

2012 College of Micronesia Combined Research and Extension Annual Report of Accomplishments and Results

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I. Report Overview

1. Executive Summary

Integrated research and extension programs to address economic, social, and ecological issues continued with special emphasis on the national priority areas and the national outcomes and indicators. 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). The thrusts of the programs were dissemination of new knowledge and technologies to sustain and improve the quality of life of all Micronesians in the Republic of the Marshall Islands (RMI), Federated States of Micronesia (FSM), and Republic of Palau (ROP).

Mitigation and adaptation programs on climate change; food security, food safety and childhood obesity programs were launched and supplemented programs on proper hygiene and healthy lifestyle that are important in safeguarding the well-being of citizens. Although sustainable energy was deemed crucial in addressing energy needs, program implementation was not done due to lack of local expertise. The rising sea level due to climate change has become a really serious concern as we witnessed the catastrophic effects of this phenomenon on sea shores. The increasing cost of food and fuel has forced people to make adjustments necessary for the new economic, social and environmental conditions and find innovative methods of farming of crops, livestock, and aquaculture species. Research and extension activities promoted agricultural productivity and food security, self-sufficiency, and enhancing quality of life. The utilization, processing and development of new products from staple food crops that are acceptable to the native population and in local markets continued. Trials on taro varieties (*Cyrtosperma* spp. & *Colocasia* spp.) for their suitability to grow under atoll conditions continued and the micro propagation of elite (disease-free and high yielding) varieties that will improve the quality and quantity of certain crop varieties for 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 incomes towards their 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. A project got underway to develop the technology for the farming of sea cucumbers in the FSM to enable the replenishment of lagoons and reefs depleted as a result of over harvesting.

Other outreach programs continued on issues ranging from food safety and quality, food security, families and youths, water quality, and managing limited natural resources and the environment. Health and nutrition programs continued on the importance of healthy lifestyles, which included physical activity and consumption of safe and nutritious local food to combat obesity, diabetes, heart diseases and other NCDs. The youth development programs provided information to increase knowledge and appreciation of marine and terrestrial flora and fauna and more students are exposed to computers, which provided the opportunity to use the Internet as an introduction to electronic connectivity and information gathering. Water quality education programs continued as collaborative efforts with international and regional

organizations, government agencies, and community groups. Sustainable agriculture and IPM programs provided farmers information on agricultural production practices that protect the fragile island ecosystem integrity and biodiversity. Programs continued on resistant crop varieties and practical biological pest control measures to provide useful tools for stakeholders to combat crop pests and diseases and increase productivity. The use of beneficial organisms was emphasized to reduce pest threats on crops.

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

Total Actual Amount of professional FTEs/SYs for this State

| Year: 2012 | Extension | | Research | |
|------------|-----------|------|----------|------|
| | 1862 | 1890 | 1862 | 1890 |
| Plan | 40.0 | 0.0 | 14.0 | 0.0 |
| Actual | 40.4 | 0.0 | 18.0 | 0.0 |

II. Merit Review Process

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

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

2. Brief Explanation

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

III. Stakeholder Input

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

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

Brief explanation.

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

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

1. Method to identify individuals and groups

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

Brief explanation.

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

projects.

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

1. Methods for collecting Stakeholder Input

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

Brief explanation.

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

3. A statement of how the input will be considered

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

Brief explanation.

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

Brief Explanation of what you learned from your Stakeholders

We learned that farmers, homemakers, fishermen, community groups and others are good sources of traditional knowledge which can be considered and used to improve social,

agricultural and environmental issues. Entrepreneurs interested in business development lack marketing strategies and training is necessary for them to be successful.

IV. Expenditure Summary

| 1. Total Actual Formula dollars Allocated (prepopulated from C-REEMS) | | | |
|--|-----------------------|-----------------|--------------------|
| Extension | | Research | |
| Smith-Lever 3b & 3c | 1890 Extension | Hatch | Evans-Allen |
| 1040166 | 0 | 947963 | 0 |

| 2. Totaled Actual dollars from Planned Programs Inputs | | | | |
|---|--------------------------------|-----------------------|-----------------|--------------------|
| Extension | | | Research | |
| | Smith-Lever 3b & 3c | 1890 Extension | Hatch | Evans-Allen |
| Actual Formula | 1087766 | 0 | 884208 | 0 |
| Actual Matching | 92344 | 0 | 0 | 0 |
| Actual All Other | 0 | 0 | 0 | 0 |
| Total Actual Expended | 1180110 | 0 | 884208 | 0 |

| 3. Amount of Above Actual Formula Dollars Expended which comes from Carryover funds from previous | | | | |
|--|---------|---|--------|---|
| Carryover | 1071033 | 0 | 882761 | 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 | 10% | | 10% | |
| 302 | Nutrient Utilization in Animals | 15% | | 15% | |
| 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: 2012 | Extension | | Research | |
|--------------------------|-----------|------|----------|------|
| | 1862 | 1890 | 1862 | 1890 |
| Plan | 4.0 | 0.0 | 3.0 | 0.0 |
| Actual Paid Professional | 5.2 | 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 |
| 139663 | 0 | 122128 | 0 |
| 1862 Matching | 1890 Matching | 1862 Matching | 1890 Matching |
| 11857 | 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: Hatchery produced crablets with total carapace length was about 2 inches were given to two local crab farmers for grow-out trial in pens inside the mangroves. A floating fish cage was completed and was stocked with rabbitfish and milkfish broodstock. Walk-in visitors, school children and people in the government visited the hatchery and fish cages to observe the on-going aquaculture activities.

CMI: Three spawning runs for the production of pearl oyster spats were conducted and some spats were brought to a pearl farm. The remaining spats were kept at the college's farm waiting for shipment to other farms. New batches of rabbit fish brood stock were collected and spontaneous natural spawning was recorded. Viability of spawned eggs and hatching rate were close to 100% and preliminary larval rearing trial was conducted. Five on the job local trainees were hired learned the basics of pearl farming and one of them was able to establish his own farm. Three atolls were visited and lectures and site assessment were conducted in line with aquaculture development. Local farmers growing rabbit fish in cages were visited and technical assistance was provided.

COM-FSM: Total of eight spawning-runs was conducted over one year period to settled approximately 100,000 early stage juveniles of sandfish sea cucumber. Tagging trials were also conducted for the wild-caught and hatchery-produced sandfish in Pohnpei. Pohnpei's pearl project conducted a half-pearl or hemispherical pearl production, of which activity focused on skill training of the half-pearl nuclei implantation, harvesting and processing techniques for the extension staff and for the local youths. The cultivation period of half-pearls was 7-10 months from nucleus implantation to the harvest, which was greatly shorter than those round-pearl farming. Four local communities of Nett, Pweniau Island, Pakin Atoll and Pingelap Atoll joined skill training on the half-pearl seeding and pearl accessory making, which involved 13 trainees for the seeding skills using 4,000 pearl oysters and approximately 150 people from four communities for the accessory making, respectively. 3,000 oysters were harvested and produced over 10,000 half-pearls. The training programs also involved three interns from COM-FSM Marine Science. For local sales and marketing promotion of the pearls from the project, display-charity sale was conducted in Pohnpei, which sold \$15,000 of the round-pearls and \$500 of half-pearl accessories in one day session. Both In Pohnpei and Yap, sea cucumber aquaculture workshops were conducted with the onsite demonstrations of hatchery operations and tagging practices. In Yap, approximately 1,000 tilapia were successfully removed from mangrove ecosystem in one of the two communities involved, of which

captured animals were used as the feed for chicken farming.

2. Brief description of the target audience

PCC: Existing fish and crab farmers, students, government officials, traditional leaders, tourists and the general public are the target audience of aquaculture activities in Palau.

CMI: Community leaders, tourists, diplomats, local governments, and students were the major target audience.

COM-FSM: Communities and families who participated in pilot farming programs, state and municipal governments personnel who collaborated on aquaculture activities, overseas governments and international agencies who showed their interests in economic development supports in this region and local and overseas business owners who expressed interests in investment to aquaculture business were the target audience. Furthermore, secondary and tertiary students, members of youth activities and women's group were also important target as the majority of them were under-privileged but becoming potentially vehicles of aquaculture industry once it is developed. Scientists and professionals overseas were also target audience through international conferences and internet presentations such as using YouTube for disseminating unique tropical aquaculture research and extension work undertaken in this country

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

| 2012 | Direct Contacts Adults | Indirect Contacts Adults | Direct Contacts Youth | Indirect Contacts Youth |
|---------------|------------------------|--------------------------|-----------------------|-------------------------|
| Actual | 377 | 2100 | 265 | 1055 |

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

Patent Applications Submitted

Year: 2012

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

| | | | |
|---------------|------------------|-----------------|--------------|
| 2012 | Extension | Research | Total |
| Actual | 1 | 1 | 2 |

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of demonstration farms established.

| Year | Actual |
|-------------|---------------|
| 2012 | 6 |

Output #2

Output Measure

- Number of publications for lay use.

| Year | Actual |
|-------------|---------------|
| 2012 | 3 |

Output #3

Output Measure

- Number of conference paper and publication/presentation.

| Year | Actual |
|-------------|---------------|
| 2012 | 3 |

Output #4

Output Measure

- Expected Professional Journal publications.

| Year | Actual |
|-------------|---------------|
| 2012 | 1 |

Output #5

Output Measure

- Expected Gray Literatures.

| Year | Actual |
|-------------|---------------|
| 2012 | 5 |

Output #6

Output Measure

- Expected publications for lay use.

| Year | Actual |
|-------------|---------------|
| 2012 | 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 |
|------|--------|
| 2012 | 475 |

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

PCC: People have limited knowledge on how to grow mangrove crabs. Existing farms have small or undersized wild-caught crabs. Rabbit fish were grown mainly in pen-enclosures which are difficult to manage.

