

2013 College of Micronesia Combined Research and Extension Annual Report of Accomplishments and Results

Status: Accepted

Date Accepted: 05/23/2014

I. Report Overview

1. Executive Summary

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

The sequestration had a negative effect on programs with about 10 percent reduction in funds for Micronesia. However, mitigation and adaptation programs on climate change continued as well as programs on food security, food safety and childhood obesity that were supplemented by programs on proper hygiene and healthy lifestyle that are important in safeguarding the well-being of citizens. The rising sea level due to climate change has become catastrophic to the low-lying atolls. The increasing cost of food and fuel has forced people to make adjustments necessary for the new economic, social and environmental conditions and find innovative methods of farming of crops, livestock, and aquaculture species. Research and extension activities promoted agricultural productivity and food security, self-sufficiency, and enhancing quality of life. The utilization, processing and development of new products from staple food crops that are acceptable to the native population and in local markets continued. Trials on taro varieties for their suitability to grow under atoll conditions continued and the micro propagation of elite (disease-free and high yielding) varieties that will improve the quality and quantity of certain crop varieties for food security were ongoing. Continued germplasm maintenance of staple root crops has insured genetic conservation of these valuable resources for future generations. This has also facilitated the continued supply of planting materials to growers and for in-vitro multiplication of other food crops.

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

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, including a Financial Assistance and Scholarship Program for program staff and financial assistance from the CarriPac program to college students enrolled in agriculture and home economic. Other capacity building activities included sustainable agriculture workshops, tissue culture and nursery practice, IPM, health and nutrition, and basic sewing attended by farmers, homemakers, the youth and adult sectors of the society and the underprivileged.

Total Actual Amount of professional FTEs/SYs for this State

Year: 2013	Extension		Research	
	1862	1890	1862	1890
Plan	40.0	0.0	14.0	0.0
Actual	36.7	0.0	16.3	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 or disapproval.

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 applied 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
946398	0	866641	0

2. Totaled Actual dollars from Planned Programs Inputs				
Extension			Research	
	Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
Actual Formula	922423	0	965802	0
Actual Matching	123726	0	31196	0
Actual All Other	0	0	0	0
Total Actual Expended	1046149	0	996998	0

3. Amount of Above Actual Formula Dollars Expended which comes from Carryover funds from previous				
Carryover	922423	0	946516	0

V. Planned Program Table of Content

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

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: 2013	Extension		Research	
	1862	1890	1862	1890
Plan	4.0	0.0	3.0	0.0
Actual Paid Professional	4.8	0.0	2.5	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
135402	0	149043	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
18163	0	14000	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

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

2. Brief description of the target audience

Community fishermen, government officials, elementary, high school and college students, researchers and extension agents, international and regional organizations, commercial businesses, foreign investors, NGOs and local residents.

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2013	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	814	2962	489	2713

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

Year: 2013
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2013	Extension	Research	Total
Actual	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of demonstration farms established.

Year	Actual
2013	14

Output #2

Output Measure

- Number of publications for lay use.

Year	Actual
2013	5

Output #3

Output Measure

- Number of conference paper and publication/presentation.

Year	Actual
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2013 3

Output #4

Output Measure

- Expected Professional Journal publications.

Year	Actual
2013	1

Output #5

Output Measure

- Expected Gray Literatures.

Year	Actual
2013	3

Output #6

Output Measure

- Expected publications for lay use.

Year	Actual
2013	2

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
2013	1359

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

PCC: Mangrove crab farmers lack knowledge in proper farming technology. Milkfish and rabbit fish farmers are not aware that fry can be produced locally.

CMI: People still lack knowledge and experience about aquaculture.

COM-FSM: Aquaculture has not been appreciated and promoted. Insufficient demonstration of the value of aquaculture has taken place in the communities.

What has been done

PCC: Hatchery-bred crablets were produced and grow-out techniques were taught to farmers. Hatchery production of rabbit fish was continued and milkfish breeding was initiated.

CMI: Community outreach and informal education by extension agent in communities empowered people with right and better approaches in the suitability of harvesting fish, crabs and other marine and land species. Moratoriums are now in place for exportation and a proposed legislation on overfishing and overharvesting is now on its way for the parliament consideration.

COM-FSM: Hatchery production of sandfish (Holothurian scabra) and Black teat fish (H. whitmaei) and pearl oysters for restocking and training continued raising aquaculture awareness. Tilapia control management was demonstrated.

Results

PCC: People became aware of the different farming techniques and that hatchery bred crablets can be produced. Fish farmers learned that hatchery techniques for rabbit fish and milkfish are available and supported the idea to establish local fry production.

CMI: People at communities that were visited have gained the knowledge of the right timing of harvesting marine and land species such as fish and crabs. The attitudes have improved to safeguard their food in a sustainable manner. They are now fully aware of the negative impacts that will directly affecting the future of their respective communities with scarcity of food.

COM-FSM: Steps are initiated to develop laws to differentiate wild caught and hatchery based fishery of marine resources. Hatchery production of sea cucumbers refined to suit local conditions and results disseminated. Half pearl seeding technology was transferred to some communities. Local individuals have partnered with foreign investors to initiate sea cucumber aquaculture. Yap communities were aware of the negative impacts of invasive fish species like Tilapia.

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
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3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

PCC: Mangrove areas were depleted of crabs. Some farmers lost interest in farming crabs and rabbit fish. Milkfish production became unsustainable due to dependence on imported fry.

CMI: Local governments are not keen and enthusiastic to start pearl farming. There are more marine species that are overharvested and have huge impact on food security.

COM-FSM: There is a need for alternative sources of income generation. The State and National Governments consider both community and business based aquaculture.

What has been done

PCC: Crablet production and grow-out techniques were presented to farmers. Fingerling production of rabbit fish was disseminated. Local milkfish fry production was encouraged.

CMI: Continuation of seed production of pearl oyster had successfully under gone two spawning and spats were kept at Arrak farm as well as delivering 80 % of the production to the farmers.

COM-FSM: Half-pearl seeding, accessory making and grading trainings were given. Sea cucumber hatchery and tilapia control trainings were conducted.

Results

PCC: Forty farmers were interested to grow mangrove crabs and there were more requests for the release of crablets in their respective States. Nine hatchery operators and technicians showed interest to adopt the hatchery technique for mangrove crabs and rabbit fish. Thirty milkfish farm operators and technicians have supported the establishment of local milkfish fry production.

CMI: Pearl farmers have continued expanding and a lead local government has been advising three other potential local governments who have expressed their interest to set-up their own pearl farms.

COM-FSM: Two farmers consolidated their aquaculture business to produce half pearls of high value and to start sea cucumber farming. National and, State governments are forming aquaculture development plans. Communities and NGO's requested sea cucumber and pearl aquaculture in their Marine Protected Areas. Tilapia capture resulted in 80 % invasive stock reduction from the previous year. Tilapia was used as a local protein source for chicken 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 #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
2013	30

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

PCC: Low production, lack of seed stock, and technology discouraged farmers to grow mangrove crab and rabbit fish. Milkfish farmers cannot sustain production due to unreliable sources of fry.

