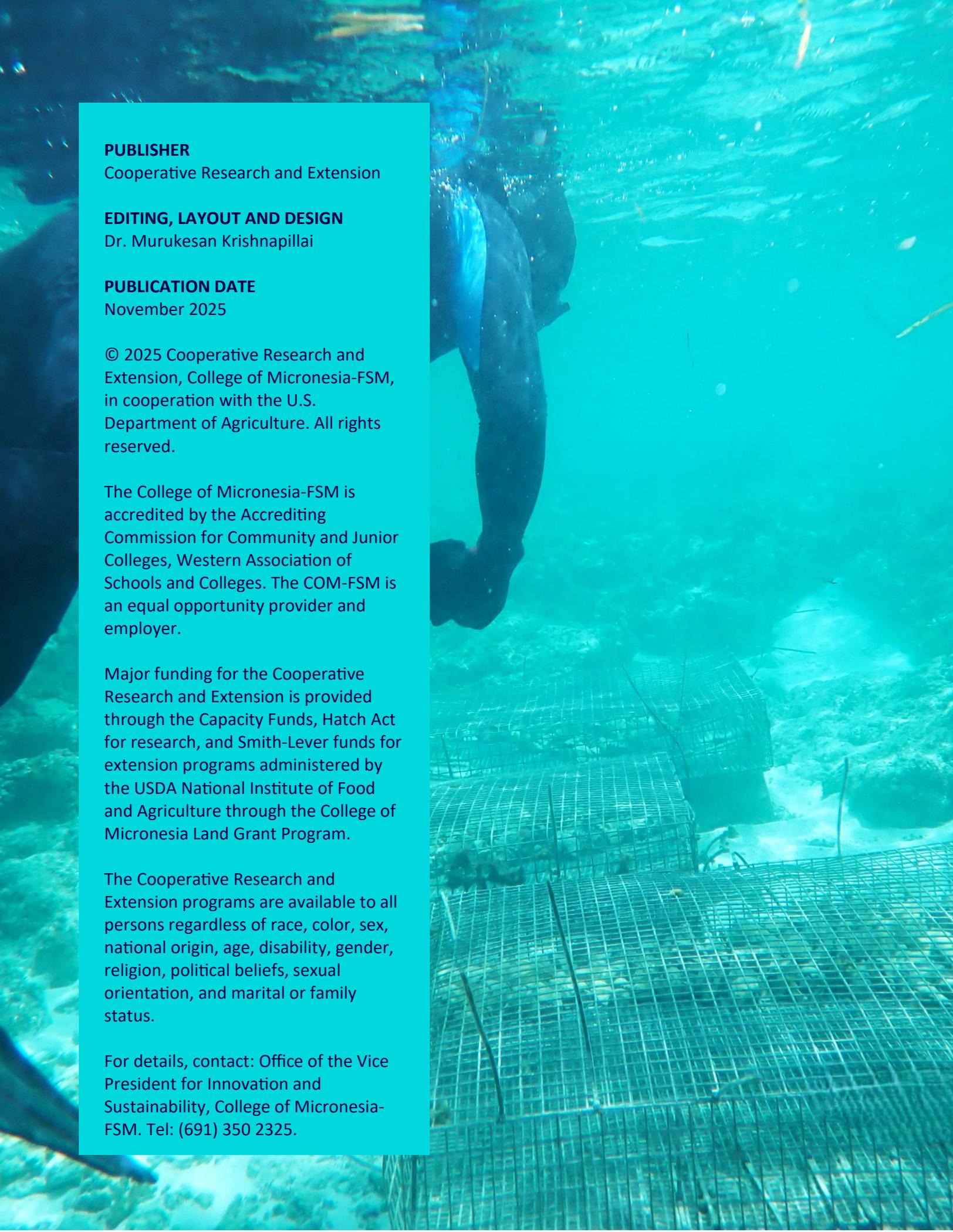


COOPERATIVE RESEARCH AND EXTENSION REPORT TO THE BOARD OF REGENTS



FY 2025 HIGHLIGHTS

An underwater photograph showing a diver in the upper left and several wire mesh crab traps on the seabed. The water is clear and blue, with sunlight filtering through from above. The traps are arranged in a line, and some contain crabs.

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CRE Mission Statement

The Cooperative Research and Extension's mission is to enhance accessible, innovative, and resilient development in agriculture, aquaculture, nutrition, community empowerment, and youth and family well-being, while advancing climate change adaptation. Through research, education, and extension, we collaborate with stakeholders to support the College's mission and FSM's socioeconomic and environmental priorities and long-term goals.



**COOPERATIVE RESEARCH
AND EXTENSION**

Building Resilient Communities

In FY 2025, the CRE Program delivered a wide range of agriculture, aquaculture, food safety, nutrition education, and climate resilience initiatives that reached thousands across all the FSM states. Through hands-on training, school and community outreach, and evidence-based EFNEP nutrition programming, CRE strengthened local food production, improved dietary practices and sanitation, and expanded sustainable aquaculture and climate-smart farming. These efforts equipped farmers, youth, women, and low-income households with practical skills that enhanced food security, household income, and overall community resilience. Collectively, the 2025 CRE initiatives made significant contributions to FSM's goals for sustainable development, climate adaptation, improved public health, and long-term self-reliance.

HIGHLIGHTS

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EXECUTIVE SUMMARY

In 2025, the Cooperative Research and Extension (CRE) Program advanced a comprehensive portfolio of research, education, nutrition, and community-based initiatives that significantly strengthened food security, public health, youth development, and climate resilience across all four states of the FSM. Through integrated efforts in agriculture, aquaculture, food safety, youth and family programs, climate-smart farming, water security, and the Expanded Food and Nutrition Education Program (EFNEP), CRE engaged thousands of residents, including farmers, youth, women, teachers, community leaders, and low-income households, through hands-on demonstrations, technical training, school-based outreach, and applied research.

Agriculture and aquaculture initiatives expanded local food production by improving crop propagation techniques, strengthening home gardening and composting, and revitalizing traditional management practices. Community-led aquaculture programs advanced clam rearing, rabbitfish and crab management, and hatchery-based training, increasing local capacity and supporting household income. Entrepreneurship, livestock improvement, and value-added food processing programs created opportunities that enhanced economic resilience and diversified livelihoods through poultry, swine, sewing, and local product development.

The EFNEP contributed substantially to public health improvements across all the FSM states by delivering evidence-based nutrition education to 906 youth and 686 adults, representing 3,609 household members. Youth demonstrated significant gains in diet quality, food safety, physical activity, and food budgeting skills, with 98–100% showing positive behavior change. Adults showed similar improvements in diet quality, enhanced food resource management, increased physical activity, and strengthened food safety practices. The EFNEP's reach into low-income and rural communities, where 100% of adult participants lived at or below 50% of the poverty level, ensured that the most vulnerable families benefited from improved nutrition, better budgeting, and healthier lifestyles.

Water security efforts further protected community health through household surveys, drinking water testing, filter distribution, and training that enabled families to manage and monitor their water sources safely. Partnerships with UNICEF, state and municipal governments, schools, churches, and regional institutions such as the University of Guam amplified CRE's reach and strengthened program sustainability.

Collectively, the 2025 CRE programs demonstrated a coordinated response to the FSM's development needs, increasing food sovereignty, improving public health, diversifying household income, and building greater community resilience. These achievements reflect the CRE's continued commitment to empowering island communities with the knowledge, tools, and skills needed for a sustainable, self-reliant future.



CENTER FOR ENTREPRENEURSHIP

YOUTH PROGRAM

Program Overview

The Youth and Families Program is designed to address persistent challenges in youth unemployment, low family income, and limited business skills in the Federated States of Micronesia (FSM). Approximately one-third of the population is aged 15–34, yet youth unemployment remains above 20 percent, and fewer than 10 percent of small family enterprises maintain financial records.

To address these issues, the program focused on building entrepreneurial and financial management capacities among youth and families, linking livelihood development with health, nutrition, and water and sanitation. Its overarching goal is to help families become more self-reliant, productive, and resilient contributors to community development.

Key Activities and Achievements

- ◆ Total of 25 major activities implemented across the FSM, including:
 - ◇ 23 entrepreneurship and agribusiness training
 - ◇ 1 internship and school-garden project
 - ◇ 1 youth business-simulation event
- ◆ 596 participants (263 male, 333 female) completed trainings across all four FSM states:
 - ◇ Pohnpei: 8 trainings – 290 participants (100 male, 190 female)
 - ◇ Chuuk: 3 trainings – 87 participants (28 male, 59 female)
 - ◇ Kosrae: 3 trainings – 111 participants (56 male, 55 female)
 - ◇ Yap: 9 trainings – 267 participants (124 male, 143 female)
- ◆ Training topics covered: starting hydroponic businesses, record-keeping, cash-flow management, and preparation of simple financial statements.
- ◆ Participants demonstrated an average learning gain of 34 %, confirming measurable improvement in financial and business literacy.
- ◆ A Food Safety, Sanitation, and Vendor Certification Workshop in Kosrae (in collaboration with the Department of Health and Sanitation) helped vendors comply with hygiene and safety standards.
- ◆ A UNICEF-supported internship in Pohnpei and Kosrae trained 24 interns in

climate-smart agriculture and farm management.

- ◇ Practical training included intercropping, raised-bed systems, mulching, trellising, and composting.
 - ◇ Each intern earned \$30 per day, totaling approximately \$2,400 over six months.
 - ◇ The program established a school-based demonstration farm supplying fresh produce to the COM-FSM dining hall, a successful farm-to-table model.
 - ◇ Interns also conducted 100 household visits (60 in Pohnpei, 40 in Kosrae) to survey sanitation practices and conduct water-quality testing.
- ◆ In partnership with the Upward Bound Program, a weeklong “Business Blitz” simulation engaged 53 students (15 male, 38 female) organized into 11 teams, each receiving \$100 in seed funding to start small enterprises.
- ◇ Students practiced budgeting, marketing, teamwork, and entrepreneurial problem-solving.



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Program Impacts

- ◆ A total of 673 individuals (596 trainees, 24 interns, and 53 student competitors) directly benefited from the program.
- ◆ Participants gained greater understanding of business management, financial planning, and record-keeping, with a 34 percent measured learning gain.
- ◆ Youth interns developed leadership experience in climate-smart agriculture, community outreach, and farm management, while earning wages that reinforced productivity and responsibility.
- ◆ The COM-FSM demonstration farm now provides fresh produce to the college dining hall, reducing reliance on imported vegetables and strengthening local food security.
- ◆ The Kosrae vendor-certification training improved food hygiene and safety in local markets.
- ◆ Household water-testing activities identified sanitation gaps, leading to plans for Sawyer water filter distribution in Yap and Chuuk to improve community health.
- ◆ The program enhanced community engagement and positioned youth and families as role models for responsible, entrepreneurial, and sustainable living across the FSM.



CENTER FOR ENTREPRENEURSHIP

MARKETING AND EXPORT PROGRAM

Program Overview

Access to finance remains one of the significant challenges for small business owners and aspiring entrepreneurs in the FSM. Many citizens lack the financial literacy and technical knowledge needed to prepare business plans, maintain bookkeeping records, or create financial projections, key requirements for securing commercial loans.

To address these barriers, the CFE partnered with the FSM Development Bank (FSMDB) to enhance financial literacy, business planning, and loan readiness among local entrepreneurs. The program aims to equip participants with practical knowledge and confidence to engage effectively with financial institutions, enhancing their ability to access formal financial support and expand local businesses.

Key Activities and Achievements

- ◆ Conducted a four-day Financial Literacy and Business Planning Workshop in collaboration with FSMDB.
- ◆ Training focused on key topics including:
 - ◇ Basics of bookkeeping and income statement preparation
 - ◇ Pricing strategies and cost analysis
 - ◇ Writing business plans and developing financial projections
 - ◇ Understanding loan application procedures and the bank evaluation process
- ◆ The FSMDB representatives facilitated sessions on loan application requirements and evaluation criteria, while participants engaged in group exercises and case studies for hands-on learning.
- ◆ Interactive learning methods such as Q&A games were used to enhance engagement; active participants received small rewards (e.g., calculators) as motivation.
- ◆ The workshop directly improved participants' confidence in preparing business documents and interacting with financial institutions.
- ◆ Immediate tangible outcomes:
 - ◇ Five participants (3 female, 2 male) successfully secured business loans from FSMDB shortly after the workshop.
 - ◇ Loan amounts ranged from \$2,500 to \$30,000, totaling \$60,107.76.
 - ◇ These loans were used to either expand existing businesses or start new

CENTER FOR ENTREPRENEURSHIP

ventures in local communities.

- ◆ The FSMDB representatives facilitated sessions on loan application requirements and evaluation criteria, while participants engaged in group exercises and case studies for hands-on learning.
- ◆ Interactive learning methods such as Q&A games were used to enhance engagement; active participants received small rewards (e.g., calculators) as motivation.

Program Impacts

- ◆ Enhanced financial capacity and confidence: Participants gained practical skills in bookkeeping, pricing, and business planning, enabling them to prepare accurate financial documents and access credit facilities.
- ◆ Improved access to finance: The five loans totaling \$60,107.76 demonstrated a clear link between the training and participants' ability to secure financial support for business growth.
- ◆ Job creation and community benefits: The new and expanded businesses generated part-time and full-time employment opportunities, increased household income, and stimulated local commerce through higher purchasing and service demand.
- ◆ Strengthened sustainability and repayment culture: Participants' improved financial management skills are expected to reduce default risks and improve loan repayment performance, reinforcing community trust in financial institutions.
- ◆ Broader economic impact: The program expanded the pool of loan-ready entrepreneurs, fostering a healthier small-business environment and encouraging responsible borrowing and entrepreneurship throughout FSM.

Program Impacts Local Economy



- ◆ The collaboration between the COM-FSM and the FSMDB demonstrated that education and finance can work together to drive inclusive economic growth, building a financially literate and empowered population capable of sustaining local development across the islands.



UNICEF WASH Program

Program Overview

In close partnership with UNICEF, the CFE continues its mission to ensure clean, safe, and reliable drinking water for households across the Federated States of Micronesia. Building on the Household Drinking Water and Sanitation Survey conducted earlier in Eirike, Nett, the program returned to the community to initiate the first round of Sawyer Water Filter distribution and training.

This intervention directly responds to critical needs identified in the survey, which revealed that over 60% of households do not treat their drinking water, 68% reported visible particles or insects, and 54% of tested samples showed bacterial contamination. The initiative combines technology, education, and community empowerment to strengthen household-level WASH (Water, Sanitation, and Hygiene) resilience.

Key Achievements

- ◆ Conducted the first distribution and training event in Eirike based on detailed household survey findings.
- ◆ Distributed 37 household filter kits, directly benefiting at least 358 individuals.
- ◆ Provided two water testing kits and trained residents to independently test and compare both old and filtered water sources.
- ◆ Offered hands-on demonstrations of proper filter use, sanitation techniques, and maintenance, including side-by-side comparisons of unfiltered vs. filtered water.
- ◆ Conducted education sessions highlighting the survey findings and emphasizing the importance of safe water handling, treatment, and storage.
- ◆ Strengthened coverage through collaboration with the FSM Assemblies of God Church, which contributed 20 additional filter sets, complementing the 50 provided by UNICEF and

CENTER FOR ENTREPRENEURSHIP

expanding the reach to more households.

- ◆ Engaged UNICEF student interns, who actively assisted in the training and gained practical experience in community engagement and WASH programming.
- ◆ Established a schedule for continuing distribution of remaining filter sets, along with plans for follow-up visits to monitor health outcomes and filter usage.
- ◆ Advanced the program's regional scope through ongoing survey activities in Kosrae and preparations for data collection in Yap, pending internship recruitment.

Program Impacts

- ◆ Provided immediate access to safe drinking water for at least 358 individuals, reducing exposure to waterborne illnesses linked to contamination found in 54% of tested samples.
- ◆ Empowered residents with practical knowledge and tools to monitor water quality, leading to community-led testing and increased ownership of household water safety.
- ◆ Addressed significant risk indicators, including the over 60% of households not treating water and the 68% reporting visible contaminants, through direct education and technology deployment.
- ◆ Strengthened community resilience by combining technology (Sawyer filters) with training that promotes sustainable, long-term safe water practices.
- ◆ Encouraged behavior change through visual demonstrations, allowing families to see clear improvements between raw and filtered water.
- ◆ Enabled data-driven decision-making: survey findings guided precise targeting of households and shaped tailored training messages that address actual risks and practices.
- ◆ Fostered multi-sector collaboration among UNICEF, CRE, FSM Assemblies of God Church, and MFAT New Zealand, establishing a strong model for coordinated community health initiatives.



YAP CRE



Italian Project on Water and Food Security

Project Overview

The gardening and community water security program continued to strengthen food production, household resilience, and climate adaptation in Yap's displaced atoll communities. The program delivered hands-on training, technical assistance, and continuous field monitoring to support both new and existing clients in establishing and maintaining home gardens, with a strong emphasis on sweet potato and soft taro production, two culturally important staple crops.

In parallel, the program advanced infrastructure improvements by renovating three community houses and installing rainwater harvesting systems to improve access to clean water in the targeted settlements. This dual focus on food production and water security reflects the project's integrated approach to supporting climate-resilient livelihoods for vulnerable households.

Key Achievements

- ◆ Conducted extensive garden visits to monitor crop progress, identify pest and weed issues, and provide timely advice on plant care.
- ◆ Delivered technical support for tilling, garden bed preparation, composting, planting, fertilization, side dressing, and crop maintenance.
- ◆ Provided training sessions for new clients on site selection, compost preparation, fertilization, and crop management techniques.
- ◆ Performed weekly monitoring of crop growth and replaced dead plants to maintain strong yields.
- ◆ Assisted in cleaning, weighing, and documenting harvested produce for record-keeping and crop performance tracking.
- ◆ Supported the transition of newly harvested plots into replanting cycles, including bi-weekly side dressing for four weeks after planting.

- ◆ Renovated roofs and installed rainwater harvesting systems at three community settlement houses located in Daboch, Ablul, and Satawal Compound.
- ◆ Conducted three water quality and rainwater harvesting system maintenance sessions following the renovations.
- ◆ Trained 46 participants from the three targeted settlements on water system care and maintenance.
- ◆ Prepared a maintenance plan for each settlement and entrusted it to community members for ongoing management.
- ◆ Supported 48 households (representing approximately 156 members) who actively participated in gardening and food-production activities.
- ◆ Facilitated the cultivation of gardens containing 3–4 beds dedicated to sweet potato or soft taro.
- ◆ Communities harvested 1,304 lbs. of sweet potato and 1,331 lbs. of soft taro, which were returned to households for direct consumption.
- ◆ Successfully resubmitted two annual reports through the FSM Mission in New York, meeting the Italian Ministry’s compliance requirements; both reports were formally accepted on November 6, 2025.

