2015 College of Micronesia Combined Research and Extension Annual Report of Accomplishments and Results

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I. Report Overview

1. Executive Summary

Programs on mitigation and adaptation continued as the effects of climate change have been devastating on food security and food safety in the communities. Salt tolerant species of 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. Vacant positions have been filled with graduates of 2-year Agriculture and Natural Resources program. Student interns funded under the Resident Instruction in the Insular Areas grants have gained experience working with CRE services. Other capacity building activities included sustainable agriculture workshops, tissue culture and nursery practice, IPM, health and nutrition, and basic sewing attended by farmers, homemakers, the youth and adult sectors of the society and the underprivileged.

Total Actual Amount of professional FTEs/SYs for this State

Year: 2015	Extension		Research	
	1862	1890	1862	1890
Plan	40.0	0.0	14.0	0.0
Actual	38.8	0.0	20.2	0.0

II. Merit Review Process

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

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

2. Brief Explanation

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

III. Stakeholder Input

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

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

- Survey of selected individuals from the general public

Brief explanation.

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

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

1. Method to identify individuals and groups

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

Brief explanation.

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

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

1. Methods for collecting Stakeholder Input

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

Brief explanation.

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

3. A statement of how the input will be considered

- In the Budget Process
- To Identify Emerging Issues
- Redirect Extension Programs
- Redirect Research Programs
- In the Staff Hiring Process
- In the Action Plans
- To Set Priorities

Brief explanation.

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

Brief Explanation of what you learned from your Stakeholders

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

IV. Expenditure Summary

1. Total Actual Formula dollars Allocated (prepopulated from C-REEMS)			
Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
1290134	0	1161981	0

2. Totaled Actual dollars from Planned Programs Inputs				
	Extension		Research	
	Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
Actual Formula	1085316	0	1019626	0
Actual Matching	34454	0	13242	0
Actual All Other	0	0	0	0
Total Actual Expended	1119770	0	1032868	0

3. Amount of Above Actual Formula Dollars Expended which comes from Carryover funds from previous				
Carryover	1119770	0	896258	0

V. Planned Program Table of Content

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	15%		15%	
302	Nutrient Utilization in Animals	10%		10%	
307	Animal Management Systems	15%		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: 2015	Extension		Research	
	1862	1890	1862	1890
Plan	5.0	0.0	4.0	0.0
Actual Paid	5.7	0.0	4.4	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**
159441	0	368163	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
5062	0	0	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

PCC: Two hatchery runs were conducted to produce crablets of mangrove crabs at the hatchery and a grow-out trial for rabbit fish was done in floating cages. About 8,000 crablets were given to 8 local farmers for grow-out trials in ponds and cages and about 6,000 crablets were released to the mangroves for stock enhancement. Rabbitfish grown in tanks and floating cages have reached marketable size in less than 1 year and these were shown to visitors and fish farmers who came to the hatchery. Farmers interested on growing crabs and rabbitfish were entertained for technical discussions and guidance. A partnership between PCC and a local aquaculture company was continued for the implementation of a project on milkfish fry production. Posters and aquarium exhibits were shown to the public in national events.

CMI: Two runs for the production of pearl oyster spats were conducted; spats were continued to deliver to the three sites, two that are now established in Majuro. Like in previous years some were kept at the college's farm waiting for shipment to other potential farms. All that could happen while there is no researcher as yet. Continue maintenance of the species is needed or release all as we wait for the researcher to be on board. A half-pearl grafting training was also conducted through the main office in Pohnpei with outer-island participants as well as participants.

COM-FSM: Construction of a hatchery facility is near completion and will be in use as soon as the hatchery system is completed. Construction of the facility began during fiscal year 2014 following the signing of the Memorandum of Understanding (MOU) between the Yap State Government and the College. An Aquaculture agent was hired at the beginning of the fiscal year 2015 and immediately began to assist one community to maintain their fishpond project, by providing technical assistance in stock survey of rabbit fish juveniles, techniques of catching rabbit fish juveniles, pond reconditioning and feeding. Technical assistance including giant clam nursery, grow-out, and an open ocean culture was provided to the government and private entities. Two community groups were assisted in restocking of giant clam and with freshwater aquaponics.

At the primary aquaculture nursery, sea cucumber has been the primary focus. New management protocols were developed to control mortality of juveniles. 63,254 juveniles were produced from 4 spawning events in the year. Out-planting was attempted at four farms. Two tropical storms damaged the facility and killed most of the experimental stock. Spawning from the recaptured stock continues.

On-going extension efforts include half-pearl production, and value added training and assistance in marketing. Collaboration on a sea-weed project is conducted with the state fisheries and aquaculture

office. Five college students and one high school student were trained as interns during the year. The high school student presented a paper of his sea cucumber experiment at a conference in Washington D.C. during the year.

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

2015	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	334	2324	342	2276

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

Patent Applications Submitted

Year:	2015
Actual:	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2015	Extension	Research	Total
Actual	0	1	1

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of demonstration farms established.

Year	Actual
2015	18

Output #2

Output Measure

- Number of publications for lay use.

Year	Actual
2015	5

Output #3

Output Measure

- Number of conference paper and publication/presentation.

Year	Actual
2015	4

Output #4

Output Measure

- Expected Professional Journal publications.

Year	Actual
2015	0

Output #5

Output Measure

- Expected Gray Literatures.

Year	Actual
2015	4

Output #6

Output Measure

- Expected publications for lay use.

Year	Actual
2015	3

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

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

Outcome #1

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	501

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
PCC: Supply of mangrove crabs is very limited and people become interested in farming them. There is high interest in farming rabbitfish and milkfish and farmers need information on how to grow them.

CMI: Clients lack the understanding to do the work affectively and sustainably.

COM-FSM: Community members have limited knowledge, skills and opportunities in sustainable aquaculture technologies. Entrepreneurial opportunities exist in aquaculture.

What has been done
PCC: Hatchery-produced juveniles of crabs and rabbitfish were given to farmers and grow-out techniques were demonstrated. Egg production of milkfish was monitored larval rearing was demonstrated.

CMI: Presentations were conducted in communities and in schools.

COM-FSM: Technical assistance has been provided to the community members and individuals in regard to raising rabbit fish, giant clams, micro-algae culture and sandfish.

Results
PCC: Farmers learned that crabs and rabbitfish could be raised to marketable size in tanks, ponds and cages. Milkfish farmers saw the potential of producing the fry locally.

CMI: The basic knowledge and understanding shared to the people, provides well informed information and better prepared the clients in safeguarding the environment and the ego-system.

COM-FSM: Communities and individual farmers have increased their knowledge in rabbit fish culture, rearing of giant clam, aquaponics system and sandfish culture. Swine and poultry farmers continue to harvest and use tilapia from the brackish water areas to use for animal feed.

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

Adoption of sustainable aquaculture technologies by commercial and community groups.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	283

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

PCC: Some farmers lose interest on growing crabs and rabbitfish. Some people interested in farming milkfish have no access to imported fry.

CMI: Many people do not have the motivation to start a fish farm, pearl or other potential aquaculture project. Scarcity of marine food is because of overharvesting.

COM-FSM: There are limited numbers of people engage in aquaculture activities or operations because resources needed to start aquaculture are limited.

What has been done

PCC: Crablet production was continued and grow-out techniques were demonstrated to crab and rabbitfish farmers. Milkfish eggs were collected preliminary larval rearing was conducted.

