Annual Report of Accomplishments and Results – College of Micronesia

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ANNUAL REPORT OF ACCOMPLISHMENTS AND RESULTS FOR COLLEGE OF MICRONESIA FOR FY 2001:

I. GENERAL OVERVIEW

Research and extension programs continued to address important agricultural, environmental, and human health and well being issues affecting small island communities. Due to limited amount of land in Micronesia, farming of both crops and livestock continued to be mostly on a subsistence level. A few small aquaculture/Mari culture projects are now underway and will require the appropriate technology and necessary infrastructure to reach productive level.

Research programs and activities were augmented with the completion of a research and development station in Palau and the Marshall Islands Science Station (MISS), and the ground breaking for the construction of a research station in the FSM State of Yap. Projects included research and development activities on the utilization, processing and development of new products from taro and cassava that are acceptable in the local markets and the trials on taro varieties (Cyrtosperma spp. & Colocasia spp.) for their suitability to grow under atoll conditions. The trials on banana varieties resistant to the black leaf streak (BLS) and other diseases and the micro propagation of elite (disease-free and early maturing) of certain banana varieties that will improve the quality and quantity of certain banana varieties for the export market are continuing.

On-going biological control projects on three invasive weeds; lantana, giant sensitive weed and Siam weed have been expanded to reach other sites and islands that were also affected by these weeds. The biological control of these invasive weeds has been successful by opening up areas for farming without the use of harmful chemicals. Other biological control projects are on the fruit piercing moth, cassava spider mites, and the breadfruit mealy bug.

In the Marshalls, a field experiment for the grafting of breadfruit cultivars have been initiated. More than 30 graft unions have been applied to the two breadfruit cultivars, *Mejwan* and *Petaktak*.

In aquaculture, technologies are being developed for the production of fresh water prawns and pearl oyster. These projects will encourage local prawn and pearl oyster production that will benefit farmers, develop prawn and pearl oyster cultures industries, create job opportunities, and increase national revenues. Aquarium and Mari culture trials have demonstrated that sponges have potential in the aquarium trade, which could lead to new business opportunities. In Palau, technologies have been developed for the Mari culture of corals for the aquarium trade and for transplant to damaged areas to aid in the recovery of coral populations. And in the Marshalls, an assessment of the potential for hatchery production of sea cucumbers has been conducted.

Outreach educational programs continued to focus on improving health and nutrition, strengthening families and developing youth, developing leadership and volunteerism, and managing natural resources. The nutrition, diet and health programs continued to stress the importance of locally available food and a balanced diet. Nutrition educational programs continued to focus on diabetes mellitus and other non-communicable diseases and diet related illnesses. Malnutrition continues to be a major issue in some parts of Micronesia. The ability to grow food is an important component in providing food security and alleviating malnutrition. Information on balanced diets incorporating native foods, food safety and handling, and water borne disease issues were shared through direct contact with clientele, through cooking demonstrations, workshops, meetings, newspaper articles and TV and radio programs.

The 4-H programs continued throughout the islands with Elementary School children. More and more students are now exposed to computers and were given the opportunity to use the Internet as an introduction to electronic connectivity and information gathering.

Water quality and food safety education programs continued throughout the island communities. COM land-grant programs staff continued to work very closely with international

organizations, government agencies, and community groups to provide programs on the process of water management and to ensure that safe drinking water is available to everyone. Fresh drinking water is limited on most parts of Micronesia as some islands are less than 25 feet above sea level and less than 1,000 feet in length. On-going sustainable agriculture and integrated pest management programs provided farmers awareness, understanding, and information regarding the adoption of sound agricultural production practices that sustain or protect the ecosystem integrity and biodiversity. Tropical agriculture programs were provided to farmers and community leaders about farming activities on coral atoll/islands.

Collaboration with other American-Pacific land-grant universities and colleges through the Agricultural Development in the American Pacific (ADAP) Project provided for the continuation of the following projects: a swine breeding program through the use of artificial insemination; improving management of livestock waste to address environmental concerns; and development of agricultural statistics systems. Partnership with the University of Hawaii College of Tropical Agriculture & Human Resources, Secretariat of the Pacific Community (SPC), and Pohnpei State Agriculture Station on a banana project continues. This project has introduced to the Micronesian islands banana germplasm that are resistant to the banana black leaf streak disease, caused by the fungus *Mycosphaerella fijiensis*. A cost-sharing agreement with Pohnpei State Government continues, whereby Extension Agents from the Agriculture Station are working side-by-side with Pohnpei CES staffs.

Human resource and capacity building efforts included a High School Summer Apprenticeship Program and the 10th Pacific Science Inter-Congress held in Guam. The 10-week High School Summer Program provided an opportunity for ten high school students to learn about land-grant programs under the guidance and supervision of research and extension staffs. Other staff development activities included: demonstrations on breeding swine through the use of artificial insemination technology; the conference on "Sustainable Agricultural and Food Security for All: 2020 Vision" held in Bonn, Germany; the 9th International Congress on Invertebrate Reproduction and Development in Grahamstown, South Africa; and the Extension Middle Managers Conference in Denver, Colorado. Other training activities included agriculture workshops, pesticide application, cooking demonstrations, and basic sewing attended by farmers, producers, the youth and adult sectors of the society, the underprivileged and people with disability. Capacity building programs for COM land-grant staff and constituents will continue to be of high priority as new issues and programs continue to emerge.

II. GOAL 1 - TO ACHIEVE AN AGRICULTURAL PRODUCTION SYSTEM THAT IS COMPETITIVE IN THE GLOBAL ECONOMY.

A. Goal Accomplishment Narrative

PCC-CRE:

To develop economic opportunities in the local market and economy in Palau, programs in agriculture, aquaculture, and food technology focused on development of relevant and affordable technologies to develop food and aquaculture products that were highly competitive in the local and regional markets. Key themes addressed this year were on plant germplasm, innovative farming techniques, new uses for agriculture products, and aquaculture.

The germplasm collection of sweet potato, cassava, and taro ensured the conservation of the genetic resources of the staple root crops in Palau for future generations. The evaluation and identification of high-yielding and disease resistant varieties of these root crops will result in improvement of yields. Distribution of planting materials of high-yielding sweet potatoes and cassava enhanced economic opportunities for farmers growing these crops.

A demonstration project on traditional and modern taro production systems will show the benefits of a mechanized system for wetland and upland taro production. Appropriate nutrient and pest management strategies will show the benefits of increased farm efficiency and increased yields and income of taro growers.

Research and development activities on utilization, processing, and development of new products from taro and cassava acceptable in the local market were being undertaken. Technologies that were being developed aimed at producing value-added products from these root crops to make them competitive in the local market, thus reducing dependence on imported foodstuffs and enhancing food security.

In aquaculture, technologies were developed for the production of freshwater prawns in Palau. This will encourage local prawn production to benefit farmers, develop a prawn culture industry, create job opportunities, and increase national revenues. Likewise, aquarium and Mari culture trials demonstrated the potential for sponges and hard corals in the aquarium trade, which could lead to new business opportunities for the people of Palau. Technologies were developed for the Mari culture of corals for the aquarium trade and for the transporting of corals to damaged coral reef areas to aid in their recovery.

CMI-CRE:

Two aquaculture researchers were recruited and they provided technical assistance for the design and construction of the Marshall Island Science Station (MISS), which has been recently completed. This facility will house a marine laboratory and an agriculture research station. With the completion and installation of the research station, MISS will serve as a model and also demonstration site for the farmers, students, and communities in the Marshall Islands.

Three research papers were sent to scientific journals for publication.

Research and development activities on the grafting of breadfruit cultivars have been initiated. This effort is in response to the country's growing dependence on imported foodstuffs and to provide food security to the Marshallese.

The Tissue Culture Laboratory has been established at the Uliga campus. Nursery for breadfruit grafting project is being installed in the new Research and Development station in Laura village. The site includes the construction of polyhouse (30'x60'), shade house (50'x60'), drip irrigation system, fence etc.

The germplasm collection of banana ensures the conservation of the genetic resources of the staple crop in RMI for the future generations. Evaluation and identification of high-yielding and disease resistant varieties of banana will result in the improvement of yields.

COM-FSM/CRE:

Yap Site:

Fourteen varieties of *Coloccasia* taro were collected from throughout Yap and are being propagated for scientific classification and for distribution to schools and private farmers. This is a collaborative project with SPC and UOG.

Tumeric plants (*curcuma longa)* are being raised for public demonstration on making the traditional *tumeric powder*. Interested individuals learned the process of making the tumeric powder and the different traditional names of the by-products. A tumeric plant is an herb with broad and elongated leaves and grows in the tropics. The tumeric powder is made from the roots or tuber corm of the plant. Either in processed, powdery form or freshly grounded, it was used by 10 trainees as cooking spice and also learned its medicinal properties. In processed powdery form, but compressed into a hardball size weighting about 8 oz apiece, each sells in Yap at $50.00 to $80.00. As a traditional cosmetic product, it is used in dancing functions by both sexes, as well as in funerals, decorating the body of the deceased.

Chuuk Site:

Agriculture production continues on a downward trend while importation of foodstuffs has increased. This is due mainly to the dramatic increase in the population and the limited amount of land and poor soil condition of these islands.

Extension staffs conducted sustainable agriculture programs, which included lessons in small farm management and backyard gardening. Throughout the islands where sustainable agriculture programs were conducted, 152 demonstrations plots were established. A total of 366 adults and 65 youths were taught techniques and proper management of small farms and backyard gardens.

Many families have started their own backyard gardens. Many people realized that home gardening is one of the most rewarding forms of farming, as it combines the pleasure of making things grow with the satisfaction of supplying the family with high quality fresh food. Home gardening projects resulted in more households growing their own local food, thereby providing fresh, palatable and more nutritious food for the family. It also cut down on family expenses as imported vegetables and fruits are very costly.

The demonstration garden and nursery at the Land Grant Office has been a source of cuttings and seeds for distribution to the municipalities and villages. It has also become a source of food during cooking demonstrations that were conducted by the health and nutrition program staff.

A research project is the trials on taro varieties (*Cyrtosperma* spp. and *Colocasia* spp.) being tested for their suitability to grow under atoll conditions. Trials on taro are also being conducted to test different varieties of *Cyrtosperma* spp. and *Colocasia* spp. in some atolls of Chuuk State. Decline of taro production in the atolls was attributed to stressful conditions of drought, high temperature and salt-water intrusion and 'overlooked' cultivation practices. The different varieties being tested are grown successfully in the main island of Pohnpei and other atolls. Identified suitable varieties as a result of the trials will be the basis for future recommendations. Also the results of the trials will increase knowledge on taro production in the atolls.

Pohnpei Site:

Outreach programs included the continuation of the marketing information system, swine enhancement, and banana production. All three programs showed some improvements or successes. Crop production forecast is now readily available to farmers and local market outlets. Farmers were provided printouts of crop production estimates for improved planning and efficiency of operations.

After many years of unsuccessful efforts teaching hog growers to improve breeding of pigs with the use of quality stock, boars especially, the artificial insemination (imported semen from pure bred) of local pigs changed views of backyard operators of a good swine operation. Many hog growers adopted management skills and had gained knowledge of swine diseases. Artificial

insemination was the main tool in improving the genetic base of swine in the islands. AI provided hybrid vigor to the offspring that translates into better performance in terms of better food conversion ratio (less feed per weight gain), faster growth rates (less growing time to achieve optimum weight), and larger, therefore meatier animals.

In banana production, the objective was to improve the quality of produce through lectures and field demonstrations on the proper procedures in cultivation, handling, and harvesting. Most people thought growing banana is to simply dig a hole and plant the tree, and come back later to harvest. Some farmers are now following recommended practices to improve yield and quality of their produce.

Research is continuing on the banana diseases trials on black leaf streak and other diseases in Micronesia. This is a collaborative project with the College of Tropical Agriculture and Human Resources at the University of Hawaii. New improved, recommended and designated hybrid bananas were introduced for resistance/tolerance evaluation to black leaf streak (BLS) and other diseases in Micronesia. These bananas were developed at the International Center for the Improvement of Banana and Plantain (INIBAP) for resistance and other superior qualities. BLS is prevalent in FSM, particularly Pohnpei. Rigorous chemical spraying is costly to the farmers' control of the disease. Moreover, control with the use of chemical is an environment hazard, especially to small islands in the Pacific. Results of the trials on resistance/tolerance of the banana varieties to BLS and other diseases will be the basis of recommendations for production and toward developing value added commodities and products.

In aquaculture, a research project is trying to develop and assist the export aquaculture industry throughout the FSM. Activities of this project focused around gathering stakeholder input, developing funding sources, formulating proposals, gaining project approvals and conducting research. Work to obtain equipment and improve facilities for aquaculture research was also conducted. The first program research proposal approval was received and research has been initiated. Travel to other islands in the FSM were conducted to meet with stakeholders and to get their inputs and to also observe the social and economic conditions of those sites.

Kosrae Site:

The Micronesia Plant Propagation Research Center (MPPRC) is focusing on procedures to micro propagate elite (disease free and early maturing) planting materials of banana (*Musa sp)* local varieties. Local varieties such as "Kufwafwa, Apat fissus, Apat regular and Lacatan" were standardized. The results were published in the 10th Pacific Science Inter Congress held at the University of Guam. Other goals achieved included scaling up of production to over 2000 plantlets per month and setting up a field performance evaluation experiment using micro propagated bananas and conventional suckers as control.

