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 2000:

I. GENERAL OVERVIEW

The Micronesia FY 2000 Annual Report of Accomplishments and Results covers research and extension activities. College of Micronesia land-grant programs continued to be implemented through the Cooperative Research and Extension (CRE) Department at the three colleges, namely: Palau Community College (PCC), College of Micronesia – FSM (COM-FSM), and College of the Marshall Islands (CMI), and through mini campuses of COM-FSM in Yap, Chuuk, Pohnpei, and Kosrae. Although this is the first year of implementing the AREERA mandated POW, COM land-grant program staff and staff from collaborating agencies have put

a lot of effort into learning and understanding the specific guidelines and policies that govern program development, implementation, and management.

Due to limited amount of land in Micronesia, farming of both crops and livestock is mostly on a subsistence level. Recently, small coastal marine projects have been introduced. A small number of commercial farms face the challenge of generating sufficient income to pay for high cost of shipping and handling, increasing taxes, and still provide for a family living. There is still a challenge of competing with well-organized export companies from the U.S. Mainland, Australia, New Zealand, and the Asian and South Pacific countries. To be competitive in the global economy, agricultural infrastructures need to be upgraded with appropriate technology, and human resource and capacity enhanced. This will also require increased efforts in developing innovative applied research strategies to develop new varieties or cultivars that will be resistant to pests and diseases and plant and animal breeds for higher production and profitability. Addressing these and other economic, environmental and social issues have been the thrust of COM land-grant programs and activities.

Research activities were further augmented with the completion of a research facility in Palau as a result of a twenty–acre plot of government land acquired for a research and development station. Additional funds were secured from a collaborative project with the Agricultural Development in the American Pacific (ADAP) Project for the establishment of a tissue culture laboratory for the trials of banana varieties resistant to the black leaf streak (BLS) and other diseases. A matching project with Kosrae State Government introduced the tissue culture technology for the production of disease-free banana plantlets that will improve the quality of certain banana varieties for the export market. In the Marshall Islands, a Hatch approved research project has been initiated seeking to intensify and diversify breadfruit production and to increase the ability to propagate elite atoll plants through tissue culture methodology. An on-going project is on the control of the breadfruit mealy bug.

A research project in Palau on the value of plants for medicinal purposes and the danger of losing those plants is being addressed through a project entitled, “Search, Preservation and Propagation of Medicinal Plants”. Also in an effort to increase production of root crops without the use of pesticides, another research project is being conducted to determine which root crop varieties produce higher yields and better resistance to pests. Projects proposed for plant protection geared at restoring natural vegetation and improving yields of crops were approved by USDA/CRIS for implementation. 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. Other biological control projects are on the fruit piercing moth, cassava spider mites, and the breadfruit mealy bug. To increase food production at the subsistence level in the Marshall Islands, USDA awarded CRE/CMI a research project aimed at understanding the Marshall atolls soil chemistry in order to develop appropriate amendment recommendations. This project will analyze the soil chemistry of 25 of the 29 atolls and 5 islands

In aquaculture, some species of corals were successfully cultured in confinement. Some sponges that showed suitability and survivability in typical home aquarium systems were identified for Mari culture work aimed at the aquarium trade. Other on-going research projects included the identification and cultivation of suitable marine invertebrates for the aquarium trade and the cultivation of Scleractinian Corals for the aquarium trade. A feasibility study is underway for spat collection, as part of an increasing interest in pearl oyster farming.

Extension education programs continue to focus on improving health and nutrition, strengthening families and developing youth, developing leadership and volunteerism, and managing resources. Programs have been extended far beyond the central locations,

reaching outer islands/atolls and isolated areas that are serviced occasionally by small planes and boats. The nutrition, diet and health programs continued to stress the importance of locally available food and a balanced diet. Nutrition educational programs focused 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. The soil chemistry analysis is the first ever for the Marshall Islands and has yielded important information that addresses the ability to grow food on low-lying coralline atolls. The RMI Food Security Policy recommended against the use of chemical fertilizers, however this policy should be revisited since the low level of potassium is the limiting factor in the ability to grow food. Information on balanced diets incorporating native foods, food safety and handling, and water borne disease issues were shared through direct contact with clientele, cooking demonstrations, newspaper articles and TV and radio programs.

The 4-H programs have been revitalized with the initiation of new 4-H clubs. 4-H and youth related information was shared with over 800 Elementary School students at eight schools. More than 75 percent of the students retained the information shared based on test results. Members of the 4-H Program, especially those who are not in school, were given the opportunity to use the Internet as an introduction to electronic connectivity and as a mechanism to entice them to return to school. In addressing family and other social issues, collaboration was established with the Secretariat of the South Pacific Community (SPC) to address the issue of violence against women. Stakeholders from Marshallese women groups have identified the needs for intervention and prevention, and efforts are underway for the ratification by the government of the United Nations Convention on the Elimination of All Forms of Discrimination Against Women.