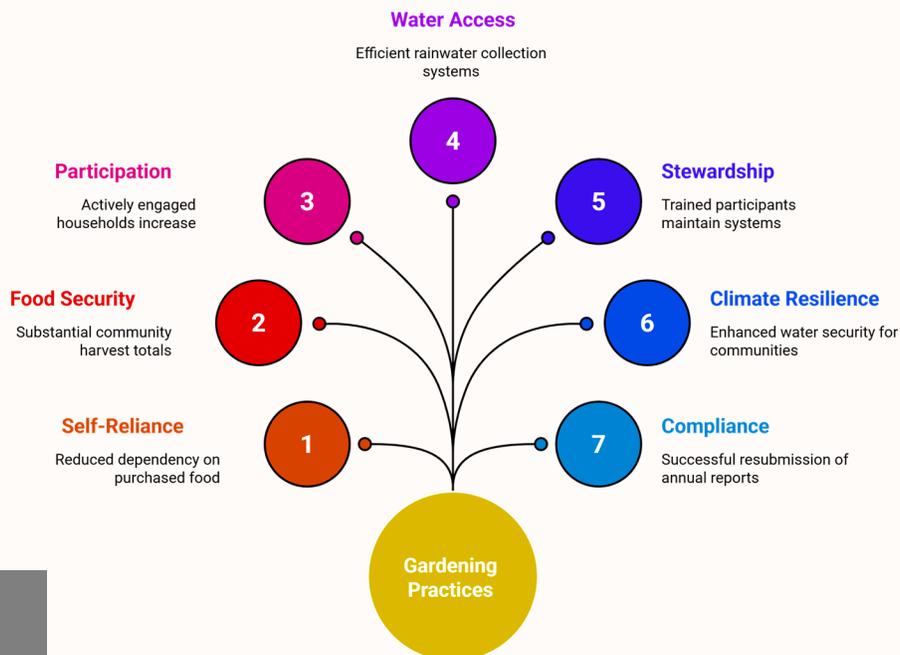




Impacts

- ◆ Strengthened home-gardening capacity, with participants demonstrating improved skills in compost preparation, planting techniques, crop care, and harvest management.
- ◆ Enhanced household self-reliance by introducing sustainable, low-cost gardening practices that reduced dependency on purchased food.
- ◆ Improved food security through substantial community harvest totals: 1,304 lbs. of sweet potato and 1,331 lbs. of soft taro, all used for household consumption.
- ◆ Increased participation with 48 households actively engaged in staple-crop cultivation, and some expanding into complementary leafy-vegetable production.
- ◆ Improved access to water resources through the refurbishment of community roofing and installation of rainwater harvesting systems at three settlements, ensuring efficient and reliable rainwater collection.
- ◆ Reinforced community stewardship through training of 46 participants in water system maintenance and creation of maintenance plans tailored to each settlement.
- ◆ Contributed to climate-resilient agriculture by combining crop production support with infrastructure improvements that enhance water security for displaced atoll communities.
- ◆ Strengthened administrative and reporting compliance by successfully resubmitting two annual reports in the required format to the Italian Ministry, supporting continued funding and program credibility.

Sustainable Gardening Improves Community Resilience





Giant Clam Project

Project Overview

The project *Studies on the Population Status and Genetic Diversity, Conservation and Sustainable Aquaculture of Endangered Giant Clam Species in Micronesia* addresses critical knowledge gaps affecting the conservation and sustainable aquaculture of giant clam species across the FSM. Giant clams are ecologically important reef organisms and valuable coastal food resources. However, these species face intensified threats from overexploitation, habitat degradation, and climate-related bleaching, resulting in declining populations and heightened conservation needs.

The project aims to:

1. Illustrate the phylogenetic relationship of giant clam species across the FSM, the Marshall Islands, and Palau.
2. Investigate the genetic diversity and population structure using mitochondrial DNA markers.
3. Transition from research-scale to commercial-scale juvenile production to support sustainable aquaculture.
4. Provide scientific information on the status of giant clam fisheries to support long-term conservation and management planning.

Key Achievements

- ◆ Conducted ongoing giant clam species surveys across the FSM, and partner locations in the Marshall Islands, and Palau.
- ◆ Continued genetic sampling to assess population structure and genetic diversity using mitochondrial markers.
- ◆ Successfully conducted giant clam spawning session, resulting in an estimated 640,000 larvae produced in the hatchery.
- ◆ Demonstrated successful spawning induction, larval rearing, and early-stage husbandry techniques.
- ◆ Conducted high-level consultations with government officials

and stakeholders in Kosrae and Chuuk regarding ongoing clam research and management initiatives.

- ◆ Held scientific discussions with Mr. Enjoy Rain (Deputy Director of Marine Resources) and Mr. Bradford Mori (Director, EPA).
- ◆ Collaborated with Dr. Taihun Kim of KIOST and joined his team in scientific surveys of coral reefs, giant clam species, and other marine organisms in Chuuk.

Impacts

- ◆ The production of approximately 640,000 giant clam larvae marks a substantial step toward developing a research-to-commercial juvenile production pipeline, supporting future restocking and conservation activities.
- ◆ Continued species surveys across the FSM and neighboring jurisdictions advance understanding of giant clam distribution, stock availability, and habitat conditions critical for conservation planning.
- ◆ Ongoing genetic work contributes essential insights for identifying distinct stocks, informing restocking strategies, and improving long-term resource management.
- ◆ Cross-state and international collaboration strengthens regional scientific capacity and aligns research efforts with broader Pacific conservation priorities.
- ◆ Collaborative reef and species surveys in Chuuk with KIOST support ecosystem-level understanding, contributing to evidence-based conservation and aquaculture strategies.



YAP CRE



Sea Cucumber Project

Project Overview

The project *Studies on the Genetic Variation of *Holothuria scabra* and Integrated Selective Breeding Program for Sustainable Aquaculture System in the FSM* focuses on the declining stocks and genetic vulnerability of sandfish sea cucumber, a high-value species and critical income source for rural communities in the FSM.

Global populations of sea cucumber have declined by 60–90%, driven by overharvesting and ineffective management. In the FSM, little is known about the species' population structure or genetic diversity, limiting the ability to inform sustainable aquaculture and restocking programs. This research addresses those gaps by assessing genetic variation, conducting phylogenetic analyses of different phenotypes, and developing an integrated selective breeding program to prevent inbreeding and support sustainable production.

Key Achievements

1. Phylogenetic and Genetic Diversity Studies

- ◇ Continued sea cucumber species surveys across Yap, Pohnpei, Kosrae, Chuuk, the Republic of the Marshall Islands, and the Republic of Palau.
- ◇ Continued genetic sampling work to analyze the population genetics of *H. scabra* using DNA-based markers.

2. Species Survey and Identification

- ◇ Species surveys were conducted across 25 villages in Yap State, identifying 10 sea cucumber species.
- ◇ In Chuuk State, at 11 survey sites, a total of 16 sea cucumber species were identified.

3. Breeding and Juvenile Production Trials

- ◇ Conducted spawning and larval rearing of sea cucumber at the CRE hatchery in Yap.

- ◇ Produced 8 batches of juvenile sandfish through controlled hatchery operations.
- ◇ Stocked batches #1 to #6 into 29 floating cages holding 15,000 juveniles during the grow-out phase.
- ◇ Maintained batch #7 and batch #8 in raceway tanks for continued larval rearing and grow-out monitoring.
- ◇ Monitored 78 broodstock through hatchery operations and field-based supply studies.

4. State-Level Scientific Coordination

- ◇ Collected DNA samples from 79 individuals (active and non-active/wild population) across Pohnpei.
- ◇ Conducted surveys in Kosrae and consulted with state directors on research initiatives.

Impacts

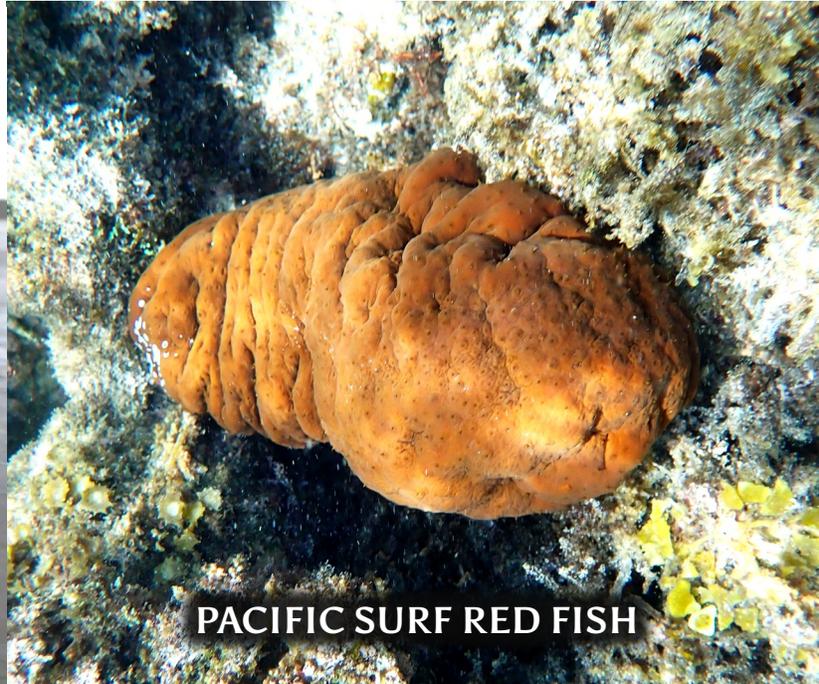
- ◆ Documented high species diversity, with 10 species identified in Yap and 16 species in Chuuk, providing critical baseline data for understanding ecosystem complexity, genetic variation, and future breeding program design.
- ◆ Produced 8 hatchery batches of sea cucumber larvae, advancing research-scale to commercial-scale production capability.
- ◆ Successfully reared 15,000 juveniles across 29 floating cages, demonstrating the feasibility of scaling up hatchery operations.



- ◆ Ongoing maintenance of two additional juvenile batches (batch #7 and #8) supports continuity of selective breeding trials.
- ◆ Genetic sampling conducted across multiple states provides insight into population structure, supports selective breeding, and informs strategies for preventing inbreeding.
- ◆ Multi-state coordination strengthened scientific capacity with direct collaborations involving marine resource departments and international experts.
- ◆ Identification of geographically distinct populations supports the long-term goal of developing a regionally informed selective breeding program.
- ◆ The collection of 78 monitored broodstock provides essential raw material for future genetic analysis, spawning trials, and broodbank development.



SAND FISH



PACIFIC SURF RED FISH



BROWN CURRY FISH SEA CUCUMBER



SAND FISH

Mud Crab Project

Project Overview

The project *Understanding Genetic Diversity of Mud Crabs and Aquaculture Development in Micronesia: An Assessment of Cultured Technical and Economic Performance* addresses urgent scientific gaps in the biology, genetics, and hatchery development of mud crabs across the FSM. Mud crabs are highly valuable seafood species with strong demand in local and international markets. However, increasing exploitation has led to a heavy reliance on wild-caught juveniles and overfishing pressure, compounded by the slow development of hatchery technology and limited scientific information on optimal juvenile rearing conditions, diet, and survival rates.

Key Achievements

1. Genetic Diversity and Population Structure Studies

- ◇ Continued collection of mud crab samples across the FSM states, as well as from the Marshall Islands, Palau and Guam to support mitochondrial DNA sequencing and phylogenetic analysis.
- ◇ Sample acquisition efforts remain ongoing to complete cross-regional genetic datasets.

2. Species Survey and Population Assessment

- ◇ Conducted multi-state species surveys in identifying mud crab populations and habitat distribution for genetic analysis and broodstock characterization.
- ◇ Surveys included scientific discussions with resource management authorities and agency directors across different states to verify species presence and support genetic sampling protocols.

3. Hatchery System Preparation and Microalgae Production

- ◇ Established microalgae production capacity in the Yap CRE hatchery to support larval and juvenile mud crab rearing research.
- ◇ Successfully produced six microalgae species as critical live feed for hatchery trials.
- ◇ Cultured macroalgae in raceway tanks for future experimental use in mud crab diet and shelter-density experiments.

4. Technical and Scientific Coordination

- ◇ Coordinated research discussions and consultations with state agencies, including DREA and Marine Resources, and KIRMA (Kosrae), and stakeholders in Yap, Pohnpei, and Chuuk.
- ◇ Prepared technical groundwork for upcoming genetic improvement and selective breeding experiments.

Impacts

- ◆ Multi-state sampling efforts provided foundational data for understanding genetic variability, enabling stock identification necessary for long-term management and selective breeding programs.
- ◆ Establishment of microalgae and macroalgae cultures strengthens research readiness and supports future larval trials and nutritional studies.
- ◆ Documentation of mud crab populations across Yap, Pohnpei, Kosrae, and Chuuk supports regional assessment of population structure and demographic shifts.
- ◆ Inter-agency scientific consultations across the FSM and the wider Pacific region (Marshall Islands, Palau, Guam) have laid the groundwork for future cooperative genetic studies and hatchery development initiatives.
- ◆ Enhanced research infrastructure, including laboratory microalgae systems and macroalgae raceway culture, supports increased scientific capacity for mud crab aquaculture development in the coming years.



Rabbitfish Project

Project Overview

The project *Studies on Population Genetic Analysis and Genetic Improvement Program of Rabbitfish in the FSM* addresses the increasing threats posed by overfishing, habitat degradation, and declining fish stocks of two economically important rabbitfish species: golden rabbitfish and forktail rabbitfish. These species are widely consumed and traded, making them vital for household nutrition and fisheries income across the FSM.

With natural stocks under increasing pressure and no existing scientific information on their genetic diversity or population structure in the FSM, this research project aims to:

1. Assess genetic diversity and population genetics across multiple island jurisdictions.
2. Investigate population structure and demographic changes influencing long-term sustainability.
3. Examine phylogenetic relationships among rabbitfish populations in FSM and regional waters.
4. Develop breeding techniques and initiate a genetic improvement program for sustainable rabbitfish aquaculture.

Key Achievements

1. Multi-State Genetic Sampling and Species Survey

- ◇ Continued collection of rabbitfish samples from Yap, Pohnpei, Kosrae, and Chuuk, as well as the Marshall Islands, Palau, and Guam, supporting population genetics, mitochondrial sequence analysis, and phylogenetic studies.
- ◇ Genetic sampling efforts remain ongoing to complete required datasets for diversity and demographic analysis.

2. Hatchery Preparations and Live Feed Production



- ◇ The Yap CRE-hatchery successfully set up laboratory microalgae systems to support larval rearing for genetic improvement studies.
- ◇ Six microalgae species were produced for live feed production.
- ◇ Initiated trial culture of macroalgae in raceway tanks to support future polyculture studies and potential environmental enrichment trials.

3. Preliminary Experiments and Research Integration

- ◇ Conducted preliminary experiments on polyculture of marine fingerlings and sandfish juveniles with seaweed species in raceway tanks as part of integrated aquaculture research.
- ◇ Technical discussions and knowledge exchange were conducted with researchers across multiple states and Southeast Asia to align breeding and genetic improvement strategies.

4. Ongoing Genetic Improvement Program Development

- ◇ Enabled foundational steps toward establishing a controlled breeding program for rabbitfish species, using microalgae-based live feed production and hatchery system readiness to support future spawning and fry production trials.
- ◇ Rabbitfish species surveys conducted in Yap, Pohnpei, Kosrae, and Chuuk contributed to confirming species presence, potential broodstock availability, and habitat condition for future broodstock selection.

Impacts

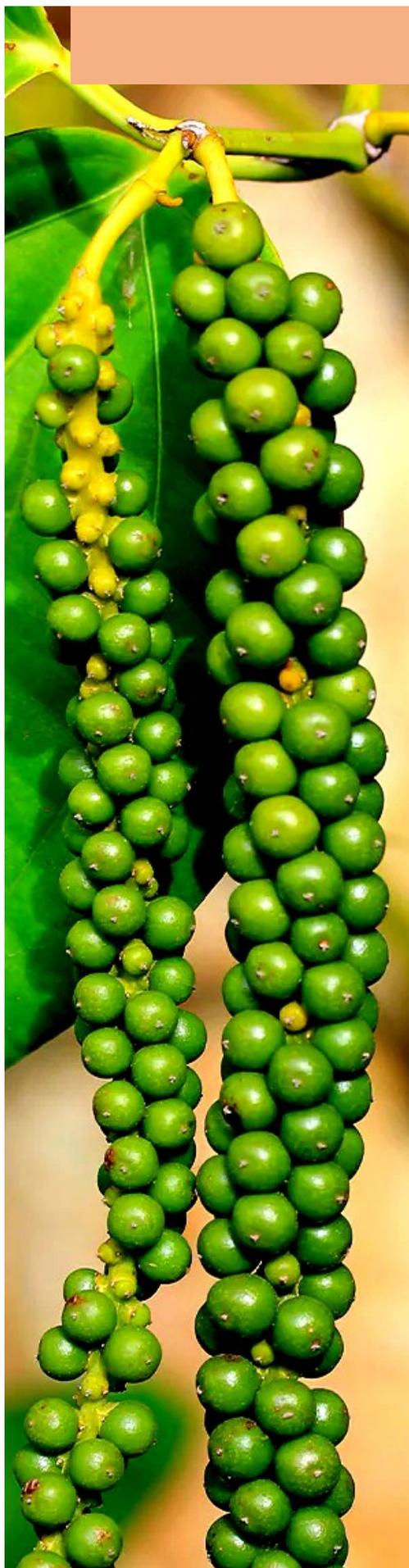
- ◆ Sample collection strengthened the scientific foundation needed to assess genetic diversity, population structure, and adaptive variation among rabbitfish species across Micronesia.
- ◆ Production of six microalgae species significantly increased research capacity, enabling future larval rearing and improving conditions for selective breeding experiments.
- ◆ Establishment of macroalgae culture systems contributes to integrated aquaculture approaches required for controlled breeding and environmental enrichment studies.
- ◆ Preliminary polyculture trials offer early insights into species interactions and growth dynamics, informing future research on optimal rearing conditions for rabbitfish fingerlings.
- ◆ Coordination with researchers across the FSM, the Marshall Islands, Palau, Guam, and Southeast Asia enhanced regional collaboration and strengthened scientific networks supporting aquaculture development.
- ◆ Ongoing sample collection and laboratory preparation position the program for genetic sequencing work necessary for population genetics, demographic history reconstruction, and breeding-line development.
- ◆ The research provides foundation required for establishing a long-term genetic improvement program and sustainable fingerling production system for rabbitfish aquaculture in the FSM.



Forktail rabbitfish (above) and Golden rabbitfish (below) serve as important food fish with high commercial and nutritional value, while also playing a critical ecological role in sustaining coral reef health.



YAP CRE



Bush Pepper Project

Project Overview

Program Overview

The project, '*Bush Pepper Production as a Cash Crop for Small-Scale Growers*,' aims to develop standardized propagation and cultivation methods for bush pepper, a sustainable and manageable variant of black pepper suitable for urban and smallholder farmers across the FSM.