CMI: Because of time, efforts and hard labor associated with pearl farming, there is less passionate to move into and make commitment in pursuing the pearl industry.

COM-FSM: Community and commercial level for sea cucumber and half pearl farmers, communities developing aquaculture in their Marine Protected areas.

What has been done

PCC: Crablet and rabbit fish fingerling production was improved and alternative grow out techniques were disseminated. Milkfish farmers were encouraged to support the production of local fry.

CMI: Project continues to inform stakeholders especially the local governments the importance of the project with guaranteed income for the less fortunate and underserved individuals in the outer islands. There are now four farmers; two local governments and two individuals.

COM-FSM: A management committee was established to assist implementing activities under the management plan. The pearl project team had provided some technical advice through workshop and demonstrations for the community.

Results

PCC: Five crab farms were established and 2 conservation areas were stocked with hatchery bred crablets. Another 20 prospective farmers were interested to start their crab farms. One farmer had started to grow rabbit fish in tanks and cages while 4 milkfish farms continued to operate.

CMI: There are three more local governments interested in pearl farming. Successful second spawning will supply more than enough spats for all interested parties. An established farm was put up in one of the small islands in Majuro lagoon.

COM-FSM: 40 trainees earned income by participating in aquaculture technology development program activities. Two farmers got \$ 1000 and \$ 560 by selling half pearls at displays during local trade shows. One community entered the commercialization phase of their half pearl project. Recapture data of Sea cucumber juveniles released in the wild or given to one farmer show that restocked sea cucumbers were growing well providing hope for the farmers to make additional income. A community harvested 80 pounds of rabbit fish from a low-input fish pond.

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: Unpredictable weather condition and extreme storm that affected Palau have adversely affected the seed production activities of mangrove crabs and rabbit fish fingerlings. Some of the milkfish and rabbit fish broodstock held in tanks died due to high turbidity of seawater source. Collection of good quality spawners became very scarce. Some facilities at the hatchery have been damaged due to the strong typhoon. Poaching and vandalism have also been experience that resulted to loss of milkfish broodstock kept in floating net cages.

CMI: Transportation to reach the people in the outer islands is a major setback. A good and well equip lab will make it easy to complete the research. Property is on a lease land and therefore might be affected 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 island of Pohnpei. At times activities were put on hold because of delayed in processing.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

PCC: The success in producing rabbit fish 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. Milkfish farmers continued their operation.

CMI: Existing pearl farms have benefitted from the oyster spats that were produced in the hatchery. More individuals are now interested in pearl farming. People in atolls are now aware about the importance of aquaculture. Students were able to witness the seeding production from an expert who came and seeded the pearls at two pearl farming sites.

COM- FSM : Feedback from the communities has been positive and encouraging. A number of trainees and inhabitants have been encouraged to acquired skills and knowledge that would foster confidence and assurance to enter entrepreneurial pearl and sea

cucumber activities. While traditionally the beche-de-mer export industry has relied on wild stock populations in a "boom and bust" practice, state laws now provide opportunity for continuous but regulated harvest of sea cucumber from hatchery and ranching or farming. This presents an opportunity for aquaculture to provide a sustainable approach to this high demand industry. Through aquaculture, the potential for sustainable production, harvest and export of beche-de-mer can be realized and the economic benefits can be improved or sustained.

Tilapia is considered an invasive species in many coastal areas in FSM. Management control is very difficult. Communities where infestations are high have noticed a decline in their native fishery species and are looking for ways to address this situation. A farmer using tilapia as a source of protein to make his own local feed for his 10 laying chickens can stop importing commercial feed at cost of \$44 per 50lb bag. Cost of processing local feed is estimated to be \$20 per bag. Farmers save about 50% on feed expense. Aquaponics system, combining production of crops and raising of fish uses limited space, saves time and requires low-input. In addition aquaponics can serve as an effective educational tool for youths and adults.

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 so the industry will be sustained. Local production of milkfish fry is important in Palau so it would be no longer dependent on imported fry.

CMI: A close and continued examining of pearl farming is highly necessary and the need to have researcher/s is a must. Years have gone by and the expectation was for the pearl production at CMI to slowly mellowing down until someone can pick up the role to the next level for commercialization. The leading pearl farm local government has expressed its willingness to guide and assist the other three new local governments, establishing their new pearl farms. The role of Land Grant will continue in the spawning production and distributions to the farmers, for now.

COM-FSM: In Small Island economies, it is preferable to link programs such as the link between invasive species control of tilapia and reduced feed costs for animal feeds. Another link would be the introduction of entrepreneurial activities for youth with the pearl and sea cucumber industries. Economies of scale would be difficult to attain by concentrating on single program outputs.

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
608	Community Resource Planning and Development	25%		25%	
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	15%		15%	
806	Youth Development	30%		30%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2013	Extension		Research	
	1862	1890	1862	1890
Plan	9.0	0.0	1.0	0.0
Actual Paid Professional	5.8	0.0	0.3	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
163610	0	17885	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
21945	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

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

2. Brief description of the target audience

Families, youths and communities all over Micronesia.

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2013	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	1643	1500	800	912

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

Patent Applications Submitted

Year: 2013
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2013	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
2013	19

Output #2

Output Measure

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

Year	Actual
2013	22

Output #3

Output Measure

- Total number of youth clubs organized.

Year	Actual
2013	6

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
2013	1550

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

PCC: Increase in positive attitude toward family relationships and youth involvement in family roles. Most youths in the island lack social skills, family roles and responsibilities. Parents have limited time to guide their children in doing household chores and community responsibilities.

CMI: Youth dependency, alcoholism, drop outs, teen pregnancy, lack of parental skills and high population growth still remains huge concerns facing the nation.

COM-FSM: Youths have to understand their roles and responsibilities to prevent them from drug abuse, suicides and other irresponsible acts.

What has been done

PCC: School outreach, fairs, summer youth sports programs, family get together, and traditional handicraft making were conducted to improve the skills and attitudes.

CMI: Awareness and informal education were conducted to address growing social issues facing the communities.

COM-FSM: Training was given in the use of local resources, gardening and youth were coached to return to school.

Results

PCC: Improved attitude toward learning family roles, social skills and relationship were achieved.

CMI: With knowledge acquired, youths came to realize their roles and many have changed their attitudes toward parents started to get involved in gardening activities.

COM-FSM: Participants in the Youth Entrepreneurship Study Program gained knowledge in entrepreneurship opportunities with handicrafts and gardening. Youth learned respect and their role in the community through experiential learning. Youth were re-introduced to the education system through special training courses.

4. Associated Knowledge Areas

KA Code	Knowledge Area
608	Community Resource Planning and Development
801	Individual and Family Resource Management
802	Human Development and Family Well-Being
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures
806	Youth Development

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
2013	610

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

PCC : Youths in the community need direction and guidance in family and community responsibilities as well as sense of independence

CMI: The structure of the family has changed from being cohesive to one that is loose.

COM-FSM: Quality of life is limited due to lack of entrepreneurial opportunity and lack of emphasis on education.

