2018 College of Micronesia Combined Research and Extension Annual Report of Accomplishments and Results

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I. Report Overview

1. Executive Summary

None Communicable Disease (NCD) remains as the leading cause of death among Pacific island people and this is very much the same in Micronesia. So, programs on NCDs and healthy lifestyle are increasingly and continuously being implemented and staple crops and climate smart production practices are being reinforced. Efforts towards improving the present monoculture planting of cassava through intercropping with nutritious and saleable vegetables were carried out. Sweet potato varieties were evaluated for yields and palatability offered another opportunity for food security and improved nutrition. 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 and tapioca varieties for their suitability to grow under atoll conditions continued. The micro propagation of elite (disease-free and high yielding) varieties that will improve the quality and quantity of certain crop varieties for food security were ongoing. Continued germplasm maintenance of staple root crops has insured genetic conservation of these valuable resources for future generations. This has facilitated the continued supply of planting materials to growers and for in-vitro multiplication of other food crops. Research continued on the identification of salt tolerant species of the predominant staple crops. In-vitro and in-vivo studies of taro, sweet potato, and cassava are on-going as is efforts to identify tissue culture protocols for the multiplication of pineapples and black pepper. Control of the environmental impact of swine production continued with the promotion of a modified deep-litter and composting system for small-scale farmers.

Aquaculture demonstration projects continued to transfer the technical know-how to Micronesians for alternative source of income towards socio-economic improvement. 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 and continuation of a project 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, youths and communities, water quality, and managing limited natural resources and the environment. Most adult residents were overweight or obese and many of them had suffered from NCD complications leading to heavy burdens to families and the state governments, due to high cost of medications and referrals abroad for treatments. The youth development programs provided information to increase knowledge and appreciation of marine and terrestrial flora and fauna. More students are exposed to computers, which provided the opportunity to use the Internet as an introduction and information gathering. 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.

Multi-state and multi-institutional efforts continued through the Center for Tropical and Subtropical Aquaculture (CTSA) on aquaculture projects with the University of Hawaii. 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. Research and extension staff were encouraged to continue their education with one staff member completing an AS degree. 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: 2018	Extension		Research	
	1862	1890	1862	1890
Plan	43.0	0.0	20.0	0.0
Actual	39.4	0.0	22.6	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.

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- Targeted invitation to traditional stakeholder individuals
- Survey of traditional stakeholder groups
- Survey of traditional stakeholder individuals
- Survey of selected individuals from the general public

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 Advisory Committees
- Use Internal Focus Groups
- Use External Focus Groups
- Open Listening Sessions
- Needs Assessments
- Use Surveys

Brief explanation.

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(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.

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 Advisory Committees
- Use Internal Focus Groups
- Use External Focus Groups
- Open Listening Sessions
- Needs Assessments
- Use Surveys

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
- In the Action Plans
- To Set Priorities

Brief explanation.

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.

Brief Explanation of what you learned from your Stakeholders

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

IV. Expenditure Summary

1. Total Actual Formula dollars Allocated (prepopulated from C-REEMS)			
Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
{No Data Entered}	{No Data Entered}	{No Data Entered}	{No Data Entered}

2. Totaled Actual dollars from Planned Programs Inputs				
	Extension		Research	
	Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
Actual Formula	1009834	0	1283881	0
Actual Matching	111454	0	13242	0
Actual All Other	0	0	0	0
Total Actual Expended	1121288	0	1297123	0

3. Amount of Above Actual Formula Dollars Expended which comes from Carryover funds from previous				
Carryover	1009834	0	910349	0

V. Planned Program Table of Content

S. No.	PROGRAM NAME
1	Aquaculture
2	Families, Youths & Communities
3	Childhood Obesity
4	Climate Change
5	Food Safety
6	Global Food Security and Hunger

V(A). Planned Program (Summary)

Program # 1

1. Name of the Planned Program

Aquaculture

☑ Reporting on this Program

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
135	Aquatic and Terrestrial Wildlife	10%		10%	
136	Conservation of Biological Diversity	10%		10%	
301	Reproductive Performance of Animals	10%		15%	
302	Nutrient Utilization in Animals	10%		10%	
307	Animal Management Systems	20%		15%	
308	Improved Animal Products (Before Harvest)	10%		10%	
315	Animal Welfare/Well-Being and Protection	10%		10%	
511	New and Improved Non-Food Products and Processes	10%		10%	
608	Community Resource Planning and Development	10%		10%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2018	Extension		Research	
	1862	1890	1862	1890
Plan	5.0	0.0	4.0	0.0
Actual Paid	6.6	0.0	4.0	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**
169160	0	227236	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
18670	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

Program activities will include establishing site-specific techniques in the protocols of hatchery, nursery and grow-out culture of targeted aquaculture species; to formulate a nutritionally balanced and economical feed for the nursery and grow-out culture; to demonstrate the economic viability of different techniques of grow-out culture of the targeted aquaculture species; to develop human resources for supporting and maintaining these industries; to develop business models and to promote local interest and participation in these industries; to demonstrate production and improve quality; to develop training and educational methods for local Micronesians; stake holder input research designing; experimental trial initiation, experimental monitoring and data collection, and data interpretation and analysis; dissemination of findings to existing and prospective farmers and individuals; promotion of new and site-specific technologies to outer-island communities; initiation of these small scale projects in outer island communities; frequent monitoring, data collection and evaluation of these projects; to develop hatchery , nursery and grow-out technologies for resource enhancement; replenishment of depleted stocks; and to test the efficiency of alternate or replacement feeds for specific aquaculture species.

2. Brief description of the target audience

Community fishermen, government officials, elementary, high school and college students, researchers and extension agents, 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

2018	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	2570	5770	6030	6550

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

Patent Applications Submitted

Year:	2018
Actual:	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2018	Extension	Research	Total
Actual	2	1	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of farms established.

Year	Actual
2018	16

Output #2

Output Measure

- Number of publications for lay use.

Year	Actual
2018	2

Output #3

Output Measure

- Number of conference paper and publication/presentation.
  Not reporting on this Output for this Annual Report

Output #4

Output Measure

- Expected Professional Journal publications.

Year	Actual
2018	1

Output #5

Output Measure

- Expected Gray Literatures.

Year	Actual
2018	2

Output #6

Output Measure

- Expected publications for lay use.

Year	Actual
2018	2

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of persons with increased awareness in the communities and prospective and existing industry about sustainable, site-specific, and hatchery based aquaculture technologies.
2	Number of persons adopting hatchery based sustainable aquaculture technologies.
3	Number of aquaculture operations generating income.

Outcome #1

1. Outcome Measures

Number of persons with increased awareness in the communities and prospective and existing industry about sustainable, site-specific, and hatchery based aquaculture technologies.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2018	1494

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

PCC: Lack of awareness has resulted in slow development of aquaculture in the country. Most of the farmers have limited knowledge in hatchery and grow-out operations.
CMI: There has been a lack of interest among the general population in learning aquaculture technologies for food security and economic development.
COM-FSM: Aquaculture and its potential for economic development and conservation of aquatic resources has not been adequately appreciated and promoted to the people of FSM.

What has been done

What has been done?
PCC: Facility tours were conducted and posters were presented during workshops. Farmers were given advice and release of juveniles to farms were reported in local media.
CMI: Trainings were provided on the development half pearl techniques. Students and visitors were informed about aquaculture programs.
COM-FSM: Awareness programs and demonstrations were conducted on the economic benefits of aquaculture, stock enhancement and conservation. Marine Science students were trained at the hatchery.