CMI: With follow-up presentations and face to face sessions, more clients adopted the system of preserving and conserving of depleted marine species.

COM-FSM: Research and experiments have been conducted to modify aquaculture technology into simple and less cost materials available on the island to run an aquaculture project.

Results

PCC: More people became interested to grow mangrove crabs and more requests for crablets were received. Milkfish farmers supported the idea of producing milkfish fry locally.

CMI: Clients sent representatives for the trainings in order to have the necessary skills to establish and manage their farms. These same clients have requested materials and supplies for the establishment of a farm.

COM-FSM: Construction and renovation at one state research and demonstration site has been initiated. A community fishpond was reconditioned and stocked with wild-caught rabbit fish juveniles. A survey of tilapia population in a community indicated that the capture and removal efforts were successful. The collaboration with one state government resulted in the passing of the Sea Cucumber Aquaculture Development Plan for the state and municipal governments to designate protected areas and for harvest of sea cucumber.

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 established aquaculture operations.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	34

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
PCC: Farm grown mangrove crab and rabbitfish was not available in the market. Milkfish farmers were dependent on imported fry for stocking and no fry was available locally.

CMI: It is a challenge to do and sustain an aquaculture farm because of money, commitment and the motivation.

COM-FSM: Economic security in Micronesia is critical.

What has been done
PCC: Crab and rabbit fish juveniles were given to farmers free of charge and grow-out techniques were demonstrated. Larval rearing of milkfish was demonstrated at PCC hatchery using locally produced eggs.

CMI: Continued outreach education and extension to clients is seen to be effective in winning their interests to look into starting a farm of their own.

COM-FSM: Proper maintenance of pearl farms led to sales of half pearl products and the provision of pearl seeding training in the Marshall Islands.

Results
PCC: Eight people were able to grow mangrove crabs using crablets produced at the hatchery and a farmer was able to grow rabbitfish in floating cages. They were able to observe the growth of crabs and rabbitfish to marketable size in their farms. Small number of milkfish fry has been

produced locally and farmers are hoping to improve the production so that they would no longer rely on imported fry.

CMI: One traditional leader has established land owners club for the development of aquaculture projects in their respective communities.

COM-FSM: Two families earned wages from the selling of value added products from the half-pearls from the black-lip pearl oysters. This is alternative source of income in two communities. With the passing of the Sea Cucumber Development plan, communities are requesting assistance to begin farming of this resource.

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

PCC: Availability of good quality spawners became very scarce. Some facilities at the hatchery are already old and need to be replaced. Unstable electrical supply resulted to breakdown of water and air pumps that resulted in fish mortalities.

CMI: Transportation to reach the people in the outer islands is a major setback. A good and well equip lab will make it possible to complete research projects. Property is on a lease land and therefore might be an issue at the end of the contract expiration.

COM-FSM: Sites visits and monitoring have been carried out, though disrupted due to bad weather and transportation limitation, especially to the other outer islands. It took time to

approve a Memorandum of Understanding between all parties for the establishment of a research and demonstration facility in a new state location. Severe weather in the form of two tropical storms and two typhoons affected the program activities and results.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

PCC: The success in producing rabbitfish fingerlings and crablets has initiated the development of the aquaculture industry in Palau. Existing farmers were able to stock their farms and were assured of the source of crablets and fingerlings for future expansion. They learn proper methods in growing crabs and rabbitfish in ponds and cages. Some farmers were able to grow crabs and rabbitfish to marketable size. Milkfish farmers became aware that sooner their production will no longer be dependent on imported fry.

CMI: Two pearl grafting took place; spawning of pearl oysters is ongoing. Trainees have gained the necessary experience in hatchery management and half pearl grafting.

COM-FSM: Feedback from the communities has been positive and encouraging. Numbers of trainees and inhabitants have been encouraged. They have acquired skills and knowledge that would foster confidence and assurance to going into pearl and sea cucumber activities. Students at the High School and College level gained experience and confidence to pursue aquaculture as a potential career.

Key Items of Evaluation

PCC: There is a need to continue the crablet and rabbit fish fingerling production to support the growing interest of existing and prospective farmers. Transfer of technology to local hatchery operators needs to be continued. Further demonstration of grow-out methods to fish farmers need to be continued. Efforts to establish technique in producing milkfish fry locally need to be continued so that farmers would no longer rely their production on imported fry. A reliable local feed for mangrove crabs and rabbitfish need to be developed so that farming of this commodity would be sustainable.

CMI: College needs a good system of supporting the implementation of activities on ground. A good lab and working environment must be upgraded. It needs to be cleared that challenges are very unique in an island setting as it is in a volcanic island setting. Missed out opportunities for people in the outer islands must look at carefully and constructively.

COM-FSM: The sandfish hatchery technology was refined and improved by experience from the previous years. Several cages of sea cucumber have been established in the communities to release sea cucumber for growth development and measure. Techniques are being developed to allow wild release of sandfish. Climate change is having a negative impact on the coral areas of the surrounding areas. This will affect the biodiversity of the area and the habitat of desired reef fish and of feedstock for pelagic species. There are invasive species such as crown-of-thorns also impacting the reef areas. Sea-level rise and increased storm frequency and intensity also affects reef habitat.

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	20%		20%	
801	Individual and Family Resource Management	10%		10%	
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: 2015	Extension		Research	
	1862	1890	1862	1890
Plan	9.0	0.0	1.0	0.0
Actual Paid	7.7	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**
215385	0	73179	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
6838	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

Note: PCC was not involved with this planned program this year again due to shortage of staff.

PCC:

CMI: Extension staffs visited schools and talked to youths and people in the communities about teenage pregnancy and alcohol and drug abuse. Extension services completed awareness on different issues ranging from teen pregnancy, tobacco and alcohol usages, sports and importance of education

COM-FSM: Training is provided to participants on income-generating opportunities including sewing, cooking and handicrafts, computer and basic business to individuals aspiring to be entrepreneurs to help them qualify for microcredit from lending institutions. Youths were taught entrepreneurship including the writing of basic business plans, marketing, pricing, cash flow projection, budgeting, and recordkeeping; after completing the initial training and skills in wood and ornamental carving, sewing, gardening, food processing, and low-cost nutritious recipes. Participants become eligible to a FSM-funded program call YES (Youth Entrepreneurship Startup). Group counseling and guidance for high school juniors also conducted to prepare them for college, future career and to live up to standard of life. Counseling and guidance was given to high school students for the college admission process, and managing life.

2. Brief description of the target audience

Targeting youths, school children and communities in the Marshall Islands and the FSM.

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2015	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	1532	2310	1320	3211

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

Patent Applications Submitted

Year: 2015

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2015	Extension	Research	Total
Actual	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of training conducted targeting youths.

Year	Actual
2015	30

Output #2

Output Measure

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

Year	Actual
2015	47

Output #3

Output Measure

- Total number of youth clubs organized.

Year	Actual

2015 8

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

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

Outcome #1

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	2210

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
PCC:

CMI: Youth dependency, alcoholism, drop outs, teen pregnancy, unemployment, lack of parental skills and high population growth continues to be a huge concern facing the nation.

COM-FSM: Youths and families with limited knowledge and skills to help them utilize available resources to generate income, produce food that may contribute to family livelihood and quality of life.

What has been done
PCC:

CMI: Awareness and informal education continued throughout schools, churches, and communities to address the growing social issues facing the communities, especially parent and children relationship. Sports activities continued throughout the communities.