Water quality and food safety education programs continued throughout the island communities in the wake of a cholera epidemic. Over 20 people died in Pohnpei as a result of the epidemic. Water quality and quantity programs continued in most areas as the El Nino and La Nina phenomena and other sources of environmental degradation continue to exist. COM land-grant programs staff worked very closely with organized government 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. Educational awareness programs were provided to farmers and community leaders about upland farming activities on high islands that would cause mudslides and destroy the watershed areas

Another major focus 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. In the Marshall Islands, this is being addressed through the digital upgrade of the PEACESAT system using satellite communication to the central hub at the University of Hawaii. Distance education will be greatly enhanced by this commitment. The CMI-CRE's contribution to upgrading the PEACESAT system and the establishment of a local area network at the college has been recognized internationally through the election of the Dean of CRE/CMI to the International PEACESAT Incorporated Board of Directors and as President of IPI. In Palau and FSM, access to the Internet is through the local Telecommunication Corporations. Most land-grant offices are now capable of accessing the WWW for information gathering.

Technology transfer and information dissemination activities were also carried out under cooperative agreements with University of Guam Cooperative Extension on two

projects. One is the Agriculture Distance Education Project entitled “Linking Up in the Pacific to Revitalize Small Scale Agriculture through Distance Education” and the CYFAR project entitled “Addressing the Problems of Children, Youth and Families in At-Risk Situations Throughout the Pacific Island Region.” These projects utilized the PEACESAT technology available in most of the Pacific Island countries.

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 2000 CSREES Fellows Program. The 10-week High School Summer Program provided an opportunity for eight High School students to learn about land-grant programs under the guidance and supervision of research and extension staffs. Other staff development activities included: a series of IPM workshops; training workshops on marketing information system and development of agricultural statistics; demonstration of breeding swine through the use of artificial insemination technology; civil rights and diversity conference; and a workshop on global warming attended by researchers and extension agents. 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.

The recruitment of an agronomist, a marine biologist, a horticulturist and two research assistants further enhanced research activities. Newly hired Extension Agents in nutrition, 4-H, water quality, and agriculture provided some badly needed support in those areas. Recruitment process for three additional Researcher’s positions and six Extension Agent’s positions has begun after the COM Board of Regents has approved the expansion of programs.

It should be noted that actual results in some of the programs have far exceeded the targeted numbers and vice versa. This is due in part by an increased of staff and redirection of efforts. Moreover, when COM planners worked on the AREERA mandated POW, performance goals, output and outcome indicators were not fully understood. In addition, more people attended workshops than were planned as a result of having the land-grant program recognized as a key component in delivering valuable information to the communities.

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

A. GOAL ACCOMPLISHMENT NARRATIVE

PCC-CRE:

Palau National Government focuses its attention on diversification and development of market-oriented agriculture and aquaculture enterprises that enhance economic opportunity and improve the quality of life of the people. The government is also focusing its attention to providing for a healthy, well-nourished population in all communities.

It is true that at present agriculture and aquaculture have the potential to solve the people's almost complete reliance on imported food products. One way to solve this problem is to see to it that there is continuous availability of high quality agriculture and aquaculture products at reasonable prices to the local populace.

To achieve the goal of contributing to market economy and improving the quality of life, Palau must have in her hands, available, relevant and affordable technologies to produce food products that are highly competitive in the local markets and also in other places.

PCC-CRE applied researches aimed at developing appropriate technologies thus ensuring the availability of products that are competitive in the global economy. Presently, there are 22 varieties of sweet potato, 51 varieties of cassava and 68 varieties of taro being evaluated in well-replicated trials at the PCC R & D Station for yield, eating quality and resistance to pests and diseases. After two growing seasons varieties of sweet potato have shown varying levels of susceptibility / resistance to tortoise shell beetle, scab and little leaf disease. Varieties of cassava showed tolerance to spider mite damage while some varieties of taro differed in their reaction to corm rot disease. These evaluation trials were shown to farmers from Ngchesar State and visitors from other states of Palau. During their visit, they were provided with planting materials of root crops they preferred to plant in their farms. Furthermore, the varieties of root crops with good eating quality, high yield and resistant to pests and diseases will be mass propagated using tissue culture techniques also for dissemination to farmers and interested parties. In two Hatch funded research projects, it was shown that Ngesuong and Ochobirang varieties of cassava can tolerate spider mite infestation and provide higher yields than other varieties. Some farmers have been provided planting materials of these two varieties of cassava for planting in their farms. This information is being disseminated to other cassava farmers in other states of Palau, emphasizing to them that it does not entail any cost to plant spider mite resistant varieties of cassava. Likewise, although it is still early to recommend, some varieties of taro seemed to be resistant to corm rot caused by the fungus.

For the research project on marine invertebrates, survivability and suitability have been demonstrated in home aquarium systems. Ways to effectively culture marine invertebrates to be sold in the booming aquarium trade are being developed. For the coral projects researchers are looking for the most effective way to grow corals for the aquarium trade and reef restoration works. The extension project on commercial sponge farming is helping private farmers set up sponge farms and providing technical assistance to sponge farmers. The shrimp demonstration project is in the initial stage and necessary steps have been implemented to prevent damage to the environment during construction of the pond.