Results

Results
PCC: People became aware that aquaculture provides an alternative livelihood in the country. They learned the importance of stock enhancement and experienced the actual operations in the hatchery and grow-out of various aquaculture species.

CMI: Seventy-nine individuals have increased their knowledge and shown interest in aquaculture.
COM-FSM: Participants have improved their skills and awareness in aquaculture programs. Students have increased their knowledge and understanding of aquaculture and marine resources management.

4. Associated Knowledge Areas

KA Code	Knowledge Area
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
608	Community Resource Planning and Development

Outcome #2

1. Outcome Measures

Number of persons adopting hatchery based sustainable aquaculture technologies.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2018	1592

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Issue (Who cares and Why)
PCC: Few people are interested to start an aquaculture business. Farmers lack skills on hatchery and grow-out techniques for rabbitfish, mangrove crabs, milkfish, and shrimps.
CMI: The current major issue in RMI?s aquaculture is the lack of strategic plans for collaboration

efforts to improve the aquaculture.
COM-FSM: Communities and aspiring entrepreneurs are hesitant to participate and invest in aquaculture ventures due to limited site-specific information and demonstrated opportunities.

What has been done
What has been done?
PCC: Training on the hatchery and nursery of rabbitfish, mangrove crab and milkfish were conducted. Grow-out farmers were attended aquaculture workshops.
CMI: Stakeholder meetings, interagency, private and local aquaculture industry conferences were conducted to promote and support aquaculture strategic plan.
COM-FSM: Technical help was provided for communities to avail government support for aquaculture. Demonstration farms for sea cucumbers were established in the communities.

Results
Results
PCC: Based on the trainings and technical assistance, 11 farmers have established aquaculture farms for rabbitfish, milkfish and mangrove crabs.
CMI: Technical staff were trained on several aquaculture techniques including microalgae cultures.
COM-FSM: As a result of increased awareness, two farmers and two communities have established sea cucumber and giant clam farming operations.

4. Associated Knowledge Areas

KA Code	Knowledge Area
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
608	Community Resource Planning and Development

Outcome #3

1. Outcome Measures

Number of aquaculture operations generating income.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2018	8

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Issue (Who cares and Why)
PCC: Most of the farmers in Palau are not able to optimize their production due to limited seed supply for stocking.
CMI: There is a large number of Marshallese who are interested in setting up aquaculture ventures but do not have the resources and technical assistance.
COM-FSM: Reliable seed supply, nursery and farming management for aquaculture species has been a major botlneck in the current and future aqauculture devlopment.

What has been done
What has been done
PCC: Increased seed supply stock and provided technical assistance to farmers on grow-out techniques. On-site visits and technical discussions with farmers were done along with their seed requirements.
CMI: Eight individuals received technical assistance for start-up information, operation assessments, proper care, maintenance and management of half pearl farms.
COM-FSM: Hatchery produced Sea cucumber juveniles have been released in the farms and given to two existing farmers and one community group to monitor the growth development.

Results
Results
PCC: Farmers were able to stock their farms with locally produced fries and juveniles. They were able to grow their fish and crabs until they reach marketable size that fetched approximately $20,000.00.
CMI: With the help of technical assistance already provided, 40,000 oyster spats were produced and are now in the main grow-out farm and will be distributed to these individual farmers to begin their own operations along with the materials and supplies needed to produce half pearls.
COM-FSM: Sea cucumber juveniles were produced as bi product of research and training and released in the wild and given to farmers for stock enhancement and aquaculture development. Recapture data shows that these restocked sea cucumbers were growing well in these areas thereby providing hope and promise for the farmers to make additional income. Two private farmers and one community have consolidated their sea cucumber farming operations of high value species.

4. Associated Knowledge Areas

KA Code	Knowledge Area
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
608	Community Resource Planning and Development

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

Brief Explanation

PCC: Farmers were able to stock their farms with locally produced fries and juveniles. They were able to grow their fish and crabs until they reached marketable size.
CMI: While new research on additional marine species is coming up, the extension activities already conducted on half pearl paved the way to reactivate the oyster project in order to accommodate the trained to-be farmers and implement the operations immediately. On the other hand, the absence of an Aquaculture researcher in the past years put the operations on hold for quite a while.
COM-FSM: Consistent numbers of market sized animals were produced. However, as the species targeted is also a delicacy for the local consumers, lots of poaching is happening in the farms despite the best efforts of the farmers. Freak storms passing through the FSM geographical area affected operations massively in Yap. Controversy of the opening of the wild sea cucumber fishery in Pohnpei State had also had some negative impact and unintended bad publicity on the demonstration farms.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Evaluation Results

PCC: By conducting a series of trainings, aquaculture exhibits, tour at PCC hatchery and demonstrating the seed production and grow-out techniques for the mangrove crabs, rabbitfish and milkfish, people became aware about the importance of aquaculture in attaining food security and providing additional source of income in the country. Local fish farmers learned the proper methods in farming these species and they become more interested to continue their grow-out operation. Currently, there are five farms that continued growing the mangrove crabs. More farmers became interested in growing rabbitfish in floating net cages. One hatchery now continues producing rabbitfish juveniles that provides additional seed stock to the fish farmers.
CMI: After over 6 years of no research proposal submissions, a new project proposal was approved in August 2018. A native Clam species Asaphis violascens was selected for aquaculture and restocking purposes.
COM-FSM: Feedback from the 2 farmers and one community who have been adopting sea cucumber farming has been positive and encouraging. Post evaluation results of previous clients have shown that those who acquired knowledge, skills and adopted the technology have been undertaking it with confidence, patience and assurance that this would benefit them in the long term. The feedback provided were used to modify and improve program deliveries to new clients and lessons learned shared with the National and State Government to form Aquaculture friendly policies.

Key Items of Evaluation

Key Items of Evaluation

PCC: More people are becoming interested to start farming rabbitfish, milkfish, mangrove crab and grouper. Existing farmers need additional support on their seedstock requirements, therefore hatchery production need to be intensified.
CMI: During this period the Microalgal laboratory at Arrak campus was put in operation, and 9 different strains of micro algae are maintained. This activity served as support for the larviculture and for future projects involving other species. A training on the main techniques on the routines for inoculation and maintenance of the microalgae strains was given to the aquaculture laboratory staff. Forty thousand black lip pearl oyster spat were produced as part of a training program to develop technology to produce half pearls to improve the Marshallese people's income.
COM-FSM: Increased number of grow-out demonstration facilities, increase in seed production for important aquaculture species,increased request to provide technical support to develop sustainable aquaculture practices, increased number of farmers adopting sustainable aquaculture practices, increased push in the FSM National and State Governments to provide a positive environment to develop sustainable aquaculture.