B. Key Themes:

Key Theme – Agricultural Profitability

a). Description of Activity **–** Monthly farm survey provided the opportunity for Extension staffs to interact with and assisted farmers on technical matters and to provide farmers production projections to help them understand their market potentials. The computer-generated projections are useful to local market outlets. It has been emphasized as a tool for farmers to use in the future for seeking for funds and financing sources. To illustrate the usefulness of production projection, the latest survey shows 21 main crops being cultivated. Local market outlets were provided with a forecast for March to June 2002 with more than 9,000 pounds for cucumber

and 1,500 pounds for sweet potato, the two most cultivated crops. The total effective area for all crops during the 4 months was less than one acre (43,255 square feet) for 54 plantings. Extension staffs are working with other agencies to begin to provide a full picture of production, marketing, and import and export.

b). Impact/Accomplishments – Eleven farms out of fifteen targeted had participated in the program. Information on yields for the current month and the next three months were provided to farmers to assist them in planning their own operations. Farmers are becoming conscious of production projections based on information generated with the use of a computer program. Farmers are now equipped with documents that will support their loan applications.

c). Source of Funds – Smith-Lever 3b&c

d). Scope of Impact – County Specific (Pohnpei)

Key Theme - Agricultural Competitiveness.

a). Description of Activity - Researcher and Research Aides at the Micronesia Plant Propagation Research Center (MPPRC) at the Kosrae Campus had standardized procedures to micro propagate elite (disease free, early maturing) planting materials of banana (*Musa* sp) local varieties "Kufwafwa, Apat fissuse, Apat regular and Lacatan". The research result was published in the 10th Pacific Science Inter-Congress, held at University of Guam. Other goals achieved included, scaling up of production to over 2000 plantlets per month and setting up a field evaluation experiment of micro propagated bananas.

b). Impact/Accomplishments - All the four banana varieties studied showed distinct media requirements for Stage I and II cultures although all of them rooted in the same medium. Most favorable nutrient medium for micro propagation of these varieties is MS Medium (Murashige and Skoog, 1962). Variety "Kufwafwa" multiplied best in MS medium containing 5 mg/l BAP (benzylamoniopurine). Kufwafwa banana has a greater requirement of potassium phosphate (250 mg/l) against the usual 170 mg/l in the MS medium. Thamin at 1 mg/l and elevated boron levels were found beneficial for micro propagation of this variety in comparison to other varieties.

Above studies enabled MPPRC staffs to micro propagate "Kufwafwa" banana faster and less expensively. The information generated is helping the State of Kosrae to reduce cost of production per micro propagated plant. The reduced cost will enable the State to provide more number of micro propagated, elite (disease free, early maturing) plants, thus enhancing banana production. Other States in the FSM and commercial facilities elsewhere could utilize this efficient procedure.

c). Source of Funds – Hatch Act & Local Match

d). Scope of Impact – County Specific (Kosrae)

Key Theme - Plant Germplasm

a). Description of Activity - A publication, "Sweet Potato Varieties in the Republic of Palau", was printed and distributed to government and traditional leaders,

schools, farmers, and other interested persons. It contained information on morphological descriptions, yield, and resistance or susceptibility to pests and diseases on the twenty-two varieties in the germplasm collection.

Morphological characterization of fifty-one varieties of cassava was done following the International Board for Plant Genetic Resources (IBPGR) descriptor's list for cassava. Results revealed that there were twenty-two duplicate varieties in the collection. Replicated yield trials will continue to be conducted. A draft manuscript titled "Cassava Varieties in the Republic of Palau" was prepared for publication.

The IBPGR descriptor's list for taro was used to characterize the seventy-eight varieties in the germplasm collection. Replicated yield trials in both wetland and upland conditions were conducted. Data gathered is still being analyzed and evaluated.

Twenty-two varieties of sweet potato and fifty-one varieties of cassava were maintained in an active field collection at the Palau Community College Research and Development (PCC-R&D) Station for distribution of panting materials to interested parties. Seventy-eight varieties of taro for the germplasm collection were maintained both in the field and in the greenhouse.

The Tissue Culture Laboratory being established at the R&D Station is currently undergoing the final stages of construction. The lab will be used for mass propagation of taro by tissue culture technique. These samples will have high yield, resistant to pests and diseases, and good quality taste and will be available for distribution to local farmers.

b). Impacts/Accomplishments – Maintenance of the germplasm collection of sweet potato, cassava, and taro, which are the staple foods of Palau, ensured the conservation of these as a valuable genetic resource for future generations. Distribution of one hundred and seventeen copies of the publication "Sweet Potato Varieties in the Republic of Palau" to government and traditional leaders, government officials, elementary and high schools, farmers, and interested individuals created an awareness of the diversity of sweet potato being grown in Palau. Planting materials were distributed to various groups who have seen the sweet potato and cassava germplasm collections and those who were exposed to the publication. This will help them to increase their root crop production.

c). Source of Federal Funds – Hatch Act and Smith-Lever Act

d). Scope of Impact – County Specific (Palau)

Key Theme - Home Gardening

a). Description of Activity – Agriculture Extension staffs visited municipalities and villages and provided agriculture and home gardening lessons/information and demonstrated gardening skills to families, youths, and community leaders. The training program included hands-on and practical experience on managing a garden, with the use of local resources as fertilizers and the application of mulching and IPM knowledge on their projects. Planting materials of different exotic and local crops such as cucumber, cabbage, beans, eggplant, tapioca, watermelon, taro, and banana were made available to all interested individuals.

b). Impact/Accomplishments – This has resulted in increase food security at the household level and also an income generation for surplus crops that were sold in the market. Out of a total of 400 participants, 123 had established and are now managing their home gardens. In addition, 88 of the participants were youth at risk, and half of them completed the program and are managing their home gardens.

c). Source of Federal Funds – Smith-Lever & Local Match

d). Scope of Impact – County Specific (Chuuk)

Key Theme - Innovative Farming Techniques

a). Description of Activity – Areas for the demonstration of traditional and modern wetland (*mesei* and *dechel*) and upland (*sers*) taro production systems in Palau were identified. Women (In Palauan culture, women do the farming) farmers were consulted on the traditional procedures for land preparation, plants used for mulch and fertilizer, and the layout of the wetland and upland areas. These traditional procedures will be compared with the modern mechanized system of land preparation under wetland and upland conditions.

b). Impact/Accomplishments – This demonstration project on the comparison of traditional and modern methods of land preparation, integrated pest management, and nutrient management in the wetland and upland taro production systems will reveal which production system is the best at giving higher yields and improving a farmers' income.

c). Source of Federal Funds – Smith-Lever

d). Scope of Impact – County Specific (Palau)

Key Theme – Adding Value to New and Old Agricultural Products

a). Description of Activity - The two areas identified in the banana project as trial sites were finally planted with the ten entries (eight banana hybrids and two local varieties). The appropriate randomization and blocking with replication were followed in the planting layout for data statistical analysis. Monthly collection of data for disease evaluation commenced six months after planting, however it was delayed by one month due to continuous heavy rains and strong winds in October 2001 (the sixth month after planting in one site).

Thirty plants (3 varieties/hybrids) at the Pohnpei Agriculture and Trade School (PATS) site are being maintained and monitored for initial field performance evaluation under local condition. Flowering commenced on the thirteenth month after field planting; 50% of the total number of plants flowered at eighteenth month after field planting. Harvest data were also collected.

b). Impact/Accomplishments - The newly established banana farms for the disease trials served as a 'show-window' of the improved hybrid bananas in Pohnpei. Local households and farmers had extended requests for planting materials even before the results of the trials. Project on "In Vitro Multiplication of the FHIA

Bananas for the Households and Performance Evaluation in Pohnpei" is being conceived for Research-Extension.

c). Source of Funds – ADAP/Hatch

d). Scope of Impact – County Specific (FSM)

Key Theme - Adding Value to New Agriculture Products

a). Description of Activity – [Processing of Root Crops in the Republic of Palau] This was a new research project this year and approved by the United States Department of Agriculture. In achieving Palau's sovereign goal of economic self-reliance, the development and utilization of food products from root crops like taro, cassava, and sweet potatoes were conducted. Twenty-two varieties of taro were boiled and subjected to taste-test to evaluate for color, texture, and flavor. Nineteen food products from taro and cassava were standardized and evaluated for their acceptability by a panel of evaluators composed of Palauans and non-Palauans. The processed products were studied for their shelf life in suitable packaging materials.

b). Impact/Accomplishments – The potential impact of the project was to focus research and development efforts on the production and utilization of local foods to deter the fast decline in the Gross Domestic Product (GDP) of Palau. The project addressed the problem of low agriculture productivity and the large importation of food in Palau, which leads to a lack of food security. This research on the root crop's product development and utilization with technical and economic feasibility and technology transfer activities enhanced food security in the country.

c). Source of Federal Funds – Hatch Act

d). Scope of Impact – County Specific (Palau)

Key Theme - Tropical Agriculture

a). Description of Activity - The taro patches/plots in the five islands/atolls in Northwest and Halls region of Chuuk State and two islands/atolls in the Southern Islands of Pohnpei and Pohnpei's main island were planted with eight varieties/cultivars each of *Cyrtosperma* spp. and *Colocasia* spp. The planting materials are both from Pohnpei and Weno, Chuuk State. The *Colocasia* spp. planted in the five islands/atolls in Northwest and Halls Region of Chuuk State came from Weno, Chuuk State (farmer's field collection sourced elsewhere in recent years and only five varieties/cultivars with no local name).

The 'training' on how to's for crop cultivation in the atolls was conducted in the five islands/atolls during establishment of the patch/plot.

Follow-up on 'problem crops' through distant crop monitoring and occasional field visits and communication with CES LGP Chuuk Campus and conduit to the atolls (for Northwest and Halls Regions, Chuuk State sites) will be conducted for on-site field experiments focusing on improving horticultural practices as interventions to the traditional practices. Participatory type of

research that is, involving inputs from the community will be adopted also in collaboration with CES LGP, Chuuk Campus.

Sourcing of the different varieties/cultivars of taro (*Cyrtosperma* spp. and *Colocasia* spp.) was accomplished in Pohnpei and from the farmers' field that was regularly monitored in cooperation with CES Extension Agent. The origin of the taro are: Ngatik, Nukuoro, Mwoakilloa, Chuuk and Pohnpei. Eight varieties/cultivars (150 per variety) were multiplied in the farmers' field, transported following quarantine requirements and planted in Northwest and Halls Regions, Chuuk State in August-September 2001. Planting in the islands/atolls of the taro was the culmination of the Year 1/Phase I of the project match. Planting in the Southern Islands, Pohnpei State was accomplished in July 2001.

The report document "Enhancing Subsistence Crop Production in the Islands/Atolls of Northwest Region of Chuuk State/Taro Trials - Year 1/Phase I, August 2000 to September 2001" was prepared and submitted for update, awareness and request for funding support for Year 2/Phase II.

b). Impact/Accomplishments – New crops were planted in the atolls

c). Source of Funds – Hatch Act and Local Match

c). Scope of Impact – County Specific (Chuuk State)

Key Theme – Tropical Agriculture

a). Description of Activity - Program delivery through presentation and demonstrations provides instructions and tips on proper production and handling practices of banana. Emphasis was given to improve the quality of produce consumption and to reduce rejection at the local market outlets. In some instances delivery of the program is conducted in conjunction with EFNEP. This approach maximized the use of resources like vehicles and it provided for more customers. However, it has not proven to produce better results than one on one contact or other settings. Topics of presentation and demonstration included: seed piece selection and preparation; site selection; field layout; field preparation; field planting; fertilization; and field maintenance – desuckering, detrashing, and terminal flower removal.

b). Impact/Accomplishments - More than 100 customers participated in presentations and demonstrations is a success in itself. Program accomplishments include the adoption of practices such as selection and preparation of planting materials, field selection, pest management, and field maintenance and harvest techniques. Most participants adopted at least 50% of the recommended practices.

c). Source of Funds – Smith-Lever

d). Scope of Impact – County Specific (Pohnpei)

Key Theme - Tropical Ag

a). Description of Activity - A program on grafting breadfruit cultivars was initiated on private land while the research facility is under construction. The project aims at contributing to the RMI national goal of economic self-reliance and food security. Developing a suitable procedure for grafting economically important breadfruit cultivars will provide a more consistent supply of tropical fruits to offset the ever-increasing importation of fruits from outside. Breadfruit is a seasonal crop, which bears fruits once or twice in a year. More than ten sites on private properties have been selected and various graft union have been applied on mature trees of the *Petaktak*, *Mejenwe*, *Mejwan* and *Bukdol* cultivars.

b). Impact/Accomplishments - The immediate impact is the beginning of serious research in agriculture in the Marshall Islands. The collection and propagation of germplasm in six varieties of this staple crop will ensure the conservation of valuable genetic resources

c). Source of Funding – Hatch Act Funds

d). Scope of Impact – County Specific (Marshall Islands)

Key Theme – Animal Health and Production Efficiency

a). Description of Activity – [Swine Production Improvement] Imported frozen semen has been used for the past several years on local pigs to improve the mostly poor breeding stock. Most of the backyard and some larger swine operations usually after continued inbreeding, ended up with poor breeding stock. Sows and gilts selected based on health, size, and proper housing. For size, sows should be at least 150 lbs while gilts must be at least 180 lbs. Beside the selection of sows and gilts, certain standards or requirements were expected to be met before the program is extended to participants. First, farmers must have proper housing that includes a concrete floor with adequate drainage, roofing, and a waste management system. Secondly, they must have good and clean source of water for cleaning and especially, for feeding, which must use commercial feeds as main or supplemental. Thirdly, the farmers must agree to have progenies and succeeding generations for replacement stock. Owners are also encouraged to exchange offspring from the artificially inseminated stock.