CMI-CRE:

An atoll-wide soil survey to determine the chemical properties of the soil throughout the Marshall Islands was conducted through a collaborative effort between CMI-CRE and the Department of Agronomy and Soil Science at the University of Hawaii. Results indicate that organic carbon level in the surface layer are generally high (5.58%), and scatter plots reveal strong correlations between OC and important soil nutrients like (N) nitrogen and phosphorus (P). The main soil nutrient, N, P, and potassium (K) are deficient on all atolls. Soil iron, manganese and zinc level fall either well above or within the established critical range in more than ¾ of the atolls sampled. Copper levels are deficient on more than half the atolls sampled. The work has shown that adding fresh coconut leaves to the soils will severely limit mineral

nitrogen availability to the plants over the short term (2 to 4 months) even if the fertilizer is added. This means that the most important food source for plants is removed by the use of coconut leaves during the initial several months of decay. The common practice of composting coconut leaves is actually detrimental in the Marshallese soils and limits food production. Since the outcome of the soil analysis desired is an increase in food production leading to the reduction in malnutrition, these findings are important and will lead to rationale amendment recommendations.

Home gardening projects continued on Arno and Majuro atolls and 60 persons participated in the home gardening programs.

More than 2000 pages of documents on agriculture kept on shelves in the office of the RMI Chief of Agriculture have been scanned and converted to portable document files (pdf) so they can be posted on the ADAP and PEOPLE web pages. This will not only make the information readily available for anyone to use, archiving the information in this manner will preserve it for future use by protecting against their inadvertent loss.

The process of establishing a tissue culture lab is underway with the initial purchase and shipment of various supplies and equipment necessary for the research facility.

Two projects entitled, "Development of Protocols for Grafting Breadfruit Cultivars of Marshall Islands" and "Generation of Know-How for In-vitro Multiplication of Food Crops of the Marshall Islands: Breadfruit and Pandanus" were approved by USDA.

COM-FSM/CRE:

Yap Site:

Fifty family farms were in operation on both the main island of Yap and on four outer islands. Farmers had good harvest, however they were having difficulty selling their farm products

The education of private farmers on agricultural techniques that are sustainable and environment-friendly continued. The traditional methods of agroforestry and home gardening, integrating science-based methods and systems of irrigation, compost making, intercropping, crop rotation, mulching, and bio-control were used. Backyard gardening in place of commercial farms is deem acceptable and practical to most farmers. Local crops and promotion of local foods in place of imported foods has been shared with farmers. Farmers were provided information on farm management practices that conform to local values and practices.

Agriculture staff assisted private farmers in the preparation of their land and improving the fertility of the soil on their lands through composting. Other private farmers were assisted and were told to drain water out of their flooded lands, as vegetables and other crops are showing signs that there maybe too much water in the soil as a result of a tarot patch located nearby.

Seven persons completed a home gardening program and were awarded certificates. The 36-hour program included basic skills in home gardening. The home gardening program was intended to support on-going food demonstrations of a variety of recipes and provide for the necessary ingredients.

Chuuk Site:

Community-training programs on basic agricultural lessons were provided to different groups of farmers on several lagoon and outer islands. Programs were focusing on conveying appropriate information that would address problems of poor health and a growing population. Six hundred forty seven adults, youths, and women attended training programs on growing enough foods to provide for food security in the family. Out of the total number of

participants, 85% had acquired the knowledge and skills necessary to start their own gardens and small farms. Some of these small farms are now supplying many families with their needs for vegetables and fruits. Surpluses from the harvest are being sold at the farmers market as a way of generating income for many families.

Pohnpei Site:

Eight farms were surveyed for the new MIS database. Of that, six were already in an existing database that uses an older MIS template version. The existing database includes 15 farms with the following information: name of farmer, farm location, type of crop, date of planting, size of area planted, and estimated yields. The newest version of the database has more features and more improved functions over the older version, which makes crop yield parameters more representative of yield of crops in the Pacific region and Western part of the United States that have similar climate and weather conditions.

More than 40 brochures have been produced and are now being evaluated through staff training. Some of these extension materials were prepared using the Power Point Presentation program, so production and distribution of these materials will be on "on-demand basis". These materials will be translated into local languages and will hopefully become part of the Portable Extension Office for Program Literature Exchange (PEOPLE) program, a collaborative project with ADAP.

Many more hog farmers were assisted through the artificial insemination program as a result of additional funds provided by the local governments. The AI project has become very popular with the introduction of new breeds from the U.S. The average litter size from artificially inseminated sows is six. Some sows gave birth to 10 or more piglets. Besides the quality of the offspring, AI reduces the operation expenses.

Over 403 farmers received help on iron injection, tooth clipping, castration, and application of antibiotics. Agriculture Extension Agents provided additional information on proper housing and feeding and selection of breeding stocks to farmers. One bottleneck of the AI project is the shipment of frozen semen from the U.S. mainland laboratory. However, plans for starting a fresh semen collection are being worked on.