CMI: Fishes are getting scarce and people are unfamiliar with fish farming. Sea cucumber resources decreased from over-harvesting.

COM-FSM: Marine resources are abundant, but low-tech and high skill aquaculture methods were of little practice for sustainable income generation.

What has been done

PCC: Seed production project on mangrove crabs was initiated. A floating fish cage was demonstrated.

CMI: Pearl oyster spats were delivered to farmers. Assessment and interviews on sea cucumber fishing were conducted. Rabbit fish brood stock were collected and interested individuals were identified.

COM-FSM: Half-pearls seeding and accessory making trainings were conducted and the land-based long-term culture system was developed by simulating natural habitats for the hatchery-based sea cucumber farming.

Results

PCC: Number of individuals increased who wanted to establish their own mangrove crab farms. Some fish farmers were interested in the floating cage design for grow-out.

CMI: Pearl farmers expanded their farms. Some individuals started collecting wild rabbit fish fingerlings and grow them in small fish cages. Number of individuals increased including students who were interested in rabbit fish farming.

COM-FSM: High skill was acquired by Micronesian technicians and trainees who produced high quality half-pearls and accessories as value-added pearl shell products, which gained attentions from domestic and international jewelry industry. Trainees from three outer islands acquired pearl farming skills except for their financial management issues. The habitat simulator system for the sea cucumbers, or the land-based long-term, low-cost and low-tech culture system, enabled training programs to repeat 8 spawning and larval rearing followed by juvenile grow-out work.

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 |
|------|--------|
|------|--------|

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

PCC: People have limited knowledge on how to grow mangrove crabs. There are existing crab farms but stocks are sourced from undersized wild caught crabs. Most of the cages used in growing rabbitfish were fixed type using pen enclosure which is difficult to manage.

CMI: People are not familiar with raising or growing fish. The sea cucumber resources are decreasing due to over harvesting.

COM-FSM: Locals are unfamiliar to jewelry or seafood production. Quality control of is key to export half-pearl jewelry. Hatchery method is a key as export ban exists for wild sea cucumbers.

What has been done

PCC: Seed production projects on mangrove crabs were initiated. A floating fish cage was demonstrated.

CMI: Seed production of pearl oyster continued and spats were delivered to farmers. Resource assessment and interviews on sea cucumber harvesting were conducted. New brood stock for rabbit fish was collected and interested individuals in farming rabbitfish were identified.

COM-FSM: Half-pearl seeding, accessory making and grading trainings were given to the outer islands. Sea cucumber hatchery trainings were conducted for Micronesian technicians.

Results

PCC: There was an increase in number of individuals who wanted to establish their own mangrove crab farm. Some fish farmers are interested to follow the floating cage design for growing fish.

CMI: Pearl farmers continued to expand their farms. Some individuals started collecting wild rabbitfish fingerlings and grow them in small fish cages. There are an increasing number of individuals, including students interested in rabbitfish farming.

COM-FSM: 13 trainees from three outer islands learned half-pearl seeding skills and 60 individuals from four communities joined half-pearl accessory making sessions. Project's seven technicians were taught pearl grading by an expert. Sea cucumber, sandfish, hatchery skills were acquired by seven extension staff who managed to produce several ten thousand juveniles for grow-out work. Technology transfer was conducted from Pohnpei to Yap for the sandfish by demonstrating broodstock holding and spawning induction methods.

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 |
|-------------|---------------|
| 2012 | 25 |

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

PCC: Some crab farmers have experienced being fined by the fish and wildlife agency for catching and keeping undersized wild caught mangrove crabs in their farm. Those who are interested to grow rabbitfish loose interest because of so many problems encountered in managing a fixed pen enclosure.

CMI: People are not interested in growing fish.

COM-FSM: A family of Pweniau Island in Pohnpei joined pearl farming. Project's pilot farms were transferred to each community. Sea cucumber hatchery project began in Yap.

What has been done

PCC: Crab and fish farmers were reached. Technical discussion was initiated and farmers were invited to visited PCC aquaculture facilities. Hatchery produced mangrove crabs and rabbitfish were introduced to existing farms for grow-out trial.

CMI: We continued seed production of pearl oysters, engaged 5 people for on the job training and local farmers were visited. Spawning of rabbit-fish was monitored and preliminary larval rearing trial was conducted. Resource and site assessment and aquaculture presentations were conducted in three atolls.

COM-FSM: Half-pearl seeding skill and accessory making trainings were offered to Pweniau family and 3 other communities. Hatchery setup and spawning techniques were demonstrated in Yap.

Results

PCC: Fish and wild life agency become aware about PCC's effort to develop a sustainable crab aquaculture in the country. Crab farmers were able to stock hatchery produced crablets in their farms and on toward incidents for fines was no longer recorded. More individuals are interested to put up their own crab farm. PCC was encouraged to continue the seed production activities for both crabs and rabbitfish.

CMI: More people are interested in pearl oyster farming and another new farm has been established. CMI is now maintaining brood-stock for rabbit-fish and first spawning has been recorded. A number of individuals are now growing rabbit-fish in small cages and Rongelap government has started activities in growing fish in collaboration with CMI. People in atolls realized the impact of overharvesting sea cucumbers and started to create management plan to revive the depleted stock.

COM-FSM: Skill trainings of half-pearl seeding and accessory making created local technicians. 4 communities in Pohnpei produced more than 3,000 half-pearls each, which resulted in high quality products. COM collaborated with the government in Yap, in which sandfish hatchery workshop and onsite demonstrations were conducted by Pohnpei staff.

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: The absence of an aquaculture researcher slowed down the efforts to provide more developments. On-going research project on mangrove crab was put on hold and discontinued.

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

COM-FSM: As usual in this country, geographical vastness of the ocean and distance between the main land and the outer islands is a major bottleneck for any aquaculture industry to be developed. The college programs and the participating outer islands always faced financial shortfalls from high fuel cost for transportation and maintaining electrical equipment.

In general, creating highly skilled technician who is supposed to be a vehicle of future industry is not a public sector's playground but is played by a private sector itself. Half-pearl project was formed to supplement the round-pearl farming development. However, island people became focusing on the half-pearl production as a sole commodity and they expect a public sector's urgent sales development activity. Without the government's rigorous support and activity into island business development, this project would end as just a college training materials. So far, no tangible support has been provided by national and state governments. The sea cucumber businesses are still based on greed or boom-and-bust activities by fake aquaculture operators of which hatchery or grow-out facilities cover-up illegal stock piling of the wild-caught animals for processing and exporting overseas. Lack of knowledge about the sea cucumber business is a problem of the extension staff and educating such staff is first step to disseminating latest information to the outer island people.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

PCC: Existing fish and crab farmers were able to benefit from the crablets and

rabbitfish juveniles that were produced. The existence of hatchery and floating fish cage demonstration facilities provided a good example to interested farmers.

CMI: Existing pearl farms have benefitted from the oyster spats that were produced in the hatchery. More individuals are now interested in pearl farming and culture of finfish. People in atolls are now aware about the importance of aquaculture and were able to identify local species that have potential for aquaculture. Students and people in the community are aware about the impact of over harvesting marine resources and that a good management plan is necessary to revive the depleted stock.

COM-FSM: Half-pearl seeding technology transfer among the Micronesians was successful in producing high quality pearls produced by those trainees. Daughters of the families from Pakin Atoll and Pweniau Island seeded 1000 oysters each and harvested more than 3000 half-pearls each. Series of accessory making sessions attracted more than 60 trainees from four communities and those produced half-pearls became materials for unique Micronesian half-pearl pendants and earrings, which fetched average \$20 per piece at charity sale in Pohnpei and samples sold at overseas jewelry outlet priced from \$75 to \$150 per piece. Half-pearls with unique bluish color and with significantly shorter cultivation period between 7 to 10 months than those of the round-pearls received more interests among the businesses both domestic and overseas markets. All the oysters were originated from the COM's hatchery project. Tropical sea cucumbers were listed by Food and Agriculture Organization of the United Nations as a primary aquaculture commodity in Asia and the Pacific region. Because the wild stocks of commercially high-valued species such as the sandfish were almost depleted in many islands, the governments imposed total export ban or restricted resource management plans which only allow aquacultured animals to be exported. Unfortunately, hatchery technologies of the tropical sea cucumbers such as the sandfish were not established widely in this region. The sea cucumber project of COM-FSM was a challenge to develop its own methods for broodstock holding, spawning induction, larval rearing and juvenile grow-out. During this reporting period, a long-term and low-cost semi-recirculating seawater system proved to be effective for continuous use for both research, training and demonstration purposes. Spawning induction technique was also standardized in this climate. COM's extension staff became core technicians to continue training of other Micronesians. Workshops conducted in Pohnpei and Yap provided local and overseas participants a wide range of knowledge of sea cucumbers including biology, wild stock abundance and distribution, behavior, history of sea cucumber fishing, processing, commercial values and hatchery demonstrations. All the activities aimed to inspire local communities and individuals to develop small-scale sea cucumber farming.