COM-FSM: Technical assistance was provided in formation and operation of youth clubs. Entrepreneurship training on basic business plans for local needs including counseling to high school students.

Results
PCC:

CMI: With knowledge presented, youths were beginning to realize their roles as many have changed to start respecting parents, search for job opportunities, get involved in developing gardens as well as fishing and support their families.

COM-FSM: 1332 adults and 878 youth increased awareness. In one state 63 youth increased their knowledge and skills in entrepreneurship, sewing, nutrition, or food processing. 10 trainings to high school students on business planning, home gardening, and sewing skills, and 2 trainings to college students on ornamental carving. 44 community level training programs were conducted to women association members and other adults in 2 communities. Introductory presentations were given to 25 college art class students. In a second state, summer arts and craft programs were conducted to improve skills in wood and ornamental carving. Hands-on training in vegetable gardening was provided.

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

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	746

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
PCC :

CMI: The structure of family values today is deteriorating; the family unit is no longer as one of the valued institution of a society; it has collapse.

COM-FSM: Many youths and families are not adopting interpersonal/entrepreneurial skills due to a number of reasons including limited resources that are spent on daily family priorities.

What has been done
PCC:

CMI: Community awareness programs, school outreach and church presentations, as well as family livelihood activities were carried out.

COM-FSM: Follow-up visits with individual clients were conducted to recruit for the YES program. Students who were not able to pass the College of Micronesia Entrance Test (COMET) were interviewed and counseled.

Results
PCC:

CMI: The gained knowledge by the youths who got involved are taken into account. Skills acquired were put into practice. Many of the youths have found jobs and are supporting their families. Their family relationships have developed and have won the family back to their normal lives. The ongoing experience in trade and skills of farming and fishing will hopefully help and support family income.

COM-FSM: More than 600 program participants adopted one or more recommended practices from participating in outreach program activities. In one state 6 participants were recruited to the YES program while 3 students passed the COMET exam to allow entry to the college. Across the country where this program was conducted, technologies were adopted to allow families and community groups to produce various handicrafts, sew garments for the family and for sale and produce foods from their own gardens for use or sale.

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

Total number of families and youths 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
2015	2932

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
PCC:

CMI: Underprivileged and underrepresented youths and families were deprive of good opportunities available to them.

COM-FSM: Many families have limited income and are experiencing difficulties as cost of living has been escalating.

What has been done
PCC:

CMI: Short trainings and workshops on basic life skills were initiated in the communities, empowering youth with the necessary skills that can help them when they were searching for employment.

COM-FSM: Close monitoring of the YES participants and their monthly sale report, and advise and make recommendation on new patterns. Follow-up visits to provide advice to those who passed the COMET.

Results
PCC:

CMI: The learned trade and skills had been carried through and continued with the targeted

groups, the youth and families with whom the lessons were taught and passed on to.

COM-FSM: Of 6 participants of the YES program, 3 have been making a substantial income by selling their products, such as blouses, muumuu, and skirts locally and to Hawaii and US Mainland. One of the participants has made close to $1,500 on a 12month period, another made $750 in 6 months, and the third made $15 in the first month.

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

PCC:

CMI: Continued lack of enthusiasm and supports from the responsible government ministry, good and reliable mean of transportation to conduct activities with participants continue to hinder the delivery of programs.

COM-FSM: Inclement weather, conflicts in community events and high costs of fuels in visiting island participants limited the outreach activities. The public schools curriculum does not orient the students on entrepreneurship and priorities are set on other areas forcing youth to voluntarily engage with limited choices for them rather than what they are interested in.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

PCC:

CMI: Increased knowledge, changed attitudes of participants toward each other and others around them is positive for the communities. The family unit continues to develop. Youth are becoming more aware of their roles in the communities.

COM-FSM: 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 techniques and generating income for their families. Parents and youths are working together gearing toward a positive living condition. Some participants reported that they sold their products through their families living outside FSM.

Key Items of Evaluation

PCC:

CMI: With the change in cultural norms, challenges facing youth at home and in the communities needs immediate consideration. The change in lifestyles related to the monetary system and such have challenged youth perspectives and motivations.

COM-FSM: Families were burdened with domestic problems associated with poverty such as teen delinquencies, substance abuse, and violence. Provision of home-based employment skills would probably improve a sense of security among these families. Good working relationship between parents and youth; generating extra family income; increased number of young parents engaged in the program could increase number of students involved.

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	25%		25%	
704	Nutrition and Hunger in the Population	25%		25%	
724	Healthy Lifestyle	25%		25%	
802	Human Development and Family Well-Being	25%		25%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2015	Extension		Research	
	1862	1890	1862	1890
Plan	4.0	0.0	1.5	0.0
Actual Paid	4.1	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**
114685	0	48786	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
3641	0	0	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

PCC: There was no decrease nor increase in childhood obesity/overweight children in Palau because children are practicing healthy eating, engaging in healthy levels of physical activity, and have access to healthy foods. The college contributed to this status quo by conducting eleven (11) Food Technology and Nutrition Education classes among school children and adults benefiting 236 participants. Book publications on local foods like taro, cassava, sweet potato, banana, coconut, and fish may have also contributed in the preparation of healthy diets among families in Palau.

CMI: Continued healthy cooking demonstrations were carried out during farmers' market, at Ministry of Health, at several schools and in communities.

COM-FSM: The main activity for this program is education in the communities and in schools. Training is conducted to mothers with young children age 3 to 5 years and other interested individuals, e.g. homemakers, young mothers, and teachers and parents of the Early Childhood Education (ECE). The focus of the program is healthy lifestyle with emphasis on healthy diet and physical exercise. The intents of the program is to also teach the clients about the existence of the non-communicable diseases (NCDs) and their implications on family health and wellbeing.

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

2015	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	2930	11390	1099	2740

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

Patent Applications Submitted

Year:	2015
Actual:	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2015	Extension	Research	Total
Actual	1	6	7

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of conference papers and publications on childhood obesity.

Year	Actual
2015	1

Output #2

Output Measure

- Number of trainings conducted on childhood obesity and physical activity.

Year	Actual
2015	6

Output #3

Output Measure

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

Year	Actual
2015	4

Output #4

Output Measure

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

Year	Actual
2015	8

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of persons 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 persons 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
2015	6310

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
PCC: Most Palauan children are not knowledgeable about eating more healthy foods, eating less of foods commonly eaten in excess like salty, sweet and fatty foods, and not following healthy eating patterns.

CMI: Parents and other family members lack understanding of childhood obesity.

COM-FSM: Parents of obese children and community leaders are not aware that overeating and lack of physical activity lead to child obesity. Their perception of a healthy child is being big or fat.

What has been done
PCC: Multi-agency collaboration promoted eating healthy local foods among school children, and nutrition education classes emphasized on eating less salty/sweet/fatty foods, as well as encouraging children and caregivers to eat breakfast and make healthy food choices.

CMI: Education and outreach activities carried out targeting families and schools. Brochures, pamphlets and other educational materials were distributed.

COM-FSM: Presentations and cooking demonstrations using less salt, fats and sugar and more local food during training programs to homemakers and family with childhood obesity problems.

Results

PCC: Of the 329 number of children reached, 193 gained knowledge about eating healthy foods, eating less salty/sweet/fatty foods and healthy eating patterns, while 136 reported an intention to do the same.

CMI: Proper knowledge was well received and participants are more vigilant of what and how much food served to their children. Schools served balance diet during lunch program.