A matching project with backyard pig farmers in the municipality of Kitti has been initiated with the distribution of breeding stocks to members of the rural community group. With 31 members, the group so far had received 15 gilts from local producers. The main goal of this project is to increase the population of breeding stock in this small community. A local farmer has been contracted to provide the remaining gilts.

Kosrae Site:

Banana tissues transferred from the old media to the new medium (containing pure chemicals) have started sprouting. Collection of the banana variety *kufwafwa* continued at different sites for experiment toward refining the procedure for multiplication of banana. Fourteen (14) different media were tested for their efficiency in producing multiple shoots. The major problem associated with tissue culturing is the scarcity of good quality suckers and loss of tissues due to internal contamination problem. While the first problem is difficult to rectify, the second problem requires the collection of few available scientific data. Combination of sterilants such as sodium hypochlorite and mercuric chlorite was used with partial success. The procedure was further refined by cutting the tissue smaller prior to HgC12 sterilization, which has better contamination results. This procedure may affect the survival and further performance of the tissue due to higher toxicity it imposes on the tissue.

The production of tissue culture banana has gone far beyond the targeted number. Around 13,890 healthy cultured banana plantlets were established and out of this number, 300 have been transferred to open spaces.

B. Research Performance Goals:

1 To annually increase the research and knowledge base on new and value-added commodities and products in the Micronesian agriculture.

1. Increase agricultural producer awareness, understanding and information on improving the productivity of the Micronesian agricultural production systems

C. Key Themes:

Key Theme(s) - Adding Value to New and Old Agricultural Products/Agricultural Competitiveness

a). Description of Activity – An AES researcher is conducting trials on banana. New improved and designated black leaf streak (BLS) bananas were introduced, which is one of the objectives of the project in collaboration with a researcher at the University of Hawaii. 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 that is costly to farmers controls the disease. Moreover, control using chemical is an environment hazard especially to small islands States in the Pacific. Results of the trials on resistant bananas will be the basis of recommendations for production towards developing value added commodity and products. Trials on taro are also being conducted to test different varieties of Cyrtosperma and Colocasia sp. suitable to atolls condition in North Western and Western Regions, Chuuk. Decline in production was attributed to stressful conditions of drought, high temperature and salt-water intrusion. Identified suitable varieties for the atolls as a result of the trials will be the basis for future recommendations. Also the results of the trials will increase knowledge base on taro production in the atolls.

b). Impact/Accomplishment – The improved/designated BLS resistant banana varieties from INIBAP through SPC were introduced to Pohnpei and multiplied for the trials consisting of two sites both in Pohnpei.

The taro patches/pits and plots in the three atolls were established. Currently being established are for the two more atolls. Identified and sourced the Cyrtosperma varieties originating from Pohnpei atolls and Chuuk and being multiplied in the field. The three identified Colocasia sp. on the other hand, are in Chuuk and also being multiplied for the trials.

c) Source of Federal Funds – ADAP (Banana); Hatch (Taro)

d). Scope of Impact – County specific: (Pohnpei for banana; Chuuk for taro) - Micronesia

Key Theme - Plant Germplasm

a). Description of Activity – The researches are based on evaluating varieties of root crops such as taro, cassava and sweet potato which are the major staple food in Palau and the Pacific Island countries. This was done by collecting and establishing a germplasm collection of different varieties of taro, cassava and sweet potato. The project aims to morphologically characterize the different varieties according to the descriptor's list of the International Board of Plant Genetic Resources (IBPGR). They are also being evaluated for yield, eating quality and reaction to pests and diseases. Elite varieties with high yield, good eating quality and resistance to pests and diseases will be propagated for distribution to the public. All these root crops are being maintained at the PCC R & D Station in Ngermeskang, Ngaremlengui.

b). Impacts

- Sweet potato (*Ipomea batatas* L.). Twenty-two varieties of sweet potato are being maintained and propagated for germplasm collection. Morphological characterization revealed that there are 5 duplicates in the collection. Hence, the actual number of varieties in the collection is seventeen (17). There are 9 varieties with yellow flesh, 5 varieties with white flesh, 4 varieties with orange flesh and 4 varieties with purple flesh. Preliminary results of the first planting of the replicated yield trials show that under field conditions at the PCC R & D Station in germeskang, Ngaremlengui, the variety Ningsing gave the highest yield of 22 tons per hectare, followed by Siakl, Kangkum and Guam White giving a yield of 13, 12 and 10 tons per hectare, respectively. The different varieties showed differential susceptibility to tortoise beetle, little leaf disease, scab and sweet potato weevil. A second planting of the replicated yield trial of the different varieties of sweet potato was done to validate the preliminary results. . A draft manuscript of "Sweet Potato Varieties in the Republic of Palau" has been completed and will be published soon. With these information, farmers will have a guide to the identification and selection of desired varieties for planting sweet potato.

