2011 College of Micronesia Combined Research and Extension Annual Report of Accomplishments and Results

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I. Report Overview

1. Executive Summary

Integrated research and extension programs continued to address economic, social, and ecological issues on small islands through the cooperative research and extension offices at the three partner colleges: College of the Marshall Islands (CMI), College of Micronesia - FSM (COM-FSM), and Palau Community College (PCC). Dissemination of new knowledge and technologies to sustain and improve the quality of life of all Micronesian citizens in the Republic of the Marshall Islands (RMI), Federated States of Micronesia (FSM), and Republic of Palau (ROP) has been the thrust of programs in all six counties.

Awareness programs on proper hygiene and healthy lifestyle were important to safeguard the well-being of citizens, so some programs continued. The rising sea level due to climate change is becoming a really serious concern as we witnessed catastrophic effects of this phenomenon. The increasing cost of food and fuel has forced people to make adjustments necessary for the new economic, social and environmental conditions and find innovative methods of farming of crops, livestock, and aquaculture species. Research and extension activities promoted agricultural productivity and food security, self-sufficiency, and enhancing quality of life. The utilization, processing and development of new products from staple food crops that are acceptable to the native population and in local markets continued. Trials on taro varieties (Cyrtosperma spp. & Colocasia spp.) for their suitability to grow under atoll conditions continued and the micro propagation of elite (disease-free and high yielding) varieties that will improve the quality and quantity of certain crop varieties for the export market were ongoing. Continued germplasm maintenance of staple root crops has insured the genetic conservation of these valuable resources for future generations. This has also facilitated the continue supply of planting materials to growers and allow in-vitro multiplication of other food crops.

Aquaculture demonstration projects continued to transfer the technical know-how to Micronesians to enable them to actively engage in projects that could provide alternate income generation with the overall aim of improving the socio-economic conditions of islanders. Efforts were made to initiate and improve site-specific multi-species aquaculture and transfer simple and appropriate feeding technology for targeted aquaculture species to farmers to formulate and prepare their own feeds. Other projects provided stock enhancement to replenish depleted stocks. A project got underway to develop the technology for the farming of sea cucumbers in the FSM to enable the

replenishment of lagoons and reefs depleted as a result of over harvesting.

Outreach programs continued on issues ranging from food safety and quality, food security, families and youths, water quality, and managing limited natural resources and the environment. Health and nutrition programs continued on the importance of healthy lifestyles, which included physical activity and consumption of safe and nutritious local food to combat obesity, diabetes, heart diseases and other NCDs. The youth development programs provided information to increase knowledge and appreciation of marine and terrestrial flora and fauna and more students are exposed to computers, which provided the opportunity to use the Internet as an introduction to electronic connectivity and information gathering. Water quality education programs continued as collaborative efforts with international and regional organizations, government agencies, and community groups. Sustainable agriculture and IPM programs provided farmers information on agricultural production practices that protect the fragile island ecosystem integrity and biodiversity. Programs continued on resistant crop varieties and practical biological pest control measures to provide useful tools for stakeholders to combat crop pests and diseases and increase productivity. The use of beneficial organisms was emphasized to reduce pest threats on crops. Biological control agents for cassava spider mites and taro leafhopper were released on cassava and taro plantings.

Multi-state and multi-institutional efforts continued through the alliance of the American-Pacific land-grant universities and colleges through the Agricultural Development in the American Pacific (ADAP) project and with the Center for Tropical and Subtropical Aquaculture (CTSA) on aquaculture projects. A cost-sharing agreement with Pohnpei State Government continued, whereby extension agents from the Agriculture Station have been collaborating with Pohnpei CES staffs. Continuing shortage of necessary human resources and professional staff remained a top priority and several programs and activities toward developing this area were implemented, including a Financial Assistance and Scholarship Program for program staff and financial assistance for college students enrolled in agriculture and home economic. Other capacity building activities included sustainable agriculture workshops, tissue culture and nursery practice, IPM, health and nutrition, and basic sewing attended by farmers, homemakers, the youth and adult sectors of the society and the underprivileged.

Total Actual Amount of professional FTEs/SYs for this State

Year: 2011	Extension		Research	
	1862	1890	1862	1890
Plan	53.0	0.0	14.0	0.0
Actual	40.0	0.0	12.0	0.0

II. Merit Review Process

1. The Merit Review Process that was Employed for this year

- Internal University Panel
- External University Panel
- External Non-University Panel
- Expert Peer Review

2. Brief Explanation

Project proposals were developed as a result of meetings and consultation with stakeholders and also based on existing plans of work for research and extension. The proposals were submitted to a publication, merit or scientifically acceptable peer review committees for comments and suggestions. Other special project proposals were subject to peer review within and outside of the colleges by other stakeholders and also subjected to review by advisory committees. Proposals were also posted on websites. Once comments were incorporated into the proposals, the Vice-President of Cooperative Research and Extension then submitted them for review and approval at each college. Final proposals were submitted to the AES/CES Interim Director through the college Presidents for approval.

III. Stakeholder Input

1. Actions taken to seek stakeholder input that encouraged their participation

- Use of media to announce public meetings and listening sessions
- Targeted invitation to traditional stakeholder groups
- Targeted invitation to non-traditional stakeholder groups
- Targeted invitation to traditional stakeholder individuals
- Survey of traditional stakeholder groups
- Survey of traditional stakeholder individuals
- Survey of selected individuals from the general public

Brief explanation.

When meetings were called to discuss research and extension planned activities, stakeholders such as community leaders, farmers, homemakers, traditional leaders and political leaders, were directly involved in the discussions. Many of their suggestions and comments were included in the planned research and extension activities. In some cases, research activities were done in farmers' fields and in so doing farmers participated directly in the implementation of projects. Scheduled meetings were also held in the communities to inform community leaders, farmers, and homemakers, political and traditional leaders about progress being made with research and extension activities. During these meetings, stakeholders were given the opportunity to ask questions, make comments, and share traditional knowledge and even suggested changes or other activities that are more important and relevant to the needs of their communities. Other methods of encouraging stakeholder participation were done through direct meetings and workshops with different sectors of the population to solicit their inputs in identifying priority issues.

2(A). A brief statement of the process that was used by the recipient institution to identify individuals and groups stakeholders and to collect input from them

1. Method to identify individuals and groups

- Use Internal Focus Groups
- Use External Focus Groups
- Open Listening Sessions
- Needs Assessments

Brief explanation.

Farmers, homemakers, political, traditional and community leaders were requested to identify names of individuals or groups in their respective communities who should be attending meetings and workshops. Other individuals were those working on similar programs with other agencies and those recommended by peers. Those identified were informed via letter, radio or through personal visits when meetings or trainings were held. Other methods were through strategic planning meetings, interagency collaboration, community associations and direct client contact and needs assessment surveys directly in the field. Meetings/discussions were also held with school authorities, church leaders, parents and the general public on the implementation of community projects.

2(B). A brief statement of the process that was used by the recipient institution to identify individuals and groups who are stakeholders and to collect input from them

1. Methods for collecting Stakeholder Input

- Meeting with traditional Stakeholder groups
- Survey of traditional Stakeholder groups
- Meeting with traditional Stakeholder individuals
- Survey of traditional Stakeholder individuals
- Meeting with invited selected individuals from the general public
- Survey of selected individuals from the general public

Brief explanation.

Some of the methods used for collecting stakeholder input were one-on-one visits conducted in the communities and through discussions and interviews with community leaders. Surveys and field observations in addition to farmers association and other community meetings were also used. Youth programs were developed through discussions with schools, church and community groups and through direct assistance to government agencies such as the Early Childhood Education (ECE) recruitment programs. Stakeholders were directly involved in identifying positions and hiring of new upper level staff. Other methods used were questionnaires, need assessments, Board of Regents reviews, annual retreat, cabinet level meetings and student recruitment campaigns.

3. A statement of how the input will be considered

- In the Budget Process
- To Identify Emerging Issues
- Redirect Extension Programs
- Redirect Research Programs

- In the Staff Hiring Process

Brief explanation.

During meetings with stakeholders, suggestions, comments and modifications from them were sorted out and those with positive impacts to research and extension project proposals were incorporated. It also helped with planning and prioritization of the next year's planned program activities. The review of strategic action plans, hiring of senior research and administrative positions, and focusing on special projects were also used to collect stakeholder inputs. State agencies assisted in developing programs and focus budgets for activities supported by matching funds through MOAs.