V(A). Planned Program (Summary)

Program # 2

1. Name of the Planned Program

Families, Youths & Communities

☑ Reporting on this Program

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
403	Waste Disposal, Recycling, and Reuse	10%		10%	
608	Community Resource Planning and Development	10%		10%	
801	Individual and Family Resource Management	20%		20%	
802	Human Development and Family Well-Being	20%		20%	
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures	10%		10%	
806	Youth Development	30%		30%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2018	Extension		Research	
	1862	1890	1862	1890
Plan	9.0	0.0	1.0	0.0
Actual Paid	6.0	0.0	1.0	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**
153782	0	56809	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
16973	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

Cultural arts and crafts training sessions targeting adults and youths will be conducted in the communities. Youths will be encouraged to participate in various community programs such as beautification, gardening, and World Clean Up Day. Life skills, sports and physical fitness are components of youth programs. Children will also be encouraged to participate in civic activities and be involved more actively in the political process. Volunteers will be recruited to serve as liaisons between the colleges and their respective communities and will assist as clientele recruiters. Other volunteers from collaborating agencies in Micronesia will serve as resource persons, mentors and youth leaders in youth development programs, and lecturers where their expertise is needed. Training people with relevant income-generating and entrepreneurial skills such as sewing, gardening, weaving, making handicrafts, and cooking. These activities will utilize their potential through income generation activities will improve their financial status and improve their family or individual economic stability, and therefore lead to an improved quality of life. Counseling and mentoring about good moral character development and literacy will be provided.

2. Brief description of the target audience

Families, youths and communities all over Micronesia.

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2018	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	383	1632	1337	2661

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

Patent Applications Submitted

Year:	2018
Actual:	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2018	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
2018	16

Output #2

Output Measure

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

Year	Actual
2018	68

Output #3

Output Measure

- Total number of youth clubs, men's group, or women's groups activities organized.

Year	Actual
2018	29

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of youths with increased knowledge in social and moral skills.
2	Number of families and/or youths adopting entrepreneurial skills.
3	Number of community groups or associations benefiting from the use of learned skills.

Outcome #1

1. Outcome Measures

Number of youths with increased knowledge in social and moral skills.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2018	1474

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Issue (Who cares and Why)
CMI: Declining moral skills and associated increase in social problems have become an issue of concern among the youth. Increased understanding about roles and relationships would help them to take responsibilities in the community.
COM-FSM: Youths lack the understanding that they can make a difference in their families, in their social groups and communities. They are limited in their awareness and understanding about the key roles they can play in sustaining their family?s livelihood and health. Youths nowadays are more likely to be on social media such as Facebook and Instagram than being outdoor and participating in programs to increase their skills in entrepreneurship opportunities. Basic livelihood skills are such as sewing, weaving, carving and entrepreneurial knowledge are very limited or not available. Many families and youths in the communities lack the basic information and skills on best practices in food handling, preparation and processing.

What has been done
What has been done.
CMI: Extension and outreach activities were conducted to help address social issues including substance abuse awareness workshops, birth control and abstinence. Organized training activities and informal lectures on sports in schools and in the community.
COM-FSM: Trainings, demonstrations, technical advice, and presentations were conducted to the targeted audience. These activities provided learning opportunity in entrepreneurial skills (introduction to business planning, marketing, sales forecast and cash flows projection, request for financing, and sale analysis). Heath and financial benefit, cooking, and nutrition were taught to the communities.

Results

Results

CMI: Community extension programs focusing youth issues have become popular as increased number of requests received from schools and communities. Youths have increased their knowledge in social and moral skills.

COM-FSM: Participants learned importance of fruits and vegetables to human health. They became aware of local plant materials and plastics as cheap sources for handicraft making. Youths were more engaged in various youth development programs and had increased awareness and understanding of roles and relationship with their families and communities. Youth participation had increased in trainings on topics such as food safety, food crop and plant science, and physical exercise.

4. Associated Knowledge Areas

KA Code	Knowledge Area
403	Waste Disposal, Recycling, and Reuse
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

Outcome #2

1. Outcome Measures

Number of families and/or youths adopting entrepreneurial skills.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2018	276

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Issue (Who cares and Why)
CMI: Youths and their families need skills in vegetable gardening skills that could help them provide a source of livelihood and income.
COM-FSM: There was heavy dependence on employed relatives to provide the needs for the whole family. The unemployed had no incentive to seek employment and the culture tolerance adds to this issue. There is limited knowledge and skills on how to run home-base businesses and to increase export sales. Families have limited financial resources start their business in sewing, handicrafts, carving, and gardening.

What has been done
What has been done
CMI: Extension activities provided families and unemployed youths best management practices in establishing backyard gardens for income.
COM-FSM: Trainings were conducted on entrepreneurship skills, home gardening, sports activities, and sewing, handicrafts, and carving.

Results
Results
CMI: Five backyard gardens were established to provide learning opportunities and income for the families and communities.
COM-FSM: Participants from sewing and handicrafts training sold their crafts and homemade products in local stores and earned income for their families. Interests in sports and gardening have increased as a form of physical activities or source of income. Participants had improved skills on business planning, carving, handicrafts, and sewing.

4. Associated Knowledge Areas

KA Code	Knowledge Area
403	Waste Disposal, Recycling, and Reuse
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

Outcome #3

1. Outcome Measures

Number of community groups or associations benefiting from the use of learned skills.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2018	104

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Issue (Who cares and Why)
CMI: Sustainable and traditional fishing methods are not commonly followed among many fishermen resulting to heavy depletion of valuable fish species. The younger generation lack knowledge of sustainable traditional fishing methods.
COM-FSM: Communities and families are increasingly facing challenges to address social problems among youth . Training young people with relevant skills to utilize their potential through income generating activities would improve their financial status and increase their family or individual economic stability. Many participants had not fully benefited from learned livelihood training and skills due to limited financial resources and capital to expand their home business. There is lack of appreciation for vegetable gardening, which required intensive care and management as compared to traditional crops such as banana, coconut, and breadfruit.

What has been done

What has been done
CMI: Extension activities included presentations and informal lectures on traditional methods such as construction and use of traditional fish traps made from salt-tolerant wood.
COM-FSM: Follow-up visit and interview, close monitoring program participants, and collaborations with small business development centers and schools were conducted. In addition, continuous encouragement and advisory counseling were provided to the targeted audiences. Technical assistance and hands-on trainings in handicrafts, sewing, carvings, and vegetable gardening were also provided to youth groups.

Results

Results
CMI: A 25-member church-affiliated male group and a group of 9 unemployed male youth benefited and appreciated the use of traditional fish traps to conserve fish population and carry out sustainable fishing activities.
COM-FSM: Participants became entrepreneurs and successfully exported their hand-made merchandises. Youth and community groups sold their crops and vegetables during public and community events. Youth gardens were established and provided nutritious and fresh vegetables for their families and in the local market.

4. Associated Knowledge Areas

KA Code	Knowledge Area
403	Waste Disposal, Recycling, and Reuse
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

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

Brief Explanation
CMI: Competing public priorities among collaborators and agencies resulted in limited implementation of youth development programs.
COM-FSM: Inclement weather limited the number of trainings and meetings in the communities.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Evaluation Results
CMI: Extension activities includes focus group meetings and open discussion forums with invited stakeholders. The results were very positive in the sense that everyone involved had a better understanding of how to link and connect with each other. A national strategic plan that includes CMI land grant has been reviewed and approved and will be followed starting in 2019. In addition, to help support youth initiatives, CMI recently established Youth Corps Program and is now being implemented alongside CMI land grant extension programs.
COM-FSM: High school gardening clubs promote health benefits of fruits and vegetables to the entire high school students. Many participants have reported that they have used disseminated local recipes in school and community fund raising. Several participants displayed their sewn clothes during recently held local trade Fair. As result of interviews and observations, youth programs have improved behavior and condition of participants. Youths and young parents are sewing good products, practicing carving and weaving techniques and generating income for their families. The Public school is relying on CRE

training programs and are insisting more students, mostly males, to enter into the training course.