Key Items of Evaluation

PCC: Despite of the absence of the researcher, aquaculture staffs were able to maintain the fish stock and the facilities as well. The reinstatement of an aquaculture researcher is very crucial in order to continue the development of aquaculture in Palau.

CMI: Pearl farmers have been experiencing difficulties in sustaining their operation due to scarcity of spats collected from the wild and CMI played important role in reviving the industry by supplying them with spats produced from the hatchery. Conducting field visits and aquaculture presentations to people in different atolls are important to make people aware about the importance of aquaculture and the conservation of marine resources. Rabbitfish is a potential species for aquaculture development in RMI and a number of individuals are interested to start commercial farming of this species.

COM-FSM: Because of distant and difficulty to transport and communicate to the outer islands, the project staff often postponed or cancelled onsite work of demonstration and training. Also, electricity supply was always done by a generator and bringing and maintaining electrical machines and tools into the outer islands were not as easy as in the main island of Pohnpei. These affected by slowing down progress of practicing accessory making on the outer islands. Therefore, the project main work of pendant making demonstration were often conducted in Pohnpei, in which only limited number of trainees were called to Pohnpei from the outer islands without involving entire family members. Sometimes those who invited joined but not continuously for longer months as they were unable to support themselves in Pohnpei. For marketing development, unless selling majority of the products domestically, regional promotion may be needed such as Guam as a jumping board for selling half-pearl products. In Yap, a small hatchery tank system which had been developed in Pohnpei as a habitat simulator was constructed for holding the sandfish at the Yap State Marine Resource Management and Development (MRMD). This was because of a series of meetings with the stakeholders during the first quarter of this reporting period, who expressed their interests, concerns and supports to the sea cucumber aquaculture as an important export business opportunity if it is implemented. However, MRMD was unable to secure to purchase necessary equipment and materials for a proposed hatchery construction. Therefore, maintenance and monitoring of the holding tank and animals were done by a COM-Yap aquaculture extension staff with minimum equipment. At this reporting date, a proposed hatchery site at MRMD has remained the same without a facility construction by the government for their hatchery-based sandfish project. In spite of these difficulties, spawning demonstration and workshop were conducted by during the third quarter. In Yap, approximately 1000 tilapia was successfully removed from mangrove tidal flat area at one of the two communities, which were used as feed for chicken farming. This could show a way to eradicate invasive fish effectively by utilizing its fishmeal for local poultry business.

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 | 20% | | 20% | |
| 802 | Human Development and Family Well-Being | 20% | | 20% | |
| 804 | Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures | 10% | | 10% | |
| 806 | Youth Development | 25% | | 25% | |
| | Total | 100% | | 100% | |

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

| Year: 2012 | Extension | | Research | |
|--------------------------|-----------|------|----------|------|
| | 1862 | 1890 | 1862 | 1890 |
| Plan | 9.0 | 0.0 | 1.0 | 0.0 |
| Actual Paid Professional | 8.5 | 0.0 | 0.0 | 0.0 |
| Actual Volunteer | 2.0 | 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 |
| 228297 | 0 | 0 | 0 |
| 1862 Matching | 1890 Matching | 1862 Matching | 1890 Matching |
| 19381 | 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: School outreach, Upward Bound summer program, summer camps, Earth Day mini fair, STEM fair and childhood obesity intervention activities were conducted in the schools and communities. Youths were engaged in weaving, traditional fishing, traditional dance, architecture and teenage pregnancy and alcohol and drug use. The activities conducted promote creativity, social values, family health issues and independency for youths in Palau.

CMI: Activities continued to focus on youths, school dropouts and police officer computer training. Extension agents conducted partnership activities with high school interns in providing reading programs to young children in two communities. Reading to the young children continued in the remote island communities as well during outreach visitations. Extension agents continued producing videos of activities and providing the media centers and TV stations to be aired live on the television channels.

COM-FSM: Activities benefitted or directly impacted both family and community by engaging them in core programs of gardening, arts and crafts, community beautification and sport and physical activities. Communities were afforded the opportunity to fully participate in the planning, implementation, and the evaluation of their programs. Volunteerism and leadership development becomes a critical by-product of activities of their programs. Sewing, cooking and handicraft skills using traditional materials and recyclable solid wastes were taught. Business planning for small home-based enterprises in acquired skills was provided to women participants. High school drop-outs from the youth program were provided basic skills in English, math and science for re-admissions to their respective schools. In Kosrae, trainings were conducted on basic computer applications to 12 youth, aged 11-15. Entrepreneurship training was conducted to 5 youth aged 24 to 35. Woodcarving was taught to 11 male youth; sewing to 93 young mothers and 17 young, interested teenage individuals were provided counseling and guidance.

2. Brief description of the target audience

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

CMI: Local experts, land owners, students, parents, teachers, school administrators and others.

COM-FSM: Target audience included youths, homemakers, students, employees, unemployed and other interested individuals and groups like churches, 4Hers, students, youth club members, juvenile delinquents, and idle youths in the villages.

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

| 2012 | Direct Contacts Adults | Indirect Contacts Adults | Direct Contacts Youth | Indirect Contacts Youth |
|--------|------------------------|--------------------------|-----------------------|-------------------------|
| Actual | 609 | 1500 | 1000 | 1400 |

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

Patent Applications Submitted

Year: 2012

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

| 2012 | 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 |
|------|--------|
| 2012 | 9 |

Output #2

Output Measure

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

| Year | Actual |
|-------------|---------------|
| 2012 | 11 |

Output #3

Output Measure

- Total number of youth clubs organized.

| Year | Actual |
|-------------|---------------|
| 2012 | 3 |

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

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

| Year | Actual |
|-------------|---------------|
| 2012 | 700 |

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

PCC: Most youths lack social skills, family roles and responsibilities. Most parents spend little time with their kids, which resulted in kids incapable of doing household and society roles and responsibilities.

CMI: The concerns of unemployment, youth dropout, teen pregnancy, alcohol and substance abuse, and suicides are the issues that need more attention. The relationship between parents and children is deteriorating as both are preoccupied with responsibilities.

COM-FSM: Due to the poor economy of the FSM, many youths see little hope and have few dreams for their futures. The FYC programs are directed to provide that hope.

What has been done

PCC: School outreach, STEM fair, summer programs, summer camps, physical fitness activities and fieldtrips were coordinated to help educate youths, teachers and parents.

CMI: The 4-H extension agent continued providing training and skills development activities in schools and communities that will provide experience and knowledge to do different skills that can open opportunities to generate income to support their families. They were coached and trained to be responsible in helping out their parents and other family members.

COM-FSM: Culinary arts, handicrafts, sewing and business skills training and youth remedial courses were provided to target audiences. Volunteerism and leadership were developed with the self-governing youth groups.

Results

PCC: Slowly youths are becoming aware about the social value, roles and responsibilities in the family. More participation of parents in their kids? school, community and church programs.

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

COM-FSM: High school drop-outs from the youth program acquired basic skills in English, math and science and were re-admitted to their respective 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 |

Outcome #2

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

| Year | Actual |
|-------------|---------------|
| 2012 | 295 |

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

PCC: There is a need to change attitudes of youth and the community toward social values, roles and responsibilities in the families.

CMI: There is a breakdown of what used to be a tight-knit family structure.

COM-FSM: Families, communities and youth continually struggle with escalating prices of imported goods and services. There is a lack of competitive local labor to undergo small business endeavors and to pursue higher education through secondary schools.

What has been done

PCC: School outreach, STEM fair, summer programs, summer camps, physical fitness activities and fieldtrips were coordinated to help educate youths, teachers and parents to work together.

CMI: Handicraft training at different schools was provided and completed by the 4-H Extension Agent. Students were taught how to make handicrafts and products were exhibited. Students were taught about good housekeeping, proper hygiene, as well as cooking activities. Students were also taught how to use computers during and after school hours. Activities like traditional fishing and gardening were also conducted. High schools and college students were involved in teaching kindergarten students how to sing, read and write.

COM-FSM: Youth develop government and leadership by electing officers of their groups, establishing savings accounts, planning, implementing and evaluating projects such as business plan writing, sewing, and wood carving through training.

Results

PCC: Slowly youths are becoming aware about the social value, traditional arts & crafts making, roles and responsibilities in the family. More participation of parents in their kids' school, community and church programs are up-and-coming. Youths are involved in 'Stop' tobacco and 'Don't Drink and Drive' campaign.

CMI: With the skills and experiences that were acquired by the college students and the youth, it gave them the enthusiasm and confidence to do what is best to support their families. The learned trade and skills will supposedly applied during their long breaks especially those students and youths families who depend on handicrafts, copra making as well as fishing, to help and support their families' income.

COM-FSM: Members, families and communities feel better as a result of clean and care activities of the youth. Youth work better amongst themselves and are more self-confident to help other communities. Participants used their acquired skills in sewing, handicrafts and cooking. Some business-minded graduates availed of local bank micro-lending. Several youth trainees re-applied to their respective high schools for 2012-2013 school years. Some graduates went to COM-FSM under the GED program. Ten business plans were completed last year and graduates are currently seeking financing. Forty nine students are able to sew and generate income for their families.