Brief Explanation of what you learned from your Stakeholders

We learned that farmers, homemakers, community groups and others are good sources of traditional knowledge which can be applied and used to improve social, agricultural and environmental issues. Entrepreneurs interested in business development lack marketing strategies and training necessary for them to be successful.

IV. Expenditure Summary

1. Total Actual Formula dollars Allocated (prepopulated from C-REEMS)			
Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
1031117	0	949301	0

2. Totaled Actual dollars from Planned Programs Inputs				
	Extension		Research	
	Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
Actual Formula	895153	0	697693	0
Actual Matching	204324	0	32000	0
Actual All Other	0	0	0	0
Total Actual Expended	1099477	0	729693	0

3. Amount of Above Actual Formula Dollars Expended which comes from Carryover funds from previous				
Carryover	895153	0	635197	0

V. Planned Program Table of Content

V(A). Planned Program (Summary)

Program # 1

1. Name of the Planned Program

Aquaculture

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
133	Pollution Prevention and Mitigation	5%		5%	
135	Aquatic and Terrestrial Wildlife	14%		3%	
136	Conservation of Biological Diversity	15%		37%	
301	Reproductive Performance of Animals	12%		10%	
302	Nutrient Utilization in Animals	18%		5%	
307	Animal Management Systems	22%		22%	
308	Improved Animal Products (Before Harvest)	8%		8%	
315	Animal Welfare/Well-Being and Protection	3%		5%	
511	New and Improved Non-Food Products and Processes	3%		5%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2011	Extension		Research	
	1862	1890	1862	1890
Plan	9.0	0.0	5.0	0.0
Actual Paid Professional	4.0	0.0	2.0	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
89515	0	116282	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
21434	0	5000	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

PCC: A series of larval rearing on rabbitfish and mangrove crabs were conducted at the multi-species hatchery. Thousands of rabbitfish and mangrove crabs were produced and distributed. Over 5,000 mangrove crablets were produced and due to the success of this work, farms were established. Over 500 hatchery-produced crablets were provided to farmers. Monitoring and evaluation of crab performance is on-going. Thirty pieces milkfish (Chanos chanos) brood stock were collected and stocked. Lectures on aquaculture were conducted in several schools. Local clients planning to start hatchery for rabbitfish operations were assisted. Posters and aquarium exhibits were presented in various local and national events.

CMI: Hatchery produced pearl oyster spats were distributed to local pearl farms. The extension agent participated in the auction of pearls produced from local farms which generated $31,000. A visit and assessment of marine resources in outer atolls was conducted. Inventory and sampling of marine finfish brood stock was done. New stocks of microalgae starters were obtained from Marshall Islands Marine Resources Authority (MIMRA) hatchery and University of Hawaii-Hilo.

COM-FSM: Hatchery skill training continued in Pohnpei with three new trainees of the college graduates and pearl grafting and jewelry making training were also conducted for four island communities. Pakin atoll used to have more than 6000 oysters but half of them were found dead because of negligence of maintenance by the islanders. Still COM demonstrated half-pearl grafting and harvesting more than 1000 oysters. In August 2011, the project's display and sale of sample round-pearls and half-pearls fetched more than $7000 in Pohnpei. The sea cucumber hatchery training also continued for COM-FSM graduates and interns, from which more than 10,000 juveniles were settled in tank system. Tagging trials were conducted for the sandfish in tank systems by utilizing standard fish tags, i.e. T-bar anchor tags.

Aquaculture efforts also focus on use of fish wastes and invasive marine species as feed sources for the stock and chickens. One farm has been helped to begin growing captured rabbit fish for market.

2. Brief description of the target audience

Community fishermen, government officials, elementary, high school and college

students, researchers and extension agents, local, international and regional organizations, commercial businesses, foreign investors, NGOs and local residents.

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2011	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	1500	20000	4050	15000

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2011

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2011	Extension	Research	Total
Actual	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of demonstration farms established.

Year	Actual
2011	23

Output #2

Output Measure

- Number of publications for lay use.

Year	Actual
2011	3

Output #3

Output Measure

- Number of conference paper and publication/presentation.

Year	Actual
2011	3

Output #4

Output Measure

- Expected Professional Journal publications.

Year	Actual
2011	3

Output #5

Output Measure

- Expected Gray Literatures.

Year	Actual
2011	5

Output #6

Output Measure

- Expected publications for lay use.

Year	Actual
2011	5

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Increase awareness in the communities and prospective and existing industry about sustainable, site-specific, and low energy aquaculture technologies.
2	Adoption of sustainable aquaculture technologies by commercial and community groups.
3	Number of established aquaculture operations.

Outcome #1

1. Outcome Measures

Increase awareness in the communities and prospective and existing industry about sustainable, site-specific, and low energy aquaculture technologies.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	5762

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
PCC: People, including government officials, are not aware of aquaculture developments in Palau. Individuals with limited know how are interested to start aquaculture projects.

CMI: Many people did not know the importance of aquaculture in the country. There are 2 existing pearl farms, however, local people are not aware of the business opportunity in hatchery produced oysters. Local governments are aware that fish is getting scarce and believe that aquaculture would be a solution to overfishing.

COM-FSM: Local capacity building has not progressed as quickly as expected due to bottlenecks in the public sector where staffs are trained but the transfer to the private sector is limited. Efforts have been made by the governments for awareness programs on aquaculture.

What has been done
PCC: Facilitated posters and aquarium displays, print and radio media, annual reports, walk-in and pre-arranged visits, and technical assistance about aquaculture. Presented lectures about biology of fishes and aquaculture in schools.

CMI: Pearl oyster spats produced were distributed to local pearl farms. Technical discussions with people involved in pearl farming and the community were done during visits to the outer atolls. Posters and pearl farm model were displayed in various national events.

COM-FSM: Three communities received farming skill training. Community members also participated in the sea cucumber wild stock survey as well as half-pearl seeding skill and half-

pearl pendant making.

Results
PCC: People have realized the importance and contribution of aquaculture to the country?s food security and economic development. The Multi-species Hatchery is essential to make aquaculture sustainable. Fish farmers gained knowledge on operation of aquaculture projects. Students learned the basic concepts of aquaculture.

CMI: Pearl farms received supply hatchery produced spats. The government realized the importance of hatchery in support to ongoing pearl industry. Some people in RMI are now aware of aquaculture efforts to help develop aquaculture in the country.

COM-FSM: More than 650 individuals including farmers, homemakers, and high school and college students improved their knowledge in aquaculture.

4. Associated Knowledge Areas

KA Code	Knowledge Area
133	Pollution Prevention and Mitigation
135	Aquatic and Terrestrial Wildlife
136	Conservation of Biological Diversity
301	Reproductive Performance of Animals
302	Nutrient Utilization in Animals
307	Animal Management Systems
308	Improved Animal Products (Before Harvest)
315	Animal Welfare/Well-Being and Protection
511	New and Improved Non-Food Products and Processes

Outcome #2

1. Outcome Measures

Adoption of sustainable aquaculture technologies by commercial and community groups.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	2079

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

PCC: Survival of rabbitfish and natural spawning of mangrove crab at the Multi Species Hatchery was unsuccessful. Mangrove crab farmers depend on wild caught crabs and importation for seed stock.

CMI: People involved in the pearl industry have been losing interest to continue the business due to unstable supply of pearl spats. There is a need to enhance local fisheries stock in many atolls; however, production of fingerlings in the hatchery has not yet been successful.

COM-FSM: Hatchery protocols for pearl oyster and the sea cucumber were standardized for skill training purpose. Juvenile production became stable for experiments and small-scale grow-out. Display-sale of sample half-pearl products gave positive impact to local people as well as overseas.

What has been done

PCC: Larval rearing and grow-out trials of rabbitfish using brood stock feeds in the hatchery, ponds and cages were done. Adaptation of new technique for seed production of mangrove crabs provided better results.

CMI: Spawning and larval rearing of pearl oysters were done in collaboration with the government agency. Private farms participated by providing logistics during the shipment of hatchery produced oyster spats.

COM-FSM: Pearl farming training continued both in Pohnpei and outer islands. Skill training for producing value-added products (half-pearls) introduced product?s grading techniques for both project staff and farmers. Extension agents continued to provide technical assistance to communities and interested individual who are developing their sites for culturing rabbit fish.