To enhance the efficiency of the AI program, estrus checks are made visually and through the use of an estrus device. If the finding is positive, then the sow/gilt inseminated. Imported frozen semen of the four bloodlines (Duroc, Hampshire, Landrace, and Yorkshire) has been used during the first three cycles of the artificial insemination. Besides improving breeding stock, the program staffs also conducted health and piglet management training for agriculture extension agents, hog producers, and backyard operators. Extension Agents also engaged in tooth clipping and injection of Iron, internal and external parasite control, scours and infection treatment, castration, and weaning and feeding.

b). Impact/Accomplishments – Of the 564 hog growers who were assisted, 100 are backyard pig farmers on the outer islands/atolls. Of the estimated 25,000 pigs on the island, 3,000 or 12% are of improved genetic stock or offspring from the

artificial insemination program. More than 150 sows have been inseminated since 1999, offspring of some of which are third generation stocks. Participating hog growers now recognized the importance of genetics as their hogs now showing hybrid vigor, which is expressed in bigger and faster growing pigs and have better feed conversion ratio. Farmers had learned to select replacement-breeding stocks based on these factors or traits. The latest assessment in 2001 showed an increase of about 800% pigs in the community, from 25 breeding stock to 200 pigs.

c). Source of Funds – Smith-Lever 3b&c

d). Scope of Impact – County Specific (Pohnpei)

Key Theme – Aquaculture

a). Description of Activity – [Sea Cucumber] An assessment of the potential for hatchery production of sea cucumbers in the Marshall Islands has been conducted, including the development of easy and reliable aquaculture methods to produce sea cucumber juveniles of commercial species in land-based facilities. The objectives of this study are: 1) to find out which local species are the most suitable for aquaculture on the basis of habitat potential and commercial value; 2) acquire better control over brood stock management and spawning induction methods; and, 3) determine the optimal conditions for larval/juvenile growth and survival.

b). Impact/Accomplishments – An aquaculture station was built and field surveys of natural stocks of promising commercial species of sea cucumbers were conducted. Two high-value species were discovered to be fairly abundant. A routine for safe transport of brood stock was devised and different holding conditions were tested to stimulate their growth and maturation. A method was also developed to reliably induce spawning in mature adults (these results have been accepted for publication in the journal of Invertebrate Reproduction & Development). Overall, the project is generating tools for restocking natural sea cucumber populations and sustaining the local fisheries.

c). Source of Federal Funds – Hatch and Local RMI Match

d). Scope of Impact – County Specific (Marshall Islands)

Key Theme – Aquaculture

a). Description of Activity – An assessment for the potential for pearl farming was conducted by Yap State Marine Resources staffs and the CES Marine Extension Agent. The Marine Extension Agent and Marine Resources staffs also met with traditional leaders on several outer islands to discuss the program and to select ideal locations that may be used as farm sites.

b). Impact/Accomplishments – Collaborative agreements were reached between CES, Marine Resources, and traditional leaders to go ahead with the project. Collection of pearls from the wild has begun.

c). Source of Federal Funds – Hatch Act

d). Scope of Impact – Yap (Micronesia)

Key Theme – Aquaculture

a). Description of Activity – [Marine Ornamental Project] This project has been studying the possibility to farm marine invertebrates to sustain the aquarium trade and handicraft business. The project aims at determining which species would be suitable for aquaculture/restocking, considering their value as marine ornamentals and their use in the making of handicraft. Possible marine ornamentals are the cowries, mollusks, rose petal bubble shell, and conch shell and sea urchins. Collection and maintenance of healthy populations of mature adults in land-based tanks has begun while research staffs are studying the reproductive cycle and evaluate the reproductive capabilities of the adults. Studying the developmental stages of the larvae and acquiring knowledge on the general biology of the species to facilitate captive breeding and maintenance and eventual resale or restocking of the specimens will follow.

b). Impact/Accomplishments – Brood stock of several species was collected from the wild or purchased from local harvesters. Indoor and outdoor holding tanks were tested in their aptitude to best maintain healthy specimens. Spawning and successful fertilization were observed in several mollusks (white cowry, rose petal bubble shell, conch) and echinoderms (sea urchins and starfish). The larvae of most of them were reared up to settlement. This project is showing that captive breeding and farming of attractive marine species is cheap and fairly easy and could provide alternative methods of sustaining commercial undertakings in a way that is environmentally sound.

c). Source of Federal Funds – Hatch Act & Local Match

d). Scope of Impact – County-Specific (Marshall Islands)

Key Theme - Aquaculture

a). Description of Activity – [The Identification and Cultivation of Suitable Marine Invertebrates for the Aquarium Trade] Sponges were identified and tested in home aquarium systems for survivability and suitability. Growth tests were conducted in laboratory water tables and in the fields to determine the best Mari culture methods. The field trials yielded better results than the laboratory trials.

b). Impact/Accomplishments – The aquarium and Mari culture trials demonstrated the sponges had the potential for the aquarium trade. This could lead to new business opportunities for the people of Palau.

c). Source of Federal Funds – Hatch Act

d). Scope of Impact – County Specific (Palau)

Key Theme – Aquaculture

a). Description of Activity – [Cultivation of Scleractinian Corals for the Aquarium Trade] Coral Mari culture trails were conducted at barrier reef, lagoon, and laboratory sites to determine if there were differences in growth and survivability rates between the various sites. Growth measurements of the samples were conducted every two months. The data was collected and entered into a database so that analysis can be conducted at the end of the project.

b). Impact/Accomplishments – This work will help farmers in Palau that want to grow corals for the aquarium trade without the use of a land-based facility. Mari cultured corals can also be transplanted to damaged reef areas to aid the recovery of natural coral population.

c). Source of Federal Funds – Hatch Act

d). Scope of Impact – County Specific (Palau)

Key Theme - Aquaculture

a). Description of Activity – [Culture of the Giant Freshwater Prawn in the Republic of Palau] The aquaculture laboratory, spawning, hatching and rearing fiberglass tanks, larval culture aquariums, prawn culture ponds were prepared. The larval food, prawn feed, and all necessary supplies and materials were ordered and most were ready for hatchery and pond culture operations. A hatchery building, the concrete brood stock tanks, a pump house, and a water reservoir is now under construction.

b). Impact/Accomplishments – Culture of the giant freshwater prawn has developed into a multi-million dollar industry in many countries. Development of this program will be an important component of Palau's economy with the potential to greatly increase the economy. The development of the prawn culture industry in Palau will benefit local farmers, create job opportunities, and increase national revenues.

c). Source of Federal Funds – Smith-Lever Act

d). Scope of Impact – County Specific (Palau)

Key Theme – Aquaculture

a). Description of Activity – The potential for pearl aquaculture has been demonstrated by the establishment of two pearl oyster farms in the Marshall Islands and one farm on the island of Nucor in Pohnpei State. Other South Pacific countries such as the Cook Islands and Fiji are also developing pearl industries. The construction of a hatchery for spawning and larval rearing of pearl oyster in Pohnpei will further contribute to ongoing efforts toward production and marketing of pearl oysters.

b). Impact/Accomplishment – Confidence in establishing pearl oyster farms in Micronesia has been boosted after a successful initial trial spawning run that

produced several thousand baby oysters (spat). The success of this process demonstrated the feasibility of establishing a pearl industry in Micronesia.

c). Source of Funds – Hatch Act

d). Scope of Impact – Micronesia

C. ALLOCATED RESOURCES

Fiscal Resources

Extension

Year	Federal	State	Local	Other
2000	300,953	107,483	21,479	0
2001	276,931	55,193	69,225	0
2002				0
2003				0
2004				0

Research

Year	Federal	State	Local	Other
2000	407,240	85,470	10,055	0
2001	291,492	71,817	59,143	0
2002				0
2003				0
2004				0

Manner of Expenditures:
Expenditures from formula funds from Hatch and Smith-Lever 3b&c and local matching funds were used to fund research, extension and integrated research and extension projects. In general, these monies were used for salaries and wages and fringe benefits of the Acting AES/CES Director, Vice Presidents of CRE, research, extension and administrative staff. International travels for program personnel to participate in workshops; meetings and conferences designed for exchange of information, ideas and forming regional collaboration in projects were also funded. Domestic travels were for monitoring progress on research and extension projects. Publication/printing costs on published articles in local newspapers, scientific journals and manuals; proceedings, pamphlets and brochures were part of the total expenditures. Communication within the COM region and to offices collaborating with the College through phone calls, faxes, e-mails and regular mails was also an expense.

Human Resources (FTEs)

Extension FTEs

Year	Professional			Paraprofessional		
	1862	1890	Other	1862	1890	Other
2000	3.60	0.0	0.0	18.70	0.0	0.0
2001	4.80	0.0	0.0	17.00	0.0	0.0
2002	0.0	0.0	0.0	0.00	0.0	0.0
2003	0.0	0.0	0.0	0.00	0.0	0.0
2004	0.0	0.0	0.0	0.00	0.0	0.0

Research SYs Only

Year	Scientist Years			Research Assistants		
	1862	1890	Other	1862	1890	Other
2000	6.17	0.0	0.0	3.00	0.0	0.0
2001	5.40	0.0	0.0	3.12	0.0	0.0
2002	0.00	0.0	0.0	0.00	0.0	0.0
2003	0.00	0.0	0.0	0.00	0.0	0.0
2004	0.00	0.0	0.0	0.00	0.0	0.0

Of the FY2001 total FTE of 86.69, 30.32 FTE has been assigned to programs that support GPRA Goal 1, representing 35% of the total FTE for all programs. The FY2001 budget allocated to GPRA Goal 1 takes into account this FTE distribution plus how Goal 1 integrates with other programs conducted by COM as a whole.

III. GOAL 2 - A SAFE, SECURE FOOD AND FIBER SYSTEM.

A. Goal Accomplishment Narrative

PCC-CRE:

Food and water borne illness have persisted in Palau due to its warm and humid climate. In 1998 for example, 1,192 cases of food and water borne illnesses accounting for almost seven percent of the Republic's population were reported, according to Palau Public Health. Food continued to be prepared and served improperly to hundreds of citizens during custom celebrations like weddings, funerals, birthdays, house parties, and other civic and sport events, due to inadequate knowledge, information, and expertise on proper food handling, selection, storage, and safety measures. The sale of expired foods was also a major concern to consumers. Palau also had to contend with low quality produce due to the damages caused by pests, particularly insects and disease.

This year, a CREES-USDA Project (No. 99-FSQ-99-415630677) entitled "Reduction of Food borne Illness in Palau" was completed. The project established the Palau Food Safety and Education Program that resulted in the implementation of food safety programs that targeted students, teachers, trainees, women, food handlers, families, and community leaders.

CMI-CRE:

The EFNEP Extension Agent joined the RMI Mobile Teams on their visits to 6 outer atolls. The RMI Mobile Teams composed of 6-7 members from different government ministries, including CMI-CRE, whose main goal is to conduct awareness/training programs to people in the outer atolls on a variety of issues. This amounted to an outreach to 700 people on these atolls. Food safety and nutrition information and food safety demonstrations were conducted. Composting techniques were demonstrated and identification of good areas with rich soil conditions for gardening was conducted. Discussions on other issues such as family planning, personal hygiene, non-communicable diseases, and youth and family were also conducted during these visits. EFNEP staffs demonstrated a variety of recipes, using green leafy vegetables grown locally and local meat such as fish.

In her continuing collaborative work with the RMI Ministry of Health and Environment, the EFNEP Extension Agent conducted nutritional counseling lessons with diabetic patients in three communities. These counseling sessions included lessons on proper diets and physical exercises. She also visited three outer atolls to conduct weekly workshops on nutrition education, which included food preparation and handling and a nutrition bingo game.

COM-FSM/CRE:

Chuuk Site:

Chuuk State Hospital records indicated that intestinal infections, parasitic, diarrhea diseases and food poisoning are among the most common causes for hospital admissions among the cross section of the population. Environmental sanitation and personal hygiene have deteriorated due to overcrowding on some islands.

As the economic situation changes from subsistence to a cash economy, many people leave home for employment at the State center where their means of survival is eating at grocery stores and at fast food places. Cognizant of this changing lifestyle, support groups have been organized and educational programs on food safety and quality have been conducted as intervention toward the unwelcome trend. Non-formal education program was conducted to both adult and youth population and lessons included personal hygiene, environmental sanitation, disease organisms, food selection and purchase, food storage and proper food handling and preparation.

Collaborative efforts continued with the Department of Health Services in the training of food handlers. Twenty-eight food handlers had completed a five-day food handler's workshop.

Collaborative work continued also with the Chuuk Association for Community Action (COCA) on food safety and quality programs for the Head Start Program staffs and parents of Head Start students.

Pohnpei Site:

Extension staff conducted food safety lessons as a component of EFNEP. All the clienteles were the same for the two programs, except for the security aspect that was delivered under home gardening. Food safety and secure food and fiber are three issues least understood in Micronesia. One proof of this lack of understanding is the cholera epidemic that hit Pohnpei in May 2000. The best protection from cholera is environmental sanitation and personal hygiene. Sanitation and hygiene are critical when it comes to food preparation and storage. However, these are not very well understood by some older people who grew up without the use of a refrigerator.

Home garden is considered an important component of the food safety secure food and fiber. Home gardening programs and technical assistance were provided to farmers, homemakers and school children. The emphasis was food from the garden is fresh and nutritious and that it is available all the time.

Kosrae Site:

Food safety lessons were taught as a major component of EFNEP. EFNEP staffs worked very closely with government agencies to educate mothers and children on appropriate food safety tips. Food safety lessons included, understanding food labels, proper storage of perishable food, and proper food cleaning practices. Food safety has always been emphasized during food demonstrations conducted in schools and in the communities.