- Cassava (*Manihot esculenta* Crantz). Fifty-one varieties of cassava have been collected for germplasm collection. They have been morphologically characterized with respect to shape, size and color of leaves, stem, flowers, tubers and reaction to pests and diseases following the cassava descriptor's list of the IBPGR. The twenty most popular cassava varieties in this germplasm collection have been planted and maintained for evaluation in replicated yield trials

- Taro (*Colocasia esculenta* Schott.) **-** Morphological characterization of sixty eight (68) taro varieties collected, maintained, and propagated for germplasm collection is being done following the descriptor's list of the IBPGR. Their reaction to taro leafhopper, aphids, and taro corm rot was also noted. The first planting of a replicated yield trial of twenty varieties of taro grown in upland and wetland conditions has been harvested.

- Tissue Culture - Ninety accessions of taro are being maintained in a green house at PCC-CRE for germplasm conservation and tissue culture. In addition, 20 varieties of banana have been collected and maintained in a field gene bank also for germplasm conservation and tissue culture. These varieties will be micro propagated in the Tissue Culture Laboratory, which is being established at the Research and Development Station Building. A brochure on the process, advantages and uses of plant tissue culture for micro propagation, germplasm conservation and exchange has been prepared and distributed to interested individuals.

c). Source of Funds – Hatch & Smith-Lever

d). Scope of Impact – County Specific (Palau)
Integrated Research & Extension

Key Theme – Agricultural Profitability

a). Description of Activity - Extension Agents conducted eight farms surveys for a new Marketing Information Systems (MIS) database for the period beginning year 2000 and beyond. Of that, six were already in an earlier database that uses an older MIS template version. The existing database includes 15 farms with the following information: Name of farmer, farm location, and type of crop, date of planting, size of area planted, and estimated yields. The newest version of the database has more features and more improved functions over the older version, which makes crop yield parameters more representative of yield of crops in the Pacific region, including areas in the Western Region of the United States with similar climate and weather conditions.

b). Impact – Pohnpei State Agriculture is also conducting market survey and has agreed to work with the MIS program by providing actual volume of local produce marketed and volume of agriculture commodities imported. From these, comparison will be made and recommendation developed for farmers. Those farmers participating in the MIS survey have expressed interest in using the results – production forecasts. One farmer whose cucumber crops were destroyed by insect pests and diseases offered to have an IPM demonstration established at his farm.

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

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

Key Themes – Agricultural Competitiveness.

a). Description of Activity – A Researcher and Research Aides at the Micronesia Plant Propagation Research Center, in Kosrae are producing elite planting materials of banana (*Musa sp*) local variety *kufwafwa*. First Objective of the project is to develop a suitable protocol for the micro propagation of the kufwafwa banana. To realize this goal, it is necessary to test the efficacy of some

popular tissue culture media formulations, modification of the nutrient composition in the most favorable media formulation and testing of different plant growth regulators for their role in enhancing the micro propagation rate. Second objective is to scale up the level of micropropagation-2000-2500 plants/month. A third objective of the project is to carryout field trial experiments using tissue culture raised plants to ensure the advantages of the micro propagation seedlings.

b). Impact – Thus far the most favorable medium for micro propagation of variety *kufwafwa* out of the five popular tissue culture media tested id identified. MS medium (Musrashige and Skoog 1962 medium) was found to be the most suitable basic medium. A few modifications in the macro and micronutrient composition of MS medium were tested to better suit micro propagation of the variety. Modification of the plant growth regulator regime in the medium is underway to find their best composition in the medium. This work is allowing us to refine the micro propagation protocol to make a more efficient micro propagation system for the variety. Developing such a high efficiency protocol will improve the cost – benefit ratio of the laboratory/ agriculture station/commercial laboratory utilizing this protocol for tissue culture propagation of bananas.

c). Source of Federal funds – Hatch and Local Matching Funds

d). Scope of Impact - County Specific (Kosrae, Micronesia)

Key Theme – Agricultural Competitiveness

a). Description of Activity - Artificial insemination of swine is now a proven technology for genetic improvement of swine in Micronesia. Activities of this project were carried out both by AES and CES staff. Sows and gilts were identified based on health, body shape and weight for the artificial insemination. Besides the selection of sows and gilts, certain standards or requirements were set before the program is extended to participants. A few of the standards are: (1) proper housing which include concrete floor, adequate roofing, and the consideration for the environment – established waste management system preferred, but not a limiting factor, (2) owner is able to use provide adequate watering and feeding – use of commercial as main or supplement feed, (3) owner agreed to have progenies and succeeding generations mainly for replacement breeding until such time that breeding lines are established to meet breeding and market needs. New genetics must be regularly introduced to avoid depression in reproductive performance due to inbreeding. To enhance the success of the AI program, estrus detection is done through visual and the use of an estrus device. Imported frozen semen of the following bloodline - Duroc, Hampshire, Landrace, and Yorkshire has been used during the first three cycles of the artificial insemination. Health and piglet management are major components of the program. Training of agriculture extension agents, hog producers, and a backyard operator is another component of the program.