Unlike traditional black pepper vines that require tall supports and shaded environments, bush pepper is compact, growing to about two feet in height, and can be cultivated in pots or limited spaces, making it ideal for household and urban gardens. The research focuses on identifying the most effective growing media and rooting hormone combinations to enhance the rooting and establishment of bush pepper plants. Ultimately, this project will make bush pepper cultivation practical, productive, and economically viable for small-scale farmers while promoting local spice production, reducing household costs, and potentially generating export opportunities.

Key Achievements

- ◆ Initiated controlled pot experiments to evaluate the growth performance of lateral branch cuttings from mature vines under various growing media combinations.
- ◆ Tested different cocopeat and potting mix ratios, alongside native soil blends, to determine the optimal conditions for rooting and establishment.
- ◆ Applied and evaluated rooting hormones to enhance survival and rooting rates of bush pepper cuttings.
- ◆ Conducted periodic evaluations after each experimental cycle to refine and standardize propagation protocols.
- ◆ Preliminary experimental findings included:
 - ◇ 41% survival rate in cuttings grown in a 3:1 cocopeat-to-potting soil mix.
 - ◇ 72% survival rate in cuttings grown in an equal mixture of native and potting soil during the first cycle.

◇ In the second cycle, 32% survival rate was observed in cuttings grown in a 3:1 cocopeat-to-potting soil mix, while 70% survival rate was recorded in the equal native and potting soil mixture.

- ◆ The experiments will continue for another 3–4 cycles to validate and refine propagation methods.
- ◆ From June 18–21, 2025, the Researcher visited the University of Guam’s College of Natural and Applied Sciences (CNAS) to share technical expertise on black pepper cultivation trials, including shade and nutrient management practices.
- ◆ Delivered a presentation titled “Black Pepper – Science, Cultivation, and Global Perspectives”



during the Black Pepper Forum as Chief Guest and presenter, and produced an informational brochure on “Black Pepper Cultivation in Islands” to promote scientific pepper cultivation.

- ◆ Participated in the 53rd Annual Session of the International Pepper Community (IPC) in Kochi, India, and presented a lecture titled “Cultivating Resilience: Climate Risk Mapping for Black Pepper Cultivation in Island and Asian Landscapes.”

Impacts

- ◆ Generated data-driven insights on propagation, identifying the most effective growing media with survival rates reaching 72%, thereby advancing scientific understanding of bush pepper rooting and propagation methods.
- ◆ Made significant progress toward developing a standardized propagation and cultivation protocol for bush pepper that can be effectively adopted by urban and small-scale farmers across the FSM.
- ◆ Enhanced regional scientific collaboration through active technical exchanges with the UOG, integrating local research with broader initiatives in tropical agriculture and climate adaptation.
- ◆ Broadened access to scientific knowledge and best cultivation practices by sharing research findings through forums, brochures, and presentations, improving regional awareness of both black and bush pepper production.
- ◆ Strengthened the FSM’s position in regional agricultural research networks, fostering innovation, academic collaboration, and future joint ventures in tropical spice research and sustainable agriculture.



YAP CRE

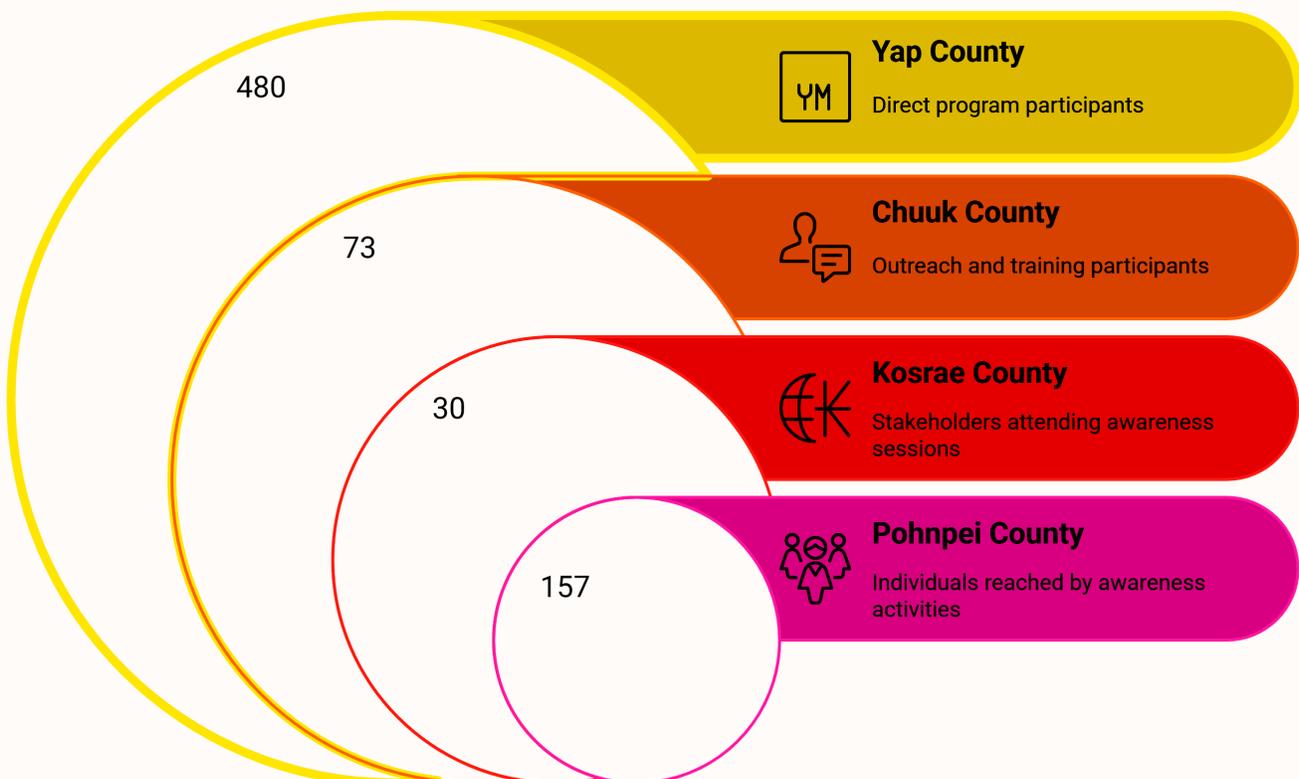
Aquaculture Extension

Key Achievements

1. Multistate Engagement and Participation

- ◇ In Yap County, the program directly involved 480 participants (440 new, 40 returning) and indirectly reached over 400 additional community members.
- ◇ Participants included 70 adults (23 women, 47 men), 177 youth (78 female, 99 male), and 233 children (127 female, 106 male).
- ◇ In Chuuk County (Extension Specialist activity component), outreach and training reached 73 participants (49 men, 24 women) from four communities and three agencies.
- ◇ 21 participants (1 man, 20 women) joined a rabbitfish collection training, followed by technical assistance for 10 individuals and a rabbitfish farming session.
- ◇ In Kosrae County, 30 stakeholders (including 12 fishers and 5 agency representatives) attended awareness sessions on mangrove crab aquaculture.
- ◇ In Pohnpei County, awareness activities on mangrove crab culture reached 157 individuals and 85 students.

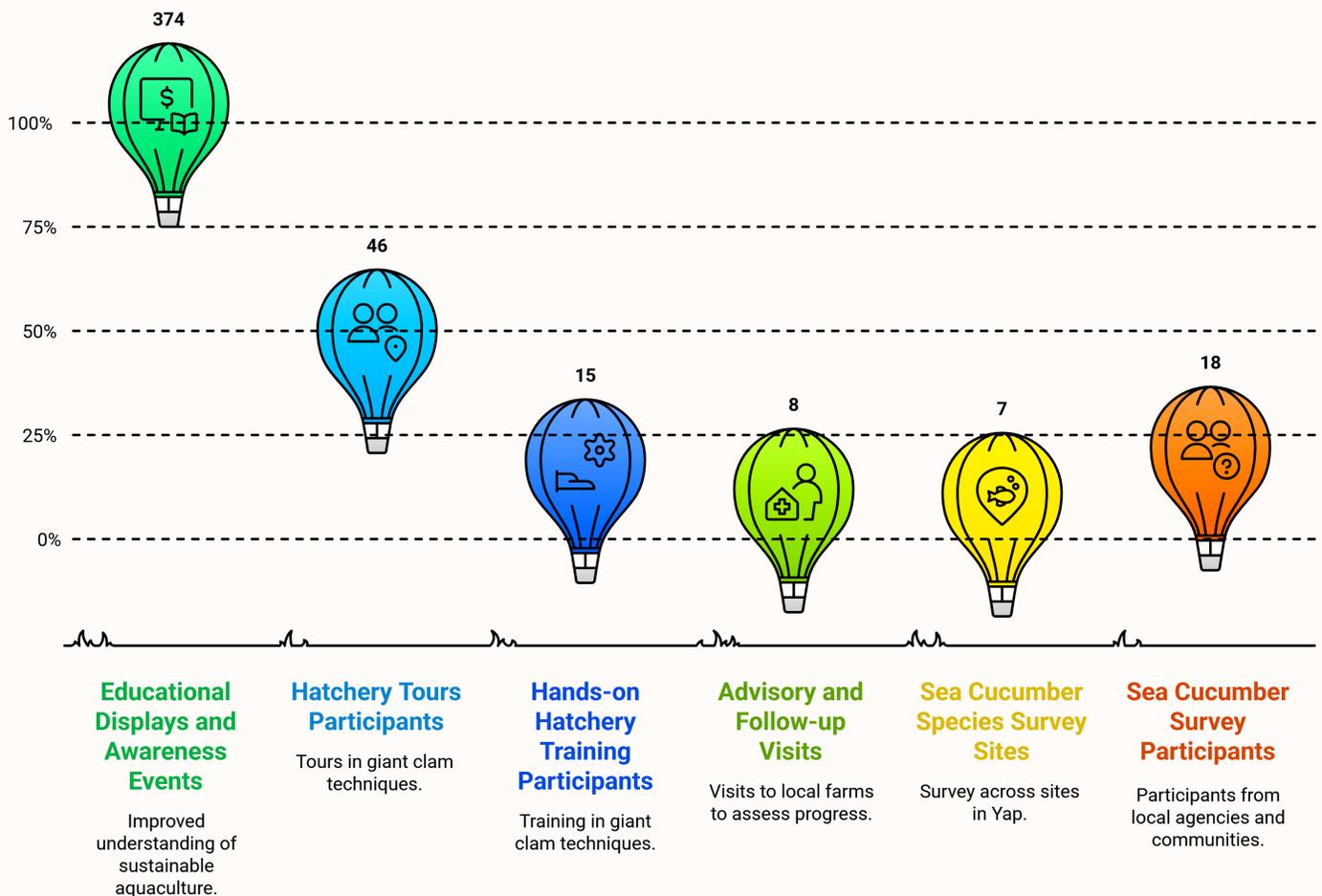
Participants in Micronesia Program



2. Core Activities and Capacity Building

- ◇ Delivered educational displays and awareness events for 374 participants, improving understanding of sustainable aquaculture, marine conservation, and livelihood diversification.
- ◇ Conducted hatchery tours for 46 participants and hands-on hatchery training for 15 participants in giant clam techniques, water-quality management, and farm maintenance.
- ◇ Completed eight advisory and follow-up visits to local farms to assess progress and address technical issues.
- ◇ Expanded scope includes sea cucumber aquaculture, organizing a technical spawning workshop, and hatchery tours for students.
- ◇ Conducted a sea cucumber species survey across seven sites in Yap, engaging 18 participants from local agencies and communities to gather baseline data for future broodstock planning.

Core Activities and Capacity Building



3. Regional Collaboration

- ◇ Shared technical data and hatchery practices with partners in Pohnpei, Kosrae, and Chuuk, as well as collaborators in Southeast Asia.
- ◇ Supported inter-island exchange of expertise on sandfish spawning, algae culture, larval rearing, and raceway-based grow-out systems.
- ◇ Fostered collaboration with the Yap Fishing Authority to explore marine finfish aquaculture and other high-value species.

Regional Aquaculture Collaboration

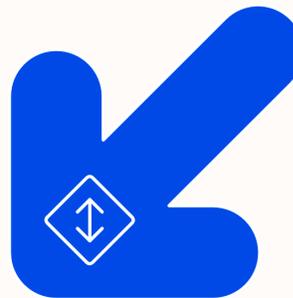
Collaboration with Yap Fishing Authority

Working together to explore new aquaculture opportunities



Technical Data Sharing

Exchanging scientific information to improve aquaculture techniques



Expertise Exchange

Facilitating the transfer of knowledge among islands



Hatchery Practices

Sharing methods for breeding and raising aquatic species



Impacts

1. Strengthening Food Security and Livelihoods

- ◇ Four community farms in Yap are successfully maintaining giant clam stocks, supporting community goals for food production, livelihood development and hands-on experience in responsible resource management.
- ◇ Communities in Chuuk and Kosrae have adopted new aquaculture practices through workshops and demonstrations, improving their capacity for sustainable seafood production.
- ◇ These activities collectively reduced pressure on wild reef stocks while expanding opportunities for local aquaculture-based livelihoods.

2. Building Technical Capacity and Environmental Awareness

- ◇ More than 480 direct participants gained practical skills in hatchery management, broodstock care, and sustainable farming methods.
- ◇ Public awareness and education events inspired 374 individuals and students to pursue aquaculture and marine science interests.
- ◇ The sea cucumber baseline survey (7 sites, 18 participants) produced critical ecological data to inform conservation and hatchery development plans.

3. Fostering Collaboration and Institutional Support

- ◇ Strengthened partnerships among community organizations, schools, research institutions, and state agencies, including the Yap Marine Resources Management & Development Division and Chuuk State PAN Committee.

Program Impacts



Food Security

Community farms maintain clam stocks, generating food and income. New aquaculture practices improve seafood production.

Participants gained skills in hatchery management and sustainable farming. Public events inspired interest in aquaculture.

Technical Capacity



Strengthened partnerships among organizations, schools, and agencies. Collaboration led to clam restocking and aquaculture integration.



Collaboration

Inter-island cooperation enhanced regional capacity and climate resilience. Communities gained awareness of marine resource stewardship.

Public Benefits



◇ Collaboration led to planning of giant clam restocking and integration of aquaculture within marine conservation zones.

◇ Improved coordination across the FSM has enhanced knowledge sharing, decision-making, and resource management capacity.

4. Broader Public Benefits

◇ Broadened inter-island cooperation enhanced regional capacity in aquaculture development and climate resilience.

◇ Communities and youth gained awareness of marine resource stewardship and environmental sustainability.

◇ The program's success has demonstrated aquaculture's potential as a viable, climate-resilient, and income-generating solution for small island communities.

YAP CRE

Poultry Program

Key Achievements

- ◆ 23 poultry farmers participated in the program, including 15 men, 4 women, 3 male youth, and 1 female youth, demonstrating strong engagement across age groups and genders.
- ◆ Delivered a comprehensive two-day training workshop covering essential topics such as poultry housing, feeding, nutrition, disease control, egg and meat production, breeding, and daily flock management.
- ◆ All 23 farmers were assessed and certified upon completion of the workshop, confirming improved knowledge in Poultry Farming Basics.
- ◆ Each certified farmer received chickens and starter feed supplies to initiate or strengthen their poultry operations.
- ◆ Conducted four hands-on training and demonstration sessions, providing step-by-step guidance on:
 - ◇ Coop construction and maintenance
 - ◇ Nesting setup
 - ◇ Stocking density
 - ◇ Feed preparation
 - ◇ Daily care routines
 - ◇ Incubation and brooding
 - ◇ Basic farm recordkeeping
- ◆ Implemented continuous follow-up visits and advisory check-ins, enabling farmers to troubleshoot challenges and receive individualized technical guidance.
- ◆ Supported the establishment of 21 new poultry farms, including 2 community-operated farms and 19 household farms, showing strong local commitment to small-scale poultry production.
- ◆ Enabled 19 farmers to expand their flock sizes from an average of 7 chickens to 29, yielding higher production of eggs and chicks.
- ◆ Strengthened livelihood opportunities, with 19 households generating income from poultry products (eggs and chicks).
- ◆ Farmers collectively earned \$10,910.60 in profit, including sales from both household-level producers and one commercial farmer supplying local markets.

Impacts

- ◆ Improved technical capacity: All 23 certified farmers demonstrated increased proficiency in poultry management, resulting in improved flock health, higher productivity, and lower mortality rates.
- ◆ Expansion of local poultry supply: The creation of 21 new farms significantly increased local poultry

production, enhancing access to fresh eggs and chicken for households and community members.

- ◆ Enhanced food security: With more households practicing poultry farming, families gained regular access to protein-rich foods, reducing reliance on costly imported chicken and eggs.
- ◆ Increased household income: The \$10,910.60 total profit earned by 19 households highlights poultry farming as a viable income-generating activity that contributes directly to local economic resilience.
- ◆ Youth empowerment and skill development: The participation of three male youth and one female youth, along with youth among the 42 awareness recipients, provided young people with practical farming skills and exposure to entrepreneurship.
- ◆ Improved management leads to larger flocks: Farmers who applied improved housing, feeding, and sanitation practices expanded their flocks from 7 to 29 chickens, demonstrating measurable gains in productivity.
- ◆ Community-level nutrition improvement: Increased local production allowed families to consume more locally raised poultry products, strengthening dietary diversity and improving health outcomes.
- ◆ Broader public benefit: Through training and support to 42 additional recipients (including 26 students, 5 teachers, and 11 potential farmers), the program widened community awareness, sparked new interest, and inspired future adopters of small-scale poultry production.
- ◆ Strengthened agricultural education efforts: Collaboration with schools and community groups promoted agricultural literacy, practical skills, and long-term engagement in sustainable poultry farming.



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Crop Production Program

Key Achievements

- ◆ Delivered 10 hands-on training sessions and demonstrations across 4 schools and 10 households, followed by 37 advisory and follow-up visits, engaging 84 direct participants.
- ◆ Direct school-based participants totaled 72 individuals, including 5 adults (2 men, 3 women), 31 youth (15 males, 16 females), and 36 children.
- ◆ Individual farmer participation included 12 individuals from 10 households, consisting of 3 returning clients and 9 new clients (10 adults and 2 youth).
- ◆ Conducted agriculture awareness education for an additional 484 recipients: 83 adults (31 men, 52 women), 135 youth (61 males, 74 females), and 266 children.
- ◆ Training topics covered air-layering, seed germination, transplanting, watering, fertilizing, basic pest management, harvesting, and soil preparation. Supplies such as grower bags, fertilizer, and chicken manure were also distributed to support home gardens.
- ◆ Achieved the following measurable outcomes:
 - ◇ 9 new farmers and 3 returning farmers demonstrated increased knowledge and skills in sustainable agriculture.
 - ◇ 7 new gardens were successfully established, and 3 returning farmers maintained their farms.
 - ◇ 6 households generated income from vegetable production, including three commercial farmers who collectively earned \$17,050.
- ◆ Vegetable gardens were strengthened at 3 schools, with Maap ECE Center supplying its cafeteria vegetables throughout the school year.