Results

PCC: Natural spawning, high survival rate and production of natural food for two species of rabbitfish at the hatchery were improved. Seed production of mangrove crabs was successful. Growing rabbitfish with high protein feed in ponds and fish cages is feasible and encourages more farmers to go into aquaculture activities. Two aquaculture operators are now regularly harvesting and marketing cage-grown fish. Farmers obtained improved growth of rabbitfish in ponds and cages using the recommended feeds. Hatchery-produced crablets were stocked in two crab farms for future evaluation.

CMI: Pearl oyster spats were produced and pearl farm operators and government are now expanding their farms. Cooperation between the government agencies and the private sectors

were established. CMI will continue the seed production of marine fishes and inquiries on how to grow rabbitfish and grouper has been received.

COM-FSM: Three community-based pearl farms were transferred to pilot commercial farms, which began producing half-pearls as value-added products to black pearls. A new tank-based grow-out system was developed for the sea cucumbers by simulating wild habitat.

4. Associated Knowledge Areas

KA Code	Knowledge Area
133	Pollution Prevention and Mitigation
135	Aquatic and Terrestrial Wildlife
136	Conservation of Biological Diversity
301	Reproductive Performance of Animals
302	Nutrient Utilization in Animals
307	Animal Management Systems
308	Improved Animal Products (Before Harvest)
315	Animal Welfare/Well-Being and Protection
511	New and Improved Non-Food Products and Processes

Outcome #3

1. Outcome Measures

Number of established aquaculture operations.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	150

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
PCC: Inconsistent supply of hatchery-produced rabbitfish fingerlings and mangrove crabs, discourages farmers to grow them in ponds and cages.

CMI: Pearl farmers were losing interest to continue their projects due to limited supply of pearl oyster spats. Fish supply for local consumption is declining, due to overfishing while other important marine resources are utilize. Only few people have the skills and educational background related to aquaculture.

COM-FSM: Regular supply of pearl oyster spat was established for small-scale community farmers, but they were unable to pay their own farm workers or to purchase their own equipment and tools because of lack of finance.

What has been done

PCC: Larval rearing of two species of rabbitfish produced 5000 fingerlings and stocked in two fish farms using appropriate feeds. Hatchery-produced mangrove crabs were distributed to crab farmers.

CMI: CMI collaborated with the government and pearl farm operators in an effort to revive the pearl industry. CMI hatchery facility was re-conditioned and new stocks of microalgae were obtained from government hatchery and Hawaii. Larval rearing trials were done and were able to produced spats.

COM-FSM: The project transferred its pilot farms to communities and families and conducted display-sale of sample products to help reduce financial burden to begin operating commercial activities.

Results

PCC: Growing rabbitfish with high protein feed in ponds and fish cages is feasible and encourages more farmers to go into aquaculture activities. Two aquaculture operators are now regularly harvesting and marketing cage-grown fish. Performance of hatchery- produced mangrove crabs in two crab farms is being monitored.

CMI: CMI hatchery was able to produce about 500,000 pearl oyster spats and was distributed to pearl farms. Good quality stocks of microalgae are now being maintained in the hatchery and CMI became capable for succeeding runs. Other atolls have begun showing interest in pearl oyster farming and plans to start new farms will be implemented soon. CMI is now maintaining the fish hatchery is now being maintained and fish brood stock are now being monitored. Collection of new brood stock for rabbitfish and grouper has been scheduled.

COM-FSM: Communities and families received grafted oysters and pearls from the COM demonstrations and training station so as to begin making money for operating the farms. Half-pearl pendants and earrings fetched average at US 20 dollars per piece in local display-sale.

4. Associated Knowledge Areas

KA Code	Knowledge Area
133	Pollution Prevention and Mitigation
135	Aquatic and Terrestrial Wildlife
136	Conservation of Biological Diversity
301	Reproductive Performance of Animals

302	Nutrient Utilization in Animals
307	Animal Management Systems
308	Improved Animal Products (Before Harvest)
315	Animal Welfare/Well-Being and Protection
511	New and Improved Non-Food Products and Processes

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Populations changes (immigration, new cultural groupings, etc.)

Brief Explanation

PCC: None

CMI:Accessibility is one of the main constraints in delivering services to Atolls outside Majuro. A reliable boat with good engine is needed to reach nearby island and atoll communities. Staff should be re-certified for scuba diving so that farms will be assisted accordingly. Taiwan fish hatchery that was turned over to CMI needs further renovation in order to be more functional. Current design and condition of tanks are not suitable for fish larval rearing.

COM-FSM: For pearl farming at outer islands, weather conditions, transportation methods, rising costs of fuel for boats and machinery were major problems, which often disrupted onsite supervision and coordination by the extension staffs. Hatchery facility was constantly repaired from its aging structure and by repeated vandalism with few security measures from public sector. Lack of financial and logistic supports from both public and private sectors has been slowing down to promote the Micronesian brand pearls and half-pearl products for developing a new industry. Constant poaching by locals on released broodstock sea cucumbers adjacent to the hatchery affected the hatchery operation to repeat broodstock collection away from the hatchery because the sandfish is one of the most favored seafood from the tidal flat areas along mangrove shores in Pohnpei.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

PCC: In the past people have been dependent on fish caught from the wild. With the success in producing rabbitfish fingerlings in the hatchery, people become aware of the potentials in growing these important fish species in ponds and cages. Establishment of

the Multi-Species Hatchery promoted development of aquaculture by providing consistent supply of fingerlings of rabbitfish. There was an increase in number of fish and mangrove crabs in ponds and cages. More people are becoming interested in growing fish and mangrove crab for commercial purpose.

CMI: Land Grant played in important role in reviving the pearl industry in Namdrik and Rongelap atolls. The government recognized the efforts made and CMI hatchery was designated to be the main site for producing oyster spat. More people are now interested to start a new farm. CMI hatchery is now operational and is capable of providing more oyster spats to pearl farms. The newly hired researcher is working hand in hand with his staff and extension agent to meet the demands of stakeholders. People in some atoll communities became aware of the importance of aquaculture and interest in growing fish and other marine commodities is increasing.

COM-FSM: Sites visits and monitoring have been carried out, though disrupted due to bad weather and transportation limitation, especially to the outer islands of all states. Fuel shortages and lack of secure and regular transport to outer islands either by air or surface severely limits the ability to reach the more remote populations.Extension staff worked not only coordinating community engagements but also helped onsite hatchery and grow-out operations and research data taking. A family-based farm volunteered to joined hatchery work and wild stock survey and also began training their own members for farming and grafting skills.

Key Items of Evaluation

PCC: A practical method in larval rearing of two rabbitfish species has been documented with success in natural spawning of breeders in captivity. Nursery and grow-out of rabbitfish in cages has been verified and better feeding protocol was developed. Success of producing high-valued aquaculture species such as grouper provides an opportunity to fish farmers to experience growing them in ponds or cages. Mangrove crab has a niche market that could bring a high price in the local and international market. Support and development of the mangrove crab industry can potentially improve the local economy. Students became more interested in learning fish biology and aquaculture through lectures in schools and poster and aquarium displays in national events. The development of techniques in seed production of mangrove crabs also encouraged more farmers to grow this high valued aquaculture species in ponds and cages.

CMI: Pearl farmers have been experiencing difficulties in sustaining their operation due to scarcity of spats collected from the wild. To address this problem, CMI and the government worked together to revive the production of spats in the hatchery and CMI hatchery was designated to be the main site because of cost constraints. Larval rearing trials produced significant numbers of spats that were distributed to the pearl farms. To make people aware about the importance of aquaculture, brochures and posters were produced and were displayed during national public gatherings. Extension agents and aquaculture staff also took part in the outreach programs that were conducted in different villages and atolls.

COM-FSM: The hatchery-based pearl project entered into commercialization phase for a small scale commercial farming as regular spat supply was established. Value-added product (half-pearl) demonstrated its potential to develop a new market in domestic and overseas as display-sale in Pohnpei received favorable results by fetching average US20

dollar per sample, all of which were produced by trainees. The project continued promotion and market development for the Micronesian branded products. The sea cucumber hatchery and tank-based holding techniques improved so as the project to move onto restocking phase for help developing small-scale grow-out farmers.