B. Key Themes:

Key Theme - Food Safety

a). Description of Activity - Palau Community College-Cooperative Research and Extension Department staffs had developed the Palau Food Safety and Quality Education Program that was implemented through various activities such as: (1) The Healthy Body, Healthy Mind Campaign - an after-school-enrichment program for youths ages 9-19 and conducted at private and public schools; (2) Integration of food safety lessons in multi-disciplinary approaches like EFNEP, Water Quality, 4-H, and Youth Development; (3) Development of Food Safety Activity Packets that included coloring pages, puzzles, and other activities relevant to reducing causes of food-borne illnesses and the development of brochures describing the Food Safety and Quality Program and Food Safety Tips, which were distributed to participants and clients; (4) Development of the Train-the Trainer Program, whereby teachers were presented with the Healthy Body, Healthy Mind program; (5) Collaborative efforts were pursed with the Ministry of Education and with several local governments of the various states of Palau, and non-government agencies like the Head Start Program; and (6) Hands-on activities like the preparation of healthy snacks, which involved food safety skills that were put into practice in preparing a safe packed-lunch by young participants of the Healthy Body, Healthy Mind program.

b). Impact/Accomplishments – To help reduce food borne illnesses reported in Palau, the following were accomplished: (1) Improved knowledge and awareness

of food safety practices among youth aged 9-19 in public and private schools with one hundred and four participants; (2) Successful integration of the Food Safety and Quality Program in multi-disciplinary approaches with EFNEP, Water Quality, 4-H, and Youth Development; (3) Establishment of collaborative efforts with the Ministry of Education, local and state governments in the different states of Palau, and non-governmental agencies like the Head Start Program; and (4) Youth skill development in the preparation, storage, and handling practices of a safe packed-lunch. These programs have reached five of the sixteen states in Palau through integration with the EFNEP program

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c). Source of Federal Funds – CSREES-USDA Project No. 99-FSQ-99-415630677

d). Scope of Impact – County Specific (Palau)

Key Theme – Food Safety

a). Description of Activity - Program delivery is conducted with EFNEP to groups in the communities. It was also conducted at schools and to individuals. In either approaches, participants were provided the necessary skills in preparing and storing food for their families. Emphasis was placed on food safety: proper sanitation in preparation and storage of food, cleaning and storing utensils and selecting food ingredients for nutritional values. In most cases, program delivery was by means of lecture or presentation and cooking demonstrations.

b). Accomplishments/Impacts – A total of 208 customers were served in six villages. Two schools were also assisted. Based on the "24-Hour Food Recall" survey taken of participants before and after the program, approximately 75% of the clients showed improvement in subject matters related to food safety and good nutrition practices. In addition, a number of clientele who completed the program found employment as cook in the Head Start Program. Although finding employment is not an objective of the program, it is seen as a positive impact.

c). Source of Funds – Smith-Lever

d). Scope of Impact – County Specific (Pohnpei)

Key Theme - Food Quality

a). Description of Activity – The Food Safety and Quality Education Program in Palau included the following: (1) Practicing safe food handling to prevent disease; (2) Applying appropriate storage techniques; (3) Adopting recommended cooking times and temperatures; (4) Using proper hygiene; and (5) Using careful food selection techniques at restaurants, cafeterias, take-out counters, parties, and other social occasions. The program was also used in Food Safety Seminars and Workshops in collaboration with the Palau Healthy Islands/National Environmental Health Action Plan initiative, spearheaded by the Ministry of Health as agreed to during an introductory meeting held on August 16th, 2001. These lessons were also imparted to 8 women participants of EFNEP classes in Kayangel State for a period of three weeks, between July and September 2001.

b). Impact/Accomplishments – Sixty-three percent or five out of the eight participants showed an improvement in one or more of the food safety practices, i.e. thawing and proper storage of food, integrated in EFNEP classes conducted in Kayangel Sate.

c). Source of Federal Funds – Smith-Lever Act

d). Source of Impact – County Specific (Palau)

Key Theme - Food Security

a). Description of Activity – A handbook on "Food Technology", featuring methods of food preparation and utilizing local produce, like fish, root crops, bananas, and coconuts, was prepared by extension agents. The handbook is to be used by EFNEP staffs during training sessions with women, families, community leaders, and adults in the different states of Palau. The handbook included thirty food technologies that were simple, practical, did not require sophisticated equipment, and having easy to follow directions on preserving foods.

b). Impact/Accomplishments – All thirty-food technologies were taught and practiced by the eight women participants of the Kayangel State EFNEP training. By putting the methods into practice, their families will be able to enjoy a year-round supply of these foods, even when they are out of season, as well as avoiding spoilage of these agricultural products.

The food technologies learned not only served as a good reference to the cottage and small-scale processors involved in mass food production, but also has the potential for the start of a small business, which could add to the family income.

c). Source of Funds – Smith-Lever Act

d). Scope of Impact – County Specific (Palau)

Key Theme - Food Security & Food Accessibility and Affordability

a). Description of Activity - Home gardening is being implemented from two directions or approaches. First, in the course of the survey of farms for the Crop Monitoring Program, the survey team usually gets inquiries from participating farmers about specific aspects of commercial crop production. The team usually responds on the spot, but sometimes need to come back later with the proper paraphernalia and/or illustrated guides to provide clear understanding of the operations or problems in question. Secondly, the Youth Extension Agent has targeted the parents of children attending the Head Start Program Centers located around the island. Whichever approach, the participants received illustrated guides for all crop production aspects from the CES Office.

b). Impact/Accomplishments - Eleven farms in the Crop Production and Marketing Information System, plus 14 Head Start Centers and three EFNEP groups composed of 268 individuals received instructions and demonstrations on nursery and field operations on vegetable culture. Eight of the 11 farms targeted are implementing the recommended practices. Gardens were established and

fresh produce was used at eight of the 14 Head Start Centers. The number of parents and EFNEP participants implementing or intending to implement the recommendations was not recorded, but most of the kids in the Head Start Centers joined their parents in the lectures and demonstrations. Oftentimes the children were actually doing the chores themselves side-by-side with their parents, which should go a long way towards ingraining a positive attitude towards home gardening where it counts most, in the home.

c). Source of Funds – Smith-Lever

d). Scope of Impact – County Specific (Pohnpei)

Key Theme – Food Handling

a). Description of Activity – An Extension staff visited several outer islands and conducted weeklong workshops with adult and youth community members. Lessons on food handling and preparation were presented, accompanied by cooking demonstrations on a variety of local recipes.

b). Impact/Accomplishments – A total of 1,150 people attended the workshops. The result of a 24-hours food recall indicated an increased awareness of the importance of proper food handling and serving a balanced and nutritious meal.

c). Source of Funds – Smith-Lever 3b&c

d). Scope of Impact – County Specific (Marshall Islands)

Key Theme – Food Handling

a). Description of Activity – Joint coordination and sponsorship was established with Chuuk Environmental Health and Sanitation Division in conducting a training program for food handlers. Food handlers from the hotels, restaurants, “take out” shops, department stores, fish, vegetables, and food market, took part in the training. Information imparted from the training included rules and regulations of food establishments, food borne diseases, personal hygiene, safe food supply, food handling and preparation, and food selection, purchasing and storage.

b). Impact/Accomplishments – Thirty-one food handlers attended and successfully completed the one-week training. School cooks also attended the training. Follow-up visits revealed cleaner food establishments and shopkeepers and food handlers have practiced good personal hygiene.

c). Source of Federal Funds – Smith-Lever
d). Scope of Impact – Chuuk (Micronesia)

C. ALLOCATED RESOURCES

Fiscal Resources
Extension

Year	Federal	State	Local	Other
2000	121,461	43,379	8,676	0
2001	111,280	22,179	27,817	0
2002				0
2003				0
2004				0

Research

Year	Federal	State	Local	Other
2000	71,807	15,071	1,773	0
2001	92,374	22,759	18,743	0
2002	0	0	0	0
2003	0	0	0	0
2004	0	0	0	0

Manner of Expenditures:
Funds from formula funds and other sources like local matching funds were expended as planned in each specific research, extension and integrated research and extension projects. In general, these funds were utilized for the salaries and wages and fringe benefits of research, extension and administrative staff. International travels were conducted as key program and management staffs participated in international workshops, meetings and conferences designed for exchange of information, ideas and forming regional collaboration in projects. Domestic travels were for monitoring research progress in effectiveness of bio-control agents, different uses of local plants for medicines, suitability of aquatic life in cultures environment and dissemination of information from research to intended users through open forums, meetings and training in local communities. Supplies like films, video apes, pesticides, fertilizers, seeds needed for the research and extension activities were purchased as well. In some instances when local experts were not available like marketing, resource economics and sociology, some funds used to hire consultants from other land-grant or other agencies for a period of one to two weeks. Publication/printing costs for publishing articles in local newspapers, scientific journals and manuals, proceedings, pamphlets and brochures were part of the total expenditures. Communication within the COM region and to offices collaborating with the College through phone calls, faxes, e-mails and regular mails was part of the total cost of this Goal.

Human Resources (FTEs)

Extension FTEs

Year	Professional			Paraprofessional		
	1862	1890	Other	1862	1890	Other
2000	2.90	0.0	0.0	6.1	0.0	0.0
2001	2.56	0.0	0.0	6.2	0.0	0.0
2002	0.0	0.0	0.0	0.0	0.0	0.0
2003	0.0	0.0	0.0	0.0	0.0	0.0
2004	0.0	0.0	0.0	0.0	0.0	0.0

Research SYs Only

Year	Scientist Years			Research Assistants		
	1862	1890	Other	1862	1890	Other
2000	1.94	0.0	0.0	0.3	0.0	0.0
2001	2.20	0.0	0.0	0.5	0.0	0.0
2002	0.0	0.0	0.0	0.0	0.0	0.0
2003	0.0	0.0	0.0	0.0	0.0	0.0
2004	0.0	0.0	0.0	0.0	0.0	0.0

From the FY2001 total FTE of 86.69, 11.46 has been assigned under GPRA Goal 2, representing 13% of FTE input. The FY2001 budget allocated to GPRA Goal 2 takes into account this FTE distribution plus how Goal 2 integrates with the programs conducted by COM as a whole.

IV. GOAL 3 - A HEALTHY, WELL-NOURISHED POPULATION.

A. Goal Accomplishment Narrative

PCC-CRE:

Malnutrition continued to be a major health problem in Micronesia due to the following: (1) New lifestyles which shifted from a subsistence economy to a wage economy; (2) High preference for low nutritional imported foods over locally grown nutritious foods; (3) Convenience in obtaining, cooking, and storing imported foods; (4) Socio-economic and cultural restrictions; (5) Illiteracy; (6) Geographical distances between islands; and (7) Lack of knowledge in planning and preparing nutritious meals for families and children.

This program considered educational approaches that were appropriate for different ages, cultures, races, and levels of preparedness. The program covered home, school, work, and community groups to reach all people to develop a healthy and well-nourished population. Health and nutrition staff continued to work closely with community leaders, men and women's groups, youth groups, and inter-agency groups in the planning and implementation of health and nutrition activities.

This year, a three-week Adult EFNEP program was conducted for eight women in Kayangel State, one of the under-served states in Palau. One hundred percent of the participants showed improvement in one or more food resource management practices - planning meals, comparing prices, having food available, and using grocery lists.

A Youth EFNEP program involved sixty-two students who learned lessons in making wise food choices, how nutrients affect the body, safe food handling and storing, safety tips in the kitchen, preparing healthy snacks, and other health concepts that could be applied to their everyday lives.

Once the manuscript on the medicinal plants in Palau is published, it will create awareness on the identification and uses of locally available plants that possessed healing properties for a variety of ailments.

EFNEP and Medicinal Plants will continue to be conducted as outreach programs and research, with the focus on changing perceptions and behavior to attain a healthy and well-nourished population.

COM-FSM/CRE:

Yap Site:

Collaborative efforts with Yap Interagency Nutrition Education Council (YINEC) on health, physical education, and nutrition education programs continued. The Extension staff participated in planning activities of the World Food Day, Yap Day, and the FSM Games held in Yap during the summer.

Chuuk Site:

Heart diseases, hypertension, and diabetes are the three top causes of morbidity and mortality in Chuuk State. One of the causes of NCD is high consumption of foods high in fats, sugar and salt. While obesity and NCD are the problems among adults, under nutrition and micronutrients deficiency remain a problem among children. Pregnant and nursing mothers were also found to be anemic, one of the causes of low birth weight babies.

Combating these problems is through non-formal education programs, which included meal planning and eating a variety of food everyday. It further required macro and micro nutrient intake, proper nutrition during pregnancy and lactation, infant nutrition and complimentary feeding, nutrition for preschoolers, geriatric nutrition and dietary counseling.

Various agencies have been involved in these educational programs and collaborative efforts. Health and nutrition information were disseminated and shared during World Food Day observance and during breastfeeding and diabetes campaigns. These campaigns were able to raise awareness among the general public on the urgency and the magnitude of health and nutrition problems i.e. diabetes, hypertension and heart diseases.

The health and nutrition education programs had made an impact in changing eating patterns/habits of the population. It has been observed that more recipes were used in preparing meals, which included green leafy and yellow vegetables and crops. More multi mixes from local starch, fish/meat/poultry, vegetables and fruits were served in the homes. As a result of these efforts, there has been an increase in the consumption of local food, food high in fibers and micronutrients.

Pohnpei Site:

All families, regardless of level of income were targeted for this nutrition education. Such nutrition education is particularly important in this changing time to meet nutritional needs resulting from such social realities as lifestyle with increased use of imported food. The Western-style meals and imported food preferred by kids and many adults are easier and less messy to prepare. And in many cases are cheaper to prepare. Participants are made aware of such problem with imported food. They usually contain more salt and preservatives and are therefore less healthful than local ones and are more harmful in the long run because of build up of salt and cholesterol, etc.

Lack of understanding and poor practice is evidenced by the increasing incidences of obesity, one of the causes of diabetes and other non-communicable diseases.

Kosrae Site:

Despite the availability of local nutritious food, Kosraens continued to have a high preference for imported foodstuffs. This has contributed to an increase in diet related illnesses in both adult and children.