COM-FSM: 2485 parents increased their knowledge of the causes of childhood obesity and understanding that being physically active and living a healthy lifestyle can prevent them from having their children sick or suffering the effects of NCDs in their future. Participants increased awareness about the health complications of childhood obesity and knowledge about balanced diet and healthy physical fitness for childhood obesity prevention.

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
2015	928

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

PCC: Obese/overweight children do not practice preparing nutritious local foods and make no effort of balancing food intake and physical activity.

CMI: Parents of obese children need to be appraised on the physical and health of their children.

COM-FSM: The concerned parents who have limited resources to adopt recommended healthy lifestyle practices including food selection and preparation, and physical exercise.

What has been done

PCC: Trainings on the preparation of nutritious local foods were conducted among 193 participants and physical activities were encouraged among the participants.

CMI: Presentation and outreach activities were carried out to parents, teachers, students, youth, and other target groups, acquired the necessary skills and continue to follow.

COM-FSM: Follow-up visits were conducted to determine if participants are utilizing recipes learned during training workshops and if they are growing and using vegetables in meals.

Results

PCC: One hundred ninety three children and youth who were trained to produce and preserve healthy local foods were able to learn nutritious one-dish meals and 30 food products from local food sources as well as encouraged to increase physical activity.

CMI: Parents of the young children instituted a corrective measure by following the advice and guidance of the extension agent, with the right preventive measures.

COM-FSM: 939 or about 30% of participants adopted one or more recommended practices after completing the program. Observations and interviews in one state showed about 10% of program families maintain gardens and use the vegetables in their meals. In a second state, a higher percentage of program families are preparing healthy meals and use food crops and vegetables from their garden in meals. Observation and interviews indicated many families are now mindful of time their children spent on such activities like watching TV.

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
2015	367

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
PCC: Obese/overweight Palauan children and youths do not supplement their diets with healthy foods and do not engage in a daily 60-minute or more of physical activity.

CMI: Lack of data collection by professionals continue to hindered the extension activities.

COM-FSM: Non-communicable disease (NCD) is a concern to the general population and especially parents with obese individuals in their families.

What has been done
PCC: Youth clients were taught to prepare healthy local foods and other stakeholders were served food products and they are encouraged to practice increased physical activity.

CMI: Meeting continue to take place with health professional to remind of the important need to monitor the healthy lifestyle of the obese children.

COM-FSM: In collaboration with Public Health conducted monitoring, evaluation, and referrals for specific intervention measures in communities, schools, and public areas to reduce NCD health problems.

Results
PCC: Of the 727 stakeholders reached, 193 children have practiced healthy eating and engaged in healthy levels of physical activity, while 534 have reported an intention to eat fruits, vegetables, fish and milk and local foods that they have tasted from outreach programs. This activity contributed to the overall status quo in childhood obesity in Palau.

CMI: Continue presentations in schools and communities, including cooking demonstrations, and training for staff are ongoing targeting the obese children, parents and families.

COM-FSM: Reduction of 16% in obese children is evidenced by feedback during observation and follow-up visits. Observations also indicated 142 program families or 81% of program participants supported each other by providing healthy food and snacks to eat, and doing physical activities, while education department banned the selling of junk food and snacks on school

premises.

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

PCC: The increasing number of obese children in Palau may be caused by developments in technology like too much television viewing and playing games in the computers. Sedentary lifestyles like access to cars instead of walking, and convenience of eating imported foods which are oftentimes fattening and not eating healthy local foods also lead to obesity.

CMI: Experts properly advice on good and better way forward as well as developing good curriculum on food and nutrition. Families continue acquiring unhealthy food and less on the healthy diet. Bad influences of different eating lifestyles challenged the basic foundation of bringing good and well informed families on the best diet for their children.

COM-FSM: Severe typhoon damage affected the amount and quality of foods available to major portions of the country. Relief food supplies reinforced the transition to imported rice and canned food. Lack of public water transportation limits access to the program for populations in the lagoon and outer islands. Generally, consumers' preference of imported canned and processed foods versus local healthy foods hinders in promoting eating healthy, balanced diets. Lack of healthy and cheap local produce also limits intake of nutritious and balanced diets. There were few things which affected the delivery of the program include weather, funerals in the communities, and transportation.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

PCC: Nutrition education programs are evaluated by the participants before and after the program through tests.

CMI: If data will be provided by the health professionals, the outcome will be positive as we can observed that the children of the parent who is continuously monitoring the child diet has lost some weight.

COM-FSM: Childhood obesity could be prevented with consistent public awareness campaigns through training, education, demonstrations, dissemination of information materials, feedbacks from surveys and collaborative efforts of communities especially the concerned families. As results of interventions and follow up visits, more gardens are in place and new recipes are practiced using less salt, sugar and fats in cooking. The results showed that parents and children increased eating healthy food and doing physical activities after participating in programs.

Key Items of Evaluation

PCC: The status quo in overweight/obese Palauan children have practiced consuming more healthy foods from local sources, have consumed less salty/sweet/fatty foods, have engaged in healthy levels of physical activity, and they belong to families who have access to more healthy foods.

CMI: If data will be provided by the health professionals, the outcome will be positive as we can observed that the child of the parent who is continuously monitoring the child diet has lost some weight.

COM-FSM: To sustain community interests and participation, stronger collaboration among programs with related concerns in preventing and/or reducing childhood obesity and developing volunteerism among trained participants are essential. Focus on the roles and responsibilities of families, communities, and schools to ensure continuing public awareness and adoption of recommended balanced diets and activities. Questions on the adult survey based on 24-hour food recall and behavior checklists needed to be prepared carefully. Students' survey based on the behavior, food recall, intake of fruits and vegetables and sugar drinks are needed.

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	10%		10%	
131	Alternative Uses of Land	10%		10%	
132	Weather and Climate	10%		10%	
133	Pollution Prevention and Mitigation	5%		5%	
134	Outdoor Recreation	10%		10%	
135	Aquatic and Terrestrial Wildlife	15%		15%	
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	5%		5%	
605	Natural Resource and Environmental Economics	5%		5%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2015	Extension		Research	
	1862	1890	1862	1890
Plan	2.0	0.0	3.0	0.0
Actual Paid	4.7	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**
131469	0	107929	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
4174	0	0	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

PCC: Drought and salt water intrusion into taro patches have been unfavorable for taro cultivation. Salt water intrusion was prevented by raising levels of the dike and construction of secondary dike inside the taro patches to hold and contain fresh water. Three salt tolerant taro varieties were identified. Farmers and communities affected by the drought and salt water intrusion were assisted by providing them 7,829 planting materials of taro, cassava, sweet potato, giant swamp taro, vegetable seeds and fruit tree seedlings to ensure food security.

CMI: Extension education and activities carried out to communities that were not reached last year, in other islands that continue to be affected as a result of drought and sea inundation on land. Presentations were delivered in the communities and schools, targeting students, faculty, staff, administration, church members, and local government/traditional leaders.

COM-FSM: With rising sea level due to climate change, the local population, scattered throughout small islands and low-lying coral atolls, is seriously at risk and is vulnerable. These atolls and the low-lying areas of volcanic islands are affected by salt toxicity. The local population must take necessary actions in response to these impacts and find sustainable methods of farming crops, livestock and aquaculture species. The local communities are at high risk in terms of food security as rising temperatures and changes in rainfall patterns affect the food crops, livestock, and properties.