Impacts

- ◆ Improved agricultural capacity: A total of 568 participants (84 direct participants + 484 awareness recipients) enhanced their skills in sustainable crop production, seedling management, composting, soil preparation, pest identification, and garden maintenance. As a result, more households and schools adopted home gardening and sustainable farming practices.
- ◆ Increased household and school food security: The establishment of 7 new gardens and continued maintenance of 3 existing farms increased access to fresh vegetables at the household and school levels. The Maap ECE school garden provided a continuous supply of vegetables to its cafeteria, thereby improving student nutrition.
- ◆ Income generation and economic benefits: Six households earned income from vegetable sales, demonstrating the financial viability of small-scale crop production. The combined profit of \$17,050 from the three commercial farmers demonstrates strong market demand for local

YAP CRE

vegetables and strengthens household economies.

- ◆ Strengthened community engagement: The participation of 484 additional community recipients in awareness activities promoted broader understanding of healthy eating, composting, and sustainable agriculture, helping to shift community norms toward local food production.
- ◆ Broader public benefits: Increased adoption of household and community gardens improved regular access to fresh vegetables, supported healthier diets, reduced reliance on imported foods, and helped address nutrition-related health concerns. Expanded community involvement contributed to stronger food security, enhanced resilience, and greater community-wide awareness of sustainable agricultural practices.



Swine Program

Key Achievements

- ◆ Engaged a total of 18 participants, including 9 new farmers, 6 returning farmers, and 3 program recipients, all of whom strengthened their knowledge and practical skills in sustainable swine production.
- ◆ Provided advisory sessions to 15 active farmers covering proper housing, sanitation, feeding practices, swine health management, and breed improvement.
- ◆ Conducted 4 hands-on training sessions on swine castration for 5 selected farmers, enabling them to safely and accurately apply the technique.
- ◆ Supported 3 program recipients (1 male youth and 2 adult men) in mastering castration through repeated practical sessions.
- ◆ Completed multiple follow-up and monitoring visits to assess pig recovery, evaluate improvements in sanitation and housing, and reinforce correct management practices.
- ◆ Facilitated adoption of enhanced production techniques that led 7 households to expand their herd sizes from 1 - 3 pigs to 5 - 8 pigs per household, after improvements in housing, sanitation, feeding, basic health care, and installation of water nipple systems.
- ◆ Documented herd increases across participating households:
 - ◇ Before intervention: 9 households held 11 pigs total
 - ◇ After improvements: 7 households expanded to 44 pigs total
 - ◇ Supported diversified production outcomes:
 - ◇ 4 farmers focused on breeding pigs and selling piglets
 - ◇ 4 farmers raised pigs for meat production and sales
 - ◇ 8 farmers raised pigs primarily for home consumption
- ◆ Total reported income reported by farmers from swine production in 2025 reached \$41,250, including \$25,000 from pork sales and \$15,750 from piglet sales.

Impacts

- ◆ Improved farmer capacity: All 18 participants enhanced their skills in sanitation, feeding, health care, castration, breeding improvement, and safe butchering, leading to more efficient and confident farm management.
- ◆ Growth in herd size and production: Adoption of improved practices enabled 7 households to significantly expand their herds significantly, increasing pig numbers from 11 to 44, providing more reliable sources of meat and income.
- ◆ Income diversification and economic gains:
 - ◇ Swine producers generated \$41,250 in total income for 2025.

- ◇ Sales of both pork (\$25,000) and piglets (\$15,750) strengthened household economies and reduced dependence on imported meat.
- ◆ Enhanced household food security:
 - ◇ 8 farmers raising pigs primarily for home consumption improved family nutrition and reduced reliance on expensive imported foods.
- ◆ Strengthened local pork supply: Farmers maintaining or expanding operations provided fresh pork and piglets for community events, gifting, and market sales, supporting the broader community despite a decrease in direct participation (from 110 in 2024 to 18 in 2025).
- ◆ Reduced dependency on imports: Local swine production contributes to lowering pork imports, helping retain income within the Yap economy and improving local food resilience.
- ◆ Sustained influence despite lower participation:
 - ◇ Knowledge from previous years' training continues to benefit the broader public through active farmers who serve as local examples and informal mentors.
 - ◇ Ongoing follow-up visits and demonstrations maintain public engagement and interest in sustainable swine production.
- ◆ Identification of emerging challenges: The decline in income from \$44,800 in 2024 to \$41,250 in 2025 signals constraints such as limited feed resources and competing livelihood priorities, informing future program planning and outreach strategies.

Swine Program Impacts



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Youth Program

Key Achievements

- ◆ Successfully exceeded the state-level target by reaching 777 participants (515 new and 262 returning), demonstrating strong outreach performance.
- ◆ Participant demographics included:
 - ◆ 227 young men and 295 young women (ages 15–30)
 - ◆ 84 boys and 97 girls (ages 12–14)
 - ◆ 28 men and 46 women (ages 35 and above)
- ◆ Activities implemented:
 - ◆ Traditional and modern craft-making workshops
 - ◆ Vegetable gardening demonstrations
 - ◆ Youth mentoring sessions
- ◆ Participants developed four or more key practical and life skills, including teamwork, communication, goal-setting, positive coping strategies, leadership, and basic entrepreneurship.
- ◆ School and community groups continued gardening and craft projects independently, demonstrating early and sustained skill adoption.
- ◆ Youth mentoring in the Upward Bound Program resulted in:
 - ◆ 70% increase in knowledge
 - ◆ 65% improvement in practical skills
 - ◆ GPA improvement and enhanced academic behaviors
 - ◆ Significant improvements in reading, math, comprehension, and responsibility
- ◆ The program directly supported culturally relevant skill retention and self-reliance, aligning with long-term community resilience goals.

Impacts

- ◆ The program benefited 777 individuals during FY2025, strengthening confidence, responsibility, discipline, and community engagement.
- ◆ 95% of participants reported enhanced social, moral, and entrepreneurial skills, showing strong alignment with stated objectives.
- ◆ Youth and families gained practical skills in gardening and craft-making, supporting food security, creativity, and income generation.
- ◆ Economic contributions included:
 - ◇ Three youth using their craft-making skills to generate \$1,009 in sales.
 - ◇ Three household gardens and one school garden generating approximately \$600 in revenue.
- ◆ Mentoring programs significantly improved academic performance, responsibility, and respect toward peers and adults, contributing to stronger family and school environments.
- ◆ Activities strengthened cultural preservation by reviving local craft-making and gardening traditions.
- ◆ Community-level benefits included improved social cohesion, intergenerational knowledge-sharing, food security support, and mental well-being through reduced stress and improved coping skills.
- ◆ The program enhanced community resilience by producing responsible youth, stronger family engagement, and increased practical skill application across the county.



YAP CRE



Obesity Program

Key Achievements

- ◆ The program reached 1,577 individuals (794 new, 783 returning), reflecting strong engagement across 14 schools, 2 agencies, and 4 communities.
- ◆ Participant demographics included:
 - ◇ 641 children (278 boys, 363 girls)
 - ◇ 823 youth (418 males, 405 females)
 - ◇ 113 adults (49 men, 64 women)
- ◆ To support objective 1, 13 health assessment sessions were conducted with 268 participants, recording Body Mass Index (BMI) and vital signs for baseline tracking.
- ◆ To increase awareness, 19 obesity awareness sessions engaged 404 participants, focusing on balanced nutrition, physical activity, hydration, and stress management.
- ◆ 5 physical exercise sessions with 91 participants demonstrated enjoyable, accessible physical activity options such as rope-jumping, walking, gardening, and school sports.
- ◆ To strengthen ongoing learning and retention, 46 follow-up sessions engaged 814 participants to recheck BMI/vitals and complete learning surveys.
- ◆ Follow-up surveys from 252 participants recorded a 110% increase in knowledge about obesity prevention and healthy lifestyle practices.
- ◆ The “Local Food Day Fridays” initiative started with 9 participants and expanded to 46 by the end of the school year, promoting nutritious, locally sourced foods. The initiative was fully relaunched in August 2025 by teachers and students, demonstrating independent sustainability.
- ◆ Program growth increased by 49%, expanding

participation from 1,057 to 1,577 individuals.

Impacts

- ◆ Participants reported improved awareness of obesity risks, healthier eating patterns, and more active daily routines.
- ◆ Families applied learning by joining nutrition-focused cooking classes and starting home gardens, reinforcing the connection between knowledge and practice.
- ◆ Physical exercise sessions increased motivation to adopt consistent movement routines, positively influencing energy levels, focus, and well-being.
- ◆ Teachers observed improved student concentration and engagement following Local Food Days, while students reported feeling more energized.
- ◆ Follow-up monitoring reinforced accountability and long-term behavior change, with participants reporting increased water intake, reduced sugary drink consumption, and continued physical activity.
- ◆ Community-wide benefits included growing demand for local produce, strengthened cultural pride in local foods, and greater visibility of health-promoting initiatives in schools.
- ◆ Overall, the program demonstrated early progress toward long-term obesity prevention by shaping healthier behaviors, improving self-awareness, and encouraging sustainable wellness practices among children, youth, and families in Yap.



YAP CRE



Climate Change Program

Key Achievements

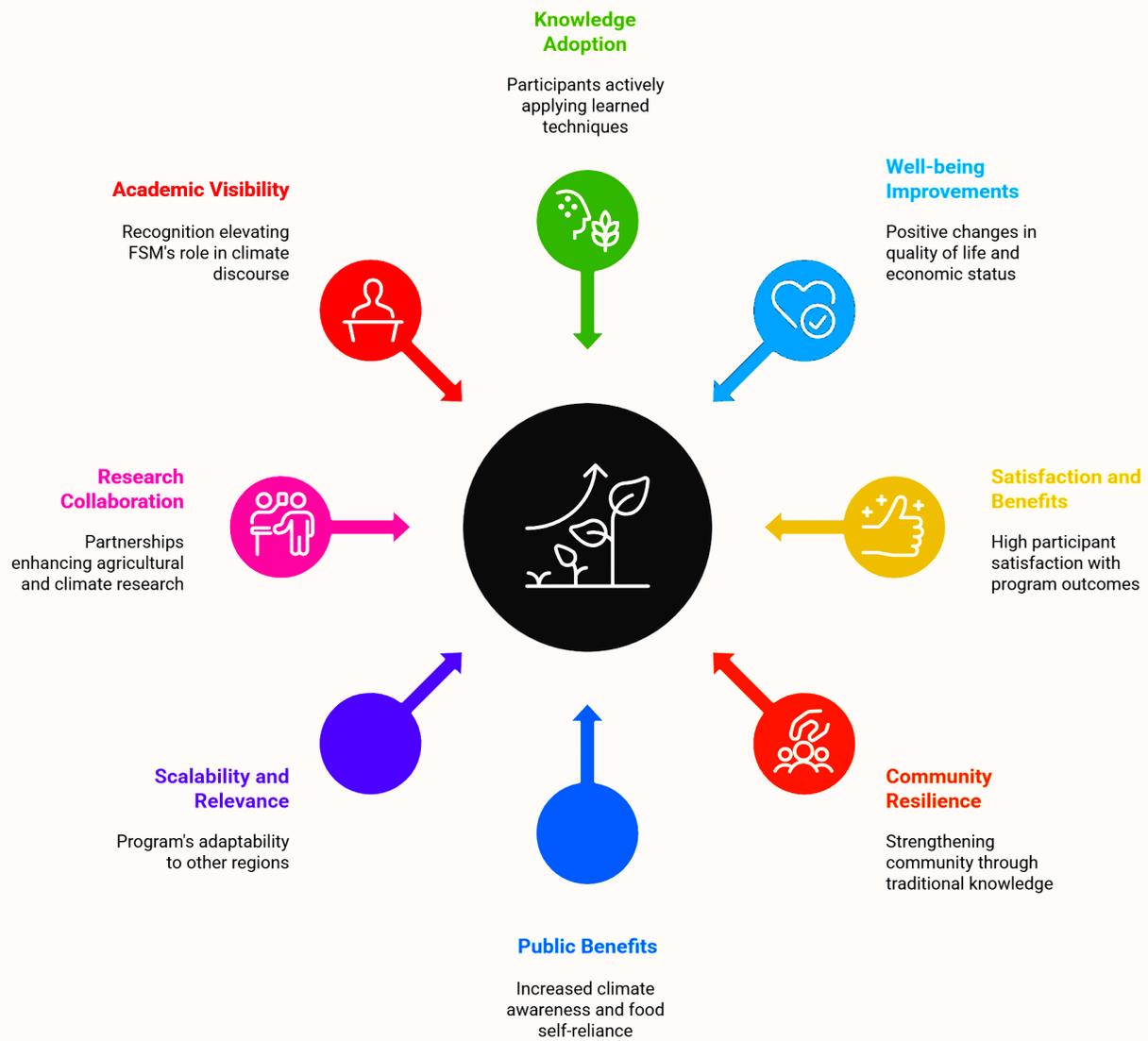
- ◆ The program directly engaged 109 adults (51 men and 58 women), 10 youths, and 11 Early Childhood Education children, while indirectly reaching more than 300 additional individuals through broader outreach.
- ◆ Delivered extensive hands-on training on:
 - ◇ volcanic soil management
 - ◇ composting
 - ◇ seed germination
 - ◇ nutrient enhancement strategies
 - ◇ production of alternative vegetables on degraded lands
- ◆ Introduced low-cost, site-specific climate-resilient farming techniques that support continuous food production under harsh climate conditions.
- ◆ Strengthened climate literacy by helping participants understand climate impacts, local vulnerabilities, and adaptive strategies suitable for their specific environments.
- ◆ Improved local vegetable access and diversified household diets through training focused on nutrient-rich vegetable production.
- ◆ Volunteers contributed 96 volunteer hours valued at USD 618, enhancing community-based implementation and lowering program operational costs.
- ◆ Staff presented at two major regional and international academic events:
 - ◇ Delivered a guest lecture at the University of Guam's College of Natural and Applied Sciences (CNAS) on "Growing Food in a Changing Climate – Lessons from Community-based Climate Change Adaptation Projects."

- ◇ Received the Best Oral Presentation Award at the Regional Climate Change Conference (RCCC) 2025 in Colombo, Sri Lanka, for the paper “*The Economics of Climate Change in the Federated States of Micronesia.*”

Impacts

- ◆ Strong knowledge adoption:
 - ◇ 79% of participants (n = 42) attempted vegetable cultivation
 - ◇ 83.3% applied the climate-smart techniques they learned
 - ◇ 71.4% reported increased motivation for gardening
 - ◇ 38% continued growing at least two types of vegetables
 - ◇ 88.1% consumed vegetables produced in their own gardens
- ◆ Significant improvements in well-being:
 - ◇ 66.7% reported improved quality of life due to program participation
 - ◇ 76.2% noted positive changes in economic well-being
 - ◇ 59.5% expressed willingness to join future activities
- ◆ High satisfaction and perceived benefits:
 - ◇ Over 91% of participants confirmed positive impacts on food security, agricultural resilience, and climate preparedness
- ◆ Community resilience strengthened through:
 - ◇ Intergenerational transfer of traditional knowledge
 - ◇ Enhanced cultural practices linked to climate adaptability
 - ◇ Improved household nutrition and reliable local food production even during climate extremes
- ◆ Broader public benefits included:
 - ◇ Increased climate awareness and understanding of local climate risks
 - ◇ Enhanced self-reliance in food production
 - ◇ Support for older adults (65+) through gardening activities that improved social engagement and physical health
- ◆ The program’s teaching model demonstrated strong scalability and relevance for other climate-sensitive regions of the FSM.
- ◆ Strengthened research and academic collaboration: The exchange with the University of Guam (CNAS) deepened regional partnerships for tropical agriculture and climate adaptation research.
- ◆ Elevated FSM’s academic visibility and policy relevance: The RCCC 2025 award-winning presentation positioned FSM as a regional leader in climate adaptation discourse, highlighting the economic implications of climate change for small island developing states.

Factors Contributing to Program Success



Food Safety Program

Key Achievements

1. Training and Participation

- ◇ The program directly reached 420 participants, including 177 youth (86 females and 91 males) and 243 adults (155 women and 88 men), reflecting strong participation from women as the primary household food preparers.
- ◇ Activities were conducted in 3 schools, and 4 communities, including *Fais Island* and three groups on Yap Main Island.

2. Core Learning Modules and Achievements

- ◇ Personal Hygiene & Wellness: Participants learned essential self-care practices such as handwashing, nail care, and cleanliness foundational elements of food safety.
- ◇ Microbial Defense: Sessions addressed safe food storage, temperature “danger zones,” and prevention of cross-contamination in kitchens.
- ◇ Water & Environmental Hazards: Participants learned to identify unsafe water sources, manage waste effectively, and maintain household and environmental cleanliness.
- ◇ Safe Food Processing Application: Integrated training on hygienic handling, processing, and storage techniques reinforced the practical application of microbial safety principles.

3. Student Training Outcomes

- ◇ A total of 84 students completed food sanitation and hygiene training.
- ◇ 100% of students passed post-session assessments, scoring 80% or higher, demonstrating complete mastery of key food safety concepts.
- ◇ Teachers incorporated hygiene reminders, particularly proper handwashing after breaks, into daily routines, resulting in fewer school absences due to flu-like symptoms.



4. Adult Training and Household Impact

- ◇ Among 243 adult participants, 102 individuals (58%) reported increased confidence in handling and preparing food safely.
- ◇ Interviews revealed reduced food waste and household cost savings from improved storage and preparation habits.

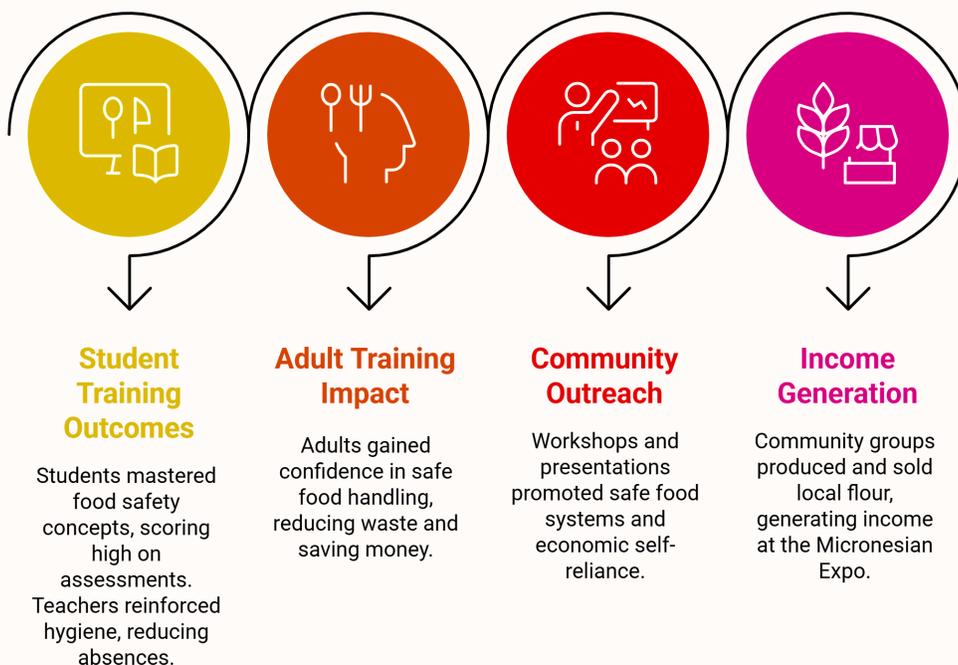
5. Community Outreach and Events

- ◇ Conducted safety food processing workshops, school sessions, and community-based presentations, including at the World Food Day celebration, the Reading Program, and a workshop with Early Childhood Education (ECE) teachers.
- ◇ Shared local food processing techniques promoting safe and sustainable food systems and economic self-reliance.