What has been done

PCC: Skills and attitudes on family and community responsibilities were enhanced by school outreach, fairs, summer youth sports programs, family get together, and traditional handicraft making

CMI: Community awareness, outreach and church presentations were carried out.

COM-FSM: Youths and adults trainings on sewing, entrepreneurship and carving were conducted. Youth received training to re-introduce them to formal education.

Results

PCC: There was slight improvement in youth and family interpersonal relationship; increase in family harmony and children's participation in household chores. The sports programs increased children's physical activity thus improving their health and social relationships.

CMI: Knowledge gained by youths who got involved was put into practice. Most of the participants have find jobs and supported their families. Their family relationships improved and have got the family back to their lives. The ongoing experience in trade and skills of farming, making handicrafts helped and supported their family income.

COM-FSM: Vocational teachers were able to use the given instruction to teach their students in the school curriculum. Family income was assisted by making handicrafts, dresses, shorts and processed foods. Youth were able to return the schools or enter college.

4. Associated Knowledge Areas

KA Code	Knowledge Area
608	Community Resource Planning and Development
801	Individual and Family Resource Management
802	Human Development and Family Well-Being
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures
806	Youth Development

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
2013	450

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

PCC: There is a need to involve youth in family, school and community activities that promotes social values, traditional skills, and family responsibilities.

CMI: Underprivileged and underrepresented youths and families are disadvantaged of good opportunities available to them.

COM-FSM: Cost of living is high compared to wage earning opportunities causing stress in families. Family support for formal education is limited in some cases.

What has been done

PCC: Youth and families participated in school outreach, club activities, sports camps, family get together and street campaigns against drunken driving, violence, suicide, teen pregnancy, and domestic violence.

CMI: Trainings and workshops on basic life skills were initiated in the communities empowering youths with the necessary skills that can help them when they find a job. (NO. Will be inserted later as the extension is tallying them) Activities were conducted in 10 atolls and one island communities.

COM-FSM: Conducted trainings, follow up visits and provide guidance to clients after trainings in home-based enterprises for under-privileged participants including courses to return youth to the formal education system.

Results

PCC: There was an increase in school attendance and decline in school drop outs due to improvement of family relationship as a result of the various activities that they have participated in.

CMI: The learned trade and skills had been carried through and continued with the targeted groups, the youth and families whom the lessons were taught and passed on to.

COM-FSM: 45 individuals are earning extra income by sewing; one family is making and selling

handicrafts; 2 vocational teachers are teaching students as required in the curriculum. Youths, their families and communities gained confidence and hope of improvement in their welfare from extra incomes derived from their handicrafts, sewn garments and packed meals. About 80% of school drop outs who underwent refresher courses were able to be re-admitted to their chosen schools.

4. Associated Knowledge Areas

KA Code	Knowledge Area
608	Community Resource Planning and Development
801	Individual and Family Resource Management
802	Human Development and Family Well-Being
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures
806	Youth Development

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: Access to modern amenities in life such as cars, television, video games and computers has led to sedentary lifestyle and self - centered attitude.

CMI: Ongoing lack of enthusiasms and supports from the responsible government ministry, good and reliable mean of transportation to conduct activities with participants.

COM-FSM: The public schools curriculum does not orient the target audience 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. Inclement weather, conflicts in community events and high costs of fuels in visiting island participants limited the outreach activities.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

PCC: The activities and outreaches that were conducted to enhance the positive family relationship and responsibilities and social values (traditional arts & crafts and skills) resulted in increase in school attendance and decline in school dropout.

CMI: Increased in knowledge capacity bring attitudinal changes of participants toward redundancies and lack of respect for each other. The family unit has developed strongly. Both the youth and parent complement each other of the contributions shared either in monetary work around the house etc. The bond and respect has also built with strong sentiment.

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. Results showed that participants already exported their products through their families living outside the state. Youths trained in math, science and English competencies were re-admitted to their schools.

Key Items of Evaluation

PCC: More programs and resources in improving youth and family relationships should be given to schools, communities, church groups and organizations that help the family and community issues like more parental involvement in schools and community activities.

CMI: The challenges facing the family institution should carefully put into perspective as circumstances of life styles had changed the family cultural norm where people use to follow. The cultural value has always been taught and each family member understood his/her social class. There were unnecessary norms to continue obtaining, but their many valuable once that needs to be maintained. One is the unconditional respect for parents. Often times' youths, if they asked money from parents, especially when they are under the influence of alcohol and the request is not met, they went and commit suicide. Where is all this leads to? Continue to avail the services as it's been done and it is the desire and hope to have in-depth training for the extension to be ready to tackle issues professionally.

COM-FSM: Good working relationship between parents and youth; generated extra family income; increased number of young parents engaged in the program; increased number of students involved. Decreased rates of teen pregnancy, suicides, drug abuse and domestic abuses.

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: 2013	Extension		Research	
	1862	1890	1862	1890
Plan	4.0	0.0	1.5	0.0
Actual Paid Professional	3.4	0.0	0.7	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
95909	0	41735	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
12864	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 a decrease in childhood obesity/overweight children from 33% in 2010 to 30% in 2013 (MOH, 2013). As intervention program, diet modification and increased physical activity were encouraged. Nutrition education classes were conducted where participants did hands-on food preparation. Books on the utilization of taro, cassava, sweet potato, fish, coconut, and banana were prepared. There was a decrease in childhood obesity/overweight children from 33% in 2010 to 30% in 2013 (MOH, 2013).

CMI: Extension activities for child obesity continued taking action in the pre-schools as well as in the communities. Supports by the traditional leaders, politician, church leaders, school administrators and teachers were enormous. They make the outreach and visits to be possible and well attended.

COM-FSM: Community awareness and school enrichment programs were conducted. Youth summer programs educating participants on benefits of fruits and vegetables and the importance of local foods and calories in food were highlighted through the "Let's Go Local" food campaign. A baby food recipe book was developed and distributed to State Leaders and mothers engaged in the program. Collaboration with State Departments of Health and Education to conduct the Child Find Survey, to promote local foods and to review and improve gatherers' menus for ECE program. Workshops for ECE parents were conducted and educational materials distributed. Recipes were translated into local language to help families prepare local foods with less salt, fats and sugar using more fruits and vegetables. Target participants were informed about balanced diets, Body Mass Index (BMI), food recalls. Participants underwent training in gardening for physical activities and cooking healthy meals for the families. Public awareness activities included participation in community events such as World Food Day, COM-FSM Staff Development Day, Public Health and Chuuk Women's Council (CWAC) campaigns.

2. Brief description of the target audience

PCC: The targeted audiences include 2-8 years old children and their teachers, parents, and school administrators, policy makers, and coordinated efforts among agencies such as Ministry Of Education, Ministry Of Health, Palau Community College, Bureau of Agriculture, Head Start, Council of Chiefs, and Association of Principals in Palau.

CMI: Target audience includes housewives, young mothers, youths and school aged children.

COM-FSM: The Micronesians suffer from one of the highest rates of non-communicable disease incidence (NCD) in the world. Health care services and budgets are severely and negatively affected by these conditions. A state-of-emergency has been declared in at least two states. Nutrition programs are a serious effort to reduce this problem. The targeted audiences include school children, youths, teachers, parents, gatherers, administrators and policy makers, women groups, ECE parents, homemakers and program managers of other related agencies.