Key Items of Evaluation

Key Items of Evaluation

CMI:

- Increased knowledge of participants
- Improved understanding among participants
- Increased change in behavior among participants
- Decreased number of dropouts
- Decreased number of unemployed youth

COM-FSM:

- Increased income and family well-being

Encouraged youths to become contributing members of family and society

V(A). Planned Program (Summary)

Program # 3

1. Name of the Planned Program

Childhood Obesity

☑ Reporting on this Program

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
703	Nutrition Education and Behavior	30%		30%	
704	Nutrition and Hunger in the Population	20%		20%	
724	Healthy Lifestyle	30%		30%	
802	Human Development and Family Well-Being	20%		20%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2018	Extension		Research	
	1862	1890	1862	1890
Plan	4.0	0.0	1.5	0.0
Actual Paid	2.3	0.0	1.0	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**
58950	0	56809	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
6506	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

Program will reduce childhood obesity through technical assistance and trainings, physical activities, educating parents, teachers, and children on healthy food consumption and active living, teaching physical activities and movement, healthy living in Micronesia , and physical fitness.

Work with leadership and policy makers to develop policies to serve healthy food in schools and communities, and to incorporate agriculture and physical fitness in the curriculum.
Work in collaboration with youth services, Departments of Education, agriculture and Health Services, and non-government organizations (NGOS) to develop and implement programs.

2. Brief description of the target audience

The target audiences include children, teachers, parents, school administrators, policy makers, and others.

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2018	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	818	16800	617	20725

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

Patent Applications Submitted

Year:	2018
Actual:	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2018	Extension	Research	Total
Actual	2	0	2

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of conference papers and extension publications on childhood obesity and physical activity.

Year	Actual
2018	2

Output #2

Output Measure

- Number of training conducted on childhood obesity, proper diet and physical activity.

Year	Actual
2018	6

Output #3

Output Measure

- Number of extension publications on childhood obesity, proper diet and physical activity.

Year	Actual
2018	2

Output #4

Output Measure

- Number of training conducted on proper diet and physical activity.

Year	Actual
2018	4

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of clients with increased knowledge in healthy food choices and physical activity.
2	Number of program participants adopting recommended practices on healthy food choices and physical activity.
3	Reduction in the number of obese children.

Outcome #1

1. Outcome Measures

Number of clients with increased knowledge in healthy food choices and physical activity.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2018	2029

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Issue (Who cares and Why)
PCC: There is a need to increase awareness of the importance of healthy diet and physical activity among children. The lack of this knowledge and application contributes to the increase of obesity among children.
CMI: There is a prevalent and alarming increase in the rate of obesity among women and children in the RMI.
COM-FSM: Targeted audience have limited knowledge and skills in the area of nutrition and physical activities. There is a need to increase the understanding of the importance of how these relates to health.

What has been done

What has been done
PCC: Two agriculture camps and five table top garden demonstrations were conducted in different schools that involved about 200 participants. About 87 table top gardens were distributed and children were taught about how to take care of vegetables. Participants had the opportunity to be physically involved in maintaining their own table top garden. Cooking demonstrations were also conducted to teach children on vegetable utilization. Foods grown in their gardens are added to their daily meals, healthier meals are prepared and consumed.
CMI: Through collaborative efforts, extension services not only provided vital information on healthy lifestyles to school children, but also provided fun and motivation in carrying out physical activities. In addition, given the limited resources in this program, there is now an ongoing effort to revamp and revitalize these extension activities through collaboration with other organizations such as the college?s recently established Youth Corps Program and the Ministry of Internal Affair?s Youth Bureau in order to reach a wider population in the Marshall Islands.

COM-FSM: Cooking demonstrations and trainings about affordable recipes, healthy food choices, physical activities, and using local produce were conducted. The target audience were informed about health benefits of these recipes particularly ingredients. These cooking demonstrations emphasized use of local produce, less salt, fats and sugar and the effects (negative and positive) of these ingredients.

Results

Results

PCC: Children learned how to grow vegetables in their homes, involved in gardening activities and learned to include vegetables as part of their diet.

CMI: Students showed great interest and motivation through their participation in the activities and many schools have started physical fitness action plans as part of the curriculum.

COM-FSM: There was increased awareness among targeted audience about health consequences of poor diets and lack of physical activities, and how to offset obesity and other non-communicable diseases in the communities of the targeted audience.

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior
704	Nutrition and Hunger in the Population
724	Healthy Lifestyle
802	Human Development and Family Well-Being

Outcome #2

1. Outcome Measures

Number of program participants adopting recommended practices on healthy food choices and physical activity.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2018	959

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Issue (Who cares and Why)
PCC: Many children in Palau are not used to eat vegetables as part of the diet and lack of physical activities lead to obesity.
CMI: Lack of knowledge on unhealthy and imported food, and lack of exercise along with limited resources and relevant programs contributes immensely to the rise in childhood obesity.
COM-FSM: In spite of collaborated efforts of government and non-government agencies in promoting healthy lifestyle in reducing childhood obesity, many local people still depend on the convenience of unhealthy food selection such as imported and processed foods. In addition to unhealthy choices, there is high preference of sedentary lifestyles to the active lifestyle. Ergo, there is a high incident of non-communicable diseases that concerns the program participants.

What has been done

What has been done
PCC: Children were taught how to take care of plants daily and encouraged them to eat more vegetables from self-grown table top gardens. They were also taught how to prepare healthy nutritious meals.
CMI: Through collaborative efforts, extension services not only provided vital information on healthy lifestyles to school children, but actually provided fun and motivation in doing physical activities with a strong emphasis on the development of personal goals and objectives in keeping in shape.
COM-FSM: After review of lessons taught during previous training sessions, follow-up visits, nutritional surveys and cooking demonstrations were conducted. Additional information about health benefits of consuming local fruits and vegetables and possible complications from poor lifestyles were disseminated.

Results

Results
PCC: Children learned how to plant and take care for their vegetable gardens and prepare healthy nutritious dishes to prevent obesity.
CMI: Students in each of the participating schools were able to develop their own personal physical fitness activity plans as well as their daily food intake plans in correlation with the main nutritional food groups.
COM-FSM: Increased number of target audience adopted recommended healthy eating practices and regular physical activities.

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior
704	Nutrition and Hunger in the Population
724	Healthy Lifestyle
802	Human Development and Family Well-Being

Outcome #3

1. Outcome Measures

Reduction in the number of obese children.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2018	183

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Issue (Who cares and Why)
PCC: Eating unhealthy foods in conjunction with less physical activity lead to increased childhood obesity. Children are not aware about the healthy diets and the benefits of doing home gardening during their spare time.
CMI: It is of the utmost significant that prior and post data is collected in order to effectively measure the effectiveness and impact of these services and activities. The current data only shows the number of clients served, but not the desired reduction in number of obese children (This is not an issue. If no activity was conducted for this outcome, it should be mentioned as ?no report.?)
COM-FSM: Program participants still have prevailing health concerns and lack of incentive/ motivation to change their lifestyle to address their health issues.

What has been done
What has been done
PCC: Children were taught how to prepare vegetable dishes and encouraged to increase physical activity by engaging in home gardening.
CMI: As mention in the previous planned program (Youth & Family Health), there were no specific data collected to accommodate these measurements and to make comparisons (see comment above).
COM-FSM: Trainings and information campaigns for adoption of healthy lifestyle were conducted. Through demonstrations of home gardening, food preparation/preservation, dissemination of healthy recipes, participants were encouraged to consume locally grown fruits and vegetables in every meal.