6. Income-Generating Activities

- ◇ Trained community groups began producing and marketing local flour from breadfruit and banana.
- ◇ During the Micronesian Expo (Yap), one group earned \$250 from banana flour and \$375 from breadfruit flour sales, showcasing how food safety and processing skills can generate local income.

Food Safety Training Outcomes



Impacts

1. Health and Hygiene Improvements

- ◇ The program improved hygiene behavior across schools and households. Students and teachers institutionalized handwashing practices, which contributed to improved attendance and a reduction in illness.
- ◇ Families adopted safe food handling, storage, and sanitation habits, reducing the incidence of foodborne diseases.

2. Empowerment and Economic Benefits

- ◇ 58% of adult trainees reported greater confidence and competence in food safety, leading to tangible household benefits such as less food spoilage and reduced medical expenses.
- ◇ Communities demonstrate innovation by converting local produce (breadfruit, banana) into flour, reducing dependency on imported goods and increasing financial resilience.

3. Community and Institutional Engagement

- ◇ Collaboration with schools, teachers, community leaders, and state agencies strengthened FSM's network of trained advocates for food safety and sanitation.
- ◇ The program's success stories, such as school hygiene integration and local flour production, have inspired replication in neighboring communities.

4. Sustainability and Public Health Contribution

- ◇ Improved knowledge among 420 direct participants and hundreds more indirectly reached has contributed to healthier, cleaner, and more self-sufficient communities.
- ◇ The program promotes sustainable local food processing, environmental hygiene, and public awareness, advancing the FSM's long-term goals in food security, health promotion, and community resilience.



KOSRAE CRE



Mud Crab Project

Project Overview

The mud crab project addresses urgent challenges affecting crab populations and food security in the FSM. A preliminary assessment revealed a decline in crab stock availability due to overharvesting, habitat degradation, pollution, and the impacts of climate change, collectively threatening the nation's food security and livelihoods. Local hatchery programs remain underdeveloped, and communities rely heavily on imported foods rather than fresh marine products. Therefore, the project's overarching goal is to produce juvenile crabs for food, replenish natural populations, and strengthen socioeconomic stability through education, research, and extension activities.

Key Achievements

- ◆ Conducted crab stock assessments and broodstock availability surveys across Kosrae, Pohnpei, and Yap, providing critical baseline data for hatchery preparation.
- ◆ Focused research activities examined morphological characteristics, sex ratios, maturity stages, spawning seasons, and local fishing techniques used to harvest crabs.
- ◆ Strengthened skills and technical knowledge of local staff to prepare them for upcoming hatchery operations.
- ◆ Represented the FSM aquaculture initiatives internationally at the 7th International Conference on Fisheries, Aquatic, and Environmental Science held in Banda Aceh, Indonesia.
- ◆ Delivered a talk on "Regional Priorities of Aquaculture and Hatchery Programs in Micronesia."
- ◆ Participation in the conference enhanced the PI's technical capacity to apply innovative approaches for reducing juvenile crab mortality in hatchery operations.

Impacts

- ◆ Strengthened partnerships between local communities, farmers, extension agents, and students engaged in small-scale aquaculture.
- ◆ Increased local awareness of the potential for hatchery-based crab production, prompting community interest in future collaboration.
- ◆ Established the FSM's first model of a sustainable crab hatchery program utilizing environmentally friendly captive-breeding techniques.
- ◆ Shared regional information on crab biology, stock conditions, and aquaculture opportunities with national stakeholders and international experts.
- ◆ Contributed towards knowledge-based planning for sustainable aquaculture development across the FSM.



KOSRAE CRE



Seaweed Project

Project Overview

The seaweed project focuses on cultivating green seaweed (sea grapes), an edible macroalgae commonly known as sea grapes or green caviar. Globally, seaweed accounts for approximately 50% of all marine aquaculture production, with an annual average of 35 million tons (wet weight) for human consumption. Despite the high market demand and the strong potential as a nutrient-rich local food source, production remains limited due to the absence of hatchery systems, insufficient cultivation infrastructure, and a lack of technical knowledge. The project aims to produce seedstock, promote community-based farming, strengthen income-generating opportunities, and support wastewater treatment and nutrient recycling through integrated aquaculture systems.

Key Achievements

- ◆ Conducted research activities focused on species identification and distribution surveys of green seaweed *Caulerpa* species around Kosrae Island. Four species were identified.
- ◆ Implemented small-scale cultivation trials under ambient light and temperature conditions at the CRE office.
- ◆ Among the tested species, *C. racemosa* showed superior growth performance, better taste quality, and higher consumer preference.
- ◆ Conducted polyculture trials integrating seaweed and oyster farming, which demonstrated improved growth and healthier conditions compared to seaweed-only culture.
- ◆ Early cultivation trials of 2–3 weeks produced promising initial results, supporting the potential for continuous seedstock development.
- ◆ Initiated comparative experiments with additional environmental parameters, which are currently in progress.

- ◆ Observed strong public interest in seaweed cultivation demonstrations, encouraging future community collaboration and training efforts.
- ◆ Provided technical guidance to staff and local farmers on feasible home-based cultivation techniques to support local food production and nutrient recycling.

Impacts

- ◆ Increased public awareness of the potential of green seaweed as a locally available, nutritious, and income-generating food source.
- ◆ Enhanced technical skills among community stakeholders, including students, extension agents, research assistants, youth groups, government personnel, NGOs, and farmers, through demonstrations and training sessions.
- ◆ Improved understanding of tank-based seaweed cultivation practices and the use of *Caulerpa racemosa* as seedstock for local production.
- ◆ Reinforced the project's objective of developing community-based aquaculture that supports local food supply and nutrient recycling within hatchery systems.
- ◆ Positioned the project as the first model of seaweed cultivation using native species in Kosrae and other FSM states.
- ◆ Provided foundational research data for future public dissemination, contributing to long-term planning and community adoption.



Oyster and seaweed polyculture

KOSRAE CRE



Edible Oyster Project

Project Overview

The project *Cultivation of Hatchery-Produced Edible Oyster Spats* addresses a critical gap in sustainable aquaculture capacity within Kosrae and the wider FSM. Although oysters are globally recognized for their ecological functions, natural filtration, reef building, and support for ecosystem balance, and are a premium, high-demand seafood item in Southeast Asia, oyster farming remains limited in the FSM. Edible oyster cultivation is a feasible, low-tech aquaculture method that local communities can easily adopt. However, local oyster availability is challenged by uncertainty in species identification due to morphological variability, historical eradication efforts, and limited hatchery infrastructure. This project aims to develop local oyster seed production, promote community-based oyster farming, enhance technical skills, and contribute to food security and economic resilience through environmentally friendly aquaculture practices.

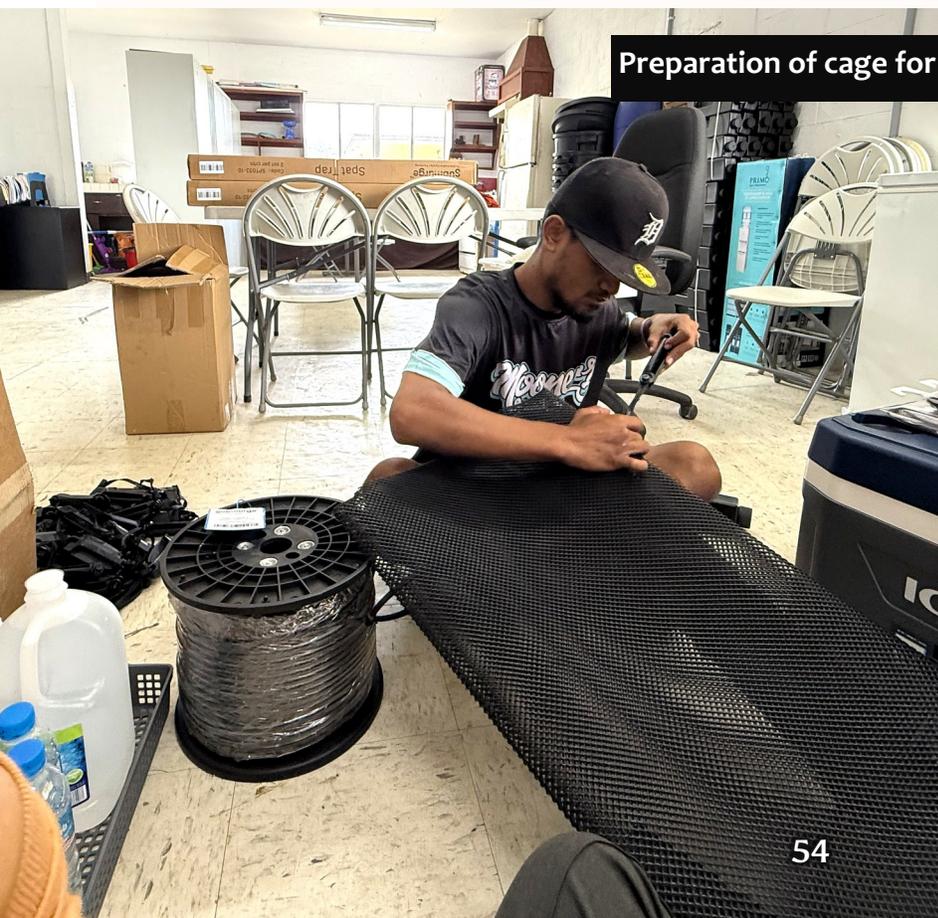
Key Achievements

- ◆ Designed and initiated environmentally friendly hatchery techniques focused on:
 - I. Producing oyster spats via external fertilization using the stripping method.
 - II. Monitoring growth and survival rates of oyster larvae and spats.
 - III. Determining long-line floating farm performance for hatchery-reared spats.
- ◆ Procured hatchery-related equipment and began work on broodstock collection, assessing maturity stages necessary for spawning.
- ◆ Conducted field surveys of oyster beds and laboratory analysis.
- ◆ Laboratory analysis revealed microplastic accumulation in oyster stomach contents, highlighting the impact of coastal pollution on marine resources.

- ◆ Implemented external fertilization using broodstock larger than 9 cm shell length, validating the feasibility of small-scale hatchery production in ambient environmental conditions.
- ◆ Confirmed early-stage feasibility of oyster larvae growth.
- ◆ Promoted local awareness and interest in oyster aquaculture by demonstrating food preparation, cultivation benefits, and environmentally sustainable methods.
- ◆ Strengthened capacity-building efforts by exposing the community to practical aquaculture demonstrations and small-scale trials.

Impacts

- ◆ Enhanced public awareness of the ecological value of oysters and their potential role in community-based aquaculture systems.
- ◆ Initiated stakeholder engagement to establish a new hatchery center at Lelu Marine Park and shared program updates with officials and community partners. These efforts led to significant progress toward securing a 10-year land-use guarantee through a sublease from the Lelu Town Government.
- ◆ Identified and documented environmental considerations, specifically the necessity of seawater filtration and ecological impact assessments for future hatchery operations.
- ◆ Strengthened partnerships among community members, extension staff, and local aquaculture practitioners, laying the foundation for long-term support of sustainable coastal resources development.



KOSRAE CRE

Crop Production

Key Achievements

- ◆ Engaged a total of 263 participants in 2025, including 38 adults (28 males, 10 females), 130 youth (students), 24 staff members, and 71 households.
- ◆ Conducted 15 outreach events, covering propagation techniques, plant nutrient management, cultivar conservation, local staple crop production, and Good Agricultural Practices (GAP) for crops such as coconut, local citruses, dragon fruit, and vegetables.
- ◆ Delivered three project presentations reaching 38 community participants, focusing on plant propagation, nutrient management, and conservation of essential crop cultivars.
- ◆ Implemented three informal lecture sessions with 130 students and 24 staff, providing training on:
 - ◇ Data collection,
 - ◇ Natural fertilizer production,
 - ◇ Soil and nutrient testing,
 - ◇ Crop production techniques relevant to the FSM.
- ◆ Completed three site surveys with students and staff in collaboration with the Pilot Farm and the Pohnpei State Department of Resources and Development, covering data collection, value addition procedures, and field assessments.
- ◆ Conducted six hands-on and practical training sessions, engaging 71 households from Kosrae and Pohnpei on air-layering, plant nutrient management, and sustainable use of local coconut pith as a growing medium.
- ◆ *Youth in Farming* program participants planted 50 citrus (lime) plants, established 139 home gardens, and maintained four school gardens along with four citrus planting sites, managed by 18 youth members.
- ◆ Across seven elementary schools and Kosrae High School, agriculture was integrated into the curriculum, involving 240 individuals and 83 students through CRE-supported school and community agriculture activities.
- ◆ *Youth in Farming* program participants sold 1,048 pounds of cooking bananas and 180 pounds of eating bananas, generating practical learning experiences in crop marketing and local food production.

Impacts

- ◆ Strengthened youth engagement in agriculture: More than 130 students and 18 Youth in Farming members gained practical experience in cultivation, citrus planting, the use of natural fertilizers, and data collection, helping to counteract the disinterest among youth in agriculture. Over 90% of young participants demonstrated improved understanding and adoption of propagation techniques and sustainable gardening practices.

- ◆ Improved household food security: The establishment of 139 home gardens provided families with regular access to fresh vegetables and produce, contributing to improved nutrition and reduced dependence on imported foods. 71 participating households benefited from hands-on training in sustainable agriculture and plant propagation.
- ◆ Adoption of improved production practices: Training results indicate that nearly 50% of participants increased their knowledge of plant propagation and soil nutrient management. In comparison, 20% of the 71 households successfully adopted air-layering grow kits, coconut pith use, and nutrient management techniques.
- ◆ Revitalization and conservation of local crop species: Community households and youth assisted in the propagation and replanting of citrus and coconut species across three municipalities in Kosrae and two municipalities in Pohnpei, thereby supporting the long-term conservation and revitalization of declining local cultivars.
- ◆ Enhanced technical skills and agricultural competence: Participants gained practical skills in soil testing, fertilizer preparation, trellis maintenance for dragon fruit, and crop establishment, thereby strengthening local capacity for sustainable, climate-resilient crop production.
- ◆ Food sovereignty and economic empowerment: *Youth in Farming* program sales of 1,048 lbs. of cooking bananas and 180 lbs. of eating bananas enhanced their confidence, leadership, and economic participation. Their work inspired neighboring villages to adopt farming as a means of development and to improve community health.
- ◆ Broader public benefit and free access to training: CRE provided free agricultural services to individuals, schools, and communities, expanding outreach and strengthening awareness of nutrient-rich local food systems and sustainable production practices.





Kosrae CRE Ag Program Extension Activities

KOSRAE CRE

Youth Program

Key Achievements

- ◆ Implemented a comprehensive set of youth and family training activities, including 6 fafa trainings, 3 wood carving trainings, 2 canoe-making trainings, 1 sewing training, and 4 one-on-one youth consultation sessions with 2 high school students.
- ◆ Strengthened partnerships with key stakeholders such as Mayors' Office, Youth Organizations, Women's Groups, Department of Health Services, and Department of Education to support youth development and family cohesion.
- ◆ Provided free, community-based training that combined lectures, hands-on demonstrations, and skills practice, enabling smooth delivery of traditional and entrepreneurial skill-building programs.
- ◆ Engaged a total of 440 participants throughout the reporting year, including 254 females and 186 males, who received training in traditional skills, sewing, canoe making, carving, food preparation, and youth leadership.
- ◆ Enabled mastery and measurable skill development among program participants:
 - ◇ 20 youth members successfully mastered fafa preparation techniques.
 - ◇ 66 participants learned canoe-building skills, with 1 individual mastering the full carving of a local canoe.
 - ◇ 24 females learned and earned income from preparing sweet toppings for fafa.
 - ◇ 2 high school students were readmitted to Kosrae High School, graduated, and earned diplomas following individual counseling sessions.
 - ◇ 98 youth participated in community fundraising activities such as food sales, sewn product sales, and clean-up events.
- ◆ Advanced sewing skills across the community, with 230 clients actively participating:
 - ◇ 182 participants learned basic sewing techniques.
 - ◇ 35 participants successfully sewed school uniforms using newly learned skills.
 - ◇ 13 participants began selling sewn products, generating income to support household needs.

Impacts

- ◆ Revitalization of Cultural Knowledge: Programs in fafa preparation, canoe making, and wood carving helped preserve diminishing Kosraean traditions and equipped youth with culturally rooted skills.
- ◆ Enhanced Entrepreneurial Capacity:
 - ◇ 100% of program clients gained awareness of the importance of entrepreneurial skills—including sewing, food preparation, and local product development.
 - ◇ More than **35%** of participants applied their new skills in real-life settings, demonstrating

KOSRAE CRE

improved confidence, productivity, and responsibility.

◆ **Income Generation and Economic Support:**

- ◇ Training outcomes enabled youth and families to earn income through food sales, sewn items, sweet toppings for fafa, and community fundraising events.
- ◇ The 13 clients selling sewn products and 24 females preparing fafa toppings contributed directly to household economic resilience.

◆ **Improved Family and Youth Well-Being:**

- ◇ Strengthened relationships between youth and families through group activities, counseling sessions, and community engagement.
- ◇ Counseling support helped 2 high school students successfully return to school and complete their diplomas.

◆ **Community-Wide Benefits:**

- ◇ The program fostered collaboration across agencies, youth groups, and families, creating a supportive environment that enhanced learning and shared responsibility.
- ◇ Traditional and modern skills acquired through the program empowered participants to contribute meaningfully to family projects, community events, and cultural preservation initiatives.

◆ **Greater Access and Inclusion:**

- ◇ With the program being open and free to all, it provided equitable opportunities for skill development and social growth within the broader Kosraean community.