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2013	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	1229	2550	375	1078

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

Year: 2013
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2013	Extension	Research	Total
Actual	3	6	9

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of conference papers and publications on childhood obesity.

Year	Actual
2013	5

Output #2

Output Measure

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

Year	Actual
2013	20

Output #3

Output Measure

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

Year	Actual
------	--------

2013 12

Output #4

Output Measure

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

Year	Actual
2013	14

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
2013	2187

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

PCC: People are not fully aware about the importance of proper nutrition and physical activity that are the causes of childhood obesity.

CMI: Child obesity also leads to what RMI is facing today with the highest NCDs ever recorded. Therefore, Marshall Islands has topped to be the number one country by WHO with high rate of NCDs. With this news to the leaders of RMI, President of the country has declared a State of Emergency on this matter regarding the NCDs. As Community in general is the target as increase of sicknesses affecting many that are related to diabetes, hypertension and childhood obesity, conditions that have continue to plagued generations.

COM-FSM: Sufferers of NCDs. Parents and guardians of children and young families at risk.

What has been done

PCC: Training materials on preparation of local food products were developed for extension activities to increase awareness among participants.

CMI: Agents along with RMI mobile team chartered boats to visits the 24 local communities and conducted different trainings related to NCDs.

COM-FSM: Nutrition education programs were organized in schools and communities on proper food preparation using local food, more fruits, vegetables, yellow food varieties with less salt, fats and sugar.

Results

PCC: Six educational materials were developed on the processing of nutritious local foods. Materials for increasing physical activities were prepared.

CMI: It is been noticed with more sport activities, walk-a-thons, gatherings, government declaring state of emergency for NCDs, Ministry of Health radio & news paper awareness programs and many other forums discussing the NCDs issues, where it did not take place in previous years.

COM-FSM: 250 participants increased understanding of nutritive values, importance of fruits and vegetables; proper food preparation using less salt, fats and sugar; and yellow food varieties. 124 homemakers gained knowledge by attending local food, fruit juices, and vegetable preparation workshops that included the importance of physical activities. 164 youths increased knowledge on healthy snacks and physical activities. Participants increased awareness about the health complications of childhood obesity and obesity prevention. Increased desire for healthy foods and physical activity is a good indication that people care about preventing future health complications associated with obesity.

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
2013	653

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

PCC: Childhood obesity in Palau can be attributed to poor nutrition and lack of physical activity.

CMI: The wrong food served to the young children makes it hard to change their attitudes when they grow up. The unbalance diet has many implications one that is important is the malnutrition also affecting young children.

COM-FSM: Parents with young children and family members of those patients with NCDs care.

What has been done

PCC: Trainings on the preparation of nutritious local foods were conducted among 210 participants and physical activities were encouraged.

CMI: Agents, health educators and RMI mobile team, bring the child obesity and NCDs message to 10 local communities visited.

COM-FSM: Community workshops, nutrition counseling, follow-up visits and guidance were conducted. Nutrition programs and physical activities were introduced in selected schools and communities.

Results

PCC: Diet quality was improved through the use of nutritious local food among participants and increased physical activity was encouraged leading to the reduction of childhood obesity.

CMI: More involvement of people including the government leaders took part in the different childhood obesity & NCDs social events.

COM-FSM: Homemakers are using less salt and fats in cooking as revealed in the follow up visits. Many families are eating fresh vegetables from their gardens. Children are working on their school gardens. Public markets are selling more cooked local food and more schools are serving local food in the cafeterias. Increased numbers of participants prepare healthy and balanced meals, started small garden plots or walked to help decrease childhood obesity and health problems.

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
2013	394

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

PCC: Processed and expensive imported foods are the usual diet of the Palauan families so there is a need to change eating habits and increase their physical activity.

CMI: More children with obesity are a continuing treat for themselves and the NCDs outbreaks declared by the Head of State. Unbalance diets and processed food are the number one contributing factors for child obesity and malnourished children.

COM-FSM: FSM is a leading country in the world in NCDs.

What has been done

PCC: Parents, and teachers of obese / overweight children in Palau were trained on the preparation of nutritious diets from local food sources and physical activity.

CMI: Extension agents, the RMI mobile team and health educators continued to educate people in the communities on healthy food and healthy lifestyles.

COM-FSM: One-to-one contacts, meetings, workshops, distribution of printed materials and food recalls were conducted. Follow-up visits were conducted to monitor BMI to indicate their obesity status.

Results

PCC: Participants of the ten trainings conducted practiced serving nutritious meals from local sources instead of the fattening and expensive imported foods. They also increased their physical

activities, resulting in the decrease of childhood obesity in Palau from 33% to 30%.

CMI: Increase in the number of community scheduled walk-a-thons sports and preschool physical activities were carried out and joint by many participants.

COM-FSM: Local foods and drinks and healthy snacks consumption increased. Schools were not allowed to sell junk food but increased selling healthy snacks. Approximately 10% reduction in the number of obese children among participants resulted from consistent multi-agency and multi-disciplinary collaboration, monitoring and evaluation of public campaigns.

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: Constraints of acquiring needed supplies on time to implement activities that were being scheduled, with delayed PO payment processing time. Continuing challenges of the distances between islands and with fuel being very expensive.

COM-FSM: There were few things which affected the delivery of the program include weather, funerals in the communities, and transportation. At times, procurements of supplies delayed the delivery of the program. Lack of public transportation limits access of the program to scattered numerous islands in the lagoon and outer islands. Natural disaster and the change in the population due to out-migration affected program

results. Difficulties recruiting agents for vacant positions negatively affects expected outcomes.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

PCC: Nutrition education programs are evaluated by the participants before and after the program through tests. Participants in the trainings were able to prepare diets from local foods resources. Reduction in childhood obesity is monitored by MOH.. Results showed there was a decrease in childhood obesity from 33% in 2010 to 30% in 2013.

CMI: Families continued to seek help, and evaluations were conducted before, after, and during each demonstration and outreach programs. Demands for new recipes were increased among mothers. Traditional leaders supported attendance at the outreach and program activities.

COM-FSM: More gardens are in place and new recipes are practiced by homemakers. The post-evaluated surveys were better than the pre-survey based on the food and nutrition information indicating improved awareness. Evaluation results showed that childhood obesity is preventable with consistent public awareness campaigns through training, education, demonstrations, meetings, dissemination of information materials, feedbacks from surveys and collaborative efforts of communities.

Key Items of Evaluation

PCC: Incentives must be given to the agencies participating in reducing childhood obesity in the form of equipment. For example, schools should be given ovens to enable them to prepare nutritious food and exercise equipment or other facilities to expand their activities.