Results

Results

PCC: Of the 287 children that were reached, 200 of them adopted home gardening program and learned to eat vegetables as part of their diet. This resulted in reducing the incidence of the level of childhood obesity in the target groups.

CMI: This shortfall is anticipated to be taken care of in 2019 where data will be collected and used as baseline when these new extension agents are more in-tuned with the programs? goals and objectives (see comment above).

COM-FSM: Results of concerted trainings and information campaign were evident in increased consumption of fruits and vegetables and a greater number of sports activities among targeted audience. The change of lifestyle benefits is evident in diabetic patients/participants in controlling their blood sugar level and decrease in number of hospital visits.

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior
704	Nutrition and Hunger in the Population
724	Healthy Lifestyle
802	Human Development and Family Well-Being

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

Brief Explanation

PCC: The President of the nation declared year 2018 as year of good health in Palau. With this initiative, efforts and collaboration have put in place to change the school hot lunch program. It is now required that vegetable should be art of children's lunch and efforts are underway through trainings and other interventions on the target groups.

CMI: Currently, there is no legislation focusing on childhood obesity that makes it difficult in terms of program support. In addition, the lack of Government Regulations on imported consumer goods and recommended quality diets creates a stumbling block for the effective delivery of services.

COM-FSM: Bad weather, culture and tradition including funerals and community events, government priorities, policies and appropriations, transportation availability in islands affect program planning and implementation.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

V(I). Planned Program (Evaluation Studies)

Evaluation Results
PCC: There is a positive feedback from the community regarding the table top gardening and cooking demonstrations.
CMI: Through the extension activities provided, it was apparent that contributing factors to childhood obesity is not an issue within many of the schools that were served. Two extension activities that were conducted with college students and local people in the community revealed that although the issue is evident, there is lack of awareness, action and support from officials.
COM-FSM: Regular monitoring of participants is essential to ensure the sustainability of healthy lifestyle of the targeted audience. At present, the participants acknowledged their awareness of eating healthy fruits and vegetables, and physical activity in order to reduce obesity or risk of obesity in their families.

Key Items of Evaluation

Key Items of Evaluation

PCC: Increased in vegetable consumption and physical activities of the children working with home and school gardening. A strong collaboration has built with the other partner institutions to continue and expand school gardening activities.
CMI: Needs Assessments & Open Forum Discussions
FSM: Increased knowledge on balanced diet, health, healthy cooking and physical activities.

V(A). Planned Program (Summary)

Program # 4

1. Name of the Planned Program

Climate Change

☑ Reporting on this Program

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
111	Conservation and Efficient Use of Water	10%		10%	
112	Watershed Protection and Management	5%		5%	
125	Agroforestry	15%		10%	
131	Alternative Uses of Land	10%		10%	
132	Weather and Climate	5%		10%	
133	Pollution Prevention and Mitigation	10%		5%	
135	Aquatic and Terrestrial Wildlife	10%		10%	
136	Conservation of Biological Diversity	10%		10%	
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants	5%		5%	
315	Animal Welfare/Well-Being and Protection	10%		15%	
605	Natural Resource and Environmental Economics	10%		10%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2018	Extension		Research	
	1862	1890	1862	1890
Plan	2.0	0.0	3.0	0.0
Actual Paid	6.7	0.0	1.8	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**
171723	0	102256	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
18953	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

1. Provide awareness programs on climate change adaptation

1. Collaborate with government and non-governmental organizations on climate change adaptation efforts

1. Demonstrate cultivation of certain crops suitable to grow under atoll condition
2. Provide training to island communities on climate-smart agriculture, breed and techniques

1. Distribution of salt tolerant planting materials for staple crops

1. Assist with appropriate animal care and management

1. Disseminate results/findings of successful food production systems to other islands

1. Frequent monitoring, data collection and evaluation on climate change project sites

2. Brief description of the target audience

Target audiences are all communities throughout Micronesia and local, state and national governments, the private sectors, and other organizations.

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2018	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	568	1280	132	535

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

Patent Applications Submitted

Year: 2018

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2018	Extension	Research	Total
Actual	1	0	1

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of people with increased awareness and knowledge about climate change and adaptation.

Year	Actual
2018	473

Output #2

Output Measure

- Number of people who adopted adaptation practices .

Year	Actual
2018	1152

Output #3

Output Measure

- Number of people with improved preparedness toward climate change impacts including capacity to produce and preserve food.

Year	Actual
2018	3000

Output #4

Output Measure

- Increased staple food crop production.

Year	Actual
2018	400

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of persons with increased awareness and knowledge of climate change adaptation and mitigation.
2	Number of program participants who adopted adaption and mitigation practices.
3	Number of persons with improved preparedness toward climate change impacts including capacity to produce and preserve foods.

Outcome #1

1. Outcome Measures

Number of persons with increased awareness and knowledge of climate change adaptation and mitigation.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2018	926

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Issue (Who cares and Why)
CMI: Local population need awareness on appropriate adaptation strategies to cope with and lessen the impacts of climate change effects.
COM-FSM: Enhanced awareness on locally suitable adaptation strategies and protection of traditional agroforests is required for island communities to counteract the ill effects of climate variability.

What has been done
What has been done
CMI: Extension activities were conducted to impart knowledge on appropriate adaptation strategies to cope with the effects of climate change through presentations, open forum discussions with students, teachers, school administrators, traditional leaders, and informal lectures with various members of the community. Information brochures were distributed to supplement direct contact activities.
COM-FSM: Conducted awareness activities on locally appropriate adaptation strategies and importance of preserving traditional agroforests through training workshops, educational activities, lectures, demonstrations, and one-on-one interventions.

Results
Results
CMI: Training and outreach activities helped participants to improve their knowledge and understanding of the importance of climate change issues and how to alleviate impacts through appropriate adaptation strategies.

COM-FSM: Awareness programs helped participants to learn more about various adaptation strategies and importance of agroforestry practices to reduce the impacts of climate variability on traditional agriculture.

4. Associated Knowledge Areas

KA Code	Knowledge Area
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management
125	Agroforestry
131	Alternative Uses of Land
132	Weather and Climate
133	Pollution Prevention and Mitigation
135	Aquatic and Terrestrial Wildlife
136	Conservation of Biological Diversity
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants
315	Animal Welfare/Well-Being and Protection
605	Natural Resource and Environmental Economics

Outcome #2

1. Outcome Measures

Number of program participants who adopted adaption and mitigation practices.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2018	1910

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Issue (Who cares and Why)
PCC: No report
CMI: No report

COM-FSM: Though aware of various consequences, adoption of various adaptive measures to counteract the ill-effects resulting from extreme weather events induced by climate change is low.

What has been done

What has been done
PCC:
CMI:
COM-FSM: Training and demonstrations were conducted that focused on the use of local materials for container gardening, raised beds and planting salt tolerant crops, and proper solid waste management practices . In addition, inter-cropping method has already been implemented and practiced especially in slopes where some Kava cultivation is prevalent.

Results

Results
PCC:
CMI:
COM-FSM: Participants maintained container vegetable gardens and raised beds for growing vegetables for family consumption. They grew salt-tolerant staple crops like giant swamp taro. They opted composting methods rather than burning biodegradable wastes. Plastics were recycled into usable forms including pillows. Kava farmers adopted slope protection measures by planting indigenous tree species.