V(A). Planned Program (Summary)

Program # 2

1. Name of the Planned Program

Small Island Agricultural Systems

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
101	Appraisal of Soil Resources	1%		5%	
102	Soil, Plant, Water, Nutrient Relationships	13%		13%	
111	Conservation and Efficient Use of Water	10%		0%	
112	Watershed Protection and Management	10%		0%	
125	Agroforestry	7%		0%	
133	Pollution Prevention and Mitigation	3%		8%	
136	Conservation of Biological Diversity	4%		3%	
201	Plant Genome, Genetics, and Genetic Mechanisms	0%		19%	
202	Plant Genetic Resources	3%		10%	
204	Plant Product Quality and Utility (Preharvest)	14%		15%	
205	Plant Management Systems	14%		6%	
212	Pathogens and Nematodes Affecting Plants	1%		3%	
216	Integrated Pest Management Systems	16%		18%	
315	Animal Welfare/Well-Being and Protection	2%		0%	
403	Waste Disposal, Recycling, and Reuse	1%		0%	
601	Economics of Agricultural Production and Farm Management	1%		0%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2011	Extension		Research	
	1862	1890	1862	1890
Plan	19.0	0.0	7.0	0.0
Actual Paid Professional	18.0	0.0	8.0	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
427820	0	477631	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
93956	0	21333	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

PCC: Conservation and maintenance of the collection of taro, cassava and sweet potato germplasm continued. Mass propagation and conservation of taro germplasm has ensured a supply of planting materials. Taro planting materials were distributed to farmers. Other farmers received cuttings of cassava and sweet potato. Taro hybrids obtained from SPC were well adapted and accepted by Palauans. Biocontrol agents for cassava spider mite and taro leafhopper were released. A book on "Biological Control Introductions in the Freely Associated States of Micronesia" was printed and disseminated to the general public. Dry Litter waste demonstration, training on maintenance of rainwater catchments and workshop on livestock and poultry management were conducted.

CMI: The plants nurtured and raised were distributed to the public during public events. The Extension Agent has conducted several small gardening workshops to primary, secondary, and college students. He did demonstrations on composting and planting to communities in Majuro as well as outer islands. He continued to train farmers with the methods of dry litter waste management system. The Water Quality Extension Agent continued testing water in the communities. He also tested water catchments for pathogen and E-Coli. Results showed that out of the total number of water catchments tested, 477 were found to be contaminated and treated.

COM-FSM: Agriculture is the most prominent program in all States. Home and school gardening and small-scale commercialization has emerged with new farms in all islands. Research of salt tolerant root crops started in response to climate change. Agroforestry programs promoted biodiversity and food security. Livestock farmers benefited from local feed and medicinal plants as pharmaceuticals. Research and extension produced elite varieties of staple crops. A niche market has emerged for noni and farmers received quality plant stock. Germplasm of swamp taro, soft taro and sweet potato have been collected, planted and maintained for research projects. Fields were surveyed to document preferred cultivars of swamp taro with tolerance to dry corm rot disease. Giant swamp taro cultivar collection created awareness of the effect of salt spray, surges of tidal waves and flooding in reducing crop productivity. Agents assisted with entry registration, crop and livestock exhibits judging, and cooking contests at Agriculture Fairs and in World Food Day. Other efforts included securing and distribution of planting materials, and booth/poster presentations. All reported to have increased participation compared to last year events.

2. Brief description of the target audience

PCC: The agriculture research program caters to scientists, extension agents, agriculture students and professionals, federal, state and national agencies. Farmers, students, parents, state and federal government officials and private individuals are also beneficiaries of our agriculture extension programs.

CMI: The audiences targeted were community members such as, landowners, diplomats, governmental and non-governmental organizations, foreign tourists, outside experts, farmers, men, women, youth, school administrators, teachers, elementary, high school and college students.

COM-FSM: Targeted audiences included school children, NGOs, government agencies, farmers, traditional leaders, women's groups, community groups, individuals women, home makers, youths, political/traditional/church leaders, students/staffs, farmers, and interested community members.

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2011	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	3729	3250	3200	6300

2. Number of Patent Applications Submitted (Standard Research Output)
Patent Applications Submitted

Year: 2011
Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2011	Extension	Research	Total
Actual	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Expected Professional Journal Publications.

Year	Actual
2011	3

Output #2

Output Measure

- Expected Gray Literatures

Year	Actual
2011	5

Output #3

Output Measure

- Expected publications for lay use.

Year	Actual
2011	6

Output #4

Output Measure

- Conference presentations

Year	Actual
2011	8

Output #5

Output Measure

- Conference publications

Year	Actual
2011	3

Output #6

Output Measure

- Number of publications for lay use.

Year	Actual
2011	4

Output #7

Output Measure

- Number of conference paper publication/presentations.

Year	Actual
2011	18

Output #8

Output Measure

- Number of demonstration farms established.

Year	Actual
2011	31

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of persons with increased knowledge on appropriate production technologies.
2	Number of program participants adopting recommended practices.
3	Number of established farms and farm related businesses by individuals and cooperatives.

Outcome #1

1. Outcome Measures

Number of persons with increased knowledge on appropriate production technologies.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	7372

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

PCC: The Palau community is not aware of the current best management practices and crop protection measures to improve crop production, animal waste management and maintenance of rainwater catchments.

CMI: Soil fertility is an issue. Farmers had moved away from commercial fertilizer and focused on organic composting. The knowledge and understanding of the impact of commercial fertilizer and its implications to the water lens contamination is low. It must be clear that one of the major contributing factors for young children?s health is the water borne sicknesses, pathogens and E-coli. Constant monitoring and testing of water quality is highly required for better sanitation.

COM-FSM: Farmers care due to high costs and unreliable supply of commercial feeds. Tidal surges cause soil erosion and salt water intrusion causes damage to crops and structures on atolls. Diseases and conditions of staple foods cause severe hardship.

What has been done

PCC: Knowledge of best management practices and techniques are essential to increase productivity. People are unaware that wastes from piggeries have nutrients useful for crops.

CMI: The agriculture extension agent conducted workshops to farmers relating to organic composting using organic matters mix with copra cake. Other workshops were regarding proper ways of gardening on atolls. The water quality extension agent tested 1,046 catchments and treated 477 that were found to be contaminated.

COM-FSM: Multi-agency collaboration for community-level trainings, demonstrations and technical assistance was provided to farmers on innovative farming techniques, gardening, collection and screening of giant swamp taro for tolerance of salt and to dry corm rot disease.

Results

PCC: Knowledge of best management practices and techniques are essential to increase productivity. People are unaware that wastes from piggeries have nutrients useful for crops. (What has been done to teach farmers?)

CMI: The agriculture extension agent conducted workshops to farmers relating to organic composting using organic matters mix with copra cake. Other workshops were regarding proper ways of gardening on atolls. The water quality extension agent tested 1,046 catchments and treated 477 that were found to be contaminated.

COM-FSM: Multi-agency collaboration for community-level trainings, demonstrations and technical assistance was provided to farmers on innovative farming techniques, gardening, collection and screening of giant swamp taro for tolerance of salt and to dry corm rot disease.

4. Associated Knowledge Areas

KA Code	Knowledge Area
101	Appraisal of Soil Resources
102	Soil, Plant, Water, Nutrient Relationships
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management
125	Agroforestry
133	Pollution Prevention and Mitigation
136	Conservation of Biological Diversity
201	Plant Genome, Genetics, and Genetic Mechanisms
202	Plant Genetic Resources
204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems
212	Pathogens and Nematodes Affecting Plants
216	Integrated Pest Management Systems
315	Animal Welfare/Well-Being and Protection
403	Waste Disposal, Recycling, and Reuse
601	Economics of Agricultural Production and Farm Management

Outcome #2

1. Outcome Measures

Number of program participants adopting recommended practices.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	4084

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

PCC: High yielding and disease ?free planting materials, good soil nutrient management and proper control of pests of crops can greatly enhance farm productivity and yield.
Planting materials and control of pests and diseases greatly affect farm productivity. Water contaminants and improper animal waste disposal are harmful to health and the environment.

CMI: Agriculture is still perceived as being a dirty occupation and it is for losers. People have difficulty accessing different varieties and choices of crops. Water is a precious commodity to the Marshall Islands; however, it was found that there are a high number of water catchments that are contaminated.

COM-FSM: Livestock farmers require local feeding materials and feeding techniques. Consumers require improved supply of local produce in the markets. Atoll dwellers need reaction to climate change.

What has been done

PCC: Planting materials and biocontrol agents of root crops were provided to farmers. Demonstrations on cleaning water catchment and proper animal waste disposal were conducted

CMI: Due to the negative view of agriculture, the agriculture staff has been aggressively conducting awareness programs and activities in schools and communities, explaining the importance of agriculture.

COM-FSM: Trainings, workshops, demonstrations, IEC and presentations of seedling production

and distribution, and farm visits have been carried out; farmers realize raising chickens for home consumption and noni for extra income is feasible.