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

COM-FSM: Focus on the role and responsibilities of obese children's families; include communities and schools to ensure continuing public awareness and adoption of recommended balanced diets and activities; prepare questions carefully on the adult survey based on 24-hour food recall and behavior checklists; students' survey s

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	5%		5%	
131	Alternative Uses of Land	10%		10%	
132	Weather and Climate	10%		10%	
133	Pollution Prevention and Mitigation	5%		5%	
134	Outdoor Recreation	5%		5%	
135	Aquatic and Terrestrial Wildlife	10%		10%	
136	Conservation of Biological Diversity	10%		10%	
141	Air Resource Protection and Management	5%		5%	
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants	5%		5%	
315	Animal Welfare/Well-Being and Protection	10%		10%	
605	Natural Resource and Environmental Economics	10%		10%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2013	Extension		Research	
	1862	1890	1862	1890
Plan	2.0	0.0	3.0	0.0
Actual Paid Professional	3.3	0.0	3.5	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
93089	0	200661	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
12486	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: Sea level rise has led to salt water intrusion into taro patches which have been unfavorable for taro cultivation in Palau. Salt water intruded taro patches were surveyed and identified and sought ways to make these wetland taro patches productive once again. Prevention of salt water intrusion was done by raising dikes in the wetland taro patches. Secondary dikes were constructed inside the taro patch to hold and contain fresh water. Several taro varieties were planted in the salt water intruded taro patches to determine resistance to saline soil conditions. Some taro varieties were found tolerant to saline soil conditions. Farmers and communities affected by Typhoon Bopha were also assisted in land preparation and planting root and vegetable crops to ensure food security.

CMI: With the continued challenges of climate change with sea level rise, the question is how much more we can do to remedy the situation? The extension services and the knowledge that people gained, how would it be solving the inundation of sea water into the land. During the droughts, Land Grant extension agents were involved with collaborations by the RMI government, US Embassy, IOM, USAID and three NGOs.

COM-FSM: Micronesian islands are affected by global climate change phenomena. Farmers in the region are more vulnerable to the impacts of climate change because of their geographic exposure, low income, and greater reliance on agriculture as well as limited capacity to seek alternative livelihoods. Small farms and traditional agricultural systems are a part of the solution by contributing to climate change adaptation, mitigation, through carbon conservation, sequestration and substitution. Establishing ecologically designed agricultural systems can provide a buffer against extreme events. Diversified small farms have important risk-minimizing effects that lead to strengthened food security and resilience. Smallholder farmers who produce a variety of crops can continually harvest food both for the family's own consumption and potentially for income generation at the market. Small farms play a vital role in sustainable development and reducing hunger and poverty. Providing appropriate outreach, technical assistance and education efforts help the community to adapt to

changing climate and ensure food security effectively.

Government agencies and NGO's collaborated to carry out climate change outreach workshops in communities. Information about impacts of climate change and practical ways to cope were provided during meetings, workshops, consultations and island visits. Climate change strategic development plan for the communities were prepared. Research on resiliency of cultivars of root crops to salt sprays and inundation was conducted. Elite cultivars were distributed to communities. Demonstration plots using these cultivars were established.

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

2013	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	1345	1360	2117	360

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

Patent Applications Submitted

Year: 2013

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2013	Extension	Research	Total
Actual	0	3	3

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of awareness training conducted.

Year	Actual
2013	15

Output #2

Output Measure

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

Year	Actual
2013	595

Output #3

Output Measure

- Number of people who adopted sustainable food production technologies.

Year	Actual
2013	1457

Output #4

Output Measure

- Increased staple food crop production.

Year	Actual
2013	140

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
2013	2022

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

PCC: There is lack of knowledge on the impacts of climate change resulting into frequent typhoons, saltwater intrusion, excessive rainfall, flooding and soil erosion which affected some taro patches.

CMI: There is a lack of knowledge about climate change and its effects.

COM-FSM: There is a lack of knowledge about climate change effects and adaptation strategies among participants.

What has been done

PCC: Communities affected by the super typhoon were visited and measures to reestablish their farms were discussed. Taro varieties were evaluated for tolerance to salt water intruded taro patches.

CMI: Extension agents with RMI mobile team visited the affected islands and surveyed the communities? vegetation, water catchments, and ground wells for the droughts in regard to sea level rise.

COM-FSM: Meetings on climate change and strategic planning workshops with local leaders, establishment of demonstration plots and distribution of cultivars resilient to climate change.

Results

PCC: Communities affected by the super typhoon experienced and learned the impacts of climate change and ways to cope with these impacts were discussed. Salt tolerant taro varieties were identified.

CMI: Mobilization of organizations such as RMI Chief Secretary's office, Resources and Development (R&D), International Office of Migration (IOM), USAID, Environmental Protection Agency (EPA) and many NGOs delivered the necessary relief efforts to the islands affected. People understood the impact, but cannot stop the inundations of sea water into their land.

COM-FSM: Participants gained knowledge to improve farm management practices. climate change workshops were carried out in collaboration with other government agencies and NGOs in communities during the year. More than 500 participants attended the workshop and helped develop climate change strategies for the communities. Information about climate change and practical ways to cope with impacts were provided during meetings, workshops, consultations and island visits.

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
141	Air Resource Protection and Management
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
2013	700

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

PCC: Community members were affected by the disastrous impacts of climate change such as frequent typhoons and salt water intrusion into taro patches.

CMI: People in the outer islands continue to be affected by inundation of salt water into many of their food crops.

COM-FSM: Island communities affected by salt intrusion had to abandon their damaged taro patches.

What has been done

PCC: Communities affected by the super typhoon were assisted in land preparation and given planting materials of root and vegetable crops. Several taro varieties were evaluated for tolerance to saline soil conditions.

CMI: Ongoing trainings and workshops to people in the communities on climate change especially the issues that are facing the people. There were activities involving students to plant local plants along the shorelines, including food trees that are salt tolerant.

COM-FSM: Research of salt tolerant root crops with adaptation measures such as container gardening, planting in upland and composting were conducted in collaboration with other agencies.

Results

PCC: One hundred eighty two families were assisted in establishing farms and planted root and vegetable crops to ensure production and food security in communities and areas that have experienced the severe impacts of climate change. In addition, 132 backyard gardens were planted with vegetables to augment their food supply.

CMI: The agriculture demonstration site has produced enough local plants and food trees with the involvement of the students and they are ready to be distributed to the affected areas to minimize erosions. Others will be given to a re-plantation project at the airport.

COM-FSM: Communities participated in the program have improved farm management practices. Requests for demonstration and multiplication plots of salt tolerant crops to be established increased. Three thousands seedling of swamp taro and soft taro are maintained for screening to study salt tolerance level as greenhouse/nursery experiments.

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
141	Air Resource Protection and Management
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
2013	334

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

PCC: Food security is a big problem in communities when frequent high intensity typhoons and salt water intrusion into taro patches occur as a result of climate change.

CMI: The inundation of sea water and droughts had affected foods crops in many of the atolls. Sea level rise affected the airport and houses in the capital.

COM-FSM: The long-term effects of climate change impacting food security, properties and lives are major concerns to the entire population.

What has been done

PCC: Immediate replanting of root and vegetable crops as well as salt tolerant taro was done in communities affected by severe impacts of climate change after strong typhoons.

CMI: Awareness programs were made and information sharing was made to the people were scheduled accordingly; food and waters were distributed to the people that were affected.