B. Key Themes:

Key Theme - Human Nutrition

a). Program Description – [Adult EFNEP] A three-week program on Food and Nutrition was conducted for eight women in one of the under-served States in Palau. The program was developed to educate and assist limited income families and individuals in obtaining the basic nutritional knowledge and skills needed for making wise food choices to plan and prepare healthy and low cost meals. The program consisted of a series of twelve lessons that emphasized the moderation of food intake, the consumption of a wide variety of foods for different nutrients, safe food handling and storing, and the planning and the preparation of balanced meals using the Food Guide Pyramid.

b). Impact/Accomplishments – One hundred percent of the eight participants showed improvement in one or more food resource management practices, i.e. planning meals, comparing prices, having food available, and using grocery lists. As to nutrition practices, all the participants showed improvement in planning meals, making healthy food choices, preparing foods without adding too much

salt, reading nutrition labels, or having their children eat breakfast. Sixty-three percent or five out the eight participants showed improvement in one or more of the food safety practices, i.e. thawing and storing foods properly. In addition, twenty-five percent or two of the eight participants always followed the recommended practices.

c). Source of Funding – Smith-Lever 3b&c

d). Scope of Impact – County Specific (Palau)

Key Theme – Human Nutrition

a). Description of Activity – [Youth EFNEP] The Healthy Body, Healthy Mind Campaign, an enrichment program conducted after school and during the summer, was designed to teach 9-19 year old students about making wise food choices, how nutrients affect the body, safe food handling and storage, safety tips for the kitchen, preparing healthy snacks and recipes, and other health concepts that could be applied to their everyday lives. It was believed that the students would then share the skills and information leaned with their parents and other family members. Activities of the program were modified to fit the needs of the students. The Healthy Body, Healthy Mind Campaign was conducted at four elementary schools and one high school in Palau. A total of sixty-two students with grade levels ranging from 7^{th} to 12^{th} grades successfully completed the program.

b). Impact/Accomplishments – The pre- and post-test administered composed of a true or false questionnaire focusing more on nutritional knowledge of the students rather than on food variety, a student's ability to select low-cost and nutritious foods, food preparation, and safety practices. As a result, eighty-two percent of the sixty-two students had indicated an increased knowledge on the essentials of human nutrition.

c). Source of Funding – Smith-Lever 3b&c

d). Scope of Impact – County Specific (Palau)

Key Theme – Human Nutrition

a). Description of Activity - CES nutrition staffs conducted Nutrition and Food Safety lessons to six EFNEP groups that must complete at least 12 Nutrition lessons (out of a possible 18), which was supplemented by two cooking demonstrations for each lesson in order to graduate. The topics included: 24-hour food recall; the Three Basic Food Groups; Vitamins A to C and the minerals Iron and Calcium; Nutrition for 1 to 5 year-olds as well as Nutrition for Pregnancy, particularly Teen Pregnancy; Food Storage and Sanitation; Food Purchase and Meal Planning. Twenty-three recipes were demonstrated to all groups.

b). Impact/Accomplishments - Of a total of 208 clients who attended EFNEP programs, approximately 75% of them showed improvement in one or more of the 'good nutrition' practices. Good nutrition practices included, shopping with a list, using little or no salt to recipes, selecting food by labels, and making children

eat breakfast. About 60% showed improvement in one or more 'food resource management' practices such as: planning meals, comparing prices, and having good budget management of food supplies. Also, a number of clients are being considered for employment as Cook in the Head Start Program.

c). Source of Funds – Smith-Lever

d). Scope of Impact – County Specific (Pohnpei)

Key Theme – Human Nutrition

a). Description of Activity - Home based programs conducted in the communities to families to improve nutritional status emphasized food purchasing, food preparation, meal planning, food safety and food storage and sanitation. The programs required that all participants fill out 24-hour food recall and food checklist forms when entering and upon exiting the program. The forms will be compared at the end to determine participants' knowledge and skills in the program.

b). Impact/Accomplishments – Sixty-two participants completed the programs. The 24-hour food recall and food checklist showed improvement (served variety of vegetables, prepared food with less salt, sugar, fats and carbohydrate foods). Eighty-five percent showed application of five new recipes learned from the program, and 85% showed ability to read food labels, food comparison, plan nutritious menu and prepare meals properly.

c). Source of Federal Funds – Smith-Lever 3b&c

d). Scope of Impact – Kosrae (Micronesia)

Key Theme - Medicinal Plants

a). Description of Activity – A literature search and interviews were conducted on local, English and scientific names, botanical descriptions, habitats, uses, and preparation of a hundred and thirty-four plants in Palau known to have medicinal properties for various ailments. These plants were also photographed in their natural habitat. The leaves, stems, flowers, fruits, and roots of these plants were preserved in a herbarium for further identification and used as teaching materials for students and other interested parties.

b). Impact/Accomplishments – The printing and distribution of the publication "Medicinal Plants in Palau" will create an awareness of the identification of locally available plants that posses healing properties for certain ailments. This could also be used as the basis for the establishment of village-level herbal gardens in remote habitats as a source of alternative health care. A demonstration garden of medicinal plants has been established at the Super Dispensary in Ngaremlengui (in close proximity to the PCC-R&D Station) by Ngaremlengui State. Another person has also expressed an interest in establishing a botanical garden showcasing medicinal plants.

c). Source of Funding – Hatch Act Funds

d). Scope of Impact – County Specific (Palau)

Key Theme – Infant Mortality

a). Description of Activity – Among lessons developed by EFNEP staffs for community nutrition education is nutrition for women during pregnancy and lactation. It was emphasized in these lessons that pregnant mothers who are underweight should supplement their diet with food that is adequate both in macro and micronutrients. On the other hand, pregnant mothers who are obese were advised to lose weight, avoid fatty food, especially animal fats, salt and sugar. Exclusive breastfeeding was also one of the lessons. It was also emphasized in these lessons that only breast milk and no other food should be given to the baby during the first six months after birth. Dietary counseling was also provided to pregnant and lactating mothers.

b). Impact - A total of five hundred and seventy (570) homemakers participated in the program. A high percentage of these homemakers are pregnant ladies or have sisters, cousins, neighbors or friends who are also pregnant or lactating. A good number of lactating mothers are now exclusively breastfeed during the first six months and have extended breastfeeding for as long as two years. Preventing problems through proper care proved to be better than addressing problems. Fewer women have complained about breastfeeding related problems.

c). Source of Federal Funds – Smith –Lever

d). Scope of Impact – Chuuk (Micronesia)

C. ALLOCATED RESOURCES

Fiscal Resources
Extension

Year	Federal	State	Local	Other
2000	114,443	40,873	8,175	0
2001	116,616	23,242	29,151	0
2002				0
2003				0
2004				0

Research

Year	Federal	State	Local	Other
2000	71,807	15,071	1,773	0
2001	58,161	14,330	11,801	0
2002	0	0	0	0
2003	0	0	0	0
2004	0	0	0	0

Human Resources (FTEs)

Extension FTEs

Year	Professional			Paraprofessional		
	1862	1890	Other	1862	1890	Other
2000	0.68	0.0	0.0	7.80	0.0	0.0
2001	1.18	0.0	0.0	8.00	0.0	0.0
2002	0.00	0.0	0.0	0.00	0.0	0.0
2003	0.00	0.0	0.0	0.00	0.0	0.0
2004	0.00	0.0	0.0	0.00	0.0	0.0

Research SYs Only

Year	Scientist Years			Research Assistants		
	1862	1890	Other	1862	1890	Other
2000	1.13	0.0	0.0	0.3	0.0	0.0
2001	1.20	0.0	0.0	0.5	0.0	0.0
2002	0.0	0.0	0.0	0.0	0.0	0.0
2003	0.0	0.0	0.0	0.0	0.0	0.0
2004	0.0	0.0	0.0	0.0	0.0	0.0

Allocate Resources:
From the FY2001 total FTE of 86.69, 10.88 has been assigned under GPRA Goal 3, representing 12% of FTE input. The FY2001 budget allocated to GPRA Goal 3 takes into account this FTE distribution plus how Goal 3 integrates with the programs conducted by COM as a whole

V. GOAL 4 - TO ACHIEVE GREATER HARMONY (BALANCE) BETWEEN AGRICULTURE AND THE ENVIRONMENT.

A. GOAL ACCOMPLISHMENT NARRATIVE

PCC-CRE:

Our planned programs were effective in meeting the important issues facing Palau at this time. Biodiversity, biological control, integrated pest managements, and natural resource managements were key themes that were addressed for this reporting period.

Our extension efforts in marine conservation areas have led to an improved and effective management of conservation areas by resource managers. New conservation areas were being planned because of our efforts in working with communities to promote conservation of Palau's biodiversity.

The research projects on *Mimosa diplotricha* and *Chromolaena odorata* were effective in using biological control to hinder these invasive weeds. The biological control of invasive weeds was successful and it has benefited farmers by opening up areas for farming without the use of harmful chemicals. The farmers saved by not having to buy chemicals to control weeds and our environment benefited because no chemicals were used to control the weeds. Other biological control projects were just at their initial stages at the time of this writing and will be in full swing during the next year.

With the completion and implementation of the conservation plan at the PCC-R&D Station, PCC-CRE will serve as a model on how to combine agricultural production with environmental protection. The R&D Station will serve as a demonstration site for all the farmers in Palau and the region.

Stakeholders benefited much from our programs this past year. The establishment and management of conservation areas benefited our stakeholders by preserving biodiversity for today and future generations. The effective management of conservation areas was possible with information provided by our programs in marine conservation areas. Better informed and educated stakeholders on issues of conservation and natural resource management will allow our stakeholders to make wiser and more informed decisions regarding natural resource and farming issues.

In looking at the Five Year Plan of Work, we have achieved some success in addressing important issues that are impacting on our stakeholders. We still needed to improve the evaluation of our extension programs to fully document the impacts of our programs. We also need to utilize the evaluations to help improve program planning and implementation.

CMI-CRE:

Insect pests, nearly all of which are exotic to the Marshall Islands, caused significant damage to many crops and seriously affected crop productivity and overall food security. In recent years, many of these pests have become prevalent as they spread from initial points of entry to atolls, where they cause outbreaks that seriously damaged crops.

Four islands have been surveyed and at least fifteen new insects were found. *Cuscuta* is the most invasive parasitic weed found in all the islands surveyed. *Cassytha, Chromolaena odorata* and *Coccinia grandis* were common on Majuro atoll. Red coconut scale is widespread and some trees were heavily invested. The natural enemy, *Anabrolepis oceanica* was not observed in the surveyed islands. The spiraling whitefly is abundant in all the surveyed islands.

Report of insect pest survey was printed and distributed to government and traditional leaders, and farmers. It contained information on updated list of insect pests, morphological descriptions, yield, and resistance or susceptibility to pests on more than twenty crops.

A weeklong training was conducted in collaboration with SPC to twenty participants, including extension agents, plant protection and quarantine officers, and farmers.

COM-FSM/CRE:

Yap Site:

Outreach activities included lectures and presentations on environmental issues by quest speakers from various governmental agencies. Youth clubs were involved in beautification projects and organized workshops on environmental issues, such as land erosion, farming techniques and farm management, pesticide and fertilizer usage, and water pollution. Extension staff also participated in an IPM workshop conducted by SPC and an IPM specialist from PCC.

Pohnpei Site:

Programs included extension, research and research-extension projects. Integrated Pest Management (IPM) projects addressed limited or even lack of knowledge of eco-friendly approaches and practices for agriculture. Knowledge sharing of practices and technologies on production were thought beneficial to extension agents at CES Yap Campus and Chuuk Campus and staff at States Agriculture. The trainers 'Team' and participants adopted two-way information sharing. Significant increase of knowledge on practices and technologies on crop cultivation resulted among participants of LGP staff at CES Yap Campus and CES Chuuk Campus and States (Yap and Chuuk) Agriculture. Hopefully the knowledge learned would be adopted on crops cultivation in their respective areas.

Another project was the diagnoses of diseases of important crops (banana, yam, cucumber, tomato, breadfruit) reported in 2000-2001 in Pohnpei. The diseases identified were already present in Pohnpei in the past. Suggested recommendations as control measures and actions to overcome the effect of diseases outbreak were presented as guidelines for extension agents, farmers/growers and others. The project was conducted for awareness of the technical procedures to identify the disease.

The survey of insect pests in the FSM was initiated and conducted the first survey of the two-in-one survey to update and assess the insects present in the FSM. The survey being conducted is for further awareness and information on insects present and deter influx of new ones to the islands.

Research-extension project on pest and crop approach integration project for developing IPM program of leaf-footed bug on cucumber, an important commercial crop in Pohnpei was also being conducted. Eco-friendly production practices to improve poor soil and address other limiting factors on problem sites; assessment and further study of the bio-control of the pest in the island are components of the project. The first trial of the series of experiments at the two vegetable farms and State (Pohnpei) Agriculture was accomplished as of September 2001.

The extension project on fruit flies surveillance and monitoring was also conducted to strengthen quarantine service in the island (State of Pohnpei) in collaboration with SPC and State Agriculture. The project assisted the Department of Economic Affairs, Division of Sectoral Development (Agriculture), and FSM Government on collection of traps weekly for monthly fruit flies information.

Research project on endangered species (with nutritional value for growing children and adults as well) for multiplication and perpetuation of the species is also being conducted. The AES researcher is trying to address as part of conservation/preservation effort of the rare/endangered bananas recently analyzed for vitamin A content. These bananas were found rich in vitamin A. While 51% of Micronesia children are suffering from the disorder, promotion of these local bananas for consumption and part of the meal especially to growing children is important. Since these bananas are rare, anticipated increase in demand (brought about by awareness and promotion campaign) for fruits would require increase planting and hence need for planting materials. The rare banana could be multiplied faster and in mass for a shorter

period of time using tissue culture technique once the procedures are known. Collection area establishment in the lowlands and within the campus for student could facilitate awareness and for instruction purposes. Another area is the State Agriculture for accessibility and assured source of mother plants for conventional planting materials for farmers and general public. In vitro protocol for multiplication of the rare bananas and other phases of the system will be determined due to expected differences and modification/refinement needed for different species. Media additives and substitution for best tissue response is one aim in determining the in vitro propagation protocol. Knowledge and materials generated from the project is in support to increased household planting/plantation-type cultivation and production of the bananas.

Two programs conducted under this National Goal were very successful. Sustainable Kava Cultivation under Lowland Agro forest Systems started more than three years ago and thus far hundreds of people participated at one time or the other. This program was developed in cooperation with The Nature Conservancy (TNC), Pohnpei State Agriculture and Forestry, the USDA-NRCS and the Conservation Society of Pohnpei (CSP) for the purpose of discouraging the cultivation of Sakau or Kava in the uplands. As documented elsewhere, deforestation has caused a major damage to the natural forest and vegetation.