Furthermore, the local communities must improve adaptive capacity to climate change and to reduce its effects to protect main natural resources such as soil and water. Environmental parameters such as temperature and rainfall are being measured by collaborating researchers as we monitor the effects of this phenomenon. Efforts are being made to introduce salt-tolerant crop varieties and appropriate animal raising techniques, climate-friendly methods to local communities to educate, create awareness for conservation and sustainable use of natural resources.

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

2015	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	667	1028	789	9018

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

Patent Applications Submitted

Year:	2015
Actual:	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2015	Extension	Research	Total
Actual	1	4	5

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of awareness training conducted.

Year	Actual
2015	12

Output #2

Output Measure

- Number of salt-tolerant crops/plants developed and distributed.

Year	Actual

2015	5

Output #3

Output Measure

- Number of people who adopted sustainable food production technologies.

Year	Actual
2015	2195

Output #4

Output Measure

- Increased staple food crop production.

Year	Actual
2015	16

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of persons with increased awareness on impact and how to mitigate climate change in Micronesian life.
2	Number of program participants adopting sustainable food production technologies.
3	Number of persons who increased staple food crop production.

Outcome #1

1. Outcome Measures

Number of persons with increased awareness on impact and how to mitigate climate change in Micronesian life.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	729

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
PCC: Climate change impacts such as prolonged dry spells or El Nino, frequent typhoons, excessive rainfall, increased flooding and soil erosion, sea level rise, salt water intrusion, and soil salinity has been adversely affecting the farming community.

CMI: Island communities continue to be victimized by drought and sea water inundation.

COM-FSM: Residents on atolls and low-lying areas cared about their damaged crops and properties and understanding the effects of climate change and how to develop climate smart adaptation strategies.

What has been done
PCC: Planting materials of salt tolerant taro, cassava, sweet potato and vegetable seeds, seedlings and fruit trees were given to communities affected by salt water intrusion and drought.

CMI: Combine team efforts visited the affected islands and survey the communities? vegetation, water catchments, and ground wells. Information were provided to the government agencies concerned for action.

COM-FSM: Research and selection of salt tolerant staple crops, distribution of vegetable and root crop planting materials and demonstration of composting and mulching methods were done.

Results

PCC: Climate change impacts to farming communities this year was drought and salt water intrusion. The farmers were able to grow salt tolerant taro and other root crops as well as vegetables crops and fruit trees to ensure their resilience to climate change. Two manuals on taro and upland crop production were prepared and distributed.

CMI: Mobilization of combine government and NGO organizations delivered the necessary awareness and relieve efforts to the islands affected. People that were affected understood the impact, but cannot do anything to stop the drought and inundations of sea water in their land.

COM-FSM: A total of 666 program participants, families, and communities increased knowledge on securing food sources using adaptable varieties of root crops. An increased number of people knew composting, mulching and container gardening as practical ways to cope with climate change impacts as well as the various uses of some food wastes.

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
134	Outdoor Recreation
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 adopting sustainable food production technologies.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	916

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

PCC: Prolonged dry season, frequent typhoons, storm surges, sea level rise and salt water intrusion into taro patches are some of the climate change impacts in Palau that have adversely affected the community.

CMI: Salt water inundation into food crops continue affecting people's livelihoods.

COM-FSM: Farmers on the outer islands have already been affected by climate change and therefore had to adapt to the frequent sea level rise to protect their crops and properties.

What has been done

PCC: Communities affected by drought and salt water intrusion were assisted by providing them with planting materials of salt tolerant taro, other root crops, vegetable crops and fruit trees.

CMI: Trainings and workshops were carried out to remind people of the importance of growing more indigenous food crops that can survive in the tropical environment. Replanting of local plants were done on the island, aiming at the eroded shorelines to protect food crops and other living organism inland. Schools and community members were involved.

COM-FSM: We demonstrated using resistant crops in raised beds, container gardening and composting plants grown close to the seashores.

Results

PCC: One hundred one families who have experienced the severe impacts of climate change were assisted in planting root and vegetable crops to enhance food production and food security of the communities.

CMI: Clients adopted the methods and are the resource experts for the community and to those who did not participate. Expansion of the programs are the result of working together to have the programs successfully implemented.

COM-FSM: About 100 affected atoll dwellers prepared raised beds with drainage canals and grew vegetables in used containers. They used dried leaves, grass clippings and finely chopped twigs as composts or mulches to plants. Instead of throwing away some food wastes these were processed for consumption or for pig?s feed. Intercropping was encouraged and agriculture crops aside from swamp taro, compost and mulching have been always added during planting periods.

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
134	Outdoor Recreation
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 who increased staple food crop production.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	275

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
PCC: Food security in farming communities in Palau is challenged when climate change events such as drought, frequent typhoons, salt water intrusion into taro patches have taken place.

CMI: The inundation of sea water and droughts continue to be a huge concern, impinging on family livelihoods.

COM-FSM: Dwellers in atolls and low-lying areas experienced plant loss and poor yields of their plants due to salt spray and sea level rise, causing food insecurity.

What has been done

PCC: Seventy two taro farms were established in communities affected by climate change during drought and salt water intrusion by assisting them in replanting of sweet potato, cassava and vegetable crops as well as salt tolerant taro varieties. In addition, 20 farms were provided with fruit trees planting materials.

CMI: Like in previous years, awareness and informational sharing to the people were scheduled accordingly; food and water were distributed to the islands that were affected. Re-plantating of local food trees were carried out in villages.

COM-FSM: Planting materials from high islands were shared with those on the atolls where farmers were encouraged to locate their gardens in higher elevation or in container gardens away from salt spray.

Results

PCC: Adequate food supply in Palau was ensured as a result of immediate replanting of root crops and vegetable crops in areas severely affected by drought, sea level rise and salt water intrusion. Farmers readily adopted recommended cultural practices to ensure high yield and harvest.

CMI: With the assistance from outside donors, Reverse Osmosis were set up in communities that were affected by the droughts. Food donations were given to the affected communities to supplement the local foods that were not available as a result of the droughts. Needs had been fixed only in a short period of time. Long term will be for continue planting of indigenous food crops, to have enough supplies of food.

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
134	Outdoor Recreation
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

PCC: Prolonged drought or El Nino, extreme weather conditions, sea level rise and salt water intrusion sometimes destroy the replanted crops used for rehabilitation of climate change affected areas in Palau.

CMI: Keeping on top of different programs is a challenge, where few times deadlines are hard to catch-up with. If researchers will be on board, surely things will be in better position.

COM-FSM: Limited and irregulars scheduled trips to the outer islands, high costs of fuels for motorboats and inclement weather affected visits to island communities. Two typhoons caused serious damage to major portions of the nation and much effort was applied to activities to supply food and planting materials to those areas that were in most need.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

PCC: Food supply in communities which have experienced drought, strong typhoons, coastal erosion, sea level rise, and salt water intrusion have been severely affected. An essential measure to ensure resilience to impacts of climate change is the immediate replanting of root and vegetable crops in the affected communities.

CMI: As the percent of rain falls went up, a survey immediately got under way and it concluded that there will be more time for the vegetation to be restored and food crops to normally generate fruits again. Plans are now established to look into the dry and salt resistance crops.