4. Associated Knowledge Areas

KA Code	Knowledge Area
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management
125	Agroforestry
131	Alternative Uses of Land
132	Weather and Climate
133	Pollution Prevention and Mitigation
135	Aquatic and Terrestrial Wildlife
136	Conservation of Biological Diversity
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants
315	Animal Welfare/Well-Being and Protection
605	Natural Resource and Environmental Economics

Outcome #3

1. Outcome Measures

Number of persons with improved preparedness toward climate change impacts including capacity to produce and preserve foods.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2018	430

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Issue (Who cares and Why)
PCC:
CMI:
COM-FSM: Targeted audience need skills in securing climate hardy food sources to enhance sustainable crop under a changing climate. Kava cultivation within the agroforest settings lack proper management plan.

What has been done
What has been done
PCC:
CMI:
COM-FSM: In collaboration with community partners, trainings and demonstrations in climate-ready crops conducted. Kava farmers have been taught appropriate management plans for slope protection and soil erosion control.

Results
Results
PCC:
CMI:
COM-FSM: Increased number of families have established and maintained their own gardens with vegetables and staple crops such as sweet potato, banana among others. Kava farmers began implementing intercropping within agroforestry settings.

4. Associated Knowledge Areas

KA Code	Knowledge Area
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management
125	Agroforestry
131	Alternative Uses of Land
132	Weather and Climate
133	Pollution Prevention and Mitigation
135	Aquatic and Terrestrial Wildlife
136	Conservation of Biological Diversity
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants
315	Animal Welfare/Well-Being and Protection
605	Natural Resource and Environmental Economics

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

Brief Explanation
PCC:
CMI: In terms of natural disaster, the prevailing drought conditions in most of the northern and northwestern islands and atolls are resulting in less rainfall which is negatively affecting food production and quality of potable water.
COM-FSM: Planned activities were cancelled or delayed because of emerging conflicts with community events such as funerals, non-availability of motorboats for interisland activities or inclement weather.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Evaluation Results
CMI: Extension activities provided informal education on the impacts of climate change and what people can do to help minimize these impacts.
COM-FSM: More demonstration gardens were needed to secure their food sources in the eventualities of flooding and typhoons. They knew the consequences of climate change

impacts and practiced composting instead of burning biodegradables, planting rather than cutting trees in their backyards.

Key Items of Evaluation

Key Items of Evaluation

CMI: Severe weather patterns such as frequent and longer droughts are more common than ever before, and this is taking a serious toll on the normal production of food and quality drinkable water.

V(A). Planned Program (Summary)

Program # 5

1. Name of the Planned Program

Food Safety

☑ Reporting on this Program

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
703	Nutrition Education and Behavior	20%		20%	
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources	20%		20%	
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	20%		20%	
724	Healthy Lifestyle	40%		40%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2018	Extension		Research	
	1862	1890	1862	1890
Plan	3.0	0.0	1.0	0.0
Actual Paid	2.9	0.0	1.5	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**
74328	0	85213	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
8203	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

Training programs on safe food production, preparation, handling, storage and use will be conducted to school children, housewives, school cooks, food handlers, chefs and others.

2. Brief description of the target audience

Target audience include school children , food handlers and producers, chefs, school cooks, housewives, food and grocery establishments in all communities throughout Micronesia and local, state and national governments, the private sectors, and other organizations.

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2018	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	1015	4211	599	2180

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

Patent Applications Submitted

Year:	2018
Actual:	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2018	Extension	Research	Total
Actual	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of persons attending training activities on food safety.

Year	Actual
2018	2409

Output #2

Output Measure

- Number of persons with increased knowledge and practices after completing educational programs.

Year	Actual
2018	2509

Output #3

Output Measure

- Number of research and extension publications on food safety.

Year	Actual
2018	0

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of persons with increased awareness of food safety issues.
2	Number of program participants adopting recommended practices after completing educational programs.
3	Reduced incidences of food-borne and water-borne illnesses.

Outcome #1

1. Outcome Measures

Number of persons with increased awareness of food safety issues.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2018	1614

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Issue (Who cares and Why)
PCC: Food handlers are not well informed on proper handling behaviors to prevent food borne illnesses.
COM-FSM: Targeted audience have limited skills and knowledge in food safety methods. The unsafe, unsanitary, inappropriate methodologies in food handling contribute to water and food borne illnesses.
CMI: Food-borne illnesses are a part of everyday life in atolls that eventually put a huge burden and responsibility on the national government and the medical care system in terms of expenses.

What has been done

What has been done
PCC: Food safety trainings were conducted to 200 participants and were taught to wash their hands or apply sanitizers before eating.
COM-FSM: Conducted training workshops on food safety in collaboration with local agencies such as Health Services and Department of Education. The topics included proper food, hand washing, food storage, food preservation and food selection techniques; food expiration, follow-ups and public awareness were conducted for target audiences? benefit.
CMI: Food Technologist provided technical assessment to 7 public and private food vendors, provided technical assistance of best practices and recommendations. Collaboratively, both researchers and the extension agents worked together to put together banners, poster boards, brochures and pamphlets for distribution to the general public during public events.

Results

Results
PCC: Key food handling behaviors such as practicing personal hygiene, cooking foods adequately, avoiding cross-contamination, keeping food at safe temperature, avoiding food from unsafe source and proper hand-washing.
COM-FSM: Participants learned the proper food handling techniques to prevent bacterial contamination food leading to water-and food-borne illnesses e.g. maintaining hygiene in their kitchen and sanitary handling food during meal preparation.
CMI: Seventy-four individuals are more aware of the adverse consequences of not practicing food safety protocols and procedures versus the positive, productive and healthy benefits. Food vendors are now shifting from their business as usual perceptions to develop their own food safety protocols and procedures.

4. Associated Knowledge Areas

KA Code	Knowledge Area
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
2018	857

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Issue (Who cares and Why)
PCC: Food handlers are not practicing proper food handling techniques to prevent food borne

illnesses.
COM-FSM: Food and water-borne illnesses occur because of limited adoption of proper and safe food handling. Salt, sugar and fat intake is a preference and ultimately increased number of non-communicable diseases (NCD) cases.
CMI: Food borne illnesses are a common issue due to lack of understanding of food safety, and the absence of practicing the required skills and procedures further complicate these issues.

What has been done
What has been done
PCC: Food handlers were taught with proper food handling techniques in food safety classes.
COM-FSM: Demonstrations, lectures, and training on the proper food handling techniques were conducted followed by follow-up and interviews and observations after training to monitor changes in their food preparation. Food demonstrations doctored to show the positive effects of using less salt, sugar and fat in cooking and/or food preparation. Follow-up visits with targeted audiences to assess positive changes and recommended practices.
CMI: With the knowledge already provided through the visiting inspections and informal training, arrangements were made with 5 food vendors that are ready to put these practices into action. The other 2 vendors will further upgrade their facilities first and then a follow up inspection will be carried out before the food safety procedures and protocols are implemented.

Results
Results
PCC: 200 participants for Food Safety Classes have adopted behaviors in proper food handling such as practicing good personal hygiene, cooking foods adequately, avoiding cross contamination, keeping food at safe temperature and avoiding food from unsafe source.
COM-FSM: Most participants adopted proper food handling and storage methods where power is not available. Participants have started to reduce salt, sugar and fats in food preparation after completing educational program. Program participants adopted the food safety methods by increasing food safety techniques at homes, communities and schools.
CMI: Report missing

4. Associated Knowledge Areas

KA Code	Knowledge Area
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

Reduced incidences of food-borne and water-borne illnesses.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2018	115

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Issue (Who cares and Why)
PCC: Food handlers and consumers do not practice food handling procedures resulting in outbreak in food borne illnesses that occurred in the community due to warm temperature and humidity.
COM-FSM: Limited collaboration with local agencies to elaborate more on unsafe food handling, unhealthy food behavior resulting in food-borne and water-borne illnesses.
CMI: The issues of water-borne illnesses are currently being addressed by the Water Quality Extension Agent and reduction in food-borne illnesses is at starting point.