4. Associated Knowledge Areas

| KA Code | Knowledge Area |
|----------------|---|
| 608 | Community Resource Planning and Development |
| 801 | Individual and Family Resource Management |

| | |
|-----|--|
| 802 | Human Development and Family Well-Being |
| 804 | Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures |
| 806 | Youth Development |

Outcome #3

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

| Year | Actual |
|-------------|---------------|
| 2012 | 250 |

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

PCC: There is a need to increase students' involvement in activities or programs that promotes social values, traditional skills, family roles and responsibilities.

CMI: The challenges facing many parents are their young children are having babies at an early age and did not complete their education, alcohol and drug abuse.

COM-FSM: Idleness amongst youths is common. Providing opportunities to engage in educational activities deter youths from idleness and juvenile delinquency. Low-income families lacking in home-based skills experienced poverty indicated by their limited purchasing power and self-esteem.

What has been done

PCC: School outreach, youth clubs, youths' participation in street campaigns against drunk driving, street signs against tobacco use and youths involvement in family activities has been done to promote the skills that youths and families need.

CMI: In partnership with other organizations, the youth staff conducted trainings on basic life skills to communities, elementary and high schools to educate participants on how to strengthen their relationships with parents and families. To reduce students' dropout rate and substance abuse, a massive campaign program was done in collaboration with the undercover police to monitor stores to prevent minors and underage children not to purchase tobacco or cigarette.

COM-FSM: Income-generating skills and competencies in math, science and English were provided to interested individuals for betterment of their families and communities. One-on-one business counseling sessions were provided to participants both in the communities and in offices. One thousand feet of a community stone path were laid. A Japanese lighthouse and surrounding the areas were renovated and a local recreation house was built.

Results

PCC: There is now a slight increase of youths' involvement in summer camps, social clubs, school clubs, and family and society roles and responsibilities.

CMI: Many had gained the necessary knowledge from the sharing and training offered. There are improvements of stores that are now in compliance by not selling tobacco, cigarette, and alcohol to minors. With this strong enforcement of the illegal selling of these substances to minor, families and the communities experienced less disruptive behaviors and students' attendance are improving.

COM-FSM: Core programs continued to be implemented by youths themselves as a result of youth government. Families of successful participants took pride, confidence and additional comfort in household expenditures like buying healthy foods, and supporting school needs. Re-admitted youths to their schools had potential opportunities for better life in the future. On Kosrae, five participants have opened up businesses to receive orders of skirts, fitted sheets, pillow cases, men's shirts.

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: None this year

CMI: Unavailable ground transportation to implement planned activities on time, challenge of acquiring supplies on time is some of the constraints. Funding is always a major challenge to reach the outer islands to deliver the training needed. Adolescents having babies, students' dropping out of school, are major concerns to many remote communities. Lack of coordination among different state agencies and non-governmental groups doing the same thing is another challenge.

COM-FSM: External factors affecting outcome were inclement weather, conflicting activities with community events and limited micro-financing. Competing public priorities and programmatic challenges determine the focus and direction of program activities and funding. Youth often faced ignorant when seeking for business financing due to laws pertaining to under-aged cannot independently request for loans.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

PCC: Evaluation results illustrate that although there are programs out there on social values, alcohol and drug use, and teen pregnancy, traditional skills, and family roles and responsibilities youths, school administrators, teachers and parents are not aware of them. Therefore the youths have limited knowledge and skills of the family roles and responsibilities and social values (traditional arts & crafts and skills) and health impacts of alcohol & drugs, tobacco and teenage pregnancy.

CMI: Results indicated that the traditional training skills conducted to students was a success as many learned the traditional methods of cooking, building local huts, fishing and preparing delicious local dishes. Sewing course conducted at Marshall Islands High School continued to successfully graduate students each year.

COM-FSM: Acquired skills of participants in culinary, handicrafts, sewing and small home-based business management benefitted their families, friends and communities. They felt secure and proud in augmenting family incomes for meeting basic needs for food, clothing, education and medical needs. Youth- at- risks acquired skills to pass exams and further developed confidence in learning. The participants are showing more interest in the field of business and participants are more knowledgeable and have more understanding of how business works and how things are being created.

Key Items of Evaluation

PCC: Programs must help address the low level of awareness and knowledge that our youths, school administrators, teachers and parents are experiencing when it comes to social values, traditional knowledge, effects of drugs & alcohol and teenage pregnancy. The program must help the schools integrate the activities in the school curriculum so students can learn the skills and become knowledgeable with the

issues while they are still young.

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

COM-FSM: Women' groups are particularly important contacts for skills in sewing, handicrafts, cooking and practical home-based management for income-generation. Student drop-outs regained interests to come back to schools. Their re-admission to their respective schools made their families happy and hopeful of bright future for the concerned youth. Youth can improve understanding on how to contribute to society.

V(A). Planned Program (Summary)

Program # 3

1. Name of the Planned Program

Childhood Obesity

Reporting on this Program

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

| KA Code | Knowledge Area | %1862 Extension | %1890 Extension | %1862 Research | %1890 Research |
|---------|---|-----------------|-----------------|----------------|----------------|
| 703 | Nutrition Education and Behavior | 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: 2012 | Extension | | Research | |
|--------------------------|-----------|------|----------|------|
| | 1862 | 1890 | 1862 | 1890 |
| Plan | 4.0 | 0.0 | 1.5 | 0.0 |
| Actual Paid Professional | 5.3 | 0.0 | 2.0 | 0.0 |
| Actual Volunteer | 0.0 | 0.0 | 0.0 | 0.0 |

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

| Extension | | Research | |
|---------------------|----------------|----------------|----------------|
| Smith-Lever 3b & 3c | 1890 Extension | Hatch | Evans-Allen |
| 142350 | 0 | 97703 | 0 |
| 1862 Matching | 1890 Matching | 1862 Matching | 1890 Matching |
| 12085 | 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: Prevalence of overweight in Palauan children was estimated at 33% of which 75% will become obese in later years (MOH, 2010). Diet quality through a nation-wide green revolution program, nutrition education, school gardening, and redirecting researches on childhood obesity, as well as increasing physical activities are being done to address the problem.

CMI: The collaboration among health services staffs and our staff has conducted program activities in the communities in the outer islands. The continued strong supports from the landowners, NGOs and other organizations are the driving force for the successful implementation of such collaboration to combat child obesity.

COM-FSM: Program participants were trained to monitor obesity through body mass index (BMI) with emphasis on healthy and balance diet and to engage in regular physical activity like playing sports and doing home gardening. Awareness programs conducted to school children, youths and young adults, homemakers, and to interest groups in the communities. Other awareness activities were conducted to new Peace Corps volunteers, State Hospital Nurses, COM-FSM staff during Development Staff Day, COM-FSM Health Fair Day, and World Food Day. Cooking displays and contests were also presented during these events. The importance of local foods, calories in food, and the 'Let's Go Local' food campaign are components of awareness programs. Extension also assisted by reviewing and recommending improvement to Early Childhood Education (ECE) catering lunch menu.

2. Brief description of the target audience

PCC: The targeted audience included 2-8 year old children and their teachers, parents, school administrators, policy makers, and coordinated efforts among agencies such as Ministry of Education (MOE), Ministry of Health (MOH), Palau Community College (PCC), Bureau of Agriculture (BOA), Head start, Council of Chiefs, and Association of Principals.

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

COM-FSM: The targeted audiences included children, teachers, parents, school administrators, policy makers, and others.

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

| 2012 | Direct Contacts Adults | Indirect Contacts Adults | Direct Contacts Youth | Indirect Contacts Youth |
|--------|------------------------|--------------------------|-----------------------|-------------------------|
| Actual | 173 | 540 | 310 | 747 |

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

Year: 2012
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

| 2012 | Extension | Research | Total |
|--------|-----------|----------|-------|
| Actual | 3 | 0 | 3 |

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of conference papers and publications on childhood obesity.

| Year | Actual |
|------|--------|
| 2012 | 3 |

Output #2

Output Measure

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

| Year | Actual |
|------|--------|
| 2012 | 3 |

Output #3

Output Measure

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

| Year | Actual |
|------|--------|
|------|--------|

2012 6

Output #4

Output Measure

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

| Year | Actual |
|-------------|---------------|
| 2012 | 15 |

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 |
|-------------|---------------|
| 2012 | 1841 |

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

PCC: Thirty three percent of Palauan children are obese. Nutrition education and physical activity are needed as intervention to combat malnutrition and childhood obesity.

CMI: Increase of sicknesses affecting many that are related to diabetes, hypertension and childhood obesity, conditions that have continued to plagued generations.

COM-FSM: Families, communities and governments are concerned about incidence of childhood obesity, which can lead to chronic diseases like diabetes, heart problems, etc. This is due to a lack of knowledge in food preparation and food selection.

What has been done

PCC: A baseline survey was conducted by MOH in Palau to assess the incidence of obesity in children.

CMI: Agents continued to hold workshops and trainings about obesity in the communities.

COM-FSM: At community events, training and personal contacts occurred; sharing and demonstrations took place. Surveys and follow ups reviews were performed. In Pohnpei, sixteen training workshops were conducted throughout ECE programs.

Results

PCC: The MOH survey (2010) showed that 33% are overweight and the chance of becoming obese in later years was estimated at 75%.

CMI: Some mothers reported that they are now aware and being alerted to what kinds of food being served to the family.