b). Accomplishments and Impacts - Since the introduction of the AI program, artificial inseminated litters have proven to be superior in such traits as leanness,

feed conversion ratio, growth performance and the like. These traits are considered important in selecting replacement-breeding stocks because of the high cost of commercial feed and strong trend toward healthy/balance diet. Even though number of sows artificially inseminated is small, the overall impact of the project is tremendous when considering the number of people raising pigs this project has helped. For example, an average of 15 individual farmers received assistance such as vaccination, parasite control, castration, iron injection, teeth clipping and the like per week. In addition, several radio programs have been aired regarding the livestock improvement program, four workshops/training on AI with a total of 183 participants from hog producers, extension agents, private institutions and interested individuals attending the workshops/training. Improvement in the general areas of swine husbandry will be measured in the areas of profitability, health decisions and resources use and sustainability.

c). Source of Federal Funds - ADAP

d). Scope of Impact - Micronesia

Key Theme - Agricultural Competitiveness

a). Description of Project – The Integrated Control of Cassava Spider Mite research project has developed three pest management options for controlling the cassava red spider mite. These options are expected to assure continuous and sustained production of high quality cassava tubers for local consumption and possible export market. The first pest management technique is evaluating under field conditions and for two cropping seasons nine (9) different varieties of cassava for resistance to the spider mite. The second technique is to field screen in replicated trials three miticides, Vendex, Kelthane, and Diazinon including Malathion for control of the red spider mite. An unsprayed control plot was included to make valid comparisons between treatments. The third technique is to use prey-specific phytoseeid mite to control the red spider mites. This involves importing the predatory mite, *Phytoseiulus persimilis,* from a commercial company, Beneficial Bugs in Australia. The predatory mite is now being reared in the greenhouse on potted cassava plants infested with spider mites.

b). Impact - Two cassava varieties with yellow-colored tubers, Ochobirang and Ngesuong, could tolerate heavy spider mite infestation without losing their leaves. Yields of both varieties were even higher than the other varieties, Olik, Saibal, Iseball, Angaur Red, Mechebechubel, Klerang and Terue. Cuttings of these two varieties were already given to some farmers.

c). Source of Funds - Hatch

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

Key Theme – Agricultural Competitiveness

a). Description of Project - Corm rot is a major fungal disease of taro. The plant wilts and the corm starts to rot, rendering the corm inedible and unfit for human consumption. The research project is to test two techniques to control the incidence of corm rot on taro. First, twenty three varieties of taro are being evaluated for resistance/tolerance to corm rot in a well-replicated field trial in a Randomized Complete Block Design. The other approach is to try dipping planting materials to Ridomil and Captan solutions, drenching each planting hole with Ridomil and Captan solutions before planting, use of wood ash and lime in each planting hole and deeper planting.

b). Impact - Although it is still early to tell, initial field screening revealed that some varieties of taro did not show damage to corm rot, as evidenced by the absence of mother plants dying from rotting, especially the variety Kirang. Furthermore, the area designated for the chemical control trial has been designated and land preparation for the field experiment will commence soon.

c). Source of Funds - Hatch

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

Key Theme – Aquaculture

a). Description of Project - Identification and Cultivation of Suitable Marine Invertebrates for the Aquarium Trade. The first phase of the project examined survivability and suitability of sponges in typical home-aquarium systems. The successful culture of sponges has potential in terms of the home-aquarium trade and for pharmaceutical use. Twelve species were identified and tested in home-aquarium systems. The sponges that demonstrated survivability and suitability underwent mariculture trials in laboratory water tables and in the field. For three months field trial there was an average size reduction of 24%. In the laboratory water tables, the sponges increased in size by 2% for the first month and decreased by 2% by the end of the experiment eleven months later.

b). Impact - The results suggested that the cultures of sponges would be best done in the field where with faster moving waters since sponges are filter feeders. The field location where the sponge trials were conducted did not have fast enough moving currents. Additionally predation might have caused the reduction of sponge size.

c). Source of Funds: Hatch

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

Key Theme – Aquaculture

a). Description of Project - Cultivation of Scleractinian Coral for the Aquarium Trade. This year focused on how to achieve the best possible growth rate of the corals as controlled by water depth in the field. Five different depths were used to determine which would yield the best growth rate. Corals grown in 15 feet of water showed the greatest increase of growth rate by increasing an average 6.9

mm2 in a three-month period. The net growth increases for corals grown in 5, 10, and 20 feet of water were 3.5, 3.7 and 3.6 mm2 respectively. There was however a problem with mortality at all depths.

b). Impacts/Accomplishments - The results from the coral experiments will be used to show farmers in Palau how to mariculture corals for the aquarium trade using low technological equipment and inexpensive methods that will not harm the environment. As shown by this research, farmers can grow corals directly in the lagoon, therefore avoiding the expense of building a land-base facility. The results of the research can also be applied toward reef restoration work. Maricultured corals can be transplanted to damage areas to aid in the recovery of coral populations.

c). Source of Funds: Hatch

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

Key Theme – Aquaculture

a). Description of Project – The Commercial Sponge Farming project aims at promoting sustainable and a low-technological form of aquaculture as an income generating activity for residents of the under developed states in Palau.

b). Impacts/Accomplishments - During the year, sponge farming workshops were conducted and over fifty people attended the workshops at different locations throughout Palau. A private sponge farmer was also assisted in establishing his sponge farm. Seven private sponges have been in five states outlying states in Palau.

c). Source of Funds: Smith-Lever 3b

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

Key Theme – Aquaculture

a). Description of Project – The Shrimp Aquaculture demonstration project is still at the beginning stages and will focus on the culture of the giant freshwater prawn, *Macrobarchium rosenbergii*. We have been working with EQPB and Natural Resources Conservation Service to get the necessary permits for the pond construction and to institute Best Management Practices to ensure that this project will not negatively affect the environment.

b). Impacts/Accomplishments - All the necessary steps to minimize erosion and the negative effect of the pond construction on the environment have been implemented. Construction of the pond for growing the giant prawn can commence now.