COM-FSM: Training and technical assistance on innovative techniques and practices, soil media preparation was provided. Root crop cultivars evaluated for salt tolerance were distributed.

Results

PCC: As a result of immediate planting of root and vegetable crops in communities affected by the strong typhoon, there was an increase in food production. Adequate fertilization was recommended and practiced to ensure high yield and productivity of root crops and vegetables.

CMI: With the assistance from outside donors, Reverse Osmoses were set ups 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.

COM-FSM: Participating communities have cultivated crop varieties that were more resilient to climate change. Eight out of 40 municipalities contacted availed of these promising elite lines of root crops.

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
141	Air Resource Protection and Management
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: Replanted crops were destroyed during extreme weather conditions, sea level rise and salt water intrusion in taro patches.

CMI: Kept on top of different programs is a challenge, where few times deadlines are hard to catch-up with. If researchers will be onboard I am definitely sure things will be changed for better.

COM-FSM: Natural disasters and population changes affected the outcomes of program in that assistance and activities could not be carried out in isolated and remote areas, and with changes in population, pose a difficult situation in recruiting new clients. High costs of fuels for motor boats and inclement weather affected visits to island communities. The natural disasters highlight the effects of climate change and give stimulus to the conversations and immediacy to the research needs for these vulnerable island communities.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

PCC: Climate change has severely affected food supply in vulnerable communities who experienced strong typhoons, salt water intrusion and coastal erosion. Immediate replanting of root and vegetable crops is an essential measure to ensure resilience to impacts of climate change.

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 do look

into the dry and salt resistance crops.

COM-FSM: Collaborating with the local governments, NGOs and community leaders proved effective and efficient in establishing demonstration and multiplication plots of elite lines of root crops. Climate change awareness in the communities needs to be continued for the better understanding of the effects especially how it changes the weather pattern. There is a keen awareness especially among atoll communities of their vulnerability

Key Items of Evaluation

PCC: Small Pacific islands are vulnerable to climate change impacts especially strong typhoons and salt water intrusion into taro patches. Immediate planting of root crops and vegetables after the typhoon is essential to ensure adequate food supply. Farmers need salt tolerant taro varieties for resilience in salt water intruded taro patches.

CMI: Islands' vulnerability, it should be considered with urgency as these low-laying islands and atolls cannot survive along to live through climate change impacts. As these islands are known to only have 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 many people will not survive.

COM-FSM: Communities are aware of the negative effects of climate change to their food sources, properties and lives. They secure information about adaptation practices and are interested to establish multiplication plots of new promising varieties of root crops for island-wide distribution.

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: 2013	Extension		Research	
	1862	1890	1862	1890
Plan	3.0	0.0	1.0	0.0
Actual Paid Professional	2.8	0.0	0.7	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
78984	0	49730	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
10594	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: Training among food handlers on food safety were conducted to prevent food borne illness outbreaks. Food handlers now practice strict food preparation techniques and therefore avoid expensive hospitalization expenses resulting to significant decrease in the incidence of food borne illnesses in Palau from 4 outbreak investigations each year in 2005 and 2006 to 1 investigation in 2012 and almost none in 2013.

CMI: Food safety trainings were conducted in two locations, at the Wellness Center and two restaurant locations. Workshops and trainings conducted with procedures relating to proper handling of food, safety methods of water usages as well as proper disinfecting of utensils. Lectured were also done with necessary usages of cooking outfits to prevent spreading of contaminants to the food prepared.

COM-FSM: Community workshops were conducted. A Baby Food Recipe Book was produced. A Local Food Campaign, School Enrichment program, Child Find Survey and Nutrition counseling to Families with Special Needs Children were provided. Food Safety topic is always emphasized in the all food demonstrations. Training on food safety was conducted in communities, schools, youth groups and individual person to up-grade their skills and knowledge in the area of food storage and sanitation, food handling and kitchen safety. Education and training about proper food preparation, hygienic food handling, causes and prevention of food- and water-borne illnesses were conducted to communities, schools and food establishments.

2. Brief description of the target audience

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

CMI: For this year, it targeted the students who are taking the nutrition courses at the college. It also involved the kitchen staffs at different sites where the hands on training was also being conducted.

COM-FSM: Community leaders, parents with young children, school children, ECE parents, senior citizens, girl scouts, Women in Farming members, youths and families with special needs children, homemakers, cooks of food establishments, school teachers and students, government and non-government groups and other interested individuals. These clients were vital to prevention of occurrence of water-borne and food-borne diseases in the families, communities and state.

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2013	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	881	2200	448	1100

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

Year: 2013
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2013	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
2013	35

Output #2

Output Measure

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

Year	Actual
2013	759

Output #3

Output Measure

- Number of extension publications on food safety.

Year	Actual
2013	3

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
2013	1091

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 and water borne illness.

CMI: Students and food kitchen handlers were not fully aware of the proper hygienic in food preparation and water cleanliness.

COM-FSM: Food preparers in homes, restaurants and institutions, collaborators in other agencies lack understanding of the sources of food and water- borne diseases and control measures.

What has been done

PCC: Ten food safety trainings were conducted for 210 participants.

CMI: Basic procedures of handling foods and water safety concerns was provided to fourteen students and three kitchen personnel. Steps by steps were being demonstrated and participants were taking turns, inconsistencies were being corrected. Follow up exercises were arranged to make sure all participants comprehended.

COM-FSM: Organized and conducted community food safety workshops, school enrichment programs, engaged students, collaborated with health and environment 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 the participants.

CMI: Sstudents and kitchen food handlers gained knowledge about proper food preparation and how to avoid food poisoning and contamination.

COM-FSM: Extension program have improved knowledge of 549 participants involved in the program in one site. In all sites, participants increased their knowledge on rejecting of expired goods, maintaining hygiene in their kitchen and handling of meal preparation. The clients improved their skills for separation of raw meat from other food such as fruits and vegetables and in selling safe and hygienic cooked 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
2013	744

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: People did not understand many crucial safety elements associated with handling of foods.

COM-FSM: People affected by careless food handling, health care workers, and consumers of restaurant or institution food.

What has been done

PCC: Food handlers were taught proper food handling techniques such as proper hand washing, and avoiding cross contamination.

CMI: Trainings were conducted in the classrooms, kitchen in the restaurants and dining hall at the Wellness Center.

COM-FSM: Community workshops, information dissemination by prints and lectures, follow-up visits, guidance to food handlers on proper food management and safety were conducted.

Results

PCC: Participants have changed their behaviors in proper food handling such as practicing good personal hygiene, cooking foods safely and adequately, preventing cross contamination during cooking, and proper storage of cooked food.

CMI: Outcomes of the trainings proved that all the students passed the food safety procedures, evaluation tests and scored high. At the end of the two semesters, with serous of lectures and hands on activities, safety procedures acquired by participants were demonstrated and further put into practice at scheduled end of the semester food safety and healthy cooking ceremonies. 100% of the students passed their safety procedure guidelines and were given high marks.