COM-FSM: Dependence on imported convenient canned and snack food leads many families to eating unhealthy food that cause obesity and later on non-communicable diseases (NCDs). Children with sedentary lifestyles are vulnerable to childhood 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 |
|------|--------|
| 2012 | 252 |

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

PCC: There is a need to improve diet quality and increase physical activities so training and nutrition education must be conducted.

CMI: Unbalance diets had negatively impacted the food consumption of children and as a result increases number of children with obesity. It does also have a huge implication on the National and Local Governments resources.

COM-FSM: Dependence on imported convenient canned and snack food leads many families to

eating unhealthy food that cause obesity and later on non-communicable diseases (NCDs). Children with sedentary lifestyles are vulnerable to childhood obesity.

What has been done

PCC: Programs on ?green revolution?, school gardening, nutrition education, and implementing research on childhood obesity (CHL) by Local Action Committee (LAC) were done to improve diet quality, and to increase physical activities, several agencies practiced fitness activities for weight loss and launched ?Biggest Loser? contests as incentives .

CMI: The extension agent and health educators continued to educate people in the communities.

COM-FSM: Information, Education and Communications (IEC), cooking demos, and training in healthy lifestyles like gardening and eating balanced diets were done.

Results

PCC: Six classes on nutrition education were conducted; 3 states had school gardens and residents were encouraged to plant and consume vegetables. LAC in the CHL project was formed. Several agencies had fitness programs like ?Biggest Loser? as role models for obese children.

CMI: There is an increase in the number of walk-a-thons and physical activities.

COM-FSM: Participants with NCD problems in their families and other interested individuals utilized local produce in cooking nutritious and affordable food to their families, friends and relatives. This happened at family meals and during special occasions. Schools promoted gardening. Some women?s groups undertook family and community gardening. Community and school groups requested programs. Family members are enjoying delicious, nutritious and affordable meals and have been sharing dishes during celebrations and community functions.

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 |
|------|--------|
| 2012 | 189 |

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

PCC: Obese children need to undergo physical activity and improve diet quality.

CMI: Unbalance diets had negatively impacted the food consumption of children and as a result increases number of children with obesity. It does also have a huge implication on the National and Local Governments resources.

COM-FSM: Alarmed at the fast increasing rate of NCD problems, the Chuuk government issued an emergency health status of the state to reduce the burden among individuals, families and government expenditures for medication and medical referrals.

What has been done

PCC: School children and the community established school and community gardens, resulting in greater physical activity, consumption of more vegetables leading to reduction in obesity. Several agencies practiced physical fitness programs like "Biggest Loser".

CMI: Extension agents collaborated with health educators to educate people in the communities on healthy food and healthy lifestyles.

COM-FSM: Various stakeholders formed inter-agency coalitions and programs addressing the possible causes of NCDS like obesity. They employed public campaigns, cooking demos and physical fitness exercises including gardening to address the concern with NCDs.

Results

PCC: Reduction in childhood obesity resulted from greater physical activity and consumption of more vegetables because of the school and community gardens established. "Biggest Loser" fitness programs resulted in more weight loss in obese individuals in the community.

CMI: Increase in the number of community scheduled walk-a-thons and preschool physical activities.

COM-FSM: Multi-sectorial campaigns, training, gardening and cooking demonstrations improved community choices of nutritious food and methods to prepare meals using local healthy produce.

Gardening was also adopted in several communities through women's groups. People have adopted the practice of preparing nutritious dishes during gatherings and competition particularly during World Food Day events.

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.

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

COM-FSM: Inclement weather, population migration to mainland US and territories, limited project budget allotment and conflicting community events affected outcomes. Inconsistent production of fruits and vegetables and higher costs of locally grown foods in the markets and stores are causing people to actually apply gained knowledge/skills to reduce the rates of obesity. Preference of eating unhealthy foods such as rice due to cost, ease to obtain and prepare and expected storage life was shown in homemakers 24 hour food recall.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

PCC: Evaluation results showed reduction in childhood obesity due to greater physical activity and consumption of more vegetables from the school and community gardens established. "Biggest Loser" fitness programs in the various local agencies have awarded person showing the greatest weight loss.

CMI: More families are seeking help, tests are conducted before and after, during each given demonstration and outreach. More mothers are requesting the office, to have more recipes. Landowners are strongly backing up the ongoing activities especially making sure people in their communities get involved.

COM-FSM: Evaluation results show that decision makers became well informed about causal factors leading to NCDs. Food choices and preparation were enhanced by the use of more local foods, vegetables and local protein foods such as fish and sea foods as against canned meat and fish. Physical fitness by walking or gardening gained acceptance for public health maintenance. Participants increased skills and knowledge in regards to nutrition, health, and management and the utilization of meager resources as compared with the non-participating groups or communities. Participants increased knowledge on proper diets. There are increased numbers of home gardens to provide fruits and vegetables for family consumption.

Key Items of Evaluation

PCC: Incentives must be given to the participating agencies in reducing childhood obesity in the form of physical activity equipment. Schools with the highest production of food and vegetables should be given equipment for food processing to prolong the shelf life of their produce.

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 is 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: Various stakeholders including decision and policy makers supported the campaigns against leading causes of NCDs. People recognized local foods as more nutritious than imported junk and canned foods. Brisk walking and gardening were recognized as excellent physical fitness activities. Good diets preventing non-communicable diseases and obesity rely on producing and consuming local produce containing low salt, low in saturated fat and refined carbohydrates. Extension activities increased the number of participants partake in the program, increased the number of people who possessed health certificates to qualify them to prepare snacks and refreshments for general public; and showed increased seedling production and numbers of gardeners.

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 | 15% | | 15% | |
| 125 | Agroforestry | 10% | | 10% | |
| 131 | Alternative Uses of Land | 5% | | 5% | |
| 132 | Weather and Climate | 10% | | 10% | |
| 133 | Pollution Prevention and Mitigation | 10% | | 10% | |
| 134 | Outdoor Recreation | 5% | | 5% | |
| 135 | Aquatic and Terrestrial Wildlife | 5% | | 5% | |
| 136 | Conservation of Biological Diversity | 5% | | 5% | |
| 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 | 5% | | 5% | |
| | Total | 100% | | 100% | |

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

| Year: 2012 | Extension | | Research | |
|--------------------------|-----------|------|----------|------|
| | 1862 | 1890 | 1862 | 1890 |
| Plan | 2.0 | 0.0 | 3.0 | 0.0 |
| Actual Paid Professional | 4.8 | 0.0 | 3.0 | 0.0 |
| Actual Volunteer | 0.0 | 0.0 | 0.0 | 0.0 |

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

| Extension | | Research | |
|---------------------|----------------|----------------|----------------|
| Smith-Lever 3b & 3c | 1890 Extension | Hatch | Evans-Allen |
| 128920 | 0 | 146554 | 0 |
| 1862 Matching | 1890 Matching | 1862 Matching | 1890 Matching |
| 10944 | 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: We worked in collaboration with the Palau Pacific Adaptation to Climate Change (PACC) Program in conducting the socio economic survey on the impacts of climate change in Palau. Integrated Pest Management and Livestock Management trainings were conducted to enable the farmers to cope with climate change issues. Continuing educational promotion on alternative dry litter waste management was conducted to students, community people and farmers.

CMI: High tides caused widespread sea water surges and flooding, surges occurred at 1 meter (3 ft. 3 in) above sea level and outreach programs continued to deliver necessary information on climate change in the communities and at schools. Pamphlets were translated into Marshallese for the non-English speakers.

COM-FSM: Atoll dwellers, increasingly aware of the impacts of salt-water inundation to their plants, improvised raised beds, planted crops in containers and built seawalls around taro patches. Collection of giant swamp taro cultivars grown in low-lying areas was also conducted. Research for salt tolerant varieties of staple root crops has been initiated. Salt tolerant local varieties have been collected for further testing and distributed to needy areas. Training has been conducted on planting and best management practices for sweet potato as a quick recovery crop after disasters. Research has been initiated on 'Climate Smart' agricultural practices. Collaboration has been established with international, local and federal agencies and Embassies to address and respond to the climate change effects.

2. Brief description of the target audience

PCC: The research program on climate change in Palau caters to 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 climate change programs.

CMI: Everyone on the low-lying atolls was targeted. The climate change interest in RMI is growing even greater as sea level rises and inundation of water surges continue devastating shore lines and endangering the food and livelihoods of the citizens. With the growing concerns by the interest groups as well as leaders, mitigation solutions to sea level rise, in these low lying atolls continue finding solutions.

COM-FSM: Micronesian islanders are being affected by global climate change phenomena.

Farmers in the region are more vulnerable to these impacts of climate change because of their geographic exposure, low incomes, and greater reliance on agriculture as well as limited capacity to seek alternative livelihoods. Small-scale farmers work with a wide diversity of production systems, traditional knowledge, exchange systems, and cultures and often contribute to extended networks both within and outside their community. 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. The food security of the island nation rests in the hands of small scale farmers who have developed relationship with local environment, local markets and local customers. Providing appropriate outreach, technical assistance and education efforts help the community to adapt to changing climate and ensure food security effectively.