What has been done

What has been done
PCC: 200 food handlers were taught on how to avoid food borne illnesses through proper food safety practice and were taught on proper hand-washing techniques.
COM-FSM: Targeted audiences were taught proper hand washings techniques; hygiene in the kitchen, proper handling, cooking and storage of food. Expanded partnership with supporting agencies such as Department of Health Services and Department of Education.

CMI: Seventy-eight people including five food vendors were assisted with technical assessments and offered technical assistance on the best practices and up to date recommendations on food safety procedures and protocols.

Results

Results
PCC: There was no incidence of food borne illnesses in Palau due to the conduct of food safety classes among food handlers.

COM-FSM: Incidence of food-and water- borne diseases was significantly reduced among participants? families. Increased number of families using refrigerator, applied proper storage, concerned personal hygiene, applied safe food preparation, and protected food and water from contamination. There is change in healthy lifestyle toward food safety decrease in the number of hospital visitation.
CMI: The lack of valid and reliable data is not available at the present time to make the requirement measurements.

4. Associated Knowledge Areas

KA Code	Knowledge Area
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

Brief Explanation

1.
COM-FSM: Bad weather, unpredicted community events like funerals, change in government program priorities lack of water transportation and high fuel costs affected the smooth program delivery to islands.

CMI: RMI has made considerable progress in establishing producer-consumer regulations and policies through the RMI EPA department in some areas on Food Safety. One such regulation requires food vendors to have a license and a food handling certificate that must be renewed every 6 months for every employee that is involved in food production- cooked or otherwise. A sub-division of the RMI EPA is solely responsible for carrying out inspections on all retail businesses and all public and private vendors that sell food and

drinking water. While this is a wonderful progress toward a society free of food-borne illnesses, there are no regulations and policies that govern the production of food and water at every home. With an economy of limited resources and a small GDP, not every single household is capable of establishing kitchens and food preparation facilities that are 100% safe from pathogens, micro-organisms and other parasites that cause illnesses.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Evaluation Results

1.

COM-FSM: Participants are aware of different possible contamination from expired food items sold in local stores, kept their kitchen clean and aware of bacterial growth in relation to hand washing.

CMI: The visiting inspections by the Food Technologist and the summary finding reports produced reveal that on average, almost all facilities visited do not meet all food safety standards. Reports from the Ministry of Health (MOH) still show that rather than decreasing, illnesses such as diarrhea resulting from identified parasites indicate that the ongoing number of cases is a direct result of poor food safety procedures and protocols.

Key Items of Evaluation

Key Items of Evaluation

PCC: Food safety training materials such as DVDs on proper food handling need to bee shown to participants.

-

- Increased knowledge of proper food handling
- Increased awareness of water-and food-borne illnesses from bacterial contamination
- Increased adoption of food safety practices
- Reduced water-and-food-borne diseases Needs to be put into sentence.

CMI: Visits, Inspections, Report Finding, Data collected from Ministry of Health

V(A). Planned Program (Summary)

Program # 6

1. Name of the Planned Program

Global Food Security and Hunger

☑ Reporting on this Program

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
102	Soil, Plant, Water, Nutrient Relationships	10%		10%	
112	Watershed Protection and Management	10%		10%	
136	Conservation of Biological Diversity	10%		10%	
202	Plant Genetic Resources	10%		10%	
204	Plant Product Quality and Utility (Preharvest)	10%		10%	
205	Plant Management Systems	10%		10%	
212	Pathogens and Nematodes Affecting Plants	5%		5%	
216	Integrated Pest Management Systems	10%		10%	
315	Animal Welfare/Well-Being and Protection	5%		5%	
502	New and Improved Food Products	10%		10%	
601	Economics of Agricultural Production and Farm Management	10%		10%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2018	Extension		Research	
	1862	1890	1862	1890
Plan	16.0	0.0	6.0	0.0
Actual Paid	14.9	0.0	13.3	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**
381891	0	755558	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
42149	0	13242	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

Research and Extension integrated activities will include field trials to test and evaluate crop varieties, cultivation methods and ways to improve soil fertility. Extension activities on livestock will include utilizing excess local produce as feeds and how to improve management and bloodline. Other research activities will include tissue culture to develop efficient and reproducible micropropagation protocols and establish cultures of collected germplasm. Work in this area will include development of reliable micropropagation protocols and nursery management systems to produce elite seedlings for distribution and to conserve germplasm in vitro for future use.

Research-based extension materials will be developed and distributed among the farming communities to increase awareness and generate interest in agricultural systems. Workshops, group discussions, demonstrations, farm-visits and field days/fairs are other components of this program. Researchers will produce elite and disease-free seedlings through tissue culture and nursery techniques.

Trainings and demonstrations will be organized on food technology and food processing to increase shelf life of farm products and add value to agricultural produce thereby addressing food security issues.

2. Brief description of the target audience

Both crop, livestock and fish farmers, potential farmers, researchers and extension agents, homemakers and students.

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2018	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	3363	7955	1400	3040

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

Patent Applications Submitted

Year:	2018
Actual:	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2018	Extension	Research	Total
Actual	3	4	7

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Expected on-farm demonstrations.

Year	Actual
2018	45

Output #2

Output Measure

- Expected processing demonstrations.

Year	Actual
2018	19

Output #3

Output Measure

- Number of publications for lay use.

Year	Actual

2018	12

Output #4

Output Measure

- Number of conference papers and publications/presentations

Year	Actual
2018	2

Output #5

Output Measure

- Expected professional journal publications.

Year	Actual
2018	1

Output #6

Output Measure

- Expected gray literatures

Year	Actual
2018	12

Output #7

Output Measure

- Expected publications for lay use

Year	Actual
2018	12

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 persons with increased knowledge on appropriate processing technologies.
3	Number of persons adopting recommended practices.
4	Number of established farms producing/utilizing/selling produces and products.
5	Number of established businesses utilizing developed/processing tecnologies

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
2018	3645

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Issue (Who cares and Why)
PCC: Limited knowledge on high yielding planting materials and improved crop production techniques affects food production and enhance food security.
CMI: Farmers and producers have access limited access to information on suitable production techniques in atolls, including pests and disease management.
COM-FSM: Island communities need expertise on climate-smart food production systems with a diverse crop portfolio including animal production systems is required to deliver food and nutrition security needs.

What has been done
What has been done
PCC: Trainings on table top garden production technology were conducted along with the demonstration of important high yielding varieties of taro, banana, sweet potato, cassava, pineapple and yams.
CMI: Outreach and technical assistance were given to the farmers, schools and individual household members in food production methods and pests and disease management.
COM-FSM: Trainings, outreach and technical assistance programs on climate smart production systems, home gardening, livestock management were conducted for smallholders and students.

Results
Results
PCC: The communities gained knowledge on methods of growing vegetables, taro, banana, sweet potato, cassava and yam to ensure food security.