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

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

Key Theme – Others (Soil Chemistry Analysis)

a). Description of Activity - Staff of CRE/CMI and the University of Hawaii Department of Agronomy and Soil Sciences worked together to undergo an approved Hatch project to collect soils from the Marshall Islands to determine their chemical properties.

b). Impact - Results have indicated many interesting findings and helped to answer some questions that farmers had regarding why they weren't able to grow certain varieties of plants. Results also indicated that organic carbon level in the surface layer are generally high (5.58%) and scatter plots reveal strong correlations between OC and important soil nutrients like (N) nitrogen and phosphorus (P). The main soil nutrient, N, P, and potassium (K) are deficient on all atolls. Soil iron, manganese and zinc level fall either well above or within the established critical range in more than ¾ of the atolls sampled. Copper levels are deficient on more than half the atolls sampled. The common practice of composting coconut leaves is actually detrimental in the Marshallese soils and limits food production. Another interesting finding was that by adding fresh coconut leaves to the soils would severely remove important nutrients from the soil.

c). Source of Federal Funds – Hatch

d). Scope of Impact – County specific (Marshall)

D. ALLOCATED RESOURCES

Fiscal Resources

Extension

Year	Federal	State	Local	Other
2000	300,953	107,483	21,479	0
2001				0
2002				0
2003				0
2004				0

Research

Year	Federal	State	Local	Other

2000	407,240	85,470	10,055		0
2001					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	0.0	0.0	0.0	0.00	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	0.00	0.0	0.0	0.00	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

Of the FY2000 total FTE of 82.03, 30.41 FTE has been assigned to programs that support GPRA Goal 1, representing 37% of the total FTE for all programs. The FY2000 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:

Palau Food Safety & Quality program developed and implemented educational programs focusing on preventing or reducing causes of food borne illness. An enrichment program called Healthy Body, Healthy Mind Campaign was conducted throughout the year. The program introduced new information to students, reinforced what they have learned, and worked with students to develop the skills they need to make appropriate eating and physical activity choices now and in the future. The objective of the program was to teach youth the skills in making wise food choices, how nutrients affect our health, and food safety practices relevant to preventing or reducing causes of food borne illness. Topics covered included: 1) the five major food groups in the Food Guide Pyramid; 2) the importance of making wise food choices; 3) balance the food we eat with physical activity to maintain or improve our weight; 4) washing hands before preparing food and after using the bathroom, changing diapers, handling raw foods, or playing with pets; 5) cooking foods well to kill bacteria especially important for meat, poultry, fish, and eggs; and 6) refrigerate perishable food at all times such as milk, cheese, and eggs. Hands on activities included preparations of healthy snacks. Food Safety skills were put into practice during the preparations. Students of two public elementary schools, one private elementary school, and one private high school participated with a total of 62 students between the age of 10 and 16 attending.

A Food Safety Activity Package was developed and distributed to students who participated in the program. The packet includes fact sheets related to each key food safety concept, coloring pages, puzzles and other additional activities relevant to reducing causes of food borne illness. The Healthy Body, Healthy Mind Campaign was also introduced and presented during the 17th Annual Pacific Educational Conference at Palau Community College on July 25, 2000. Twenty-three participants from the Federated States of Micronesia, Marshall Islands, the Commonwealth of the northern Marianas Islands, and Palau participated in the presentation. Detailed lesson plans and activity material were distributed. The Food Safety and Quality Program incorporated food safety concepts and food safety education with Adult Expanded Food Nutrition Education Program (EFNEP) and trained participants during EFNEP workshops. Twenty participants from an under privileged community learned the importance on how to keep food safe and avoid food borne illness through proper storing, preparing, cooking, serving and handling of foods.

One hundred three participants of the targeted clientele (85) completed a non-formal, consumer education program on food safety and food borne risks and illnesses. One publication and one brochure were developed. Total number of trainings, and workshops conducted were eight. Number of news articles was two.

CMI-CRE:

EFNEP staff made weekly radio programs through the local radio station (V7AB) on food safety issues. News articles on food safety were also published in the Marshall Islands Journal. An estimated number of people had access to these programs is between10,000 to 15,000. Community workshops were also conducted at the schools and with PTA members.