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

| 2012 | Direct Contacts Adults | Indirect Contacts Adults | Direct Contacts Youth | Indirect Contacts Youth |
|---------------|------------------------|--------------------------|-----------------------|-------------------------|
| Actual | 255 | 301 | 295 | 410 |

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

Patent Applications Submitted

Year: 2012
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

| 2012 | Extension | Research | Total |
|---------------|-----------|----------|-------|
| Actual | 2 | 2 | 4 |

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of awareness training conducted.

| Year | Actual |
|-------------|---------------|
| 2012 | 6 |

Output #2

Output Measure

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

| Year | Actual |
|-------------|---------------|
| 2012 | 3 |

Output #3

Output Measure

- Number of people who adopted sustainable food production technologies.

| Year | Actual |
|-------------|---------------|
| 2012 | 1055 |

Output #4

Output Measure

- Increased staple food crop production.
Not reporting on this Output for this Annual Report

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

| O. No. | OUTCOME NAME |
|--------|--|
| 1 | Number of 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 |
|-------------|---------------|
| 2012 | 955 |

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

PCC: Palau is greatly affected by the severe impacts of climate change resulting from reduced food production due to saltwater intrusion and soil salinity, excessive rainfall, increased flooding and soil erosion.

CMI: Marshall Islands consists of 34 low-lying coral atolls and islands and are endanger of climate change as sea level rises as well as the effects of drought, El Nino, etc.

COM-FSM: The Micronesian islands are the canaries in the mines for climate change effects. Atoll dwellers are particularly vulnerable to sea level change and salt intrusion in gardens and water sources.

What has been done

PCC: A socio-economic household survey was conducted to determine the awareness of the community on climate change and its mitigation in Palau. Trainings on pest and livestock management were conducted to ensure adaptation to climate change.

CMI: On scheduled outreach activities, extension agents provided awareness programs on topics concerning climate change, focusing on land scarcity and food security as many fruit trees were affected as a result of sea level rise.

COM-FSM: Research of salt tolerant staple crops, demonstrations of food preservation and water catchment and distribution of known salt tolerant crop varieties took place.

Results

PCC: The community is now aware that impacts of climate change through the multi-agency initiative of the PACC. Salt water intrusion and inundation has been a problem in many taro patches affecting the growth and yield of taro.

CMI: People had gained the necessary knowledge that was not clearly explained to them before, detailing the impacts of climate change. Flyers were translated by extension agents and distributed during outreach activities.

COM-FSM: People dwelling on the atolls have increased planting of salt tolerant crops and quick recovery crops such as sweet potato. They constructed raised beds to stay above salt water intrusion. Improved communication with outer atoll islands allows for a quicker response for food distribution and provision of planting materials.

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 |
|-------------|---------------|
| 2012 | 523 |

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

PCC: Community members are affected by the disastrous impacts of climate change in Palau; via such salt water intrusion into taro patches.

CMI: People lack information about the climate change and its implications on land, food and safety of all.

COM-FSM: Residents in atolls and low-lying areas are the most impacted by the big wave surges, inundation by salt water and threats of life and property losses. Soil erosion, receding shorelines and decline in food production are virtual effects of climate change in these small islands.

What has been done

PCC: Trainings on pest and livestock management, and evaluation of salt tolerant taro was conducted to ensure improved production and reduce the vulnerability of the community to the impacts of climate change.

CMI: Trainings and workshops on climate change were conducted at schools and in communities.

COM-FSM: Community meetings, information and education campaigns about impacts of climate change to food security and collection of giant swamp taro were done. Demonstrations of water catchments and food preservation techniques took place.

Results

PCC: The socio-economic survey provided baseline information on impacts of climate change. Participants to the Pest and Livestock Management trainings adopted the technologies to enhance food production and awareness as intervention on the impacts of climate change.

CMI: People are now aware of the impact and are fully aware of the environmental and economic impact.

COM-FSM: Community awareness through programs in Information, Education and Communication was raised. Consultations prompted affected residents in atolls and low-lying areas to adjust their cropping practices by putting seawalls around their taro patches, using elevated seedbeds, planting in upland areas, practicing container gardening and mixed cropping.

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 |
|------|--------|
| 2012 | 150 |

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

PCC: Best management practices and salt tolerant taro should be adopted by farmers in communities affected by climate change to improve productivity.

CMI: Farmers lack knowledge of planting crops that they can harvest during different sessions.

COM-FSM: Communities in atolls and low-lying areas are vulnerable to impacts of climate change in their plant, soil and animal resources and to personal properties especially houses.

What has been done

PCC: Proper cultural management and evaluation of salt tolerant taro were done by farmers.

CMI: People were provided information on how to protect their crops and drinking water sanitization measures were extended to the communities.

COM-FSM: Atoll communities sought assistance in securing planting materials and maintaining plants as affected by salt spray, flooding, etc.

Results

PCC: Use of disease-free, high yielding planting materials and adequate fertilization were essential for high yield and productivity of root crops. Technologies learned in the trainings were adopted by farmers. Evaluation of salt tolerant taro is still on going. Conservation and protection of natural resources have improved water quality and the environment.

CMI: Adults, youths and students gained the necessary knowledge that was not clearly explained to them earlier, detailing the impact of climate change. Flyers were translated by extension agents and distributed during the outreach activities.

COM-FSM: Agroforestry plant nurseries in five regions of Chuuk were maintained for availability of planting materials to islanders. Information campaigns were done to reduce vulnerabilities to loss of food sources, properties and lives of people in low-lying areas.

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: None

CMI: Constant delay and other transportation issues affecting the delivery of program activities to the remote islands.

COM-FSM: External factors affecting the outcomes were low budget for visiting atolls; lack of educational materials, inclement weather, care free attitudes of people and lack of trained extension personnel.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

PCC: The root crops germplasm collection at has been a reliable source of planting materials of taro, sweet potato and cassava, which are essential components to reduce the vulnerability to climate change and increase productivity. Biocontrol agents have effectively controlled pests of taro and cassava. Participants gained knowledge and valued their health, water resources and environment.

CMI: Farmers are increase in number as a result of others being successful, more and more people in the community are now motivated to continue cleaning their water tanks. Students and landowners continued planting trees, especially along the shorelines, having to protect the shorelines from sea level rise and coastal erosion.

COM-FSM: Through community consultations and information sharing about impacts of climate change on their food sources, properties and lives, atoll communities are gradually becoming prepared in protecting their crops. They protected their plants from salt spray and submergence in salt water by using raised beds, windbreaks and diverse crop planting.

Key Items of Evaluation

PCC: The community is now aware of the impacts and vulnerability to climate change and food production can be reduced by the root crops planting materials. Taro

varieties are being evaluated for performance in salt water intruded taro patches. Biocontrol agents have been successful in controlling pests of root crops and invasive weeds in Palau. Water education campaign and dry litter waste management workshops and demonstrations have been successful in providing continuous education and awareness to farmers, youths, community groups, and government and private organizations.

CMI: All the islands and atolls in the Marshall Islands are low lying islands and therefore are very much vulnerable to all types of extreme weather conditions.

COM-FSM: The villagers and political leaders from affected areas sought technical assistance in coping with the negative consequences of possible damage to their crops, soil, homes and livelihood by climate change impacts,. They have secured their staple crops through preservation of planting materials and adopting sustainable land management like composting, mulching and mixed planting of crops.

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 |
|---------|---|-----------------|-----------------|----------------|----------------|
| 701 | Nutrient Composition of Food | 20% | | 20% | |
| 702 | Requirements and Function of Nutrients and Other Food Components | 10% | | 10% | |
| 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 | 10% | | 10% | |
| | Total | 100% | | 100% | |

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

| Year: 2012 | Extension | | Research | |
|--------------------------|-----------|------|----------|------|
| | 1862 | 1890 | 1862 | 1890 |
| Plan | 3.0 | 0.0 | 1.0 | 0.0 |
| Actual Paid Professional | 3.3 | 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 |
| 88633 | 0 | 122128 | 0 |
| 1862 Matching | 1890 Matching | 1862 Matching | 1890 Matching |
| 7524 | 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: Six trainings on food safety were conducted to protect consumers from contaminants that may occur during production of food to consumption. Food handlers were trained to avoid food borne illnesses through proper techniques in food preparation and therefore avoid expensive hospitalization expenses.

CMI: Ongoing safety food demonstrations were conducted at 5 different sites in collaboration with the Ministry of Health Services.

COM-FSM: Community trainings about proper food handling and safe meal preparation were provided to women's groups, cooks and kitchen staff. Nutrition agents conducted workshops, trainings, demonstrations and presentations in schools, communities and to interested groups. Eighty-five participants completed the training modules including both genders. Sixteen training workshops conducted throughout ECE programs on Pohnpei with total parental participants of 395. Other trainings/workshops were carried out with new Peace Corps recruits, Pohnpei State Hospital Nurses, COM-FSM Staff Development Day, and COM-FSM Health Fair Day. Nutrition education and food processing programs were conducted and organized in the communities, at schools and for individuals to increase knowledge and skills necessary for families to properly prepare healthy and nutritious meals. Collaboration with inter-agency groups to conduct a Child Find Survey targeting children aged 0-5 years old. Nutrition counseling programs were conducted for parents with children with special needs who qualified to the program as result of Child Find Survey. A school enrichment program to youths was organized; nutrition education programs were conducted to individuals and families. "Let's Go Local Food Campaign" took place and collaboration with Kosrae Department of Health and a booklet was developed on food for the babies to help young mothers better feed their babies with local, fresh and nutritious foods. Work was done with Kosrae Cancer Control Coalition Partnership group and 4 Health Clubs were organized and assisted in developing respective Action Plan and in implementing physical activities in the communities. Caterers' menu for Early Childhood Education program were reviewed and improved.