Results

PCC: Food supply and production in Palau has been enhanced by improved yield of farmers who are growing disease-free and high-yielding planting materials of root crops and using biocontrol agents to control pests of crops. People are now cleaning water tanks or boiling drinking water. Agencies endorsed the dry litter waste management system which is now adopted by three piggeries.

CMI: Farmers have indicated interest in the Dry Litter Waste Management device. The water quality extension agent tested water catchments and found 477 out of 1027 water catchments were contaminated and treated them.

COM-FSM: Kitchen waste (excluding cooked fatty foods and bones) and crop residues were used for composting. Home gardens were established and excess produce was sold at local markets. Agro-forestry and sustainable land management strategies including noni to supply an emerging market encourage youths and adults to establish farms cultivating different varieties of soft taro, sweet potato and vegetables distributed as seeds and seedlings. The projects have developed positive attitudes and have changed the behavior of the participants. Families are making homemade banana jams, chili base and homemade kimchee at home.

4. Associated Knowledge Areas

KA Code	Knowledge Area
101	Appraisal of Soil Resources
102	Soil, Plant, Water, Nutrient Relationships
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management
125	Agroforestry
133	Pollution Prevention and Mitigation
136	Conservation of Biological Diversity
201	Plant Genome, Genetics, and Genetic Mechanisms
202	Plant Genetic Resources
204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems
212	Pathogens and Nematodes Affecting Plants
216	Integrated Pest Management Systems
315	Animal Welfare/Well-Being and Protection
403	Waste Disposal, Recycling, and Reuse
601	Economics of Agricultural Production and Farm Management

Outcome #3

1. Outcome Measures

Number of established farms and farm related businesses by individuals and cooperatives.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	578

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

PCC: Farmers are now adopting proper cultural management technologies resulting in increased production and quality of root crops. Best management practices should be adopted by farmers to improve productivity. Clean drinking water and proper animal waste disposal are essential for health and environment.

CMI: Land for farming is still a major challenge because of limited or unavailable space to most people and many of the fruits and vegetables cannot grow well, only with proper management and good composting they will survive.

COM-FSM: Gardeners, homemakers and farmers want varieties of local plants for good health and nutrition. Atoll communities need to protect their plant, soil and facilities from climate change impacts.

What has been done

PCC: Proper cultural management techniques were adopted by farmers and quality planting materials were distributed. Demonstrations on cleaning water tanks and dry litter waste management were conducted.

CMI: Extension agents provided appropriate information to help farmers to help them maintain their farms. The Water Quality Extension Agent continued working with partner agencies to address important issues and tested water sources for bacterial contaminants.

COM-FSM: Students at all levels participated in annual fairs. Farmers imported chickens and established 4 poultry farms using local feeds. Plant nurseries were established and collection of

giant swamp taro cultivars, training and demonstrations were done.

Results

PCC: Use of disease-free and high yielding planting materials and adequate fertilization were essential for high yield and productivity of root crops. Visitors were adopting the practices showcased in the demonstration farms. Collaborative efforts on conservation and protection of natural resources have improved water quality and the environment.

CMI: Collaboration of agriculture staff, Ministry of Resources and Development and the ROC Taiwan Technical Mission staff have found environmentally friendly methods in controlling pests of crops so people can continue gardening and farming.

COM-FSM: School gardens supplement the menu to reduce cost and increase use of local vegetables. More than 30 small farms are now raising between 4-40 layers to produce eggs for home consumption. Planting materials were secured and training was given on maintaining plants on atolls despite salt spray, flooding. Farmers and gardeners improved quality and quantity and increased their local marketing of excess produce.

4. Associated Knowledge Areas

KA Code	Knowledge Area
101	Appraisal of Soil Resources
102	Soil, Plant, Water, Nutrient Relationships
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management
125	Agroforestry
133	Pollution Prevention and Mitigation
136	Conservation of Biological Diversity
201	Plant Genome, Genetics, and Genetic Mechanisms
202	Plant Genetic Resources
204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems
212	Pathogens and Nematodes Affecting Plants
216	Integrated Pest Management Systems
315	Animal Welfare/Well-Being and Protection
403	Waste Disposal, Recycling, and Reuse
601	Economics of Agricultural Production and Farm Management

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Brief Explanation

PCC: There is a need to hire a crop protection specialist in Palau to assess and develop effective techniques to control new crop pests that may seriously affect crop production. Financial constraints would affect the outcome for farmers who cannot afford the dry litter system and the supplies to operate it as well as rainwater catchments and their maintenance.

CMI: The college confronted with many challenges that would have extended more services to benefit many more people, especially the less fortunate in the communities. Often times these important services are unmet because of many stumbling blocks. The stumbling blocks ranges from extreme weather conditions, climate change, unreliable outer islands' shipping services, tidal surges, water contamination, not enough supplies to complete a demonstration or an outreach, researcher supplies not available on island, land erosion and trees falling into the sea.

COM-FSM: Limited supplies and funding, transportation, extreme bad weather, scheduling of field trip boats to the outer islands with no advance notice of ship scheduling to carry on planned activities were major constraints. Drought, heavy rains and low government budget for agriculture hampered the delivery of services especially to far-flung villages. Local populace looked down in farming as a dirty and low-paying job. Wildfires caused crop losses in affected areas. Weather contributes to the outcome, especially with cucurbits and in the production of tomatoes. Duplication of efforts through the Department of Resources and Economic Affairs and local and international NGO programs create misunderstandings with farmers. Tidal surges emphasize the need for food security initiatives, management for atoll food systems and salt-tolerant crops and/or rapid generating crops for post-disaster relief as sea levels rise. The number of working age Micronesians who are emigrating each year reduces local capacity. Availability of qualified staff to undertake field work, at times, hinders the research and extension work.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

PCC: The root crops germplasm collection has been a reliable source of high yielding varieties of taro, sweet potato and cassava, which are essential components to

increase productivity. Biological control agents have effectively controlled pests of taro and cassava. Participants gained knowledge and valued their health, water resources and environment.

CMI: At the start of an awareness or demonstration, agriculture and water quality extension agents performed before and after evaluation where it shows that changing of knowledge and understanding with participants show significant improvements. Activities on Water Quality have proven to save many lives from water borne diseases. This year, water testing shows many water catchments are contaminated.

COM: Farmers traditional knowledge and skills complement new technologies and practices to improve current practices and management styles. There is a need for accurate records, integrated production, marketing and processing of local produce, understand sustainability in traditional crop production and to develop strategies to uplift the image of farming as a stable source of family income. Families produced their own vegetables and continue to maintain their gardens. Farmers are producing enough noni to require external markets. More yellow varieties of bananas and other crops are available in markets. Animal diseases are being treated with local medicines. Atoll communities are adjusting their production technologies due to climate change. They tried raised beds, windbreaks and diverse crop planting and saved planting materials. The projects have developed positive attitudes, zeal for learning techniques and have changed the behavior of the participants. Experiments show positive results. Efficient protocols and nursery techniques are developed for mass-multiplication of different varieties of banana, taro and sweet potato. Grafting experiments on citrus are showing positive results against certain diseases. More home gardens were established, more local foods sold in the market and increased number of people are making products such as chili base, kimchee and banana jam.

Key Items of Evaluation

PCC: The tissue culture technique has been successful in providing a continuous supply of taro and banana planting materials. Biological control agents have been successful in controlling pests of root crops and invasive weeds in Palau. Water education campaign and dry litter waste management workshops and demonstrations have been successful in providing continuous education and awareness to farmers, youths, community groups, and government and private organizations.

CMI: Some people acquired basic skills in farming. This year, they worked as an association to establish a farmer's market. Farming method is an ongoing project in communities as well as in the educational system. With high health issues relating to hypertensions, diabetes, and obesity increase awareness is needed to remedy the situation. More education on healthy diets, increased agriculture and small scale gardening near houses for easy access to vegetables and local food needs to be implemented.

COM-FSM: There is a need for more entrepreneurial training. The youth addressed respond well and student numbers if the agriculture program is increasing. Use of local plants and farm residues as fertilizers and pesticides; conserving local plants for food, medicinal and other uses; revival of traditional farming through agroforestry are all areas to explore. Less laborious and demanding technologies matching with the socio-cultural activities hampering agricultural production are important factors. Research is effective in small programs if targeted efficiently. In-vivo and in-vitro grafting experiments in lime

showed positive results and sour orange rootstock accepted Mexican lime and Mexican lime thornless budwood. There is a need to develop strategic plans in food security and response to climatic change including identifying or developing salt-tolerant root crops and skills in sustainable agricultural systems. Stakeholders need marketing guidance and processing techniques to add value and to lengthen the shelf life of local foods.