Recycling and Environmental Education was aimed at educating the people through their children on the importance of keeping the island clean by collecting the imported packing materials and disposing in properly designated sites around the island.

Kosrae Site:

Farming activities in Kosrae are mostly small scale, sustainable agriculture programs that use traditional knowledge of agriculture. Training programs on agriculture were provided to farmers, extension agents, women groups, and students.

B. Key Themes:

Key Theme - Biodiversity

a). Program Description – [Marine Conservation Areas] Extension agents assisted state governments in monitoring and managing their conservation areas by conducting surveys of benthic marine invertebrate, fish, and corals to give resource managers the information the needed to make quality management decisions. Two marine conservation areas in two different states were quantitatively assessed. Extension agents also assisted a third state in the planning and selecting of a site for a conservation area. Potential sites for the proposed conservation area were surveyed and the recommendations were presented to community members during a community meeting.

b). Impact – The monitoring programs conducted by extension agents at the two established conservation areas assisted state governments and their resource managers in managing their conservation areas by providing accurate and meaningful data regarding the status of the conservation areas. The efforts by extension agents in the third state will lead to the establishment of a marine conservation area. During a community meeting, community member agreed that there was an urgent need to establish a conservation area to protect the biodiversity of the state.

c). Source of Funding – Smith-Lever Act and AusAid Funds

d). Scope of Impact – County Specific (Palau)

Key Theme - Biodiversity

a). Description of Activity – [Indigenous Environmental Knowledge, Uses, and Significances of Culturally Important Plants on Babeldaob Island, Republic of Palau] This project aimed to identify and document plants found on Palau's main island that had historical, cultural, environmental, and medicinal value to the people of Palau. Activities involved community meetings at all of the ten states in Babeldaob and individual interviews with recognized experts on plants or traditional uses of plants.

b). Impact/Accomplishments – The loss of biological diversity has been well documented. Biological diversity can be linked with cultural diversity. Thus a parallel process has occurred where the loss of biodiversity has been a key factor in the disappearance of the Palauan traditional culture, including a related loss of traditional knowledge about forest resources. The uses and other significances of Palauan plants were ultimately linked with Palau's cultural origins, which continues to be in danger of being forgotten with the present rapid growth and development that Palau has been experiencing in recent years. Documentation of indigenous environmental knowledge (traditional uses, knowledge, beliefs, and management systems) will provide the opportunity to achieve the dual objectives of protecting biological diversity and preserving cultural diversity.

c). Source of Funding – Smith-Lever Act Funds

d). Scope of Impact – County Specific (Palau)

Key Theme - Biological Control

a). Program Description – [Creeping Sensitive Plant, *Mimosa diplotricha*] A total of 2,892 adult psyllids (*Heteropsylla spinulosa*) were released at nine sites in Palau. Six months after release, the weed *Mimosa* showed yellowing and cupping of the leaves and shoots, which later turned brown including the stems. Eventually the whole *Mimosa* plant died. The pysllid dispersed naturally and even damaged *Mimosa* plants about two hundred meters from release sites.

b). Impact/Accomplishments – Along the main roads and vacant areas, natural vegetation such as shrubs and grasses started to reappear. Two farms in Airai that were abandoned due to severe *Mimosa* infestation were reopened and planted again with vegetables.

c). Source of Funding – Hatch Act Funds

d). Scope of Impact – County Specific (Palau)

Key Theme – Biological Control

a). Program Description – [Siam Weed, *Chromolaena odorata*] Field releases of the male and female gallfly were done in areas infested with the Siam weed in four states of Palau. After one year, the gallflies were firmly established on the Siam weed. Some weeds showed more than five galls and the stems had started to turn brown and die. The gallflies had reduced the spread and dispersal of the Siam weed into cultivated areas.

b). Impact – Some farmers have started to open up previously Siam weed infested areas for cultivation.

c). Source of Funding – T-Star and Hatch Act Funds

d). Scope of Impact – Multi-State (Palau and Guam)

Key Theme – Biological Control

a). Program Description – [Taro Leafhopper] The predatory mired bug (*Cyrrtorrhinus fuvus*) has been successfully reared in the greenhouse on potted taro infested with leafhoppers since October, 2000 through June, 2001. Unfortunately the cultures were lost when a strong tropical storm hit Palau and blew away the cultures and plants in the greenhouse. Since they could not be recovered even in the field, the mired bug will be collected again from Pohnpei and cultured on potted taro infested with leafhoppers. This time rearing of the mired bug will be done in a newly built laboratory and greenhouse to prevent any further loss of the cultures.

b). Impact/Accomplishments – Once enough numbers of the mired bugs are produced, about one hundred bugs will be released at two taro farms in two states on Palau. Once established, a collection of mired bugs will be done from the two sites for release at other taro farms with a leafhopper population. This will help to reduce the farmer's dependence on chemicals to control leafhoppers and at the same time ensure production of taro corms.

c). Source of Funding – Hatch Act Funds
d). Scope of Impact – County Specific (Palau)

Key Theme – Biological Control

a). Program Description – [Fruit-Piercing Moth] The larval parasitoid of the fruit-piercing moth, *Euplectrus materna*, was reared at the Entomology Department at the University of Guam. Once sufficient numbers of the parasitoid become available, some of the parasitoid will be sent to Palau for release.

b). Impact/Accomplishments – The fruit-piercing moth is a major pest of fruits. Release of the larval parasitoid of the fruit-piercing moth will help reduce the damage to fruits such as banana, mango, guava, carambola, citrus, and others.

c). Source of Funding – T-Star and Hatch Act Funds

d). Scope of Impact – Multi-State (Palau and Guam)

Key Theme - Integrated Pest Management

a). Program Description – [Integrated Control of the Cassava Spider Mite] Nine varieties of cassava were evaluated for resistance and tolerance to spider mite damage for two growing seasons. Results further confirmed that the two yellow varieties, Ochobirang and Ngesuong, consistently tolerated high spider mite damage while yielding more marketable tubers than the other seven varieties (Klerang, Terue, Mechebechubel, Saybal, Iseball, Anguar Red, and Olik).

b). Impact/Accomplishments – The first planting for the chemical control of the cassava spider mite project was completed. Results revealed that Vendex and Kelthane reduced spider mite damage to cassava plants. Yields of tubers could only be taken from two blocks (replications). The other two blocks were eaten and destroyed by wild pigs. The second planting for the chemical control of the cassava spider mite was established. The first chemical spraying is scheduled for December 7th, 2001.

The rearing of the phytoseeid mite, *Phytoseiulus persimilis*, as an effective predator of the cassava spider mite started in December 2000. They were reared on potted cassava plants inside the screenhouse and had started to increase in numbers after a few months. However the cultures were lost because of a strong tropical storm that blew away the potted plants last July. Cultures of both the spider mites and the predatory mites will be done again. To ensure their survival, some predatory mites will be reared in the newly built laboratory at the R&D Station.

Two farmers who saw the results of the field planting of the nine varieties of cassava requested stem cuttings of Ochobirang and Ngesuong. These two varieties consistently showed high tolerance against the cassava spider mite.

c). Source of Funding – Hatch Act and Integrated Pest Management Funds

d). Scope of Impact - County Specific (Palau)

Key Theme – Integrated Pest Management

a). Program Description – [Sustainable Control Strategy Against Taro Corm Rot] A field experiment on the chemical control of the taro corm rot (Obei) was installed in an upland area at the R&D Station known to have a high incidence of taro corm rot. The treatments were: (1) Ten grams each of wood ash and lime in each planting hole, (2) Deeper planting (10-11 inches), (3) Dipping planting materials overnight in Captan, and (4) Ridomil solutions, (5) Drenching planting holes with Captan, and (6) Ridomil solutions, (7) Untreated Control. Each treatment consisted of thirteen “Ngesuas” variety of taro per row replicated four times in a Randomized Complete Block Design.

b). Impact – A replicated field trail consisting of twenty-three varieties of taro was established to determine resistance/susceptibility to taro corm rot. Results of the first planting showed that Ngetmadei, Homestead, Dungersuul, and Renged showed a higher degree of resistance to taro corm rot.

Varietal evaluation will be conducted for another growing season to validate these findings. Once proven again to be resistant, planting materials of

these varieties known to be resistant to the taro corm rot will be propagated for distribution to farmers planting taro.

c). Source of Funding – Hatch Act Funds

d). Scope of Impact – County Specific (Palau)

Key Theme – Integrated Pest Management

a). Program Description – [Development of Publications on Integrated Pest Management] A publication titled "Insect Pests of Root Crops in Micronesia" was prepared and printed in Guam. Likewise the brochure, "Knowing Pesticides", was prepared and printed in English, Palauan, Sonsorolese, Hatohobein, and Filipino. Copies of these publications were distributed to farmers, extension agents, government and tradition leaders in Palau and other Micronesian islands.

b). Impact/Accomplishments – The publications "Insect Pest of Root Crops in Micronesia" and "Knowing Pesticides" were distributed to one hundred and thirty-two farmers, extension agents, government and traditional leaders. They were better informed on the identification of the pests encountered in root crop production and how to control them, thus leading to an increase root crop production. Recipients of the brochure, "Knowing Pesticides", learned which pesticide was appropriate for the control of a specific pest problem and how to properly use and apply the pesticide.

c). Source of Funding – Smith-Lever Act Funds

d). Scope of Impact – County Specific (Palau)

Key Theme - Integrated Pest Management

a). Description of Activity – [IPM Stronghold] Crop practices and management was conducted as knowledge sharing mission basically to identify possible gaps/lack of awareness among Extension Agents and State Agriculture staffs. The Researcher at the National Campus with the CRD Extension Agent at the Pohnpei Campus participating conducted 'Two-way' knowledge sharing on the 'How To's' for crops cultivation at CES offices at the Yap Campus and Chuuk Campus by the 'Team' headed. Thirty-five participants from Extension offices in Yap and Chuuk and States Agriculture Station staffs attended. Pre- and post-tests conducted revealed 'significant' increase in the knowledge on crop practices and management after the sharing. The report document on 'Some Crop Practices and Management in the FSM' was prepared based on the knowledge sharing activities conducted. Copies were provided to agencies and offices in Pohnpei and the FSM for awareness and as knowledge-based for appropriate action/recommendation to improve crop productivity and production of a particular crop.

Diagnoses of banana, yam, cucumber, tomato and breadfruit diseases in Pohnpei reported in 2000-2001 was conducted and completed. Prepared and submitted the report document to agencies, offices and other sectors such as students for awareness and knowledge on the technical procedures on disease diagnosis for identification.

The project:" Survey of Insect Pests in the FSM: Update and Assessment" was initiated. The first survey of the two-in-one survey was conducted in August 2001.

Pest approach development of IPM program on leaf-footed bug of cucurbits (cucumber) commenced in March/April 2001. The first trial was accomplished as of September 2001. Progress report was submitted to the American Farmland Trust (AFT).

Assistance was provided to the FSM Government Department of Economic Affairs, Division of Sectoral Development (Agriculture) for the needed Fruit Fly Monitoring: Traps Collection and Maintenance (Pohnpei State) to strengthen quarantine service in the island.

b). Impact/Accomplishments - The report document on IPM Stronghold, "Crop Practices and Management" was printed and distributed for reference on the knowledge shared on crops cultivation. The report document on "Diagnosis of Banana, Yam and Other Diseases in Pohnpei" was printed and distributed for awareness of the existing diseases and the technical procedures to identify the diseases.

The needed update and assessment of the insects (pests) in the FSM is being conducted.

Developing IPM for leaf-footed bug on cucumber involves three sites that include two vegetable (cucumber) farmers and State (Pohnpei) Agriculture Farm. All sites are 'problem' plots for cucumber cultivation. Cucumber harvests in the past were considerably low or nil in these areas considered as sites for the trials. One farmer owner can now harvest cucumber at adjacent plot following some crucial practices for soil fertility enhancement in growing crops (cucumber) and adopted in the trials. The IPM program for leaf-footed bug project is continuing.

c). Source of Funds – Smith-Lever

d). Scope of Impact – County Specific (FSM)

Key Theme – Endangered Species

a). Description of Activity - Stage I was accomplished as reported in FY 2000. Limited initial cultures were explanted due to rarity of the mother plants and the available right stage of the suckers. Procedures for Stage I could now be replicated for verification. Stage II (multiplication) experiments as regards the media for the different high Vitamin A containing bananas: 2 Karat, Mangat (and/or Uht en Yap or Meret/Mesepok) were conducted. Different media supplements (plant growth regulators, organic additives) for best response of the bananas were tested. Substitution of some media composition was tried for economic reason and availability. Some media components substitute available locally could facilitate sourcing chemicals and other tissue culture supplies from the mainland and elsewhere (cost and shipping time factors). Stage I in vitro initial cultures for *Uht en Yap* is needed.

b). Impact/Accomplishments - Treatments included media substitution and addition with organic additives and easily available components for multiplication. Three initiation media were tried – MS+2.5BA, MS+1IAA+2.5BA+10CW and MS+2.5BA+10CW. Better and faster response were observed on the tissues

using MS+2.5BA+10CW. Best tissue response for multiplication was on MS+2.5BA+10CW+Th. This is the addition of vitamin component (over and above the needed concentration) in the standard MS vitamins in the media. More number of developing shoots/multiple shoots were observed.

The project is on going and continuing on determining the in vitro propagation protocols with media component addition and substitution.