COM-FSM: 150 participants at one site are applying 5 keys to safer food techniques. Trained community members and students applied personal hygiene before preparing food and practiced proper food storage. Follow-up visits and surveys indicate that local food vendors adopted food safety guidelines. Participants influenced their families, neighborhoods and communities through their practice of safe ways of handling foods from buying foods to maintaining personal hygiene and cleanliness in their kitchen and utensils and in proper 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

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
2013	548

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

PCC: Food borne illness outbreaks were common occurrences in the community especially during custom events.

CMI: Food and water contamination are very important to examine and can easily be avoided without burdening the resources.

COM-FSM: Food- and water- borne diseases can be prevented by proper and sanitary handling of food from the source like garden or store up to the home.

What has been done

PCC: Food handlers were taught about prevention of foodborne illnesses through proper food safety practices.

CMI: Trainings and other activities on proper food safety and water sanitation were conducted in schools and communities.

COM-FSM: Individual training, education meetings, and collaboration with the Public Health and non-government agencies have reduced the incidence of food-borne diseases.

Results

PCC: There was significant decrease in reported outbreak of food borne illnesses as compared to 4 outbreaks in previous years.

CMI: Decreased number of food borne illnesses among the people.

COM-FSM: These activities assisted in improving skills of participants in food storage and sanitation, food handling and kitchen safety. Incidences of cholera diseases decreased. The 5% reduction of incidence of water- and food-borne diseases among participants lessened public burden of medical treatment to affected individuals. Observation of store display of expired foods, provision of signs for proper hand washing and hand washing liquids in restaurants demonstrated the increasing concern for safe foods and handling.

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: None

CMI: Drought affecting the people's dependent on clean water and healthy food make it hard to complete the outreach activities on safety as water catchments are emptied and ground water are brackish. Issue of low income families continued facing financial hardship in acquiring clean cooking materials in order to prepare safe and healthy meal for their family. The continued challenges facing many homeowners in the rural areas are the fact that cooking is done on fire with limited clean water. As much as the safety of the food concerns, the health concerns of people cooking on open fire who continuously inhaling smoke is also a health risk.

COM-FSM: Imported foods are cheaper and more convenient than the local produce in the markets. Out-migration reduces the continuity and carry-over of knowledge meaning new clients need to be taught the same information as previously provided in the same communities. Ongoing road construction affected safe supply of

drinking water and clean supplies of local produce due to mud and dust. Non-communicable Diseases are recognized as a greater health threat and not associated with Food Safety but are considered a nutrition problem. Government focus and funding is on NCDs.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

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

CMI: Students received special awards in food safety and nutrition. Food handlers, who participated, stated that the collaborative exercises enhance and gave them opportunity to pick up more tips on food safety issues.

COM-FSM: The post surveys resulted better than pre survey on food safety guidelines. More people are aware of food safety guidelines. Evaluation results showed that stores had separated displays of expired foods; food handlers put cooked foods in clean and covered containers; road markets had cleaner stalls for local produce and illnesses caused by improper food handling were reduced.

Key Items of Evaluation

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

CMI: It is highly necessary to put more emphases on trainings for the science teachers both in the primary and high schools, scheduled food safety and healthy nutrition workshops twice a year to food handlers who are serving lunch to the students especially the cooks in schools' kitchen.

COM-FSM: The following should be adhered to.

- Questionnaires on food safety guidelines must be culturally sensitive.
- Awareness of previous health consequences of improper food preparation and storage contributed to interest to learn and practice food safety.
- Previous surveys indicated that clients did not associate diseases and stomach problems with food handling and hygiene.
- Expired goods are still sold in the stores.
- Lack of refrigerators in majority of homes shortened storage of foods.
- Free-range animals (dogs, pigs and chickens) are culturally accepted and not recognized as food safety concerns.

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	20%		20%	
315	Animal Welfare/Well-Being and Protection	5%		5%	
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: 2013	Extension		Research	
	1862	1890	1862	1890
Plan	16.0	0.0	6.0	0.0
Actual Paid Professional	12.6	0.0	8.5	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
355429	0	506748	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
47674	0	17196	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

PCC: The germplasm of taro, cassava and sweet potato maintained and multiplied at the research station is a reliable source of planting materials for food security. Planting materials of taro, cassava, sweet potato and fruit trees were distributed to farmers. Farmers were also assisted in land preparation and planting of root crops, and in establishment of backyard vegetable gardens. Community members and students learned about the agricultural activities that were conducted at the research station and during national events.

CMI: Agriculture activities were primarily carried at atolls and schools, related with food security and hunger and school curriculum. In the communities, small scale gardening was provided. Small islands' communities in Majuro lagoon were visited to trained homeowners on farming. Knowledge was also shared of how crucial it is to farm as many local food crops in and around their properties.

COM-FSM: Organized workshops on farming and food processing techniques, increased number of value added products focused more on homemade flour. Educational material on farming and food processing were translated and distributed. Farmers processed rejected cucumber and long chili pepper into vinegar, increasing income. A school based program assisted vocational teachers on basic skills in agriculture. Small-scale piggeries were evaluated for use as dry-litter demonstration sites. A project of artificial insemination of sows was carried out with approximately 50% success. Research of root crops with improved productivity took place. Germplasm of different varieties of swamp taro, soft taro and sweet potato have been collected from the Micronesia Region. In vitro and in vivo screening to study salt tolerance level of swamp taro and soft taro. Local governments received selected varieties to establish multiplication plots. Integrated sustainable agriculture intervention programs to target socially disadvantaged island community promoted crop production skills. Additional income was generated through vegetable gardening efforts. Maternal and Child Health Program Coordinator reported an overall improvement in the health of the school children from the community ever since they began consuming homegrown vegetables, as measured by their blood hemoglobin count. Backyard poultry farming is established with families and individuals raising a few to several hundred layers to produce fresh eggs for home consumption and sell for extra income.

2. Brief description of the target audience

PCC: Our target audiences are scientists, extension agents, agriculture students and professionals, federal, state and national agencies, conference publications, and scientific journals. Farmers, students, parents, state and federal government officials and private individuals are also beneficiaries of our extension programs.

CMI: The audiences targeted were the schools and communities affected by the droughts and communities that were not visited in previous years

COM-FSM: Target audiences included gardeners, homemakers and young mothers engaged in Women in Farming, students, senior citizens, farmers and youths NGOs, government agencies, traditional leaders, women's groups, and community groups, church groups, policy makers, state, national project management staff, traditional smallholder farmers, and immigrant neighboring island populations. Scientists, extension staff, agricultural professionals, agriculture students, federal, state and national agencies, conference publications, and scientific journals are target audiences for research activities.

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2013	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	1792	7825	512	600

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

Patent Applications Submitted

Year: 2013
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2013	Extension	Research	Total
Actual	3	1	4

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of demonstration farms established.

Year	Actual
2013	44

Output #2

Output Measure

- Number of publications for lay use.

Year	Actual
2013	12

Output #3

Output Measure

- Number of conference papers and publications/presentations.

Year	Actual
2013	15

Output #4

Output Measure

- Expected professional journal publications

Year	Actual
2013	0

Output #5

Output Measure

- Expected gray literature.

Year	Actual
2013	2

Output #6

Output Measure

- Expected publications for lay use

Year	Actual
2013	2

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
2013	2061

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: Students and farmers lack knowledge of improved agricultural practices and importance of local food production.