COM-FSM: Time and effort to fully carry out program was limited due to remoteness and limited/scheduled trips to the outer islands that were most vulnerable to climate change. Producers though residing in challenging environments affected by climate change can still improve their livelihood by equipping them with knowledge, skills and access to appropriate technologies including new adaptive varieties of root crops and conserving environments by proper solid waste management. Populations affected by salt spray or sea level rise could protect their growing plants by using salt-tolerant crops, utilizing biodegradable and recyclable solid wastes like compost

and used containers for gardening and keeping their plants away from these hazards. Evaluations on outer islands was severely affected by lack of transportation from the main islands and by the efforts for recovery from major typhoons.

Key Items of Evaluation

PCC: This year, the most severe impact of climate change affecting food production is the drought or El Nino, strong typhoons and salt water intrusion into taro patches. Salt tolerant taro varieties were distributed as well as planting materials of other root crops and vegetables as an essential remedial measure to ensure food production in the affected areas.

CMI: Islands' vulnerability should be considered with urgency as these low-lying islands and atolls cannot survive a long climate change impacts. As these islands are known only to be about 1-3 meter above sea level, it will be impossible for the people to survive. All food crops on land will no longer be accessible and the end result will be obvious.

COM-FSM: Besides composting the biodegradable wastes instead of burning them, our participants learned and cooked some food wastes such as extracted coconut meat and banana blossoms for family snacks. Increased number of people planted some vegetables in used containers for flooded areas; applied compost as mulch. Longer period of dry weather, sea level rise, frequents storm have been the main disasters that effect edible agriculture crops on the atolls. As for the island proper heavy rain and dryer weather have been the issue on agricultural crops. There are still farmers on the higher islands who deny any effect from climate change.

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: 2015	Extension		Research	
	1862	1890	1862	1890
Plan	3.0	0.0	1.0	0.0
Actual Paid	3.9	0.0	1.1	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**
109091	0	53665	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
3463	0	0	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

PCC: Eleven Food Safety trainings were conducted for food handlers.

CMI: Food handlers continued to handle food without permit.

COM-FSM: Clients include families living in the rural and remote areas with fewer opportunities including education, jobs, and with limited resources. Target groups are identified either by request or selected based on the criteria listed above. Community workshops, training to small groups including food services staff, homemakers and church members, households, and to children and youths in Elementary and High School were conducted. Training was conducted on safe food handling, food preparation, hygienic environment, and prevention of food-and water-borne illnesses. Workshops/trainings conducted for the communities included outer islands and elementary schools to increase knowledge and skills in and an awareness of the consequences of unsanitary practices. Information provided included recipes and other printed information materials. Follow-up visits to observe and ask questions to determine impact of programs were conducted. Cross training of agents was carried out in every state of the FSM during the year.

2. Brief description of the target audience

PCC: Target audience include food handlers, food entrepreneurs, school cooks, teachers, students, and parents .

CMI: Scheduled trainings are ongoing with continue visitations from the proper authority.

COM-FSM: Target audience included homemakers, cooks of food establishments, school teachers and students, government and non-government groups and other individuals. Also included were mothers with young children, families with special need children, senior citizens, and special interest group such as "Women-in-Farming", and the outer Island peoples. Of specific interest were those citizens who were adversely affected by severe weather occurrences that affected both food and water supplies.

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2015	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	2424	2973	733	1680

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

Patent Applications Submitted

Year:	2015
Actual:	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2015	Extension	Research	Total
Actual	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of community workshops on food safety conducted.

Year	Actual
2015	62

Output #2

Output Measure

- Number of program participants with increased knowldege and practices after completing educational programs.

Year	Actual
2015	2728

Output #3

Output Measure

- Number of extension publications on food safety.

Year	Actual
2015	6

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of program participants who increase awareness of 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 program participants who increase 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
2015	1227

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
PCC: Food handlers are not well informed on proper food handling behaviors to prevent food borne illness.

CMI: Food handlers continue to handle food without permit.

COM-FSM: Homemakers, food handlers, and the general public have limited knowledge in food safety with regards to food selection, preparation, storage, and processing.

What has been done
PCC: Eleven food safety trainings were conducted to 236 participants and 491 clients were taught to wash their hands or apply sanitizers before eating.

CMI: Scheduled trainings are ongoing with continue visitations from the proper authority.

COM-FSM: Training on hygiene in kitchens and sanitary handling during meal preparation, one-to-one intervention based on requests and referrals from public health, and collaboration with similar agencies.

Results
PCC: Key food handling behaviors such as practicing personal hygiene, cooking foods adequately, avoiding cross-contamination, keeping food at safe temperature, and avoiding food from unsafe source were adequately understood by 236 participants of Food Safety Classes and other 491 clients learned proper hand-washing.

CMI: Participants gained the necessary knowledge. Food handlers alongside the road and in restaurant posted food handling permit for costumers to see.

COM-FSM: More than 2700 participants increased knowledge and skills in food safety issues, and protection of food from contaminants. Observation indicated most of the program participant families increased awareness on food safety issues. Elementary school students learned proper hands washing and food handling while adults learned and practiced food safety at homes. There are improvements to food handling in public places including serving food within 2 hours of preparation, using disposable gloves, proper packaging, wrapping, and covering of food.

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
2015	934

3c. Qualitative Outcome or Impact Statement

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

CMI: Threat of food poisoning is a major set-back for health workers.

COM-FSM: There is an increased concern to avoid water- and food-borne illnesses and a high incidence of non-communicable diseases, partly the results of unsafe and unsanitary methods of food preparation.

What has been done

PCC: Food handlers were taught proper food handling techniques in Food Safety Classes as well as to clients served with PCC-CRE food products during tours to R & D and other civic events.

CMI: Trainings and outreach education activities continue to carry out in schools, churches and communities.

COM-FSM: Follow-up visits were made to communities and schools where program was conducted to assess positive changes and to encourage adoption of knowledge and practices.

Results

PCC: Two hundred thirty six participants of 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.

CMI: Food safety and food handling brochures, wall posters were distributed and posted to remind people of the importance of food safety for healthy lifestyles. Majority adopted and share the experiences.

COM-FSM: A total of 834 program participants adopted one or more food safety practices including selection and purchase of foods, of personal hygiene, cleanliness of kitchens and utensils, sanitary meal preparation, and proper food storage. Observations conducted at the schools and communities showed that families and students increasingly applied food safety lessons.

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
2015	257

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
PCC: Food handlers and consumers do not practice proper food handling procedures resulting in outbreaks in food borne illnesses that occur in the community due to warm temperature and humidity.

CMI: Food and water continue to be a health issue in many communities.

COM-FSM: People do not always know or associate their activities such as food production, marketing and preparation with food safety and related issues such as high incidences of non-communicable disease.

What has been done
PCC: 236 food handlers were taught on how to avoid food borne illnesses through proper food safety practices and 491 clients were taught proper hand-washing techniques and/or use of sanitizers before eating PCC-CRE food products served to them.

CMI: Like in previous years, training and other activities on proper food safety and water sanitation were conducted.

COM-FSM: Safe handling and storage of foods was promoted through training, education, meetings, one-to-one contacts and partnerships. School children were taught to properly wash hands with soap and water.

Results

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

CMI: The number of food borne illnesses and water contaminants were remedies and participants gained the basic skills and knowledge of the safety measures.

COM-FSM: There appears to be reduced incidence of water- and food-borne diseases among communities which lessened public burden of medical treatment to affected individuals. Follow-up visits and observation indicated more than 250 program participants with improve health as a result of proper food preparation and storage. One household made an extension for a kitchen that uses only gravity to run water into sink and for drainage. Another acquired a refrigerator to improve food storage.

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

PCC: Facilities for proper food storage and cleaning are not always available in many homes resulting in unsafe food handling environment.