Atoll communities (specifically Northwest and Halls Regions, Chuuk State relayed to the Extension Agent during the training in the communities) expressed interest to grow vitamin A rich bananas derived from tissue culture. A follow-up project on "In Vitro Multiplication of the High Vitamin A Containing Banana" for Research-Extension is being conceived. This depends on local match support.

c). Source of Federal Funds – Hatch

d). Scope of Impact – Micronesia (FSM)

Key Theme - Natural Resource Management

a). Program Description – The Conservation Plan for Palau Community College's Research and Development Station has been completed and implementation was started. Contour farming, cover with green manure, crop rotation, and windbreak establishment has been completed. Grasses and other plants have been planted on critical areas to provide ground cover and hold the soil form eroding. Vegetative barriers have also been planted between crop rows to reduce soil erosion between fields. The plan also addressed soil quality and quantity, water quality and quantity, plant and animal concerns.

b). Impact – The implemented Plan will not only improve natural resource management at the R&D Station but also demonstrate to farmers and community members examples of productive resource management, environmental protection, pest control, and water quality protection. Workshops and training will be held at the R&D Station on how to utilize Best Management Practices to improve farmlands and yields.

c). Source of Funding – Smith-Lever Act

d). Scope of Impact – County Specific (Palau)

Key Theme - Sustainable Agriculture

a). Program Description – The forecast of vegetable production in Palau was constantly monitored by monthly farm surveys of planting dates and acreage planted in three states. Volume, prices, and value of local and imported fruits and vegetables sold and consumed in markets, hotels, and restaurants in two states was also surveyed.

Extension agents and farmers were trained on vegetable crop production with the emphasis on horticultural practices, pests, and diseases of the top selling vegetables-long beans, cucumbers, and Chinese cabbage. A demonstration on best management practices for the production and sequential planting of long beans was established at the R&D Station.

A contract growing agreement was made for a farmer who participated in the vegetable production training, conducted by CRE in April 2-5, 2000 (28

hours) to produce and sell root crops and vegetables to a hotel and restaurant. The farmer was assisted in terms of sol analysis of the farm and technical guidance in growing root crops and vegetables as well as record keeping of expenses and income from the farm.

b). Impact – Farm surveys provided information on the volume of the most widely planted vegetables that will be available in the market, while market surveys were essential in providing information on the top selling and widely consumed vegetables. This served as a guide for the most profitable vegetable commodities that should be planted to better ensure a farmer's income.

A farmer who participated in the vegetable production training entered into a contract growing agreement with a hotel and restaurant to buy the root crops and vegetables produced at his farm. This served as a model for other farmers who wished to enter into a similar agreement and have a sure market for their produce.

c). Source of Funding – Western Region Sustainable Agriculture Research and Extension (WSARE)

d). Scope of Impact – County Specific (Palau)

Key Theme - Sustainable Agriculture

a). Description of Activity – The extension part of the project on bananas on Kosrae is looking at improving sustainability of the agriculture system on Kosrae. In this regard, training / workshops were conducted to educate farmers and agriculture extension agents. Topics in these workshops included soil science, environmental science, crop production and plant pathology. Altogether138 people participated in these workshops.

The experimental farm (field trial of tissue culture plants) involved volunteer farmers who received advanced training in commercial production of bananas. They were advised on the farm and taught banana farm management practices that avoided chemical spraying for disease control. Proper rouging and sanitation procedures helped them to achieve healthy growth of their plants.

Another objective of this project was to micro propagate and distribute elite planting materials of variety Kufwafwa to farmers. As on 30th September 2001, MPPRC supplied 6340 ready-to-plant (1.5 – 2.0 ft tall with 4-6 leaves) bananas in 1 ft. tall poly bags containing enriched soil. Over 200 farmers from the 4 municipalities of Kosrae received these bananas.

b). Impact/Accomplishments - Farmers and extension staffs were trained during 5 workshops. All extension staffs with the agriculture department are transferring information gained from the workshops and the training in the experimental farm to different farmers in their respective municipalities. These extension employees are imparting the knowledge they gained to at least 50 farmers in each of the 4 municipalities on Kosrae.

Six-thousand-three-hundred-forty plants were given out to over 200 farmers. More than ten thousand shoots are regularly maintained in the laboratory. These shoots are periodically rooted and transferred to the greenhouse (2000-2500 a month). These elite plants are free of infection from soil born diseases (*Fusarium* spp., *Pseudomonas* spp.) and viruses up on

distribution to farmers. Micro propagated bananas are reported to grow faster, yield better and bear earlier than the field-grown suckers. The disease free nature of the micro propagated bananas could reduce the use of toxic chemicals in the field, provide greater yield and thus provide more profit. Synchronized flowering achieved when using micro propagated plants also reduces management and marketing cost thus increasing the profit.

c). Source of Funds – Smith-Lever 3b&c

d). Scope of Impact – County Specific (Kosrae)

Key Theme – Sustainable Agriculture

a). Description of Activity - The lowland kava program started more than three years ago continued when CES staff conducted lectures and group discussions on the various aspects of production practices that are not damaging to the environment. Staffs continued to visit farmers and assisted them in setting up individual nurseries as well as field planting of grown seedlings. Farmers and interested individuals also visited the office for advice and to pick up plastic gro-bags. Through funding from The Nature Conservancy and elsewhere, selected farmers were also provided with certain tools such as wheelbarrows, shovels, watering cans and water hoses. All giveaway items, tools and wheelbarrows, were contributed by TNC and from other sources.

b). Impact/Accomplishments - Fifty-three farmers were provided assistance in the form of lectures and group discussions on topics ranging from selection, preparation and treatment of one-to two-node cuttings prior to planting in grow bags or beds; how to prepare media (mixing topsoil with sand and compost) for the grow bags or beds; and, maintenance while in the nursery, etc. More than 300 copies each of two leaflets (One on Compost and the other on Nursery) were distributed to sakau growers. Most farmers have harvested from plants planted under the project. Many farmers are now maintaining their own sakau nurseries, however, there is still more that continue to practice the cut and plant method. Whatever method is employed, farms are now aware that cultivation in the forest can negatively degrade the fragile ecosystem and the existing biodiversity.

c). Source of Funds – Smith-Lever

d). Scope of Impact – County Specific (Pohnpei)

Key Theme – Recycling

a). Description of Activity - CES staff conducted classroom lecture on various topics on the environment and on “recycling” of both biodegrable and non-biodegradable materials in a program called “Don’t Trash the Planet” to six graders in eight elementary schools. Of particular importance, stressed to these kids, is the role they can play in making sure the environment is not continue to be degraded with aluminum cans, plastics and other food wraps being thrown around the place. For collecting aluminum cans, wire mesh were fabricated and distributed to the schools. Included as part of the program is for kids to inform their parents about the use of the receptacles

b). Impact/Accomplishments – Sixty-four six graders participated on the importance, concepts, and practices of keeping the environment clean, healthy, and unpolluted. Before the program, none of the participants knew very much about the existence of the recycling program in Pohnpei. Now when they see the aluminum collecting receptacles, they know it is where they should throw away empty soda cans and plastic wrappings.

c). Source of Funds – Smith-Lever

d). Scope of Impact – County Specific (Pohnpei)

C. ALLOCATED RESOURCES

Fiscal Resources

Extension

Year	Federal	State	Local	Other

2000	197,037	70,370	14,074	0
2001	201,346	40,129	50,331	0
2002				0
2003				0
2004				0

Research

Year	Federal	State	Local	Other
2000	254,588	53,432	6,286	0
2001	191,591	47,204	38,873	0
2002				0
2003				0
2004				0

Manner of Expenditures**:**

Budgets coming from the formula funds, competitive grants and other sources like local matching funds were expended as planned in each specific research, extension and integrated research and extension projects. In general, these monies were utilized for the salaries and wages and fringe benefits of the Vice President, key program, research, extension and administrative staff. International travels for key program personnel to participate in international workshops, meetings and conferences designed for exchange of information, ideas and forming regional collaboration in projects. Domestic travels were for monitoring research progress in effectiveness of bio-control agents, different uses of local plants for medicines, suitability of aquatic life in cultures environment and dissemination of information from research to intended users through open forums, meetings and training in local communities. Supplies like films, video apes, pesticides, fertilizers, and seeds were needed for the research and extension activities. In some instances when local experts were not available, some funds were used to hire consultants from other land grant and other institutions. Publication/printing costs were incurred as a result of publishing articles in local newspapers, scientific journals and manuals, proceedings, pamphlets and brochures. Communication cost between the six delivery sites and the Central Office located in Pohnpei and with offices collaborating with COM through phone calls, faxes, e-mails and regular mails incurred as well.

Human Resources (FTEs)

Extension FTEs

Year	Professional			Paraprofessional		

	1862	1890	Other	1862	1890	Other
2000	1.80	0.0	0.0	12.80	0.0	0.0
2001	2.00	0.0	0.0	13.85	0.0	0.0
2002	0.00	0.0	0.0	0.00	0.0	0.0
2003	0.00	0.0	0.0	0.00	0.0	0.0
2004	0.00	0.0	0.0	0.00	0.0	0.0

Research SYs Only

Year	Scientist Years			Research Assistants		
	1862	1890	Other	1862	1890	Other
2000	2.40	0.0	0.0	2.67	0.0	0.0
2001	2.50	0.0	0.0	3.10	0.0	0.0
2002	0.00	0.0	0.0	0.00	0.0	0.0
2003	0.00	0.0	0.0	0.00	0.0	0.0
2004	0.00	0.0	0.0	0.00	0.0	0.0

From the FY2001 FTE of 86.69, 21.45 has been assigned under GPRA Goal 4, representing 25% of FTE input. The FY2001 budget allocated to GPRA Goal 4 takes into account this FTE distribution plus how Goal 4 integrates with the programs conducted by COM as a whole.

VI. GOAL 5 - TO ENHANCE ECONOMIC OPPORTUNITIES AND THE QUALITY OF LIFE AMONG FAMILIES AND COMMUNITIES

A. GOAL ACCOMPLISHMENT NARRATIVE

PCC-CRE:

Poverty remained as the greatest deterrent to a better quality of life in Palau. Our plan was to address poverty through Workforce Transition. Children, youth, and families are at risk based on the fact that the poverty level in 1995, which was 60.6%, rose to 65.2% in the 1999 Palau Census (Tellames, Office of Planning, 2001).

Efforts were aimed at Head Start Program parents on how to examine family income and to cut down on unnecessary expenditures and save money for family needs. Outreach programs on employment opportunities and how to find employment in the public and private sectors were presented through leaflets and brochures.

CMI-CRE:

Twenty-five boys and girls from Laura village had completed an introduction to computer training. Two computer sessions were held during the summer. The interest in learning computer is so high and there were only a few computers available. Certificates of Completion were awarded to all 25 students. Requests from parents and students for similar training have already been received.

Elementary and high school students from the private and public schools on Majuro had the opportunity to tour the College of the Marshall Islands Science Station. Recently opened, the Science Station housed the aquaculture research lab and the agriculture research lab. The tour of the station exposed students to marine science and agriculture science activities that have just been started. About a total of 300 students visited the station this year.

COM-FSM/CRE:

Yap Site:

Discussions have been initiated with outer island inhabitants about the possibility of establishing pearl oyster nursery farms in those islands. Preliminary surveys were conducted for wild stock and a Marine Extension Agent has been hired to undertake a feasibility study.

A sewing program was conducted for elementary school students. Students learned the different parts of the sewing machine and learned to sew pillowcases, curtains, and skirts for family use and for income generation.

The Village Youth Clubs gardening projects continued to sell excess from their harvests to local stores and farmers markets.

Chuuk Site:

Through the years, there has been an erosion of the traditional family structure, which leads support to the youth members of the family. The downward trend in the family support plus the foreign influence leads to youth being confused and troubled and even led to juvenile crime.

The youth development program has picked up a big number of out of school youth from the different regions. These youth were provided services that will develop a positive outlook toward the future, enhance their personality and improve their spiritual, social and cultural values.

With active involvement by Land Grant staffs, Chuuk Small Business Women Association has been chartered and received financial support from the FSM Development Bank. Funds for this organization will support social and cultural activities in Chuuk.

The sewing program has been expanded to reach several women and youth groups from four villages. As a result of the sewing classes, many women were not only able to provide decent clothes to all members of the family, but also were able to sew for others thereby generate additional income for the family. The youths learned simple but useful things such as bags made from cloths, potholders, rags, and aprons.

Eighty- five youths participated in a Youth Summer Workshop. The workshop had presentations and demonstrations on home gardening, food and nutrition, and cultural activities.

Pohnpei Site:

There is only one program under this National Goal. The Banana Production for Family Consumption and The Export Market also reported under Goal 1. The program is with the aim to provide knowledge and skills to improve banana production efficiency. Instructions were given at home garden visits and at farmers meetings. Also emphasized were proper procedures for each step in the production process in order to improve the quality of produce and thereby reduce losses through wastage and rejection.

Kosrae Site:

A sewing program was conducted to young mothers to improve their economic well being by providing the participants the knowledge and skills necessary to sew their own clothing needs. The program taught basic, intermediate and advanced sewing skills.

A computer literacy course was conducted to nine graders at Walung Elementary School. This program provided the students a feel for the use of a computer and exposed them to the World Wide Web through the Internet.

Another youth development/4-H project was initiated through a collaborative project with the State Department of Agriculture, Land and Fisheries. The department will be distributing chicks to youth leaders upon their completion of training with the department.