KOSRAE CRE

Foods Safety Program

Key Achievements

- ◆ Implemented the Smart Food Safety Practices program across Kosrae, delivering community-based education targeting families, youth groups, students, and caretakers, the most vulnerable age groups to foodborne illnesses.
- ◆ Conducted one food safety training in collaboration with UNICEF, specifically designed for food handlers. A total of 21 participants attended this specialized training session.
- ◆ Reached and trained 206 participants (75 males and 131 females) through community outreach, school-based instruction, and household-level engagement.
- ◆ Delivered core instruction on the five keys of food safety, including:
 - ◇ Proper handwashing techniques
 - ◇ Safe handling and washing of food items
 - ◇ Correct cooking of meat and perishable foods
 - ◇ Avoiding cross-contamination during food preparation
 - ◇ Safe sorting and storage of perishable and non-perishable foods
- ◆ Reinforced classroom lessons through presentations and food demonstrations, allowing students to observe safe meal preparation practices in real time.
- ◆ Ensured all students practiced proper handwashing before recipe tasting and evaluated their understanding at the end of each training session.
- ◆ Provided continuous guidance during follow-up visits, where caretakers reported improved practices such as selecting safe drinking water, washing utensils properly, and consistently applying food safety techniques at home.

Impacts

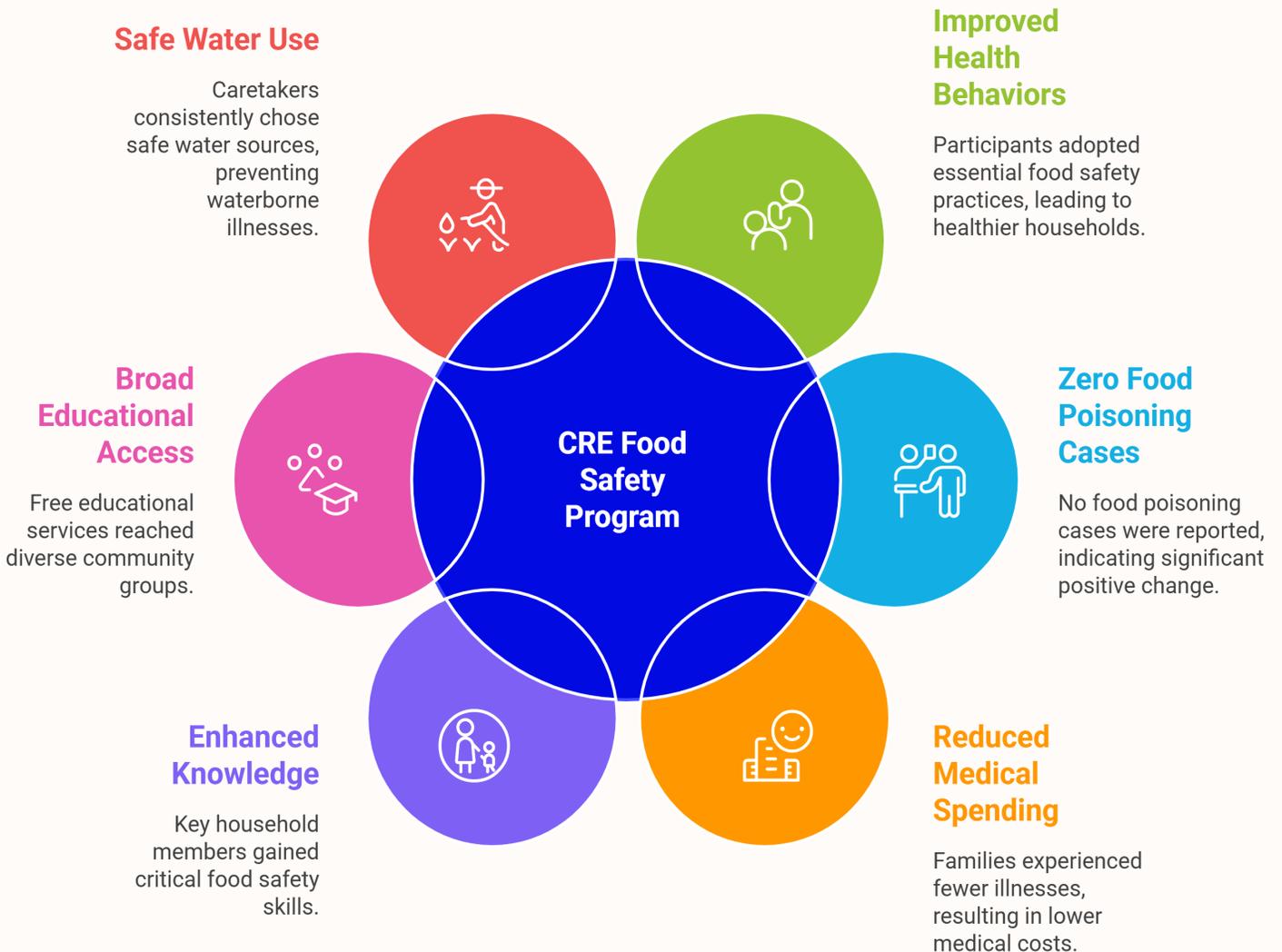
- ◆ Improved Household Health Behaviors: All 206 participants (100%) learned and applied essential food safety skills, including proper handwashing, safe food storage, and hygienic meal preparation, which directly contributed to healthier households and a reduced risk of illness.
- ◆ Zero Food Poisoning Cases Reported: Follow-up verification with the Kosrae Department of Health Services confirmed that no food poisoning cases were admitted during the reporting year, indicating significant positive behavioral change and improved public health outcomes.
- ◆ Reduced Medical Spending and Illness: Families reported fewer sicknesses caused by improper food handling, resulting in reduced medical costs and stronger overall household well-being.
- ◆ Enhanced Knowledge Among Key Household Decision-Makers: Mothers, caretakers, and youth who are typically responsible for cooking and meal preparation gained critical skills that directly

KOSRAE CRE

influence daily food safety practices within homes.

- ◆ **Broad Public Benefit Through Free Educational Access:** The CRE Food Safety Program continued providing free educational services to individuals, schools, and community groups of all ages, expanding access to essential food safety knowledge across Kosrae.
- ◆ **Increased Awareness of Safe Water Use:** Caretakers consistently reported choosing safe water sources for drinking, cooking, and washing, thereby helping to prevent waterborne illnesses alongside foodborne risks.

Food Safety Program Impacts



CHUUK CRE

Crop Production

Key Achievements

- ◆ A total of 815 clients were reached through agricultural awareness and training sessions across Chuuk State. The participants included 202 adults (96 women, 106 men) and 613 youths (356 females, 257 males).
- ◆ A total of 26 training sessions were conducted, each engaging 10 or more participants, focusing on improving food production and promoting self-reliance.
- ◆ Activities included community awareness sessions, demonstrations, and school-based training designed to encourage home gardening and sustainable farming.
- ◆ Key training topics covered:
 - ◇ Home gardening techniques
 - ◇ Importance and use of coconut peat as a sustainable growing medium
 - ◇ Seedling development and transplanting
 - ◇ New pineapple planting method using crown leaves
 - ◇ Soil improvement, composting, and basic crop-care practices
- ◆ Program activities were conducted in 9 schools and 21 communities, such as *Uman, Tonoas, Fefan, Weno, Siis, Parem, Fonomwo, Piis Paneu, and Udot Islands*.
- ◆ Demonstrations on cocopith utilization promoted environmentally friendly practices, while vegetable seedlings were planted and distributed to households and schools to sustain community participation in local food production.
- ◆ Collaboration with relevant agencies and local partners enhanced outreach effectiveness, ensuring delivery of consistent technical support and sustainable agriculture awareness.

Impacts

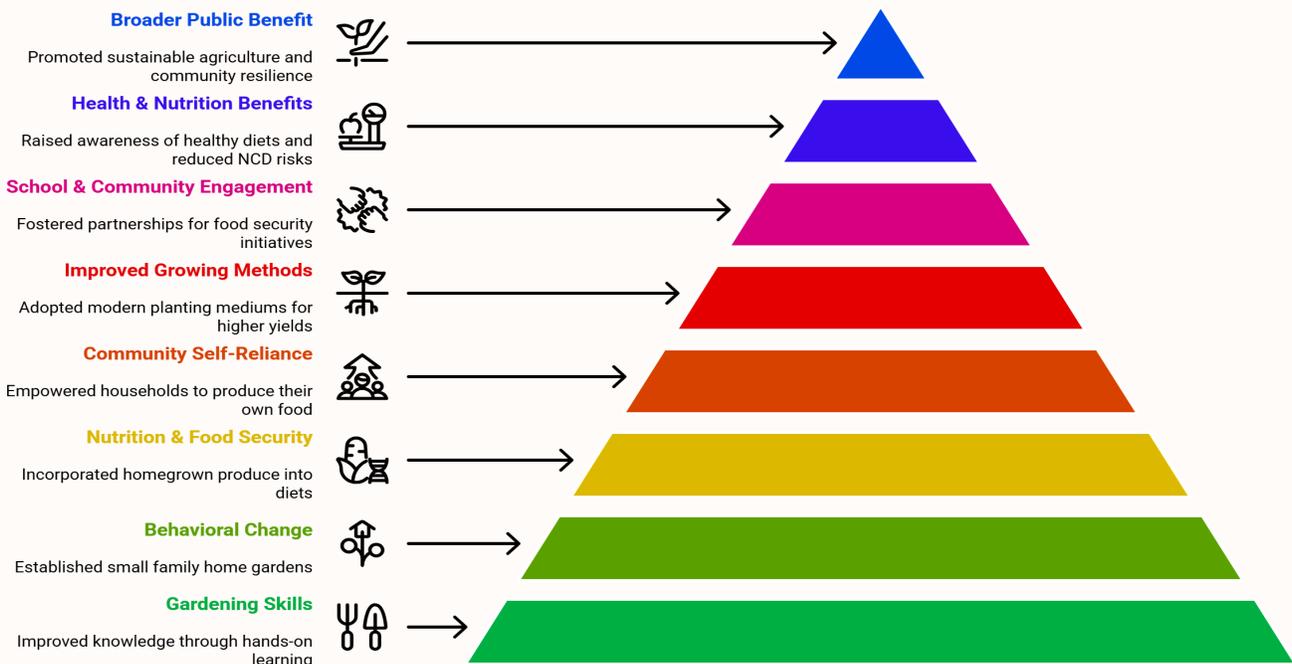
- ◆ **Gardening Skills:** All 815 participants (100%) improved their knowledge of home gardening, composting, plant propagation, and crop marketing through practical, hands-on learning experiences.
- ◆ **Behavioral Change:** About 10% of the 815 trainees established small family home gardens, primarily producing vegetables for household consumption.
- ◆ **Improved Nutrition and Food Security:** Approximately 5% of the trainees who cultivated home gardens began incorporating homegrown produce into their diets, leading to more nutritious meals and reduced dependence on imported foods.
- ◆ **Increased Community Self-Reliance:** Training sessions empowered local households to produce their own food, enhancing resilience and reducing vulnerability to market disruptions.
- ◆ **Adoption of Improved Growing Methods:** Participants adopted modern planting medium such as

the use of coconut pith resulting in healthier plants and higher yields.

- ◆ **Stronger School and Community Engagement:** The program fostered partnerships between schools, local communities, and organizations, expanding the reach of food security initiatives.
- ◆ **Health and Nutrition Benefits:** Increased consumption of locally grown fruits and vegetables helped raise awareness of the importance of healthy diets and contributed to reducing risks of non-communicable diseases (NCDs) such as diabetes and hypertension.
- ◆ **Broader Public Benefit:** Through collaboration with schools, agencies, and community organizations, the program raised public awareness of sustainable agriculture and local food systems, promoting behavioral change and long-term community resilience across Chuuk and surrounding islands.



Community Resilience Pyramid



Aquaculture Extension

Key Achievements

1. Awareness and Education Outreach

- ◆ Conducted 41 outreach sessions across elementary/high schools and communities throughout the Chuuk Lagoon.
- ◆ Reached a total of 923 participants, including 283 children (105 male, 178 female), 425 youth (238 male, 187 female), and 215 adults (125 men, 90 women). Outreach sessions covered Fefan, Tonoas, Onei, Parem, Udot, Piis Paneu, Fonoton, and Weno Islands.
- ◆ Topics included:
 - ◇ Basics of giant clam and rabbitfish culture
 - ◇ Benefits of aquaculture for food security and income
 - ◇ Role of aquaculture in reef conservation
 - ◇ Alternative systems such as sponge and sea cucumber farming
 - ◇ Low-cost aquaculture methods, site selection, water quality, and responsible resource management

2. Hands-On Training and Capacity Building

- ◆ Organized 5 technical training sessions on Onei Island for 24 participants, in partnership with:
 - ◇ MERIP (Pohnpei)
 - ◇ The Nature Conservancy (TNC)
 - ◇ Oneisomw Municipal Government
- ◆ Training covered species identification, broodstock collection, grow-out methods, disease prevention, cage construction, and site assessments, all customized for Chuuk's environment.

3. Establishment of Aquaculture Demonstration Sites

- ◆ Successfully established three community aquaculture sites across Chuuk State, at Onei, Parem and Weno. These sites function as:
 - ◇ Demonstration and learning centers
 - ◇ Locations for testing farming method
 - ◇ Broodstock holding areas for clams, sponges, rabbitfish, and sea cucumbers

4. Giant Clam Restocking and Species Reintroduction

- ◆ Deployed over 3,600 giant clam seedlings to the Onei aquaculture site, including *Tridacna gigas*, a species now locally extinct in Chuuk.
- ◆ Provided practical grow-out experience for local farmers while supporting the re-establishment of high-value clam species.

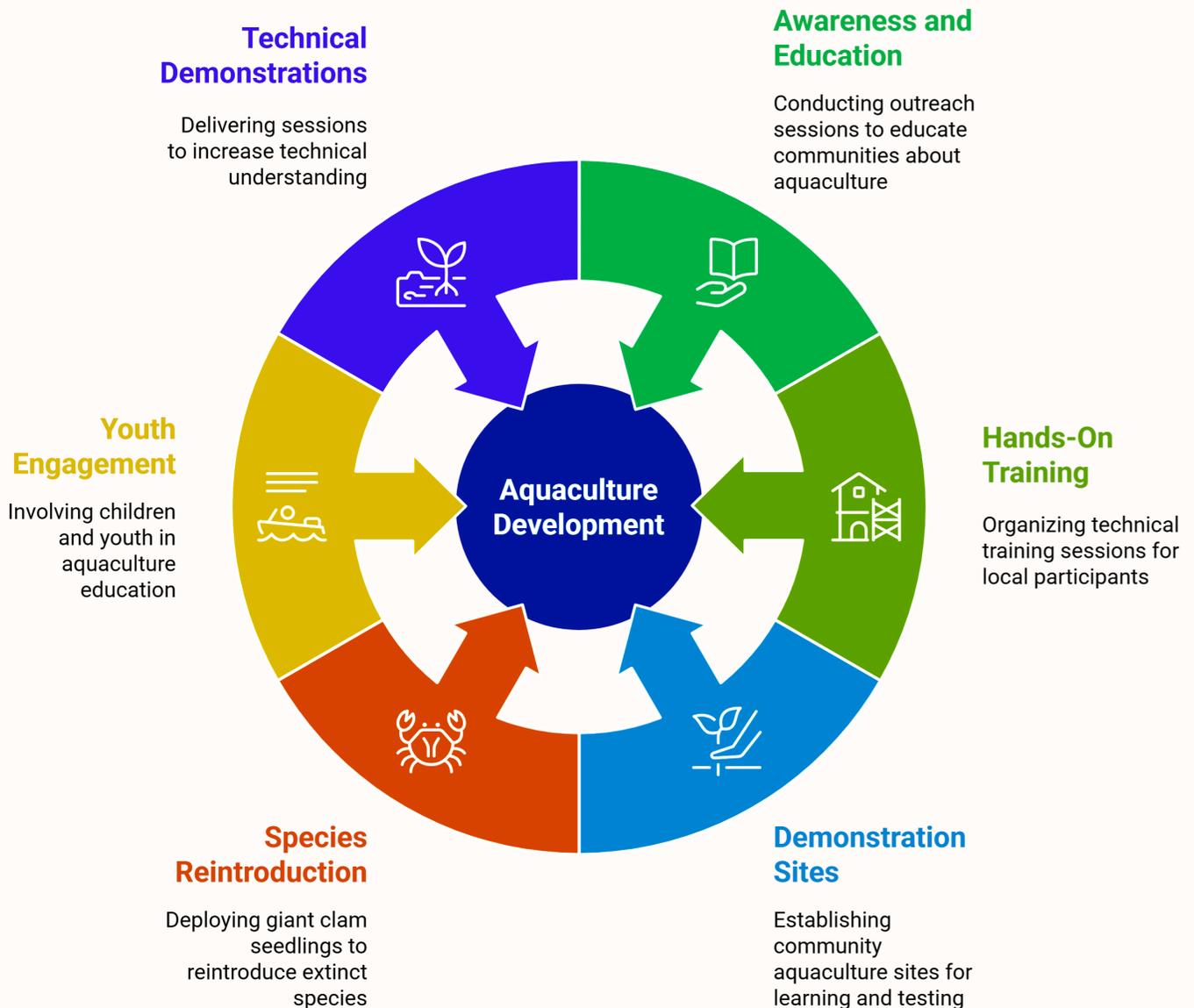
5. Youth and School Engagement

- ◆ Reached 708 children and youth, equipping them with scientific and practical knowledge about aquaculture, marine ecosystems, and future career pathways.

6. Technical Demonstration Sessions

- ◆ Delivered 10 hands-on demonstration sessions covering coral, sponge, rabbitfish, clam, and sea cucumber farming methods.
- ◆ Increased technical understanding among conservation officers, municipal leaders, reef owners, and government partners.

Aquaculture Development in Chuuk





Impacts

1. Strengthened Knowledge and Community Capacity

- ◆ All 923 participants gained essential knowledge on how aquaculture can support food security, provide income, and protect overfished reefs.
- ◆ Conservation officers, resource owners, and municipal leaders strengthened their technical understanding, enabling improved planning and policy support for local aquaculture initiatives.

2. Enhanced Opportunities for Youth and Future Workforce

- ◆ 708 youth and children acquired practical aquaculture skills that support school learning and offer clear career pathways in marine science and aquaculture.

3. Creation of Practical, Community-Based Learning Sites

- ◆ The three aquaculture sites in Onei, Parem, and Weno serve as visible, functioning examples of what sustainable aquaculture looks like.
- ◆ These centers allow communities to observe, participate, and build confidence in aquaculture as a reliable livelihood option.

4. Ecological Restoration and Species Recovery

- ◆ The deployment of 3,600+ giant clam seedlings, including *Tridacna gigas*, contributes to reef restoration and supports the recovery of ecologically and economically important marine species.
- ◆ Communities now have opportunities for future, regulated harvest as restocked clams reach maturity.

5. Improved Livelihood Potential and Reduced Pressure on Reefs

- ◆ By expanding options for farming clams, rabbitfish, sponges, and sea cucumbers, communities can diversify income sources and reduce dependence on dwindling wild stocks.