V(A). Planned Program (Summary)

Program # 3

1. Name of the Planned Program

Families, Youths & Communities

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
608	Community Resource Planning and Development	18%		10%	
801	Individual and Family Resource Management	11%		10%	
802	Human Development and Family Well-Being	14%		10%	
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures	6%		10%	
806	Youth Development	45%		30%	
901	Program and Project Design, and Statistics	2%		10%	
902	Administration of Projects and Programs	2%		10%	
903	Communication, Education, and Information Delivery	2%		10%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2011	Extension		Research	
	1862	1890	1862	1890
Plan	12.4	0.0	1.0	0.0
Actual Paid Professional	9.0	0.0	0.0	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
201408	0	0	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
42929	0	0	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

PCC: Continuous promotion of science in after-school science and summer programs for Upward Bound, school outreach presentation, Earth Day mini fairs, STEM fairs were conducted in the schools and community to promote and provide awareness on major environmental conditions, agriculture and water issues in the island. Students were involved in classroom lectures, hands on activities, science projects contests, mini fairs, field trips and summer programs.

CMI: The 4-H Extension Agent continued to assist people in the communities and in schools with appropriate information. Presentations were focusing on issues related to alcohol and drug abuse, teen pregnancy and youth dropouts. He also facilitated sport activities. Videos of all research and extension activities have been produced to be aired on local TV channels. The extension agent has also been in charge of Land Grant Newsletters that were disseminated to the public.

COM-FSM: Participants learned multiple skills in cooking, sewing and handicraft making thus enabling them to save money and help in family expenditures. Also qualified graduates after undergoing small business skill training became eligible for local bank micro-lending.

Few drop-out participants went back to school and others passed high school and COM entrance tests. Entrepreneurship training with 28 topics, sewing skills trainings for three groups and basic computer training.

2. Brief description of the target audience

PCC: The youth development program caters to students in elementary, high school, and college, teachers, school administrators, school cooks, parents, youths, homemakers, employees, unemployed, church groups and other interested individuals.

CMI: Students, parents, teachers, school administrators, staffs, men and women sport clubs, community women and men groups were targeted.

COM-FSM: The target audiences are youth ages 13-19, girl scouts, upper elementary school level

and staff, high school students and vocational teachers, interested government employees, unemployed women and low income families.

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2011	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	2900	5502	2509	4099

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2011

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2011	Extension	Research	Total
Actual	2	0	2

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of training conducted targeting youths.

Year	Actual
2011	20

Output #2

Output Measure

- Number of training conducted targeting families and youths in the communities.

Year	Actual
2011	14

Output #3

Output Measure

- Total number of youth clubs organized.

Year	Actual
2011	4

Output #4

Output Measure

- Number of students recruited for AS Degree Program as a result of their contact with research and extension.
  Not reporting on this Output for this Annual Report

Output #5

Output Measure

- Number of students recruited for Agriculture Certificate Program as a result of their contact with Research and Extension
  Not reporting on this Output for this Annual Report

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of youths with increased awareness and understanding of roles and relationship with parents.
2	Number of families adopting interpersonal skills to improve quality of life and harmony in the family.
3	Total number of families and youths benefiting from the use of learned skills.
4	Number of youth who increase knowledge in agriculture and science.

Outcome #1

1. Outcome Measures

Number of youths with increased awareness and understanding of roles and relationship with parents.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	4800

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
PCC: Youths and their families will have knowledge and awareness of environmental and marine science impact to the island. More youths will have positive perspective toward science instead of considering science as boring and only a subject for intelligent kids.
Youths, teachers and their families are not aware of issues that impact the environment and marine resources. The youth should be encouraged to enroll in science at the college.

CMI: The concerns of unemployment, youth dropout, teen pregnancy, alcohol and substance abuse, suicides, youth dependency, teacher shortages are the issues that need more attention. The relationship among parents and children is becoming worrisome and challenging as many young teenagers committed suicides when they are intoxicated and got issues with partners and parents. In today?s world, more and more children are very dreadful and oftentimes experiencing disruptive behavior.

COM-FSM: National, state and local governments are concerned about the quality of life of youth and families caused by limited income.

What has been done
PCC: STEM fair, fieldtrips, after-school and summer programs were conducted to educate youths, teachers and parents on protection and conservation of the environment.

CMI: The 4-H Extension Agent provided training and skills development activities in schools and communities. The kids were coached and trained to be responsible in helping out their parents and other family members.

COM-FSM: Women and youth are taught to sew to make clothes and how to make jams and kimchee to preserve food and for sale. Entrepreneurship training is provided to encourage home based businesses.

Results

PCC: Students, teachers, parents, school cooks and school administrators, government and non-government agencies who have participated in the program have greater awareness on protection and conservation of environment and marine resources.

CMI: More and more youths started searching for job opportunities and many more are working and now can supplement and bring in extra income to their families. More females completed handicraft training and are now putting into practice the knowledge and experience they learned by making and selling their products.

COM-FSM: One hundred percent of girls participated in the sewing training completed their individual projects and can join proposed sewing clubs in their respective villages. Students learned computer skills for use in their regular school program. Trainees in entrepreneurship completed business plans and are ready to seek financing. COM-FSM students that participated in the 2 week trial on carving using the rotary power tools will form a carving club. Target audience learned culinary arts, sewing, handicrafts, business management and school youth in reviewer courses (math, science and English).

4. Associated Knowledge Areas

KA Code	Knowledge Area
608	Community Resource Planning and Development
801	Individual and Family Resource Management
802	Human Development and Family Well-Being
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures
806	Youth Development
901	Program and Project Design, and Statistics
902	Administration of Projects and Programs
903	Communication, Education, and Information Delivery

Outcome #2

1. Outcome Measures

Number of families adopting interpersonal skills to improve quality of life and harmony in the family.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	2800

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
PCC : There is a need to change the attitude of youths and the communities toward science and protection and conservation of environment and natural resources.

CMI: Many young people are not getting along and are hesitant to discuss their problems with parents. Some children spend most of their time outside their homes while parents are taking care of all the household activities. There is still recurrent numbers of drop out students in school and limited number of professional school counselors.

COM-FSM: Families and youth need to cope with rising cost of socio-cultural and economic needs. Lack of jobs, increasing prices and food security are issues that affect every member of the community. Tutoring to return to school allow youths to improve future opportunities.

What has been done
PCC: After-school programs STEM fair, national fairs, cultural awareness and field trips has been conducted in schools and communities with youth involvement.

CMI: Handicraft training at different schools was provided. Students were taught how to make handicrafts and products were exhibited at the college ceremonies, events and many other functions which brought in good proceeds from the sales. Students were taught about good housekeeping, proper hygiene, as well as cooking activities. Students were also taught how to use computers during and after school hours. Activities like traditional fishing and gardening were also conducted.

COM-FSM: Training was given in sewing of clothing. Education preparation programs were offered to youth to allow them to reenter the education system, entrepreneurial instruction was provided to youth and food processing training was given to farm families.

Results
PCC: There is an increase in students involved in community clean up, recycling, STEM fair contest and other national fairs. Schools are now doing their own after school science program. More students are pursuing their college education in agriculture and environmental and marine

science in the local college and abroad.

CMI: With the skills and experiences acquired, it gave them the enthusiasm and confidence to do what is best to support their family.

COM-FSM: Clients are now sewing for their families. Seventy-five percent of kids participated in the trainings are readmitted to the High School. Four business plans were completed. Women are able to preserve their food due to training provided.

4. Associated Knowledge Areas

KA Code	Knowledge Area
608	Community Resource Planning and Development
801	Individual and Family Resource Management
802	Human Development and Family Well-Being
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures
806	Youth Development
901	Program and Project Design, and Statistics
902	Administration of Projects and Programs
903	Communication, Education, and Information Delivery

Outcome #3

1. Outcome Measures

Total number of families and youths benefiting from the use of learned skills.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	1200

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

PCC: There is a need to increase student enrollment in agriculture, environmental and other science based programs.

CMI: Teenage pregnancy is becoming burdensome for parents, with children having babies at an early age and was unable to complete their education.

COM-FSM: Inflation - increased cost of imported clothes and linens and even locally sewn clothes are too costly which causes hardship for local families. Low-income families had limited purchasing power and self- esteem.