C. Key Themes:

Key Theme – Family Resource Management

a). Program Description – Short-term training programs on "Personal Sewing" were conducted in almost all six counties in Micronesia. Eighty-three women had successfully completed the training programs. The programs were developed to provide families and individuals with limited income the basic sewing lessons and skills that will help them save 30-50% of the high costs of ready-made clothes sold in stores and labor fees charged by local dress shops. The skills learned in the program will not only save these women some money, but could be used as well to generate additional income for them and their families.

b). Impact/Accomplishments – The knowledge and skills obtained from the training enabled each participant to complete two dresses, two muumuus, one skirt, one blouse, one men's shirt, and one pair of shorts. The projects completed by each participant were calculated and compared against some local shops in Palau. The calculation showed a 46-52% savings for each of these women. The cost for making a simple style of a tailored dress runs from $16.95 to $39.65 in Palau. This cost variation depends upon the quality and prices for yard goods. It would cost $7.50 to $20.95 for a person who possessed some sewing skills such as the program participants to make such a dress. He/She would pay for the yard goods and accessories, whereas tailor shops charge for these things plus for the time spent on the garment.

c). Source of Funding – Smith-Lever Act Funds

d). Scope of Impact – State Specific (Micronesia)

Key Theme – Family Resource Management

a). Description of Activity – [Family Budgeting and Running a Home Effectively] The program has been designed to help individuals and families control and monitor their spending. Assistance on how to setup and maintain a budget was made available to local residents. Two brochures entitled “Holes in Your Pocket” and “Control Your Money” were created to help outline the pitfalls of careless spending and offered advice and solutions on how to curb such activities.

b). Impact – Throughout the year 5 presentations were made to local groups on how to control and monitor spending. Many of the two informative budgeting brochures were distributed at major events, printed in the local newspaper and college newsletter, and repeated over the radio in order to reach as many citizens as possible.

c). Source of Funding – Smith-Lever Act Funds

d). Scope of Impact – County Specific (Palau)

Key Theme - Youth Developpment/4-H

a). Program Description – The Summer Marine Science Program was designed for high school students and encompassed informative lectures given by local scientists and CRE staff members. The class covered a wide variety of subjects such as the formation about the rock islands, Palau’s unique marine lakes, marine invertebrates and vertebrates, and the importance of mangroves and coral reefs. After the lectures, the class would then head to the field to gain hands on knowledge corresponding with the earlier classroom lectures.

b). Impact – Each student successfully passed the class and earned a Certificate of Achievement. To pass the class, each student had to take 12 quizzes and a final exam demonstrating their new knowledge and understanding of the marine world. According to the evaluations filled out by the students, all enjoyed the program and have expressed a keen interest in joining the program next year.

c). Source of Funding – Smith-Lever Act Funds

d). Scope of Impact – County Specific (Palau)

Key Theme – Youth Development

a). Description of Activity – Extension staff conducted a basic computer-training program to thirteen students at Walung Elementary School. The six-week training program consisted of basic compute skills and Internet connection.

b). Impact – Students are now capable of using a computer and are enjoying the newly obtained skills for sending and receiving electronic mails, as well as serving the World Wide Web.

c). Source of Federal Funds – Smith-Lever

d). Scope of Impact – Kosrae (Micronesia)

Key Theme - Workforce Preparation – Youth

a). Program Description – Ten apprenticeship positions gave High School juniors and seniors an opportunity to gain valuable knowledge about the vast fields of agriculture and marine science. Under the supervision of Research and Extension staffs, students developed their own research and extension projects. The students assisted the agriculture and marine science staffs in order to gain actual agricultural and marine science work experience.

b). Impact/Accomplishments – The interns had learned a lot about agriculture marine science as career choices and what it was like to participate in a professional work environment. While the interns enjoyed their work attachment with research and extension staffs, a few have expressed openly any further desire to pursue agriculture and marine science careers.

c). Source of Funding – ADAP

d). Scope of Impact – State Specific (Micronesia)

Key Theme – Parenting

a). Description of Activity – Lessons were developed on parenting skills and were discussed with parents and children during Leadership Training workshops. The lessons included, but not limited to the following: leveling of expectation of parents and children; understanding diversity; cultural perspective; Christian values; family values, chartering relationships in the family; drawing the line; developing boundaries; changing unhealthy behavior; listening to and honoring feelings of grief, fear, guilt, anger, and compliance.

b). Impact/Accomplishments – A total of 431 youths and adults participated in the workshops. This is a big turnout and a good indication that people are coping with a changing social structure from a subsistence to a cash economy where materialism has been eroding what was once a neatly woven society.

c). Source of Federal Funds – Smith-Lever and Local Match

d). Scope of Impact – Chuuk (Micronesia)

Key Theme – Leadership Training and Development

a). Description of Activity – With active participation of Extension staffs, the Chuuk Women's Association has organized meetings to discuss various leadership roles and how to enhance women's self-esteem and self-confidence. Many of these women who are entrepreneurs have shared the skills and knowledge in running a small business and taking leadership role in the community. Other topics discussed were: value clarification, visioning, setting goals, planning, roles and relationship, leadership styles, trust, communication skills, and action planning and integration.

b). Impact/Accomplishments – It is believed that the impact will not only relate to the success of a business, but most importantly, it will be on the total personality development of the individuals, making him/her more responsible and happy.

c). Source of Funding – Smith-Lever and Local Match

d) Scope of Impact – Chuuk (Micronesia)

Key Theme – Jobs/Employment

a). Description of Activity – Development of economically viable industries in Micronesia to support the fledging economy is at the top of the development priorities. A research and extension project on developing a pearl aquaculture industry and developing local expertise in Micronesia has been initiated. A pearl hatchery expert from Australia has been hired and a hatchery was built for the training of local people, who will eventually gain the knowledge and skills necessary in establishing, managing and maintaining their own farms. There is an insufficient number of juvenile pearl oyster (spat) in the waters around Micronesia. The project will provide an alternative method of providing a constant and high quality supply of spat and immediately begin the transfer of technical know-how from the pearl expert to the local people.

b). Impacts/Accomplishments - A hatchery has been designed and constructed and three trainees were recruited. A micro-algae room was built and seawater and freshwater supply system and air supply system were installed. Initial pearl spawning and spat settlement and resettlement have been conducted with a trial run of several thousand spat. A pilot nursery farm was established adjacent to the hatchery and monitoring of growth and survival of the spat are being carried out.

c). Source of Funds – Hatch Act
d). Scope of Impact – State Specific (Micronesia)

Key Theme – Others (Export Aquaculture)

a). Description of Activity - The focus of the Export Aquaculture project is to conduct research that will assist in the development of a FSM aquaculture export industry. High value crops that do not require imported feeds or complex technologies are currently being targeted because of the high shipping costs, economic conditions and social practices within the FSM. Crops currently under consideration include black pearls, aquarium fishes, aquarium invertebrates and bioproducts. Some research into biology, sociology, and environmental conditions is also likely because crucial basic information is lacking for the FSM. Several inquiries into the export of live food fish, grabs and lobsters. Addition of a live food aquaculture export component to this position should be considered for future years.

b). Impacts/Accomplishments - The FY2001 was filled with developing Hatch proposals, structuring a peer review system for Hatch proposals, meeting with industry related visitors, initiating water quality research, developing new research ideas, and assigned duties. A marine debris compost proposal for

Hatch and Hawaii Sea Gant, and a *Saddled Butterfly fish Aquaculture with Sustainable Wild Indigenous Seed Extraction (SBA S-WISE)* Hatch proposal joined the Pohnpei Water Quality proposal in the review process. USDA approved the Pohnpei Water Quality Hatch proposal; research has been initiated and nearly 2000 measurements of conductivity, temperature and river level have been made. The CTSA capture of recruiting reef-fish proposal and the Kosrae Stream grant application were rejected. *The Saddled Butterfly fish Aquaculture with Sustainable Wild Indigenous Seed Extraction (SBA S-WISE)* approval is pending awaiting an Animal Welfare review. Improvements have been made to the Nett Point Marine Lab and COM-FSM boat. S-PLUS statistical software, a freezer, and many supply items have been purchased. Assigned duties included writing reports, attending committee meetings, and serving as Acting Vice President for Cooperative Research and Extension while the VP was away.

c). Funding Source – Hatch Act

d). Scope of Impact – County Specific (FSM)

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C. ALLOCATED RESOURCES

Fiscal Resources
Extension

Year	Federal	State	Local	Other

2000	139,005	49,645	9,929	0
2001	130,589	26,027	32,644	0
2002				0
2003				0
2004				0

Research

Year	Federal	State	Local	Other
2000	65,781	13,806	1,624	0
2001	78,689	19,387	15,966	0
2002	0	0	0	0
2003	0	0	0	0
2004	0	0	0	0

Manner of Expenditures:

Budgets coming from the formula funds and local matching funds were expended as planned in research, extension and integrated research and extension projects. In general, these monies were expended on salaries and wages and fringe benefits of the Vice President, key program, research, extension and administrative staff. International travels were for key program personnel to participate in international workshops, meetings and conferences designed for exchange of information, ideas and forming regional collaboration in projects. Domestic travels were for monitoring research progress in effectiveness of programs. In some instances when local experts are not available locally like social scientist, funds were allotted to hire consultants from other land-grant institutions or nearby institutions for a period of one to two weeks to assist in the respective activities. Publication/printing costs for publishing articles in local newspapers, scientific journals and manuals, proceedings, pamphlets and brochures were acquired. Communication between the six delivery sites and to the COM Central Office in Pohnpei, and to offices collaborating with COM through phone calls, faxes, e-mails and regular mails were part of the total expenditures.

Human Resources (FTEs)

Extension FTEs

Year	Professional			Paraprofessional		
	1862	1890	Other	1862	1890	Other

2000	3.00	0.0	0.0	7.30	0.0	0.0
2001	2.28	0.0	0.0	8.00	0.1	0.0
2002	0.0	0.0	0.0	0.00	0.0	0.0
2003	0.0	0.0	0.0	0.00	0.0	0.0
2004	0.0	0.0	0.0	0.00	0.0	0.0

Research SYs Only

Year	Professional			Paraprofessional		
	1862	1890	Other	1862	1890	Other
2000	1.01	0.0	0.0	0.3	0.0	0.0
2001	1.20	0.0	0.0	1.1	0.0	0.0
2002	0.0	0.0	0.0	0.0	0.0	0.0
2003	0.0	0.0	0.0	0.0	0.0	0.0
2004	0.0	0.0	0.0	0.0	0.0	0.0

From the FY2001 FTE of 86.69, 12.58 FTE has been assigned to programs addressing GPRA Goal 5, representing 15% of FTE input. The FY2001 budget allocated to GPRA Goal 5 takes into account this FTE distribution plus how Goal 5 integrates with other programs conducted by COM as a whole

VII. Management Key Themes:

Key Theme – Multicultural and Diversity Issues

a). Brief Description of the Activity - The Civil Rights Performance Plan to cover the period 2001-2004 was presented to a small group at the Western Extension Administrators Conference in Maui, Hawaii for feedback. The Plan will further

strengthen efforts to ensure equal access and opportunity in all aspects of federally funded and assisted programs. Much of the goals and procedures in this new Plan are the result of information obtained from the Maui meeting. Assessment of the Plan and further discussions will be conducted with COM staff and other potential stakeholders to ensure full commitment to its implementation.

b). Impacts/Accomplishments – So far, there is an increased understanding of Civil Rights laws and regulations and their impact on Research and Extension programs. Two staff attended the Western Extension Administrators Conference in Maui, Hawaii where Civil Rights/EEO matters were part of the meeting agenda. All activities with regards to responsibilities of parties under Memorandum of Agreements, Memorandum of Understanding, etc. are in compliance with non-discrimination requirements of the Civil Rights Act of 1964, as amended, Title 9 of the Education Amendment of 1972, as amended, and Section 504 of the Rehabilitation Act of 1973.

c). Source of Funding – Smith-Lever 3b&c

d). Scope of Impact - Micronesia

Key Theme - Information Technology

a). Description of Program - A continuing effort has been to provide access to the global information superhighway to the colleges and communities. The relative isolation of some islands has made access to current information very costly as well as difficult.

b). Impact/Accomplishments – Purchase of high-speed computer systems with built-in communication hardware and software are now providing research and extension staffs the capability in surfing the WWW. Most land-grant offices have computer systems and are now capable of accessing the WWW for information gathering.

c). Source of Funding – Smith-Lever/Hatch

d). Scope of Impact – Micronesia

VIII. Stakeholder Input Process:

On-going consultation through public meetings were held to discuss the U.S. Federal requirements, stakeholder input and the implementation role by COM Land Grant Program faculty and staffs. Needs assessment surveys with government offices and agencies, farmers, church groups, 4-H clubs, and NGOs were conducted. During these meeting, the public was asked or invited to define and rank issues of concern to them. Issues ranging from food security to women issues were noted.

Stakeholders input process also included interviews with government and traditional leaders, collaborating agencies, and community based organizations. Solicitation for input also occurred through direct written invitation to Ministries, Senators and Mayors, and through announcements that were placed in local newspapers and were aired over radio stations. Previous plans of work for Cooperative Extension Service for Micronesia and the GPRA Performance Plans were consulted. Review of National Master Development Plans of the three nations, UNDP reports, and survey results were used as references.

The three college presidents and the vice-residents for Cooperative Research and Extension have made state visits to the different states to meet with state leaders and community members to solicit input on state needs and issues.

The College of Micronesia Board of Regents acts as an advisory body to the COM land-grant program. The board met more frequently during the year as renegotiation of compact of free association for FSM and Marshall continues and the status of land-grant program is still in limbo. Accomplishment reports for land-grant program are always an item in their meeting agenda.

The College evaluates the relevance of priorities and concerns of the island governments with those set by the funding sources. These sources are the USDA, South Pacific Commission, Australian Center for International Research, Agricultural Development in the American Pacific and local donors, like the National Congresses, local legislatures, Board of Trustees/Regents for the three Colleges, COM Board of Regents and local governments.

IX. Program Review Process:

There are no changes in the program review process as described in the approved POW.

X. List of Acronyms

1. ADAP – Agricultural Development in the American Pacific
2. CMI – College of the Marshall Islands
3. CMI-CRE – College of the Marshall Islands Cooperative Research and Extension Department
4. COM – College of Micronesia
5. COM-FSM – College of Micronesia – Federated States of Micronesia
6. COM-FSM/CRE – College of Micronesia – Federated States of Micronesia/Cooperative Research and Extension Department
7. FSM – Federated States of Micronesia
8. IBPGR – International Board for Plant Genetic Resources
9. MISS – Marshall Islands Science Station
10. Micronesia Plant Propagation Research Center
11. PCC – Palau Community College
12. PCC-CRE – Palau Community College Cooperative Research and Extension Department
13. RMI – Republic of the Marshall Islands
14. ROP – Republic of Palau
15. SPC – Secretariat of the Pacific Community
16. UNDP – United Nations Development Program
17. UOG – University of Guam
18. USP – University of the South Pacific