2. Brief description of the target audience

Target audience include school children , food handlers, chefs, school cooks, housewives, food and

grocery establishments in all communities throughout Micronesia and local, state and national governments, the private sectors, and other organizations.

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

| 2012 | Direct Contacts Adults | Indirect Contacts Adults | Direct Contacts Youth | Indirect Contacts Youth |
|---------------|------------------------|--------------------------|-----------------------|-------------------------|
| Actual | 366 | 775 | 200 | 7500 |

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

Patent Applications Submitted

Year: 2012

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

| 2012 | 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 |
|------|--------|
| 2012 | 6 |

Output #2

Output Measure

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

| Year | Actual |
|-------------|---------------|
| 2012 | 712 |

Output #3

Output Measure

- Number of extension publications on food safety.

| Year | Actual |
|-------------|---------------|
| 2012 | 5 |

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 |
|-------------|---------------|
| 2012 | 525 |

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

PCC: Food handlers are not aware of the proper hygienic procedures in preparing food resulting in food borne illnesses.

CMI: Housewives and homemakers lack the knowledge necessary for handling foods and know if the quality of water is safe and free of water borne diseases.

COM-FSM: Hospital patrons, families, schools and food handlers lack knowledge food poisoning and other food related illnesses.

What has been done

PCC: Six food safety trainings were conducted to 149 participants.

CMI: Extension agent, with the collaborative effort from the Ministry of Health Services conducted trainings to 4 islands and 5 communities.

COM-FSM: Sixteen training workshops were conducted throughout ECE programs on Pohnpei. Other programs were done with new Peace Corps recruits, Pohnpei State Hospital Nurses, COM-FSM Staff Development Day, and COM-FSM Health Fair Day.

Results

PCC: Results showed that key food handling behaviors such as practicing food 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: Demonstrations conducted on food handling and food safety were well taken and understood and therefore participants gained the necessary knowledge and can be independently handling the food properly without any supervision.

COM-FSM: A total of 588 contacts were assisted through the food safety programs. They improved skills and knowledge of food preparation, selection of nutritious food, and they have been made aware that an active life style resulted in healthy living. Participants have improved knowledge on food safety, proper way of selecting, handling, and storing of foods.

4. Associated Knowledge Areas

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

Outcome #2

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

| Year | Actual |
|------|--------|
| 2012 | 496 |

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

PCC: Food handlers need to undergo trainings on proper food preparation in order to prepare safe food for consumers.

CMI: People easily get food poisoning during feasts and parties and it's a growing concern.

COM-FSM: Public Health and other partner agencies recognize the necessity of educating food handlers and local store owners about selling expired food items. This is to protect the public from food poisoning and related health complications.

What has been done

PCC: Six trainings on food safety were conducted to 149 participants.

CMI: The representative of the Health Services and our extension agent delivered food preparation and food security lessons to three local communities.

COM-FSM: The inter-agency coalition conducted regular monitoring of local stores and cooperating restaurants for compliance to food safety practices. Agents conducted community and school training on food safety and handling in order to improve social, economic and health of people.

Results

PCC: Participants have adopted behaviors in food safety such as practice of good personal hygiene, cook foods adequately, avoid cross contamination, keep food at safe temperature, and avoid food from unsafe source.

CMI: There were many people attending all 9 trainings and continue to seek assistance from both the Ministry of Health Services and the college.

COM-FSM: More people requested extension of the food safety program in their communities. The inter-agency coalition group engaged the local stores to put expired goods in one corner of their stores for public awareness and health concerns. Cooks of food establishments practiced proper washings of hands and food ingredients prior to cooking. Use of clean cooking utensils, clean kitchens and sanitation was accepted. In Kosrae, a total number of 150 participants attended the nutrition education programs and improved food selection, preparation and food storage techniques.

4. Associated Knowledge Areas

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

Outcome #3

1. Outcome Measures

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 |
|-------------|---------------|
| 2012 | 149 |

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

PCC: Most food borne illnesses can be prevented by proper food preparation and hygienic practices.

CMI: Food safety is important for the safety of people.

COM-FSM: Individuals and families lack knowledge about proper food handling practices.

What has been done

PCC: Food handlers were trained on proper food handling practices.

CMI: Training and awareness programs have been continued and ongoing in schools and communities.

COM-FSM: Various stakeholders formed coalition and programs addressing the possible causes of NCDS like obesity. They employed public IEC campaigns, cooking demos and physical fitness exercises including gardening.

Results

PCC: Participants have adopted practices such as proper washing of hands before food preparation and have practices good personal hygiene such as wearing of hair restraints and apron while preparing food. They have understood and put into practice right temperatures of preparing foods that will ensure safety upon consumption. Trained food handlers can prevent food-borne illness through safe food handling practices, thereby saving on hospitalization bills.

CMI: The attitude of the people has changed to be more careful now to follow food safety regulations.

COM-FSM: Multi-sectorial information, education and communications campaigns, training, gardening and cooking demonstrations in outer islands and Truk lagoon improved communities' choices of nutritious foods and preparation of meals using local healthy produce.

4. Associated Knowledge Areas

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

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

PCC: Storage and cleaning facilities are not always available in many homes so food spoilage is a common problem. Economy affects the outcomes since storage of food and cleaning facilities are not always available in many homes.

CMI: Continue challenges more on low income families who cannot afford to do away with needed supplies, clean cooking materials to prepare families meals. Often times cooking is done on fire and not enough water to clean the cooking supplies after being used.

COM-FSM: External factors affecting outcomes were heavy rains, limited project budget allotment, inclement weather and conflicting community events, long turn-around time for PO processing and lack of proper equipment and tools in order to carry out the activities of the program. Drought and floods cause unsafe drinking and cooking

water. Lack of funding for water treatment, and lack of enforcement to government regulation, e.g chilled food items are left out of refrigerator. Businesses selling expired and damaged food items.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

PCC: Results of evaluation before and after the program showed that participants have understood and practiced food safety procedures.

CMI: Before and after test results show that the knowledge has been gained.

COM-FSM: Inter-agency coalition was effective in campaigning food safety among local food establishments. Training cooks and kitchen assistants of public food stands and restaurants about food safety resulted to safe eating in these eateries. Increased awareness, skills and knowledge for participating groups and communities in regards to nutrition, health, and management and utilization of meager resources available to them as compared with the non-participating groups or communities. The extension activities have improved skills and knowledge showed on the program, improved knowledge in food preservation techniques by using cloves and careful application on personal hygiene when preparing food. These gardeners were sustainable. And more clients were recruited to the program and more planting materials and seedlings were distributed.

Key Items of Evaluation

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

CMI: It is highly recommended that more efforts be concentrated on educating the primary and secondary students.

COM-FSM: Food handlers in local restaurants and roadside food stores requested training. Stores and groceries provided healthy display corners for expired foods. Extension activities showed increased number of participants partake in the program. Increased number of people possessed health certificates to qualify them to prepare snacks and refreshments for general public; increased vegetable seedling production and increased number of gardens.

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 | 10% | | 10% | |
| 601 | Economics of Agricultural Production and Farm Management | 5% | | 5% | |
| | Total | 100% | | 100% | |

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

| Year: 2012 | Extension | | Research | |
|--------------------------|-----------|------|----------|------|
| | 1862 | 1890 | 1862 | 1890 |
| Plan | 16.0 | 0.0 | 6.0 | 0.0 |
| Actual Paid Professional | 13.4 | 0.0 | 8.1 | 0.0 |
| Actual Volunteer | 0.0 | 0.0 | 0.0 | 0.0 |

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

| Extension | | Research | |
|---------------------|----------------|----------------|----------------|
| Smith-Lever 3b & 3c | 1890 Extension | Hatch | Evans-Allen |
| 359903 | 0 | 395695 | 0 |
| 1862 Matching | 1890 Matching | 1862 Matching | 1890 Matching |
| 30553 | 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

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

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

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

2. Brief description of the target audience

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

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

| 2012 | Direct Contacts Adults | Indirect Contacts Adults | Direct Contacts Youth | Indirect Contacts Youth |
|---------------|------------------------|--------------------------|-----------------------|-------------------------|
| Actual | 750 | 1170 | 320 | 5900 |

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

Patent Applications Submitted

Year: 2012
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

| 2012 | 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 |
|------|--------|
| 2012 | 12 |

Output #2

Output Measure

- Number of publications for lay use.

| Year | Actual |
|------|--------|
| 2012 | 2 |

Output #3

Output Measure

- Number of conference papers and publications/presentations.

| Year | Actual |
|------|--------|
| 2012 | 2 |

Output #4

Output Measure

- Expected professional journal publications

| Year | Actual |
|------|--------|
|------|--------|

2012 1

Output #5

Output Measure

- Expected gray literature.

| Year | Actual |
|-------------|---------------|
| 2012 | 1 |

Output #6

Output Measure

- Expected publications for lay use

| Year | Actual |
|-------------|---------------|
| 2012 | 1 |

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 |
|-------------|---------------|
| 2012 | 895 |

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

PCC: Knowledge of best management practices and techniques to prepare new food products and prolong shelf life is essential to increase productivity and food security.

CMI: Soil fertility is an issue, organic composting is an alternative to commercial fertilizer.