CMI: Participants have gained knowledge in food production methods, and pests and disease management.
COM-FSM: Smallholders and students have gained knowledge on climate smart food production systems to enhance food and nutrition security.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
112	Watershed Protection and Management
136	Conservation of Biological Diversity
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
502	New and Improved Food Products
601	Economics of Agricultural Production and Farm Management

Outcome #2

1. Outcome Measures

Number of persons with increased knowledge on appropriate processing technologies.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2018	2320

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Issue (Who cares and Why)
CMI: There is limited commercial food processing activities due to the lack of adequate skills.

COM-FSM: Communities require training in food processing and marketing practices to increase food availability, food safety and greater profitability. Increased food production in home gardens can be an important supplement to income and local food sufficiency.

What has been done

What has been done
CMI: Trainings on food processing techniques were conducted to food handlers, students and members of women groups.
COM-FSM: Workshops, presentations and one-on-one sessions have changed many clients? knowledge and behavior on processed food.

Results

Results
CMI: Participants have acquired knowledge and skills in processing banana jam and pandanus juice.
COM-FSM: Participants gained knowledge on processing taro and tapioca flour and banana chips.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
112	Watershed Protection and Management
136	Conservation of Biological Diversity
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
502	New and Improved Food Products
601	Economics of Agricultural Production and Farm Management

Outcome #3

1. Outcome Measures

Number of persons adopting recommended practices.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2018	792

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Issue (Who cares and Why)
PCC: Farmers are not utilizing disease-free planting materials and table top gardens to enhance crop production and ensure food security.
CMI: No activity
COM-FSM: Production of nutrient-rich food crops is challenging under extreme weather events. Food production systems can be better managed by adopting climate smart interventions to boost the outputs. Improved availability of animal products will reduce reliance on import and provide additional family income.

What has been done
What has been done
PCC: Demonstration of table top gardens were conducted in the communities and disease-free planting materials were distributed.

CMI: No activity
COM-FSM: Handouts, hands on demonstrations, recommended practices, technical assistance and training were provided to interested smallholders in establishing farms and processing facilities.

Results
Results
PCC: Communities are now using table-top gardens to supplement other vegetable production methods using disease-free planting materials.

CMI: No activity
COM-FSM: Increased number of clients grow vegetable and fruits for family consumption and local market utilizing climate smart methods. Extension interventions helped community members to establish sustainable food production systems to meet food and nutrition goals. Families are raising chickens, ducks for meat and eggs. A community has established a pigpen and is raising pigs for the local market. Many schools have also established vegetable gardens.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
112	Watershed Protection and Management
136	Conservation of Biological Diversity
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
502	New and Improved Food Products
601	Economics of Agricultural Production and Farm Management

Outcome #4

1. Outcome Measures

Number of established farms producing/utilizing/selling produces and products.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2018	333

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
PCC: Farmers were not aware of improved technologies and management practices to increase productivity.

CMI: No activity
COM-FSM: Communities need efficient crop production systems to adapt to disruptions from climate hazards and sustain production to meet market demands. Farmers are striving to meet demand for animal products, reduce import, and increase their family income.

What has been done
What has been done
PCC: Training and demonstration on proper cultural management practices and use of locally suitable high-quality planting materials were provided to farmers.

CMI: No activity

COM-FSM: Technical assistance and hands-on trainings were provided to farmers to enhance production and marketing of their produce. Planting materials of recommended vegetable crops were distributed to clients. Workshops on food production and food processing methods were conducted and appropriate educational materials were distributed.

Results
Results
PCC: More than 200 small-scale taro and pineapple farms and table-top gardens increased their production of vegetable crops for home consumption and local market.

CMI: No activity

COM-FSM: There are several established farms that are producing a combination of plant and animal products for the market. Their combined sales of vegetables, local crops, and poultry eggs (chicken and ducks) provided extra earnings of more than $15,000 for their families. One producer raised chickens and sold eggs to the local market at value of more than $30,000. A community-based organization marketed their vegetables with earnings of about $2000. Gardeners were able to produce and sell their surplus. Few clients are selling value-added products and earned additional income of about $1,450.00 in one year.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
112	Watershed Protection and Management
136	Conservation of Biological Diversity
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
502	New and Improved Food Products
601	Economics of Agricultural Production and Farm Management

Outcome #5

1. Outcome Measures

Number of established businesses utilizing developed/processing tecnologies

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2018	7

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Issue (Who cares and Why)
PCC: No report
CMI: There is lack of enough technical assistance to carry out food processing activities.
COM-FSM: Good quality and regular supplies of vegetables were lacking in local stores and restaurants. Producers complained about lack of seeds that could be bought in stores for planting. Establishing farm business is challenging for island communities.

What has been done
What has been done
PCC: No report
CMI: Provided technical assistance to clients interested in food processing techniques.
COM-FSM: Training and demonstrations were conducted for growing good quality vegetables. Production of seeds of local vegetables promoted. Value addition training workshops conducted.

Results
Results
PCC: No report
CMI: One client established a food processing unit and currently producing banana jam and pandanus juice.
COM-FSM: Few homemakers are selling chili sauce, banana and breadfruit chips locally and reported a net income of $1,450.00.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
112	Watershed Protection and Management
136	Conservation of Biological Diversity
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
502	New and Improved Food Products
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

Brief Explanation
PCC: No report
CMI: Natural disaster (drought). RMI relies on the amount of rainfall due to very limited of aquifer water source.
COM-FSM: Visits to islands for training, education and demonstration were hampered by bad weather, funeral in the island, lack of boats for transport and high or non-available fuel.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

PCC: The root crops germplasm collection at PCC R & D Station using tissue culture technique became a reliable source of high yielding varieties of taro, sweet potato, pineapple, banana, and cassava which are essential components to increase productivity. Table top garden proved as a safe and reliable system to produce vegetables for school and home consumption
CMI: Composting and mulching and some other water conservation practices (like

graywater from laundry) were widely promoted and adopted by many farmers for increased crop productivity.
COM-FSM: Participants shared to their friends, neighbors and relatives the knowledge and skills learned in gardening and preparing meals from their gardens. They saved money from preparing their pot luck to public gatherings and selling some produce to their communities.

Key Items of Evaluation

Key Items of Evaluation
PCC:

- Increased knowledge in growing local vegetables
- Increased adoption of composting and mulching
- Increased interest in knowing health benefits of the vegetables in their gardens
- Additional family incomes from selling vegetables

CMI: No report
COM-FSM:

- Increased knowledge in growing local vegetables
- Increased adoption of composting and mulching
- Increased interest in knowing health benefits of the vegetables in their gardens
- Additional family incomes from selling vegetables

VI. National Outcomes and Indicators

1. NIFA Selected Outcomes and Indicators

Childhood Obesity (Outcome 1, Indicator 1.c)	
0	Number of children and youth who reported eating more of healthy foods.
Climate Change (Outcome 1, Indicator 4)	
0	Number of new crop varieties, animal breeds, and genotypes whit climate adaptive traits.
Global Food Security and Hunger (Outcome 1, Indicator 4.a)	
0	Number of participants adopting best practices and technologies resulting in increased yield, reduced inputs, increased efficiency, increased economic return, and/or conservation of resources.
Global Food Security and Hunger (Outcome 2, Indicator 1)	
0	Number of new or improved innovations developed for food enterprises.
Food Safety (Outcome 1, Indicator 1)	
0	Number of viable technologies developed or modified for the detection and
Sustainable Energy (Outcome 3, Indicator 2)	
0	Number of farmers who adopted a dedicated bioenergy crop
Sustainable Energy (Outcome 3, Indicator 4)	
0	Tons of feedstocks delivered.