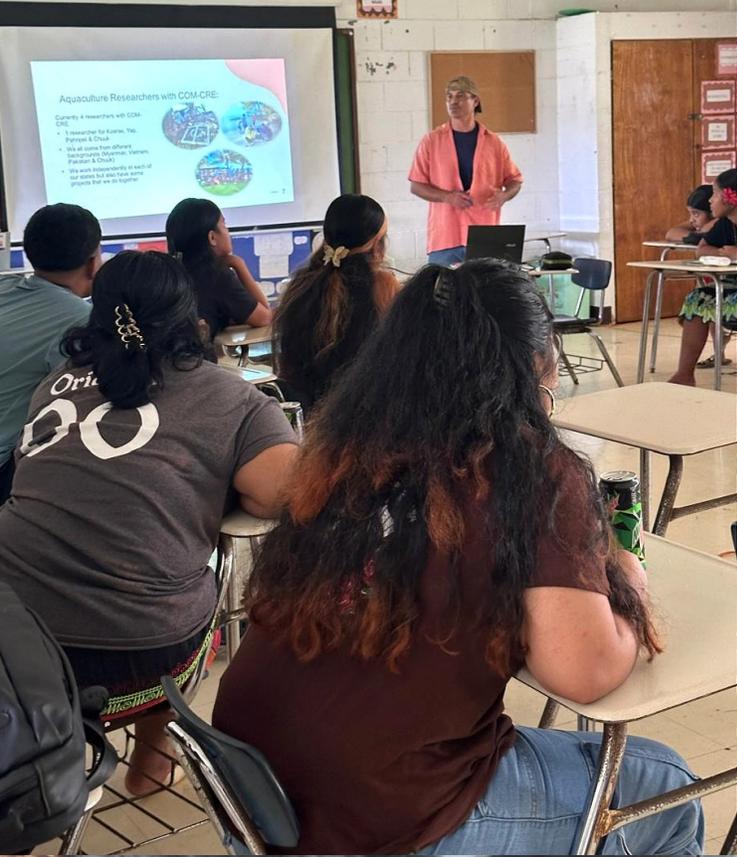
6. Stronger Multi-Agency Collaboration

- ◆ Partnerships with MERIP, TNC, Chuuk State Marine Resources, Chuuk EPA, and multiple municipal governments strengthened coordinated efforts in aquaculture development and conservation.

7. Broader Public Benefits

- ◆ Increased awareness of sustainable aquaculture across Chuuk and the FSM promotes self-sufficiency, reduces reliance on imported seafood, and builds resilience in the face of climate change and economic instability.
- ◆ The program supports a growing movement toward sustainable resource management and environmentally responsible coastal development.

Chuuk CRE aquaculture extension activities



Swine Program

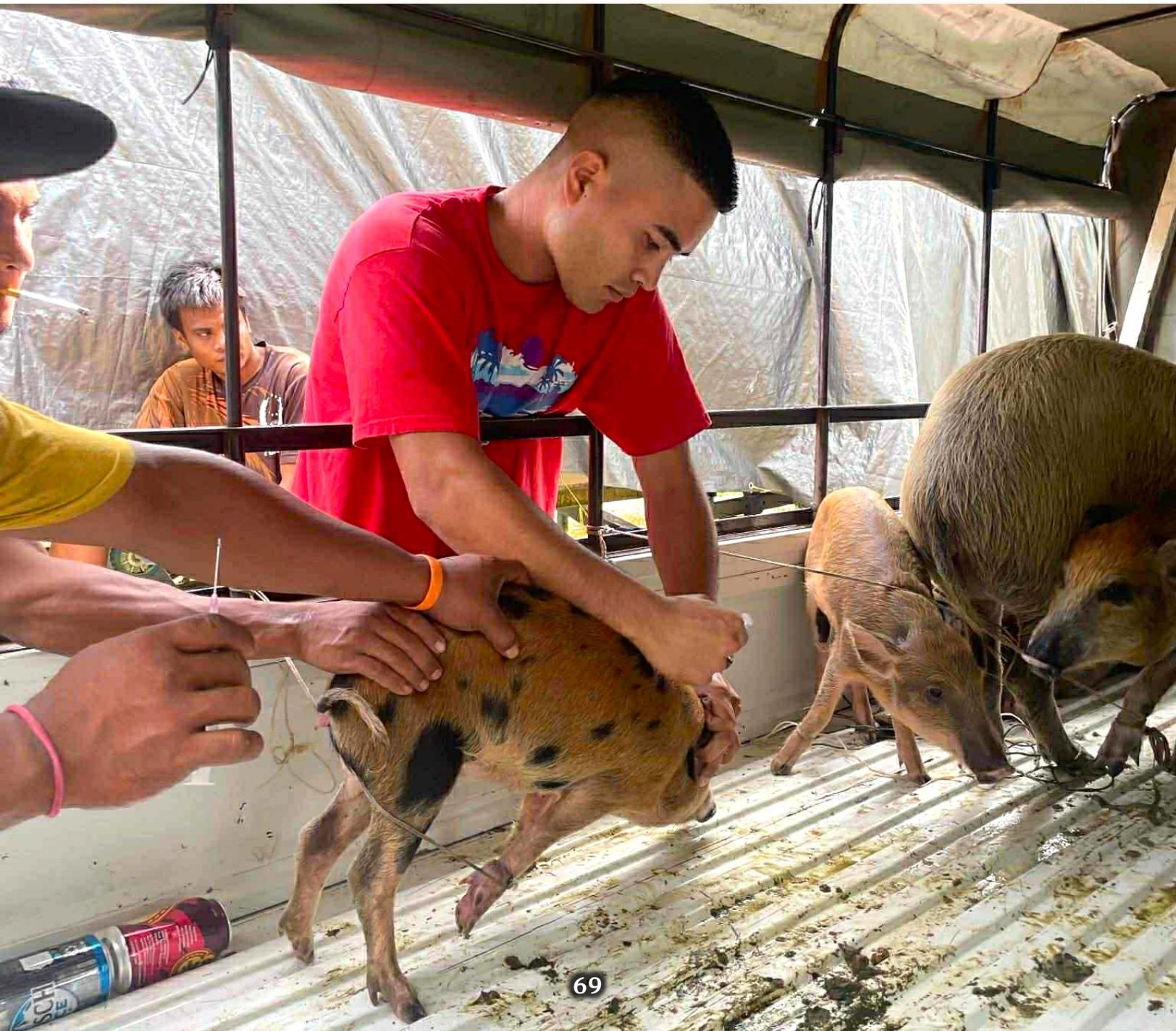
Key Achievements

- ◆ Delivered a total of 219 training and demonstration sessions across Pohnpei communities and schools, reaching 699 participants, including 273 youth and 426 adults, of whom 448 were new and 251 were returning participants.
- ◆ Conducted 205 swine medication demonstrations for 300 participants (144 youth, 156 adults), improving farmer confidence in vaccine application, disease prevention, and herd health management.
- ◆ Delivered 51 castration sessions involving 177 participants, resulting in 36 individuals able to perform castration independently.
- ◆ Implemented 44 tooth-clipping demonstrations with 199 participants, with 10 trained individuals replicating demonstrations in their own communities.
- ◆ Facilitated 300 sanitation and hygiene training sessions for 699 participants, strengthening knowledge of pen cleanliness, waste management, and improved water and sanitation practices.
- ◆ Provided 5 live-weight calculation sessions for 23 participants, teaching simple techniques to estimate pig weight for more accurate feeding and marketing decisions.
- ◆ Supported 252 total swine-related interventions, including 205 medication treatments, 51 castrations, and 44 tooth clippings.
- ◆ Enabled 12 swine owners to expand into semi-commercial operations, with pigs sold at values ranging from \$100 to \$5,000 USD each.
- ◆ Distributed 20 illustrated swine medication posters and aired two radio broadcasts to address gaps in farmer knowledge regarding medication dosage and proper application.

Impacts

- ◆ Strengthened technical capacity among farmers: All 699 participants enhanced their understanding of animal health, medication procedures, sanitation practices, and management techniques, resulting in healthier pigs and more efficient farm operations. The adoption of practices was measurable, with 36 farmers now independently performing castration and 10 individuals replicating tooth-clipping training within their communities.
- ◆ Improved herd health and productivity: The 205 medication treatments and widespread training on disease prevention contributed to stronger herd health, reduced mortality, and higher-quality animals for sale, ceremonies, and household use.
- ◆ Increased economic opportunities: Twelve farmers transitioned into semi-commercial operations, earning between \$100 and \$5,000 USD per pig, demonstrating the financial viability of improved swine husbandry. The growing confidence among farmers also increased the supply of pigs available for cultural, ceremonial, and market purposes.

- ◆ Enhanced sanitation and biosecurity: With 300 sanitation-focused sessions, farmers improved pen cleanliness, waste disposal, and water management—creating safer environments for pigs and reducing disease risks.
- ◆ Broader public benefit and expanded reach: Community participation increased dramatically from 360 farmers in FY 2023 to 699 in FY 2025, reflecting a rise in trust and awareness of improved husbandry practices. Radio broadcasts, posters, and community demonstrations extended learning beyond direct participants, benefiting households not formally enrolled in the program.
- ◆ Support for cultural and social resilience: By improving the availability and health of pigs, the program reinforced the cultural significance of swine in traditional feasts and family events, where 100–200 pigs were used during the reporting year.



CTEC CRE

Crop Production Program

Key Achievements

- ◆ Conducted 50 home gardening training sessions, demonstrations, technical assistance visits, and individual consultations across Pohnpei's main island communities.
- ◆ Reached a total of 953 participants, including 730 youth (ages 14–35) and 223 adults, with a gender distribution of 118 adult males, 105 adult females, 302 male youth, and 428 female youth.
- ◆ Strengthened school-based agriculture by establishing 8 school gardens, enabling hands-on learning for students and contributing to school-based food production.
- ◆ Supported community food production through the establishment of 27 home gardens, improving household access to fresh vegetables.
- ◆ Enabled 15 commercial farmers to earn between \$200–\$1,000+ per harvest cycle, demonstrating the profitability of improved crop production methods.
- ◆ Delivered targeted awareness sessions and distributed seeds at the Pingelap Community Center (Nan Pepper) to expand outreach beyond the main island.
- ◆ Distributed 20 home gardening posters across schools and communities to reinforce good agricultural practices and provide visual learning tools.
- ◆ Noted a doubling of participation in vegetable gardening activities compared to the previous year, indicating growing community interest and adoption of home gardening practices.

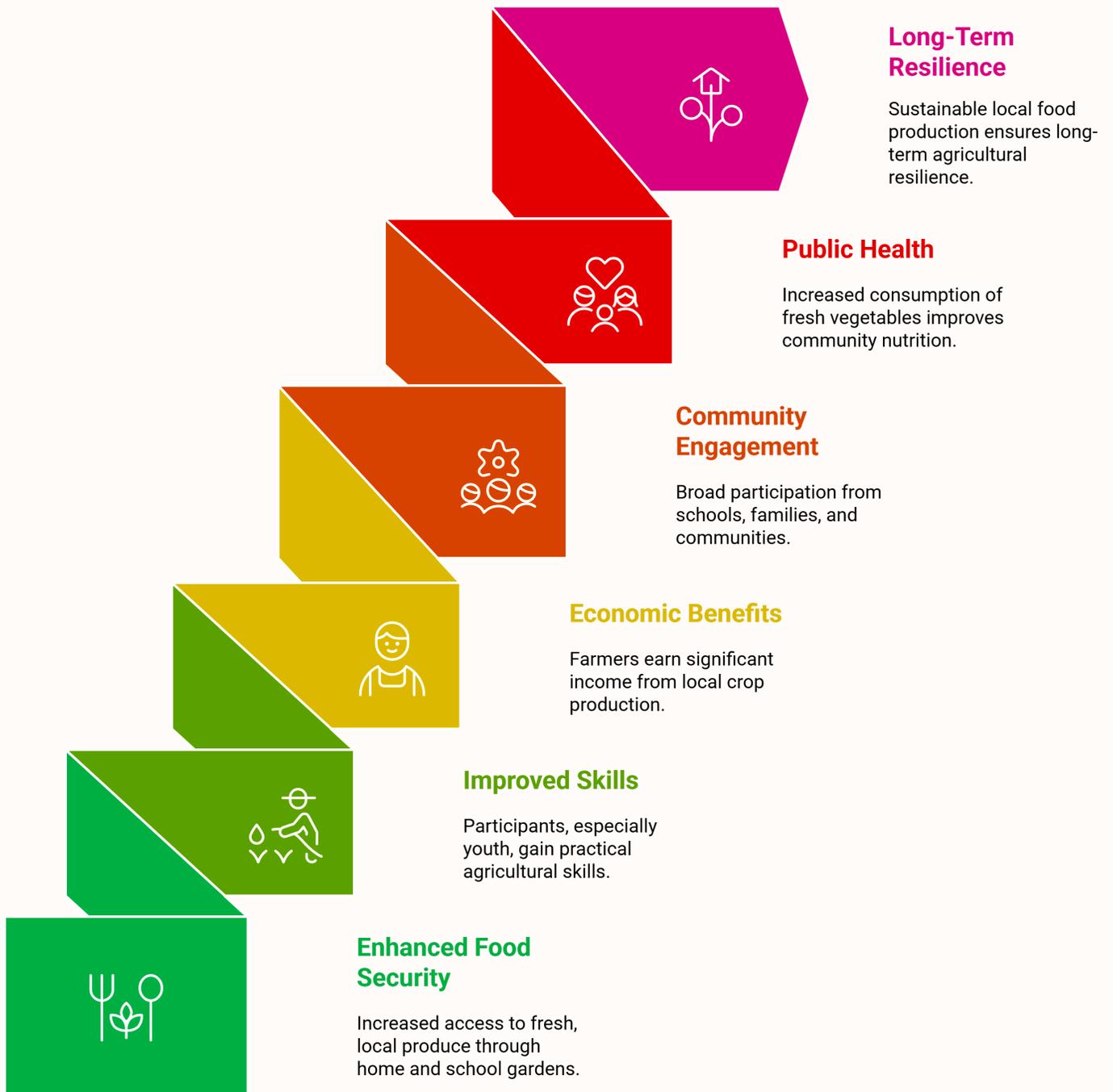
Impacts

- ◆ **Enhanced Food Security:** The establishment of 27 home gardens and 8 school gardens increased household and school access to fresh, locally grown vegetables, reducing reliance on imported foods and strengthening community food sovereignty.
- ◆ **Improved Agricultural Skills and Adoption:** Through hands-on training and one-on-one guidance, participants, especially the 730 youth, gained practical skills in soil management, composting, pest control, seed germination, staggered planting, and harvesting. Adoption of improved practices significantly increased, supported by pre- and post-training assessments and follow-up monitoring.
- ◆ **Economic Benefits for Farmers:** 15 commercial farmers earned \$200–\$1,000 or more per harvest cycle, demonstrating the economic viability of local crop production and increasing household income potential. Expanded market availability of local produce contributed to the strengthening of local food systems.
- ◆ **Strengthened Community Engagement:** The program fostered broad engagement from schools, families, women's groups, and communities, helping shift public attitudes in favor of local food production and healthier dietary habits.
- ◆ **Broader Public Health Benefits:** Increased consumption of fresh vegetables, reduced dependence on high-calorie imported goods, and greater awareness of healthy eating contributed to improving

community nutrition and lowering risks of non-communicable diseases.

- ◆ Long-Term Resilience: By doubling participation in gardening activities over the previous year and expanding technical support, the program contributed to long-term agricultural resilience. It reinforced Pohnpei’s capacity to produce local foods in a sustainable manner.

Achieving Food Security and Community Resilience



FSM - EFNEP Youth Program

EFNEP Youth Program

Impact Statement

In 2025, the Expanded Food and Nutrition Education Program (EFNEP) in the FSM reached 906 K–12 youth across Chuuk, Kosrae, Pohnpei, and Yap through 28 newly formed youth groups, all of whom completed the program with a 100% graduation rate. A total of 1,389 youth completed behavior questionnaires, providing strong evidence of program effectiveness. Youth demonstrated substantial improvements across all four federal behavior indicators: 99% (886 of 894) improved diet quality, 96% (861 of 894) strengthened food safety practices, 88% (787 of 894) increased physical activity, and 98% (398 of 407) enhanced food resource management skills.

Across grade levels, 98% of K–2, 100% of grades 3–5, and 99% of grades 6–12 reported positive behavior change in at least one core area. The program’s broad reach ensured access for underserved rural communities, with 84% of participants identifying as Native Hawaiian/Other Pacific Islander. These results demonstrate significant improvements in youth health behaviors, supporting the NIFA’s national goals of improving diet quality, reducing chronic disease risk, and strengthening nutrition resilience across Pacific Island communities.

Key Achievements

1. Program Reach and Participation

The EFNEP Youth Program engaged 906 youth across Chuuk, Kosrae, Pohnpei, and Yap.

- ◆ 435 males (48%) and 471 females (52%) successfully participated and completed the program, with a 100% graduation rate (906 of 906)
- ◆ 28 youth groups participated, all of which were new groups formed during this period
- ◆ 228 youth also engaged in other 4-H programs, showing strong cross-program integration

State-Level Participation

From the Youth Questionnaire Summary:

- ◆ Pohnpei: 407 youth (84%)
- ◆ Chuuk: 53 youth (11%)
- ◆ Yap: 26 youth (5%)
- ◆ Kosrae: 1 youth (0%)

2. Improvements in Diet Quality

The data show remarkable improvements in youths’ abilities to choose healthy foods:

Grades 6–12 (n = 407)

- ◆ 99% (403) adopted ≥ 1 healthy food selection behavior
- ◆ 98% (398) adopted ≥ 2 or more

- ◆ 96% (392) adopted ≥ 3 or more
- ◆ 88% (360) adopted ≥ 4 or more
- ◆ 50% (202) adopted ≥ 5 or more
- ◆ 11% (46) adopted ≥ 6 or more

All Children & Youth (n = 894)

99% (886) improved their abilities to choose foods according to federal dietary recommendations.

Impact: Youth across FSM demonstrated consistent improvements in diet choices, pointing toward long-term dietary behavior change and healthier lifestyles. The high scores across multiple behavior thresholds indicate strong curriculum effectiveness.

3. Improvements in Physical Activity Practices

Grades 6–12 (n = 407)

- ◆ 96% (391) improved ≥ 1 physical activity habit
- ◆ 90% (368) improved ≥ 2 habits
- ◆ 67% (274) improved ≥ 3 habits

All Children & Youth (n = 894)

88% (787) improved physical activity practices or gained knowledge.

Impact: The program successfully promoted active lifestyles among youth, helping reduce risks of obesity and non-communicable diseases, key health concerns in the FSM.

4. Improvements in Food Safety Knowledge

Grades 6–12 (n = 407)

- ◆ 98% (400) adopted ≥ 1 food safety behavior
- ◆ 96% (392) adopted ≥ 2 or more
- ◆ 92% (374) adopted ≥ 3 or more
- ◆ 56% (229) adopted ≥ 4 or more

All Children & Youth (n = 894)

96% (861) improved food safety practices or knowledge

Impact: High gains in food safety awareness reduced risks of foodborne illness and cultivate safe household food practices.