Many people are not aware that constant testing of catchments is important to prevent water borne diseases. People lack the understanding on how to clean and treat water for safe usage.

COM-FSM: People lack knowledge and skills in organic soil enriching methods, integrated pest management (IPM) and proper solid waste management. Understanding of food preservation techniques and gardening is missing. These are obstacles to food production and security.

What has been done

PCC: Information on new varieties of crops, best management practices, biocontrol agents and publications were disseminated in schools and community. Six food technology trainings were conducted as a preparatory measure on food security.

CMI: Agriculture extension agents conducted workshops and trainings to the farmers and students. Workshops and trainings on organic composting using plant materials and copra cake were conducted in schools and community centers. Communities in remote atolls were visited and catchments were tested and demonstration was conducted on how to treat the contaminated water.

COM-FSM: Hands-on trainings to increase the participant's knowledge of improved crops,

breeds of chickens and pigs were organized. Food processing training sessions were held and demonstration farms to exhibit pig management, compost making and management practices were established.

Results

PCC: Visitors to the PCC R & D Station are now aware and understand the importance of root crops germplasm conservation, use of biocontrol 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: Farmers are now aware that organic fertilizer by composting is a good alternative and more environmentally friendly. People in the communities learned that water borne diseases are caused by pathogen contaminated catchments and monitoring and treatment are crucial for healthy living.

COM-FSM: Target audiences learned soil enrichment methods, practical IPM in raising local crops and use of biodegradable solid wastes for composting. Extension activities have improved knowledge and skills of the backyard gardeners in the program. Egg production using some locally produced feed and improved piggery management using the deep litter system were demonstrated and learned. Local preferred varieties of certain crops were evaluated for resistance to specific pests.

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 |
|------|--------|
| 2012 | 550 |

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

PCC: 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: Agriculture is still perceived with a negative image. Water contamination is still a problem for a lot of people.

COM-FSM: The public is concerned about few selections, low volume and irregular supply of good quality local produce and food processing supplies. Biodegradable wastes are dumped everywhere. Special clients like prisoners, youths and private farmers care about education in agriculture, conservation, biodiversity, watershed protection and erosion.

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: Training and demonstration on composting and teaching the importance of farming for food security and good nutrition were conducted. Dry litter waste management system was also re-introduced to swine growers. Testing and treating water catchments were demonstrated during field visits.

COM-FSM: Training, demonstrations, community events and farm visits were conducted in topics ranging from crop production, livestock husbandry, nutrition and food processing and guidance in agriculture fairs. Simple and affordable appliances and solar drying techniques were used for value added food products. Seedlings were distributed to farmers.

Results

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

CMI: Some farms already stopped using commercial fertilizers and shifted to organic composting.

A number of farmers use dry litter in growing swine on their backyard. Enforcement of regulation on the use of commercial fertilizer was strengthened. People in outer islands started monitoring and treating their water catchments regularly.

COM-FSM: Several homemakers and store owners established their own gardens and sold produce. Composting biodegradable wastes increased. Clients who received training in vegetable farming established family-level vegetable gardens growing Chinese cabbage, cucumber, sweet pepper, garden beans on a regular basis. Clients managed soils effectively and adopted alternative methods such as raised bed and container gardening. Clients demonstrated improved confidence in small farm activities and now rely more on fresh garden produce. Twenty youths and adults started their farms. Ultimately extension activities changed the behavior of the participants. Planting materials of breadfruit, taro and other staple crops were distributed to atoll communities.

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 |
|------|--------|
|------|--------|

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

PCC: Best management practices should be adopted by farmers to improve productivity. Housewives should be capable of preparing new food products from their produce for food security of the family.

CMI: Land for farming is limited. Fruits and vegetables are difficult to grow because soil is poor in nutrients but using commercial fertilizer has a negative impact to ground water. Some agricultural products are destroyed by pests and invasive species. Many farmers had stopped tending their farms because of un-productivity and revenue loss. Water borne ailments continued to affect people in outer islands.

COM-FSM: Gardeners, homemakers and farmers want disease and pest resistant plant varieties of local produce for good health and nutrition and to make value added products.

What has been done

PCC: Proper cultural management and quality planting materials were adopted by farmers. Food technology trainings were conducted to enhance food security in the community.

CMI: Outer islands were visited and people were taught about the importance of agriculture for food security. Monitoring of water catchments in different atolls was continued.

COM-FSM: Demonstration farms have been assisted in all states. Improved planting materials and livestock varieties were distributed. Alternative food processing methods are demonstrated. The Piggery Advisory Council (PAC) was established with collaborating local agencies.

Results

PCC: Use of disease-free and high yielding planting materials and adequate fertilization were essential for high productivity of root crops. Practices showcased in the demonstration farms were adopted by farmers. Housewives are now able to prepare new food products from their produce for food security of the family.

CMI: More lands are utilized for farming and farmers are able to produce more local crops to supply the demand. Number of cases of water borne diseases in outer islands has been reduced.

COM-FSM: Public safety garden continue to provide nutritious and fresh crops to the prisoners? menu daily. Two farms are established and they are producing, selling and exporting their farm produce. Ultimately extension activities have changed economic condition of the participants. 10 farmers set up compost bins in order to minimize use of commercial fertilizer, reduce waste and improve soil fertility and the environment and to increase production. Pohnpei State funded a swine improvement project with frozen semen from USA yielding 27 high-performance piglets by year?s end. With the assistance of Japanese Senior Volunteer on Agro-processing, farmers are able to process reject cucumber and long chili pepper into vinegar, thus increasing income.

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: None

CMI: Accessibility is one of the main constraints in delivering services to Atolls outside Majuro. College of the Marshall Islands Cooperative Research and Extension continue to confront with many challenges that obstructed projects to move forward smoothly to meet targeted outcome results. Often times these important services are unmet because of many stumbling blocks. It ranges from extreme weather conditions, climate change, unreliable outer islands' shipping services, tidal surges, water contamination, not enough supplies to complete a demonstration or an outreach activity, researcher supplies not available on island, land erosion and many sources of food trees that are victims of Sea Level rise making these valuable trees falling into the sea, wasting of resources, no coordination in implementing the same project which create confusion to public and difficulty of recruiting qualified researchers.

COM-FSM: Pests in the gardens affected production of main ingredients needed for value added products such as chili pepper and limes. Drought, heavy rains and low government budget for agriculture hampered the delivery of efficient services especially to far-flung villages outside the lagoons due to non-availability/lack of

travel money. Local populace looked down on farming as a dirty and low-paying job. Wildfire during hot days caused crop losses in affected areas. Additionally, transportation, extreme bad weather, scheduling of field trip boats to the outer islands with no advance notice of ship scheduling, and scheduling conflict were all limiting factors.

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 excited in preparing the new food products.

CMI: Youths who have been dropping out from formal education. They had gained experience and skills in developing small scale farms through trainings that were provided. With the short term survival skills training, young families can now support their own families by selling products, the trade they pick-up as a result of the skills learned. Activities on water quality have proven to save many lives from water borne diseases.

COM-FSM: Experiments are showing positive results and farmers are showing increased interest in developing agricultural farms. The extension activities have improved knowledge, created awareness and developed skills of participants in sustainable agriculture systems. Improved knowledge in food preparation and storage techniques, and careful application on personal hygiene by using gloves when preparing food helps improve food storage. Ultimately extension activities have developed positive attitudes, zeal for learning techniques and farming aspects, and have changed the behavior and economic condition of the participants. The recent proclamation of the Chuuk Governor declared a state of emergency for NCD's. This serves as the focal point for increased importance of food security in reducing this health problem statewide. Community, family and school gardens utilize organic wastes from composting of kitchen refuse, backyard wastes from plants and other municipal wastes. There is more collaboration between the agencies, NGOs and farmers/schools with free sharing of traditional knowledge and skills to complement new technologies and practices.

Key Items of Evaluation

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

CMI: One hundred eighty farmers from have acquired the basic skills in farming and organic composting. This year they had worked together as an association to establish a farmer's market and the plan got underway very successfully. With the active participation of the officers, establishment of more markets is being proposed as they realized it is another avenue to bring revenue to the farmers that brings prosperity and good fortune to the farmer's family. Farming method is an ongoing project in communities as well as

educational systems in the outer islands.

COM-FSM: Collaboration with multi-sector agencies is effective in promotion of programs that are cross cutting such as community health, hygiene or environmental awareness. There is a growing understanding and willingness to see agriculture as sustainable and as a security issue. Climate change is affecting Food Security noticeably in the low-lying atoll islands. Increased production of local foods is important as a food security issue and to combat the incidence of Non-communicable diseases or lifestyle diseases currently in crises in Micronesia. Governments and citizens are becoming more aware of the effect humans have on the environment and there is a growing willingness to use more sustainable techniques to produce food.

V(A). Planned Program (Summary)

Program # 7

1. Name of the Planned Program

Sustainable Energy

- Reporting on this Program

Reason for not reporting

We are not reporting on this program due to the limited resources that we have in terms of lacking professionals in the energy area. In this day and age when everyone is in dire need of energy, we just can not implement this planned program due to a lack of professional staffs.

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: 2012 | 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

| 2012 | 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: 2012

Actual: {No Data Entered}

Patents listed

{No Data Entered}

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

| 2012 | 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

Brief Explanation

{No Data Entered}

V(I). Planned Program (Evaluation Studies)

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}