COM-FSM: Understanding of income generation opportunities from environmentally friendly sustainable practices in agriculture.

What has been done

PCC: Information on new varieties of crops, best management practices, bio control agents and publications were disseminated. Food technology trainings were conducted.

CMI: Small gardens in three schools were established to enhance students learning. 14 students at the college took the nutrition course (AH-101). Youth groups, women groups, families and landowners continue developing farms in order to have enough supplies of food.

COM-FSM: Workshops educated participants on environmentally friendly, economic opportunities in farming and food processing. Experimental trials were conducted using low-cost production methods of climate-smart farming.

Results

PCC: Visitors to Research Station understand the importance of root crops germplasm conservation, use of bio control agents to control pests of crops and invasive weeds, and current best management techniques to improve productivity and protect the environment. Participants in food technology trainings can prolong the shelf life of food products thus enhancing food security in the community.

CMI: Students in established school gardens have understanding of agriculture methods as they do their practical hands on experience. The small scale gardening have increased with more people demanding for seeds. During the world food day activities, people took home different varieties of food vegetation, especially the local food trees and plants to be planted around their homes.

COM-FSM: Participants have increased knowledge on composting, sustainable and economically viable farming and food processing. Participants have learned how to process feed for their laying chickens using tilapia and a variety of local materials.

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
2013	1132

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: Poor condition of atoll soils limits sustainable crop production.

COM-FSM: Farmers need to adopt techniques to protect the environment while creating economic opportunities.

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: Continuation of trainings and demonstrations on composting has extended this year to 11 underprivileged young men from the rural areas in Majuro. Dry litter waste management system and copra cakes mixing with organic materials methods were shared and passed on.

COM-FSM: The dry litter system of pig housing has been adopted to protect the environment and provide compost materials for soil improvement. Production of local feeds allows reduced costs.

Results

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

CMI: Eleven trainees have applied the composting techniques in their own respective farms. Outer islands? participants applied different composting as was demonstrated to them.

COM-FSM: Participants learned new techniques on farming and basic skills on food and feed processing. Farmers adopted compost and were selling locally made composts to earning extra income for family. 28 breeds of chicken were imported for egg production and breeding by 46 individuals. Processing and formulation of poultry and swine feeds using locally available materials was demonstrated and adopted. One family has increased their number of chickens from 20 to 200 layers. Patients of Public Health sought assistance in establishing home gardens using recommended practices. Fifty eight new youths and adults started establishing their farms and are cultivating different crops.

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
2013	263

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

PCC: Lack of best management practices limit farmers from improving productivity. Families are not capable of preparing new food products from their produce .

CMI: Space for farming, invasive species and good fertile soils are the major ongoing contributing factors for a vibrant and productive farming.

COM-FSM: Few new youths and adults are involved in farming and food processing activities. Migration patterns affect sustainability. Imported foods create price competition.

What has been done

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

CMI: With the collaborative partnership with R&D and Taiwan technical mission, efforts has made to introduced containers to be used in space that are limited, increased production of seedlings and composting was introduced and shared with schools? gardening as well as people in the town down areas.

COM-FSM: Multiplication of elite varieties of root crops to improve productivity took place. Fresh produce was donated to vulnerable populations to stimulate market interest.

Results

PCC: High productivity of root crops was attained through use of disease-free, high yielding planting materials and adequate fertilization. Practices showcased in the demonstration farms were adopted by farmers. Families prepared and have new food products from their produce for food security.

CMI: Container gardening had successfully produced about 50 small containers with cabbages and lettuces from a government school in the capital. At a scheduled open house, people attended were interested to set up small at their front yard with few containers.

COM-FSM: 70 container gardens were established. One family is making taro and tapioca flour. Farmers sell locally made compost earning extra income. 11 backyard poultry farms were established. One family sells 3 dozen eggs per week earning \$51 per month. Another sells one dozen eggs per day to earn \$127.50 per month. Increased numbers of family gardens use biodegradable wastes in composting. About 12% of participants provided technical assistance secured food from gardens they cultivated. Health status of children has improved after consumption of homegrown vegetables according to health officials. Five hundred pounds of fresh produce was donated to state hospital and vulnerable populations for consumption. Twenty new farmers are producing, selling and exporting their farm produce.

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: Continue challenges of transportation to outer islands are real. The availability of funds to buy containers for farming will be a set-back for the low income families. This year along inundation on dry land and droughts that affected the 15 atolls and islands make a huge impact on food security on the affected communities.

COM-FSM: Limited supplies and funding to carry out planned activities were major constraints in the program. Lack of transportation and fuel, extreme bad weather and conflict of activities within the communities affected the program outcomes. Establishments of plot demos in atolls and distant islands were affected by inclement weather, irregular availability of water transportation and high fuel costs. Typhoons and heavy rains affect chicken and pig farms resulting in lowering growth and production. Establishment of field trials was delayed due to non-availability of secure and accessible land.

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: More people have planted more food vegetation around their houses. The 11 trainees who were trained had developed the skills necessary and have made their own farms.

COM-FSM: Members of the community, farmers and leaders are open to new

practices such as container gardens using local basket technique and used containers. Compost and home-made pesticides are also practiced. Solar drying and grinding techniques used as replacement of electric machines for drying and grinding crops for making home-made flour are preferred. Farmers, community leaders, teachers and parents were willing to test new innovative technologies to improve current practices and management styles. There were more collaboration between farmers/schools and free sharing of traditional knowledge and skills to complement new technologies and practices. 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 produce for their families. About 20% of the clients helped have become involved and committed to raising pigs and chickens. About 5% (13 families) of clients have established poultry and piggeries.

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. Bio control 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: Even if we continue to do perfectly with farming, the one important issue farmers encountered are the diseases that destroying their affecting food crops. They have put so much effort in the beginning and later witnessing the fruits being dying out and fall down. They have used all the methods they learnt, problem never drive out. Often time farmers abandoned their farm and seek better opportunities.

COM-FSM: Increased number of container gardens and increased number of people involved in the program. Improved lifestyle, family members are working together in gardens, making home-made flour, jams, ketchup. Increasing number of communities appreciated the importance of maintaining their own gardens for availability of healthy and fresh produce and for healthy physical fitness. Observations and surveys indicate clients need

- Increased germplasm types,
- Increased seedling production,
- Increased number of farmers,
- Increased number of agricultural farms,

With proper presentation, farmers adopted best practices and technologies resulting in increased yields, reduced inputs, increased efficiency, increased economic return, and conservation of resources, fresh produce donated to vulnerable populations for consumption developed community support. Extension activities resulted in improved knowledge, created awareness and developed skills of the participants in sustainable agriculture systems.

V(A). Planned Program (Summary)

Program # 7

1. Name of the Planned Program

Sustainable Energy

- Reporting on this Program
 - Reason for not reporting
 - Lack of human resources, no experts in this area.

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: 2013	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	0.0	0.0
Actual Paid Professional	{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

2013	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: 2013

Actual: {No Data Entered}

Patents listed

{No Data Entered}

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2013	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}