What has been done

PCC: Summer science classes, school presentations, and STEM fairs were conducted in schools and communities to encourage more enrollments in science courses.

CMI: Collaborative efforts with the Youth to Youth, Ministry of Health, divisions of human services, and other NGOs conducted trainings on basic life skills in the communities to educate the participants on how to strengthen their relationships with parents and families and ways to improve their livelihoods.

COM-FSM: Training in income-generating skills and competencies in math, science and English were done. Women and youth have completed sewing trainings and received tips on how to start and manage business.

Results

PCC: There is now a significant increase of 300% in student enrollment in agriculture, environmental science, and involvement in the science clubs and projects.

CMI: Many had gain the necessary knowledge from trainings provided by the staff and their partner organizations. There are improvements of stores that are now in compliance by not selling tobacco, cigarette, and alcohol to minors. With this strong enforcement of the illegal selling of these substances to minor, families and the communities experiencing less disruptive behaviors and students? attendance are improving.

COM-FSM: Target audience and their families had pride, confidence and additional comfort in household expenditures. As a result of all trainings, most of the clients are now sewing for themselves which saves them money. A follow up survey with some of the clients indicates their standard of living has improved as they are making profit from their sewing, which is a great help to their families.

4. Associated Knowledge Areas

KA Code	Knowledge Area
608	Community Resource Planning and Development
801	Individual and Family Resource Management
802	Human Development and Family Well-Being

804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures
806	Youth Development
901	Program and Project Design, and Statistics
902	Administration of Projects and Programs
903	Communication, Education, and Information Delivery

Outcome #4

1. **Outcome Measures**

Number of youth who increase knowledge in agriculture and science.

Not Reporting on this Outcome Measure

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Brief Explanation

PCC: None

CMI: Unreliable scheduling of field trip services, extreme weather condition, unavailable ground transportation to implement planned activities on time, challenge of acquiring supplies on time are some of the constraints. As stated in the last year's report, funding is a major challenge to reach the outer islands to deliver the training and needs. Adolescents having babies, students' dropping out of school, are major concerns to many remote communities. An ongoing lack of coordination among different state agencies and non-governmental groups doing the same activity which can be confusing and send wrong messages to the people has to be corrected.

COM-FSM: Outcomes are affected by inclement weather, conflicting activities with community events and limited micro-financing. Competing public priorities and programmatic challenges determine the focus and direction of program activities and funding.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

PCC: Evaluation results show that youths, school administrators and teachers are not aware of a lot of programs on science. Local environmental issues are often overlooked because they just concentrate on the text books that are applicable on foreign context.

CMI: Results indicate that the traditional training skills conducted to students was a success as many learned the traditional methods of cooking, building local huts, fishing and preparing delicious local dish.

COM-FSM: Participants' acquired skills at culinary, handicrafts, and sewing and business management training benefitted their families, friends and communities. They earned for themselves, their families and friends. Training students acquired skills to pass exams and further developed confidence in learning.

Key Items of Evaluation

PCC : Programs must help address the low level of awareness of school administrators, teachers and students with regards to environmental and marine science issues. The program must help the schools integrate emerging environmental issues in the region in their regular class lessons as well as provide activities that will motivate the students and help them understand difficult concepts in science.

CMI: It is highly recommended that increase in awareness services be implemented affectively with enough support from outside, especially in the areas of teen pregnancy (Children having babies), drug abuse, suicide, parenting and other youth related issues. Continue to expand livelihood opportunities through targeted program and life-skills trainings. Migration will be a choice for many youth as more are coming out of school and with no job opportunities guarantee for them, therefore programs should be developed to prepare them for that future.

COM-FSM: Skills developed in income-generation and business management of participants were home-based and designed to make women and children to be productive and enterprising. These skills are life-long assets towards family and community development. Youth as leaders have to be equipped with competent academic skills for the furtherance of their employment in the future.

V(A). Planned Program (Summary)

Program # 4

1. Name of the Planned Program

Food, Nutrition & Health

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
501	New and Improved Food Processing Technologies	5%		5%	
502	New and Improved Food Products	5%		5%	
701	Nutrient Composition of Food	8%		10%	
702	Requirements and Function of Nutrients and Other Food Components	12%		20%	
703	Nutrition Education and Behavior	23%		10%	
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources	9%		20%	
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	18%		20%	
724	Healthy Lifestyle	20%		10%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2011	Extension		Research	
	1862	1890	1862	1890
Plan	12.4	0.0	1.0	0.0
Actual Paid Professional	9.0	0.0	2.0	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
176410	0	103780	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
46005	0	5667	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

PCC: The implementation of two research projects continued, Product Development for Food Security, Product Development of Rabbit fish and Crustaceans. For project 1, a total of 75 new and improved food products were developed from fish, coconuts, and bananas. Sensory evaluations of processed foods by panelists have rated all 75 products well-accepted based on characteristics such as color, flavor/taste, texture, and general acceptability. A total of 950 food tasters also rated the products well-liked, when served to clients during national gatherings. Assessment of shelf life of the 75 processed food products continued. For the projects on development of products from rabbitfish, 10 products have been improved and developed.

CMI: Trainings were conducted on food preparation and safety in schools and in the communities. A collaborative efforts with Health Services staff conducted healthy cooking demonstrations of nutritious recipes. EFNEP staff also collaborated with Republic of China, Taiwan Agriculture Technical Mission to perform food processing for the farmers' association and families at the Laura community.

COM-FSM: Food and nutrition agents continued with community visits and carried out the 24-hour food recall and checklist. Other actions included food safety, fruits and vegetable presentation, food storage and sanitation, meal planning, food purchase and processing, and food preparation cooking contests and demonstrations. Extension staff collaborated with Department of Education in State-wide promotion campaign to increase awareness of programs. A JICA volunteer continued to test, demonstrate, and process marine products and demonstrate them in the communities.

The Department of Health Services and nutrition program collaborated in carrying out a nutrition workshop in four communities for mothers. Currently 27% of children aged births through five years are not in the correct weight category for their age and height. Agents worked closely with Dept. of Education to conduct school enrichment programs, Lets Go Local Food Campaign and Child Find survey of disabilities that can be found from ages 0-5 yrs for intervention/prevention services for those identified with special needs.

2. Brief description of the target audience

PCC: The target audiences for this program were food processors, hotel and restaurant owners/managers/staff, teachers, students, parents, employees, school cafeteria cooks, food entrepreneurs, and those interested in food processing.

CMI: Target audience include housewives, young mothers, youths, school aged students, NGOs, nutritionists, farmers, church leaders, traditional leaders, local businesses, bakeries and restaurant owners, local and national government leaders and community in general.

COM-FSM: Target audience consisted of young mothers, school children, youth, and interested individuals.

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2011	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	3750	6200	608	2500

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2011

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2011	Extension	Research	Total
Actual	2	1	3

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of community workshops conducted.

Year	Actual
2011	45

Output #2

Output Measure

- Number of coalitions strenghten.

Year	Actual
2011	20

Output #3

Output Measure

- Number of intervention conducted to individuals or small groups.

Year	Actual
2011	125

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of program participants who increase awareness of nutrition related health issues.
2	Number of program participants adopting recommended practices after completing educational programs.
3	Annually increase the number of healthy food snacks or lunch programs in schools and communities.

Outcome #1

1. Outcome Measures

Number of program participants who increase awareness of nutrition related health issues.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	3400

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
PCC: Locally processed food products were not available in the market.
Clients were not aware of local raw materials that can be processed into value-added food products.

CMI: Increase in sicknesses and diseases that relate to diabetes, hypertension and obesity is affecting many. Diabetes is the number one epidemic affecting many people and is a major financial burden to the Ministry of Health Services. Increasing in the number of diabetic patients and people at risk for diabetes is mainly due to being inactive and having poor diets.

COM-FSM: In surveys carried out, over half of the children had sub-clinical Vitamin A Deficiency, (Englberger 2002) caused by a lack of Vitamin A in the diet. The VAD and some chronic diseases are related to the dietary shift and changes in lifestyles.

What has been done
PCC: Food processing techniques and skills were taught to 85 participants in the communities. Participants learned to prepare 50 different food products in 24 contact hours.

CMI: EFNEP staff continued to hold workshops and trainings on healthy and nutritious recipes in the communities and in schools.

COM-FSM: Community workshops, school and girls scout programs, State fair/local food promotions e.g cooking demonstrations, recipe competitions addressing the effect of poor diet and benefit of healthy diet for all people.