CMI: Most people lack a decent and clean surroundings to prepare food as well as clean cooking supplies and materials. Ground water is contaminated as a result of unfriendly disposable methods of all kinds of wastes. Droughts and other weather conditions including animals waste greatly have negative impacts on the water catchments.

COM-FSM: There is low motivation, limited resources and lack of clear vision on the importance of food safety. Heavy damage from typhoons severely affected water and food supplies in some parts of the islands. Consequently the focus of the people was on subsistence rather than specifically on safe food and water preparation and use. Lack of

refrigerators in majority of homes shortened storage and safety of foods. Imported foods are cheaper and more convenient than the local produces in markets. Non-Communicable Diseases are recognized as a greater health threat but are not associated with Food Safety but are considered a nutrition problem.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

PCC: Participants have understood and practiced proper food safety techniques as shown in their pre and post-tests.

CMI: Food handlers now have the opportunity to be checked and evaluated by health professionals before handling and preparing food for the public. In terms of water monitoring of water catchments is found to be contaminated immediately, contaminated water catchment are chlorinated with right amount and re-tested to make sure it is free of contaminants.

COM-FSM: Participants are using new recipes, application on food safety practices. Local stores had separated displays of expired foods. Food handlers practiced sanitary habits of preparing and storing cooked food with cover. The post survey showed that adults and students were slowly adopting food safety in their lives.

Key Items of Evaluation

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

CMI: Continue partnership of all stakeholders is highly recommended for the continued safety and wellbeing of people's life and health.

COM-FSM: Sanitation and cleanliness in the kitchen and the observing of hygienic practices by food handlers in food preparation and storage reduced incidence of water-borne and food-borne illnesses. Keeping storage quality of food under room temperature is a challenge in islands with no electricity, ice plant and refrigeration. The questionnaires on food safety guidelines in the survey determined when and how people applied food safety after training. Materials concerning disaster preparedness and reaction to extreme weather situations needs to be distributed and promoted.

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: 2015	Extension		Research	
	1862	1890	1862	1890
Plan	16.0	0.0	6.0	0.0
Actual Paid	12.7	0.0	8.9	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**
355245	0	367904	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
11276	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

PCC: Major activities at the Research and Development Station are maintenance and conservation of the root crops germplasm collection of Palau. Continued multiplication and propagation of planting materials was done to ensure adequate supply of planting materials to our farmer clients. A total of 7,829 planting materials of taro, giant swamp taro, sweet potato, cassava, vegetable and fruit trees were distributed to 101 farmers. In addition, 72 farmers affected by the drought and salt water intrusion were assisted in establishing vegetable gardens and planting fruit trees to ensure food security. Mass propagation and conservation of the taro, cassava and sweet potato germplasm has been a major activity.

CMI: Small scale and urban gardening methods were presented to students at the college, primary and high schools. Presentations were conducted during the farmers' meeting, World Food Day activities and other events sponsored by the government, college and other NGO groups.

COM-FSM: Farmers are more vulnerable to the impacts of climate change because of their geographic exposure, low income, and greater reliance on agriculture and limited capacity for alternative livelihoods. Traditional agricultural systems are part of the solution by contributing to climate change adaptation, through carbon conservation, sequestration and substitution. Ecologically designed agricultural systems can provide a buffer against extreme events. Diversified small farms have risk-minimizing effects that lead to strengthened food security and resilience. They continually provide food for the family's own consumption and potentially income generation at the market. The food security of the island nation rests with small scale farmers who have developed relationships with local environment, markets and customers. They play a vital role in sustainable development respecting local cultures and local ecosystems, and reducing hunger and poverty for the vulnerable populations. Providing appropriate outreach, technical assistance and education efforts help the community to adapt to changing climate and ensure food security effectively.

In vitro and in vivo screenings was initiated or continued for salt tolerance in locally maintained germplasm. Two books (sweet potato cultivation guide and soft taro cultivation guide) have been published. High yielding sweet potato varieties were field propagated, evaluated, and demonstrated. Intercropping cassava with okra and long beans was promoted for food security and additional income. Planting materials of sweet potato, cholesterol spinach, sweet bandanus, moringa, okra, eggplant and long beans were distributed. 19 brochures on local crops about proper growing and nutrition were prepared and distributed.

2. Brief description of the target audience

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

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2015	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	3454	13816	1722	3444

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

Patent Applications Submitted

Year: 2015

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2015	Extension	Research	Total
Actual	2	1	3

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of demonstration farms established.

Year	Actual
2015	16

Output #2

Output Measure

- Number of publications for lay use.

Year	Actual
2015	13

Output #3

Output Measure

- Number of conference papers and publications/presentations.

Year	Actual
2015	8

Output #4

Output Measure

- Expected professional journal publications

Year	Actual
2015	2

Output #5

Output Measure

- Expected gray literature.

Year	Actual
2015	7

Output #6

Output Measure

- Expected publications for lay use

Year	Actual
2015	7

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 and processing technologies.
2	Number of program participants adopting recommended practices.
3	Number of established farms producing, utilizing, and/or selling produce and products.

Outcome #1

1. Outcome Measures

Number of persons with increased knowledge on appropriate production and processing technologies.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	1256

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
PCC: Knowledge of best management practices, high yielding planting materials and techniques to prepare new food products and prolong shelf life is essential to increase productivity and food security.

CMI: People are not aware of the issues concerning storage of food and its implications.

COM-FSM: Most of the farmers and homemakers have limited knowledge in appropriate production and processing technologies.

What has been done
PCC: Workshops were conducted and information on new varieties of crops, best management practices, biocontrol agents and publications were disseminated. Eleven food technology trainings were conducted as a measure on food security.

CMI:Trainings, outreach education carried out with farmers and families. Fruit and vegetable were encourage to grow as it took only few months to harvest. Local food crops were also encourage to have available food at all time..

COM-FSM: Training/workshops, hands-on demonstrations, and one-on-one sessions, were conducted to increase the participant?s knowledge in appropriate farming, gardening, and processing technologies.

Results

PCC: Techniques to improve crop productivity and the environment such as best management practices and use of biocontrol agents have been disseminated during workshops conducted and also to visitors to the Research and Development Station. Participants in food technology trainings can prolong the shelf life of food products thus enhancing food security in the community.

CMI:Participants trained have increased their knowledge and has recommended the program to others. As mentioned in last fiscal year report activities stated were completed during this fiscal year. More farmers were able to sell products from their farm as the farm grow and produce more.

COM-FSM: Participation increased in this program and an increased number gained knowledge from workshops, training sessions, community meetings and one-on-one sessions. Production areas covered include small scale vegetable gardening, food processing methods for food security, distribution of planting materials for disaster reparation and production management. Included was sharing of improved techniques in livestock management, primarily chickens and pigs. Across the FSM, a total of 5,176 participants gained knowledge based on observation at meetings.

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
601	Economics of Agricultural Production and Farm Management

Outcome #2

1. Outcome Measures

Number of program participants adopting recommended practices.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	815

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
PCC: Limited planting materials and control of pests and diseases greatly affect farm productivity. Farm produce can be prepared in many ways to enhance food security for the family.

CMI:Clients does not have the motivation to continue and established their own farm.

COM-FSM: Limitations to the adoption of sustainable farming practices is due to lack of motivation, poor soil and unavailable garden space or lack of resources to address the socioeconomic situation.

