals suffering from or at risk for diabetes, hypertension and cancer.

## PROJECT OUTCOMES/OUTPUTS

**26 seniors** increased awareness and skills of good nutrition and setting reasonable fitness goals.

**26 seniors** increased awareness and skills to deal with the effects associated with chronic diseases.

An **Asset & Skills Map** exist that identifies ways to increase senior interaction, leadership and physical activity opportunities.





# Value-Added Food Products



ONE of the objectives in the 2009 Memorandum of Agreement between UOG Cooperative Extension Service and Guam Cooperative Farmer's Association was to develop pilot value-added products for extending the marketable season of fruit crops on Guam. To achieve this objective, soursop and calamansi were identified as the first crops to be used for processing value-added products. CES extension agents developed a pasteurized and shelf-life stable soursop puree, which can be used as a food ingredient by chefs and consumers to prepare foods such as

ice cream, drinks, yogurt, and deserts. In addition, recipes for calamansi jams and drinks were developed. To process, pasteurized and make shelf-life stable soursop puree, a simple pasteurization method using boiling water to treat soursop puree, which was packaged in a vacuum bag, was used. To minimize the reduction in quality, the thermal profiles of soursop puree during pasteurization were measured and the optimum pasteurization temperature and time were determined.

Residents participate in a free workshop on jamming and fruit preserve. Participants made soursop nectar and calamansi jam.

**Safe  
and great  
quality value  
added local  
products**



After pasteurization, the bag of pasteurized soursop puree was sealed under vacuum and stored in a refrigerator at 4°C (40°F). It was observed that the vacuum packaged soursop puree had a shelf-life of at least 3 months with good sensory quality and unique soursop aroma and taste. The number of total aerobic bacteria, molds and yeasts did not increase during storage. The pasteurized and shelf-life stable soursop puree can be used as an ingredient for chefs to use as a surprise flavor in many dishes.

In addition to soursop, the citrus fruit calamansi was used to make calamansi jams and calamansi & mango jams. Recipes were

developed for the jams with unique calamansi flavors and an excellent texture for spreading.

The calamansi jams were packaged in glass jars and pasteurized and had a shelf-life of at least 6 months at room temperature. The calamansi jams can be enjoyed by both local residents and tourists.

The pilot development of value-added products in this project also set a foundation to develop a small processing line for value-added products such as the pasteurized soursop puree in the future. It will be significant to collaborate with the Guam Cooperative Farmer's Association to develop a value-added food processing line community. Such development will not only promote the agricultural production of local



fruit crops but also benefit the tourist industries and the entrepreneurial businesses of local residents.

In addition, during the project, UOG extension staff and students also gained knowledge and skills in developing value-added food products. During the 2010 UOG Charter Day celebration, hundreds of school children from the community sampled the value-added fruit products soursop nectar and calamansi drink and were made aware of using local fruit crops to make value-added food products. The techniques using seasonal local fruit crops to make value-added food products may be applied in various ways in the community.

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