5. Improvements in Food Resource Management

Grades 6–12 (n = 407)

- ◆ 98% (398) improved ≥ 1 skill in preparing simple, nutritious, affordable food

- ◆ 85% (346) improved ≥ 2 skills

All Children & Youth

98% improved their ability to prepare affordable foods

Impact: Youth acquired practical food preparation and budgeting skills that improve household resilience and reduce food costs, critical in high-cost island environments.

6. Behavioral Improvements in Younger Age Groups (K–5)

Across kindergarten to 5th grade, significant positive shifts were recorded in:

- ◆ Recognizing healthy snacks
- ◆ Identifying fruits, vegetables, dairy
- ◆ Handwashing behaviors before eating

For example, in K–2:

- ◆ Correct identification of healthy snacks increased from 42% to 66%
- ◆ Correct food safety identification (handwashing) increased from 49% to 77%

Impact: Early childhood nutrition education helped to instill foundational lifelong habits.

7. Demographic Insights

Grade Distribution (n = 906)

- ◆ Grades 3–5: 307 youth (34%)
- ◆ Grades 6–8: 333 youth (37%)
- ◆ Grades 9–12: 92 youth (10%)

Race/Ethnicity

The EFNEP youth population is overwhelmingly Pacific Islander:

- ◆ 84% NH/OPI (764 youth)
- ◆ 16% Asian (142 youth)

Impact: The program reached the intended population, FSM’s youth in rural island communities, ensuring equity and accessibility.

8. Program Delivery and Scope

- ◆ 168 lessons delivered across states.
- ◆ Largest delivery mode: School Enrichment Programs (25 groups; 150 lessons).
- ◆ After-school programs: 2 groups; 12 lessons.

Impact: Schools are the primary channel for EFNEP delivery, allowing consistent access and structured learning environments.

Overall Impacts Across FSM

The EFNEP Youth Program is producing strong, measurable positive outcomes across all four FSM states.

Key impacts include:

1. Improved Nutrition Knowledge and Health Behaviors

Nearly all youth demonstrated significant improvements in diet quality, physical activity, and food safety, areas critical to combating rising NCD rates across the FSM.

2. Skills That Strengthen Household Food Security

With 98% of youth improving food preparation skills, families benefit from more affordable, nutritious meals.

3. Strong Engagement Across Grade Levels

High participation in middle school grades (6–8) reflects effective targeting of a formative age group.

4. Equity and Inclusion

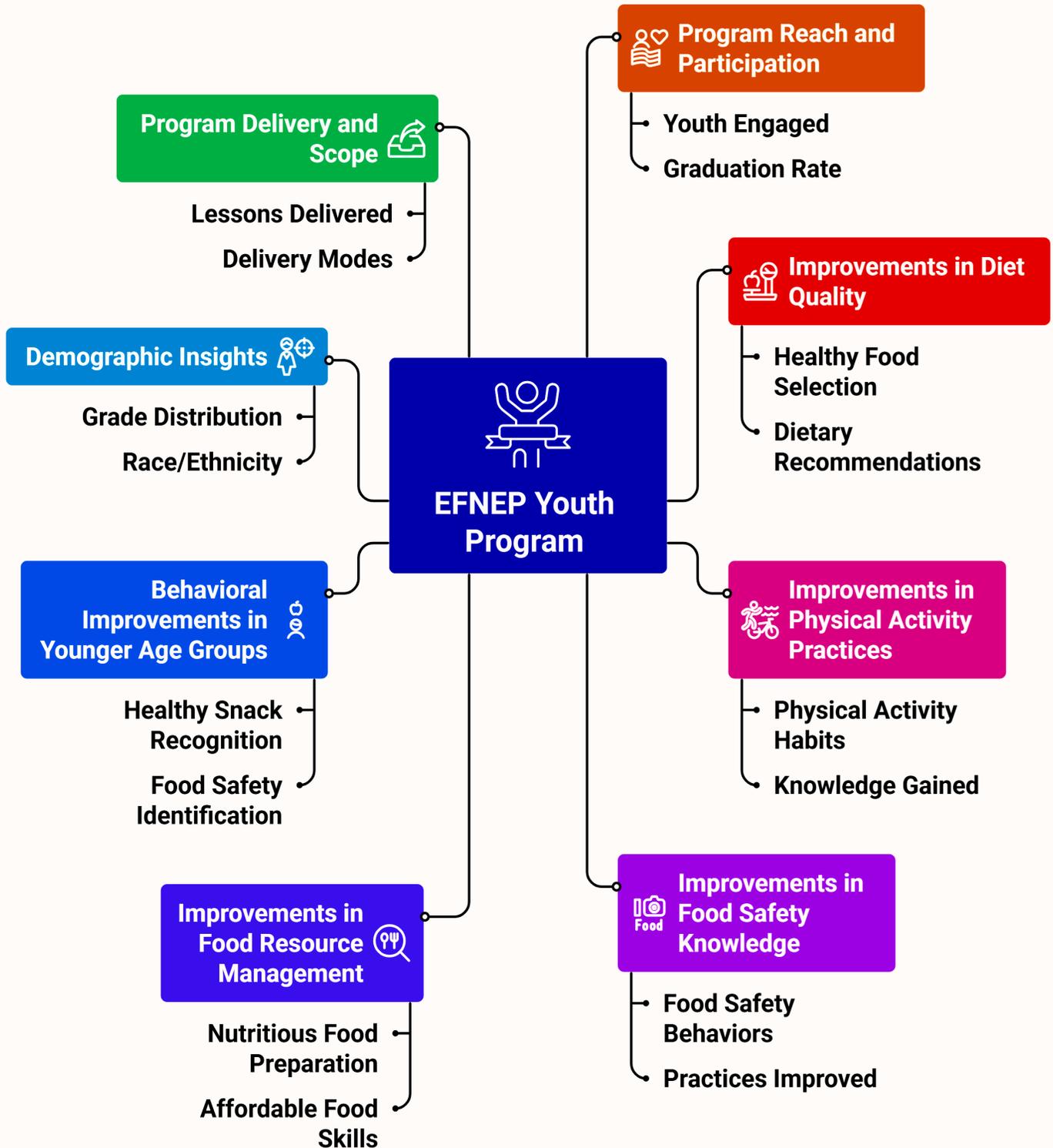
The program reaches rural island communities (100% of participants live in rural non-farm locations), ensuring access for underserved populations.

5. Excellent Retention and Completion

A 100% graduation rate demonstrates high program acceptance and successful implementation across the states.



EFNEP Youth Program: Impact and Outcomes



FSM - EFNEP Adult Program

EFNEP Adult Program

Impact Statement

The Expanded Food and Nutrition Education Program (EFNEP) served 686 low-income adult program families, representing 3,609 individuals, all of whom completed a full 12-lesson series. The EFNEP participation led to significant improvements in nutrition behaviors, food resource management, physical activity, and food safety practices. 94% (645 of 686) of adults improved one or more diet quality indicators, 88% (603 of 686) improved food resource management skills, 85% (582 of 685) increased physical activity behaviors, and 82% (565 of 685) enhanced food safety practices. Food security also improved for 48% (328 of 684) of participants. Participants demonstrated measurable behavior change, such as increasing daily fruit intake (85%, 582 of 685), drinking regular soda less often (66%, 451 of 683), cooking dinner at home more frequently (50%, 343 of 685), planning meals before shopping (68%, 462 of 679), strengthening muscles more often (79%, 540 of 683), and washing hands before food preparation (65%, 444 of 683).

These improvements translated to healthier households, stronger budgeting and food management skills, reduced foodborne illness risks, and greater capacity for families to stretch limited resources. By reaching economically vulnerable families, 100% living at or below 50% of the poverty level, the EFNEP strengthened food security, improved health behaviors, and contributed to long-term community resilience across the FSM.

Key Achievements

1. Program Reach and Participation

Total Participants and Families

- ◆ EFNEP served 686 adult program families, representing 3,609 individuals enrolled across the four FSM states.
- ◆ All 686 adults completed the full 12-lesson series, achieving a 100% graduation rate, demonstrating strong engagement and program relevance.

Group Participation

- ◆ The adult program was delivered through 47 adult groups across FSM.
- ◆ A total of 544 nutrition education lessons were delivered across the states.

Demographics of Participants

- ◆ State-level Reach
 - ◇ Pohnpei: 402 adults (59%)
 - ◇ Chuuk: 182 adults (27%)
 - ◇ Yap: 73 adults (11%)
 - ◇ Kosrae: 29 adults (3%)

- ◆ Gender:
 - ◇ 331 females (48%)
 - ◇ 355 males (52%)
- ◆ Ethnicity:
 - ◇ 97% (666 participants) Native Hawaiian/Other Pacific Islander
 - ◇ 3% (20 participants) Asian
- ◆ Education Level: (Reflecting high engagement of individuals with limited formal education—an EFNEP target group)
 - ◇ 36% (245) did not graduate from high school
 - ◇ 38% (261) completed high school
 - ◇ 25% (170) pursued technical, college, or higher studies
- ◆ Poverty Level:
 - ◇ 100% (686 families) were at or below 50% of the U.S. poverty threshold, confirming EFNEP’s strong reach into the most economically vulnerable households.

2. Diet Quality Improvement

Overall Diet Quality Change

- ◆ 94% (645 of 686) improved in one or more diet quality indicators.

Specific Behavior Improvements

- ◆ 85% (582 of 685) increased fruit intake
- ◆ 81% (552 of 685) increased vegetable intake
- ◆ 50% (343 of 685) cooked dinner at home more frequently
- ◆ 66% (451 of 683) reduced intake of soda/pop
- ◆ 72% (493 of 685) ate whole grains more often
- ◆ 67% (459 of 684) drank water more often

3. Food Resource Management (FRM)

Skills related to shopping, budgeting, meal planning, and stretching food dollars.

Overall FRM Change

- ◆ 88% (603 of 686) improved in one or more food resource management practices.

Specific FRM Improvements

- ◆ 68% (462 of 679) planned meals before shopping
- ◆ 67% (460 of 687) made a shopping list more often

- ◆ 62% (422 of 684) compared prices before shopping
- ◆ 60% (412 of 687) cooked dinner at home using basic ingredients
- ◆ 60% (411 of 684) ran out of food less often
- ◆ 48% (328 of 684) improved household food security

4. Physical Activity Improvements

Overall Physical Activity Change

- ◆ 85% (582 of 685) improved physical activity behaviors

Specific Improvements

- ◆ 79% (540 of 683) improved in muscle-strengthening exercises
- ◆ 65% (445 of 685) increased daily physical activity
- ◆ 60% (412 of 683) increased moderate/vigorous activity levels weekly

5. Food Safety Improvements

Overall Food Safety Change

- ◆ 82% (565 of 685) improved in food safety behaviors.

Specific Improvements

- ◆ 65% (444 of 683) improved in washing hands before preparing food
- ◆ 68% (465 of 683) improved in washing fruits and vegetables
- ◆ 63% (431 of 684) increased use of proper thawing methods
- ◆ 60% (410 of 684) used separate cutting boards for raw/cooked foods

Overall Impacts Across FSM

1. Improved Household Nutrition

- ◆ With 94% improving diet quality and major increases in fruit/vegetable consumption, thousands of family members indirectly benefited through healthier meals at home.

2. Stronger Food Security and Budgeting Skills

- ◆ 48% improvement in food security and 88% in FRM skills indicate households can better manage scarce food dollars, critical in remote islands with high food costs.

3. Reduced Health Risks

- ◆ EFNEP adults demonstrated healthier lifestyles through:
 - ◇ reduced soda intake (66%)
 - ◇ increased water consumption (67%)
 - ◇ increased physical activity (85%) These shifts target high-risk factors for diabetes,

hypertension, and obesity.

4. Increased Food Safety Practices

- ◆ Improved sanitation practices (82%) help prevent foodborne illness and protect vulnerable household members, including children and elders.

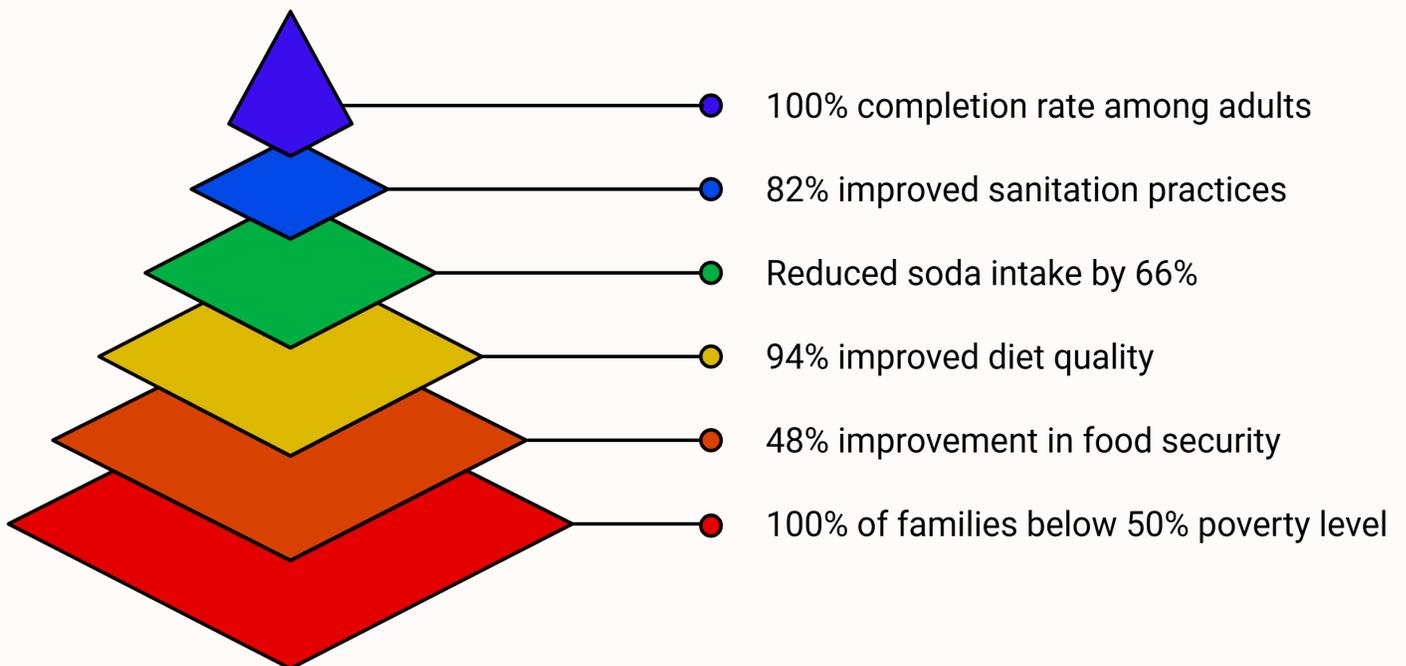
5. Targeting the Most Vulnerable Populations

- ◆ 100% of adult families live below 50% of the poverty level, demonstrating EFNEP's direct reach into the most economically disadvantaged communities.

6. Strong Program Completion

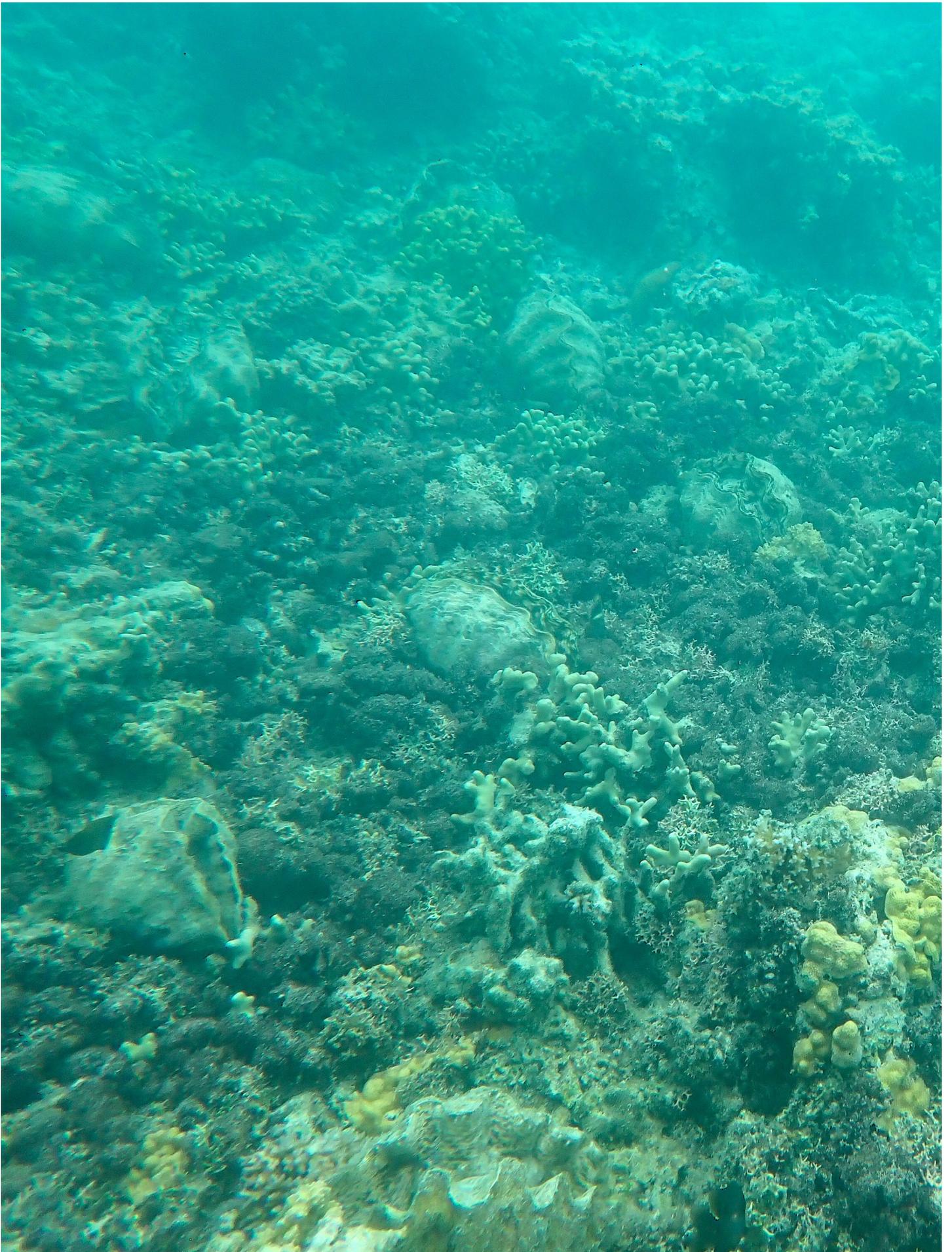
- ◆ 686 adults completed all lessons (100% completion rate), a significant achievement in remote Pacific Island contexts marked by transportation, weather, and work constraints.

EFNEP Adult Program Impact Pyramid











COOPERATIVE RESEARCH AND EXTENSION

Building Resilient Communities