What has been done
PCC: Disease-free, high yielding planting materials were distributed to farmers to increase productivity. Food technology trainings were conducted to preserve foods.

CMI: Continue follow up trainings and outreach education was necessary to find out what is holding back on clients farming activities. Trainings and demonstrations continue to be carried out to new farmers and families as well as students. Working on little spaces each client have and methods of composting continue with new clients.

COM-FSM: Technical assistance and hands-on trainings organized for youth and adult in soil management, vegetable production and use and animal husbandry were provided including follow-up visits.

Results
PCC: Participants of food technology trainings were able to prepare new food products and preserve foods. Food supply and production in Palau has been enhanced by improved yield of farmers who are growing disease-free and high-yielding planting materials of root crops and using biocontrol agents to control pests of crops.

CMI: There is an increased number of families? established urban gardening methods in the urban area. Students continued to be successful in the introduction to agriculture courses.

COM-FSM: Typhoon recovery dominated the agricultural effort. Feedback indicates most participants adopted recommended production and food processing practices. More than 50% of clients successfully adopted one or more integrated small farm practices. In one state, based on observation, interview and follow up visits, 37 participants adopted recommended practices on

food processing and 52 home gardens were established. In a second state, 50 farmers and families are growing vegetables, 34 are raising chickens for eggs and 4 raising pigs for home consumption and markets. Demonstration farms were established at four schools.

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
601	Economics of Agricultural Production and Farm Management

Outcome #3

1. Outcome Measures

Number of established farms producing, utilizing, and/or selling produce and products.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2015	870

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
PCC: Best management practices should be adopted by farmers to improve productivity. Families should be capable of preparing new food products from their produce for food security.

CMI: Land and soil lack the proper nutrient contents for healthy and productive food crops.

COM-FSM: Vegetable and livestock production is limited owing to resources availability or lack of government support to farmers and pest problems. High living cost and limited income with lack of opportunities are major issues.

What has been done

PCC: Proper cultural management and quality planting materials were adopted by farmers. Participants acquired new skills and prepared new products learned from the food technology classes.

CMI: Continued trainings and knowledge sharing to unaware farmers, families and students were carried out accordingly and on agreed scheduled time.

COM-FSM: Technical assistance has been given to farmers in establishing and expanding integrated farming activities contributing to vegetable and livestock production.

Results

PCC: Demonstration farms showcasing best management practices such as use of disease-free and high yielding planting materials and adequate fertilization led to high productivity of root crops. Families prepared and have new food products from their produce for food security.

CMI: With successful partnerships and trainings again this fiscal year, it was witnessed that there were again increased number of urban gardening sites in school campuses and in communities.

COM-FSM: Where typhoon damage was most severe, 5 program families maintained their gardens and produce with their own planting materials. In another state, 53 home gardens including a public school garden were established. 37 homemakers participated in the state fair to display recipes and earned money from sales of their products. In a third state, 35 farmers and families grew a variety of vegetables for the market. 5 are commercial growers. 34 families and farmers are producing eggs for consumption and local market and have reached production of about 80 dozen eggs per day, an increase of about 70% from last year. Egg production in Yap is meeting daily demand and is causing a drastic decline in imports.

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
601	Economics of Agricultural Production and Farm Management

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

PCC: Crops are destroyed during typhoons, heavy rains and salt water intrusion and inundation so raw materials for food processing is inadequate

CMI: Climate change will be a continued challenging factor as water sources are limited. Population density will still be a major issue with a small island setting. High humidity and salt spray in the air continue impacting the performance of the food crops.

COM-FSM: Establishments of plot demos in atolls and distant islands were affected by inclement weather, irregular availability of water transportation and high fuel costs. Sometimes transportation, fuel, extreme bad weather, and conflict of activities within the communities and funerals are constraints at all sites of the country. Two major typhoons during the reporting period constrained extension activities in the immediately affected area and altered programs in neighboring states to provide support for those devastated areas.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

PCC: The root crops germplasm collection at PCC R & D Station has been a reliable source of high yielding varieties of taro, sweet potato and cassava which are essential components to increase productivity. Biocontrol agents have effectively controlled pests of taro and cassava. Participants in the food technology trainings were very eager to prepare new food products they have learned.

CMI: There is an increased number of clients interested in pursuing the gardening methods as a supplement for their food supply. Availability of nutritious diet will greatly impacted people's health, with less reliability on unhealthy diet.

COM-FSM: Integrating nutrition information about crops to be introduced and their recommended practices is effective in convincing communities to establish their own gardens, consume and preserve them for their families. Family and school practiced container garden, using local basket and banana stem techniques. Compost and homemade

pesticides are also practiced. Two program participants are generating family income by selling value-added products. Experiments are showing positive results and audiences are showing increased interest in developing farms. The extension activities have improved knowledge, created awareness and developed skills of participants in sustainable agriculture systems. Farmers, community leaders, teachers, and parents are willing to test new innovative technologies in order to improve on current practices and management styles. There are more collaboration between the farmers and schools and free sharing of traditional knowledge and skills to complement new technologies and practices. Ultimately extension activities have developed positive attitudes, zeal for learning techniques and farming aspects, and have changed the behavior and economic condition of the participants.

Key Items of Evaluation

PCC: The tissue culture technique has been successful in providing a continuous supply of taro and banana planting materials to farmer clients. Biocontrol agents have been successful in controlling pests of root crops and invasive weeds in Palau. Families are now able to prepare new food products from their produce for food security.

CMI: With the knowledge acquired through these methods of small scale and urban gardening, it will be an excellent impend rigorous brilliant Food will be better presented if programs of cooking also included and established in order to have different cooking methods also be shared.

COM-FSM: Increasing number of communities appreciated the importance of maintaining their own gardens for availability of healthy and fresh produce and for healthy physical fitness. " Eating the Rainbow" slogan seemed easy to remember by people in growing and producing healthy local produce. There is an increased number of container gardens and increased number of people involved in the program. Participants produce and sell value-added products and generate family income.
Research now provides increased germplasm types and increased seedling production to more farmers. Those farmers work an increased number of farms, adopted best practices and technologies resulting in increased yields, reduced inputs, increased efficiency, increased economic return, and conservation of resources. Extension activities resulted in improved knowledge, created awareness and developed skills of the participants in sustainable agriculture systems and provided fresh produce to be donated to vulnerable populations for consumption. Researchers presented results of research and extension projects during scientific conferences and meetings, and developed publications related with the projects.

V(A). Planned Program (Summary)

Program # 7

1. Name of the Planned Program

Sustainable Energy

☐ Reporting on this Program

Reason for not reporting

There is no one that trained to do the program.

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2015	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	0.0	0.0
Actual Paid	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
Actual Volunteer	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
1862 Matching	1890 Matching	1862 Matching	1890 Matching
{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
1862 All Other	1890 All Other	1862 All Other	1890 All Other
{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}

V(D). Planned Program (Activity)

1. Brief description of the Activity

No planned activity.

2. Brief description of the target audience

No planned activity so no target audience.

3. How was eXtension used?

{No Data Entered}

V(E). Planned Program (Outputs)

1. Standard output measures

2015	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	0	0	0	0

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

Patent Applications Submitted

Year: 2015

Actual: {No Data Entered}

Patents listed

{No Data Entered}

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2015	Extension	Research	Total
Actual	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- {No Data Entered}

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

Outcome #1

1. **Outcome Measures**

{No Data Entered}

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

{No Data Entered}

V(I). Planned Program (Evaluation Studies)

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

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.