Results

PCC: Eighty five participants of Food Technology classes have increased their skills in food processing due to actual hands-on preparation of 50 kinds of food products from local sources. Nine hundred fifty consumers are now aware that food can be processed from local food resources through taste tests that were conducted during major national events, tours and visits to our research facility.

CMI: Mothers reported that they are now aware and being very alert and more attentive to what kind of food being served to families. More than before people are coming out to buy fruits and vegetables to include in their families? meals.

COM-FSM: Clients learned nutritious foods, healthy eating habits and healthy lifestyles, like walking and gardening. Participants were encouraged to utilize local produce in meals prepared for households and families.

4. Associated Knowledge Areas

KA Code	Knowledge Area
501	New and Improved Food Processing Technologies
502	New and Improved Food Products
701	Nutrient Composition of Food
702	Requirements and Function of Nutrients and Other Food Components
703	Nutrition Education and Behavior
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins
724	Healthy Lifestyle

Outcome #2

1. Outcome Measures

Number of program participants adopting recommended practices after completing educational programs.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	2200

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

PCC: Imported food products are expensive and unhealthy. With new skills in food processing, participants are replacing imported food with healthy locally produced alternatives.

CMI: Unbalance diets have made great impact in people?s food consumption that resulted in the increased number of individuals having NCDs. This is a major concern as it shortens people?s lives span. It?s also has a huge implication on the National and Local Governments budgets.

COM-FSM: Families still buy turkey tails and canned and junk foods, gardening or walking are not a family affair. Awareness programs need to be conducted to prevent increase in NCD numbers.

What has been done

PCC: Trainees in Food Technology were encouraged to market their food products in response to suggestions of food tasters. With the rise of NCDs people are encouraged to change to a healthy lifestyle.

CMI: Collaborative efforts with the Wellness Center, MOH-Public Health Department and Health Educators have been reaching out to the communities and conducting aggressively awareness programs on NCDs health issues. The activities started in the primary schools all the way to college.

COM-FSM: IEC, cooking demonstrations and trainings in healthy lifestyles and balanced diets were done. Backyard gardening and planting of yellow varieties of staple crops has been encouraged.

Results

PCC: Participants in food technology classes have prepared processed food products for consumption for their families and during occasions like Christmas, birthdays, special meetings and for special guests. Some entrepreneurial women have sold taro and tapioca cookies, doughnuts, and tama.

CMI: Many clients have joined programs at the Wellness Center and were continuing to participate in events such as walkathons, which motivated them to continue doing daily exercises on their own.

COM-FSM: Communities served local produce and nutritious recipes at gatherings. Schools promoted sports as part of healthy schooling. Mothers participated in the Child Find survey and had nutrition counseling on the recommended daily allowance for children 0-5 yrs old and the benefits of fruits and vegetables in the diet. More families started backyard gardens and are now using the yellow varieties as baby foods.

4. Associated Knowledge Areas

KA Code	Knowledge Area
501	New and Improved Food Processing Technologies
502	New and Improved Food Products
701	Nutrient Composition of Food
702	Requirements and Function of Nutrients and Other Food Components
703	Nutrition Education and Behavior
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins
724	Healthy Lifestyle

Outcome #3

1. Outcome Measures

Annually increase the number of healthy food snacks or lunch programs in schools and communities.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	576

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

PCC: NCD is a major threat to the island population due to increased consumption of imported goods. Palau is ranked 7th among the world?s most obese people.

CMI: People in the communities still need to be educated on ways to prevent themselves from contracting NCDs and avoid being obese.

COM-FSM: The general public cares about high incidence of non-communicable diseases. Imported foods are more affordable and available vs. local foods. All Micronesians care since money spent on Health Care cannot be spent on other development possibilities which could

mean more jobs.

What has been done

PCC: Parents and community members were trained in Food Technology. During her presentations and workshops, the Extension Agents usually choose simple and healthy recipes that children, teenagers and adults can prepare easily at home. Like in previous years, coconut jam seems to be a popular recipe where everyone can easily prepare. It is again being introduced in every demonstrations and outreaches by the EFNEP Extension Agent. The Extension Agent continues to work with the College students and community conducting cooking nutritious recipes.

CMI: Healthy recipes were demonstrated to school children, young mothers and adults in the communities.

COM-FSM: Inter-agency public IEC campaigns, gardening and cooking demonstrations and physical fitness exercises were done to address the effect of poor diet and benefit of healthy diet; nutrition and cooking demonstrations.

Results

PCC: Food products are now available in the market as a result of trainings conducted in Food Technology and nutrition. Parents and youth are now practicing skills learned for preparing nutritious meals at home and to engage in physical activities.

CMI: More families, schools and interest groups prepared and cooked healthy food as well as snacks at homes and in the school kitchens. The Wellness Center at the Ministry of Health Services announced daily to public that breakfast, lunch and dinner serving at the Center is strictly vegetarian food.

COM-FSM: Multi-sectorial IEC campaigns, training, gardening and cooking demonstrations improved community choices of nutritious foods and preparation of meals using local healthy produce. One community already organized and called themselves Women in Farming to share recipes and exchange crops such as papayas, yellow banana, taro, breadfruit, potatoes etc. One of the most rewarding things happening during the community trainings was about 90% of snacks and food provided for lunches were made from local agriculture produces.

4. Associated Knowledge Areas

KA Code	Knowledge Area
501	New and Improved Food Processing Technologies
502	New and Improved Food Products
701	Nutrient Composition of Food
702	Requirements and Function of Nutrients and Other Food Components
703	Nutrition Education and Behavior
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and

	Naturally Occurring Toxins
724	Healthy Lifestyle

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Brief Explanation

PCC: Food entrepreneurs who would like to go into the food business to practice skills learned from the Food Technology Class are hampered by strict government regulations and expensive permit to obtain license to operate.

CMI: Constraints are political interference with program implementation, limited funding, long PO processing, scheduling changes that hindered deliberation of programs to outer islands. Islands are too remote, extreme weather conditions, lack of needed supplies and materials, transportation to implement scheduled activities on time and affectively.

COM-FSM: Inclement weather, population migration to mainland US and territories, limited project budget allotment and conflicting community events affected outcomes.

Increased importation of foods, more people are depending on the imported foods due to the high cost of the local produce. Natural disaster could be a problem, heavy rain, and drought could destroy the plants. Or stealing is also a big problem. You plant, somebody else harvest, this could cause somebody to lose interest in farming. Constraints are limited funding, long turn-around time for PO processing and lack of or limited proper equipment and tools to carry out the activities of the program. Time in between visits/monitoring is too long due to boat scheduling and limited transportation means.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

PCC: Result of formal evaluation of trainees in Food Technology Classes showed that all participants had perfect score in posttest as compared to pre-tests given before the course. Results showed that the skills acquired from the training have greatly benefited the participants not only in preparing healthy foods for their families but also for business opportunities.

CMI: More families and clients' diets improved slightly during and after participating

in the workshops. There are requests made to the office wanting to have more recipes. Landowners are strongly backing up the ongoing activities especially making sure people in their communities get involves. People are now interested in buying fruits and vegetables including their strong demand to have more local food in the markets.

COM-FSM: Food choices and preparation improved such as use of more local foods, vegetables and local protein foods i.e. fish and sea foods as against canned meat and fish. Physical fitness by walking or gardening gained acceptance for health maintenance.

More people are selective in what they're buying, eating and planting, the yellow fruits/vegetables over the other varieties. More people are using the yellow banana (Taiwan) for baby foods. Increased awareness, skills and knowledge for participating groups and communities in regards to nutrition, health, and management of meager resources available to them as compared with the non-participating groups or communities.

Key Items of Evaluation

PCC: None

CMI: As these programs continued, it is difficult to cover all areas in the Marshall Islands because of islands being remote. As many citizens are now relying more on imported food it is sad to note that local food are not very popular any more. More people do prefers to choose eating imported food because it easily accessible rather than acquiring a local food where more work has to be done in order access it. This major setback must also be part of the situation contributing to the epidemic of high NCD in the Marshall Islands.

COM-FSM: People recognized local foods as more nutritious than imported junk foods; that brisk walking and gardening were excellent physical fitness and good diets preventing non-communicable diseases and obesity rely on producing and consuming local produce containing low salt, fat saturated and refined carbohydrates. Increased in knowledge and better eating pattern resulted from the food recall and the food behavioral checklist.