The EFNEP Extension Agent joined the RMI Mobile Teams on their visits to the 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 274 people on these atolls. Food safety and nutrition information and food safety demonstrations were conducted. Other discussions included issues such as family planning, personal hygiene, diabetes, youth and sports activities, home gardening demonstrations and women issues. Some food demonstrations were conducted using green leafy vegetables with local meat. Recipes were also taught as part of the outreach that included vegetables with fish, vegetables with turkey parts, fish with curry and vegetables, papaya with peaches, fruit cocktail and pineapple, soft coconut meat with peaches, local chicken with spinach, bele, and onion.

Collaboration has been explored with the RMI Environmental Protection Authority and South Pacific Commission on the possibility of implementing a project on Waste Water Treatment.

COM-FSM/CRE:

Yap Site:

The HE Agent had provided training programs to homemakers, students, and Head Start teachers. Lessons included proper ways of food handling, preparation of local nutritious food, fiber intake, the three basic food groups, a balance meal, and how to shop for cheaper and better quality food. Information on common diseases caused by what people eat and drink, such as cancer, gout, diabetes, hypertension, obesity, liver disease, and tooth decay were also shared.

The Yap Interagency Nutrition Education Council (YINEC) has been instrumental in overseeing educational programs on food sanitation and food fibers.

Chuuk Site:

Community education programs on food safety and nutrition were conducted in nine municipalities. EFNEP staff also conducted a training program in collaboration with Chuuk Health Services staff for food handlers. Twenty-eight food handlers from local food establishments attended this training**.** Rules and regulations of food establishments were part of the topics during this training, which also included microorganisms and food borne diseases, prevention of cholera, personal hygiene, food handling and preparation, and food selection, purchasing and storage. EFNEP staff also assisted the Chuuk Women's Association in providing lessons on food safety, which included food demonstrations and lessons on proper food handling and storage, food preparation, personal hygiene, and disease and sanitation.

As a result of programs provided by FSQ staff, people in the small Municipality of Udot had learned about good sanitation and cleaner environment. They had learned where to place their outdoor toilets and the use of water containers (basins) with active ingredients for washing and

flushing. House to house inspections found improvements in the way that people live and how homemakers prepare food and water for special occasions.

Pohnpei Site:

One hundred sixty-eight youths and adults received lessons on food safety and quality and nutrition. Clientele included college students and staff, elementary students, parents, Head Start Program teachers, and church members. Lessons included demonstrations of local recipes such as banana flower salad, meatless burger using banana flower, and a hibiscus flower drink.

EFNEP staff did demonstrations on two recipes during a Diabetes workshop sponsored by the Office of Public Health**.** The main ingredients for both recipes were locally grown greens, and Chaya leaves (an imported perennial vegetable). For the meatless burger, the main ingredient was banana flower

Two hundred twenty-seven youths and adults customers were assisted in starting and maintaining their own home gardens. Agriculture staff demonstrated how to prepare seedlings planted in a mixture of soil, manure, and sand. Particular emphasis was placed on the use of compost or organic matter, locating sites that have accessibility to a source of water, and on selecting acceptable vegetables to their taste. Extension agents also visited a special customer (John David) who was replanting his home garden.

Home gardening programs were also provided to 62 elementary school students and to students and staff of 8 Head Start Centers. Lessons included setting up the nursery, starting seedlings in seed boxes or on seedbeds, planting, and the use of animal manure and compost as fertilizer.

Kosrae Site:

Nutrition lessons, with major emphasis on food safety and sanitation were conducted in the schools for students and teachers. Food safety and nutrition lessons were also provided to young mothers.

Several home gardening projects were in operation at the schools and in the communities. Extension staff had conducted training workshops with students and teachers and parents in areas such as site selection, spacing between plants and rows, and maintenance of the gardens. The method of container gardening was also introduced and Extension staff demonstrated the use of simple farm machines like the hand tiller. Demonstrations were done on composting, mulching, spacing between rows and plants, application of local pesticides. Chili pepper is effectively used in the gardens by the clienteles. Chili pepper recipe called for a handful of chili pepper, crush, shift and mix well in a gallon of water. Apply on fruits and underneath the leaves. Fruits can also be eaten one day after. Compost and chicken manure were used as sources of fertilizer in the backyard gardens.

Two local pesticides were demonstrated and effectively used in the gardens. Chili pepper and ashes were the main ingredients used for the local pesticides because it is affordable and harmless to health as well as the environment. Wood ash was utilized in the backyard gardening project. The recipes called for ½ cup wood ask; ½ cup coral lime; 1-gallon water and two drops coconut oil as sticker. Mix all ingredients and let stand for 24 hour. Fill in the sprayer and spray over the plants.

B. Performance Goals:

1 To annually increase consumer awareness, understanding, and information regarding food safety and food borne risks and illnesses

2 To annually increase consumers awareness, understanding and information on food accessibility and affordability.

3 To annually decrease use of imported food and increase local food production and consumption

C. Key Themes:

Key Theme – Food Safety

a). Description of Project - Extension program was developed to enrichment program that integrates lessons in nutrition and food safety throughout the program. The length of each lesson with hands-on activities is at least 90 minutes long and classes meets twice a week until all lessons and activities are completed, usually in 4 weeks time. Classes were held at PCC-CRE Food Lab and also at school's cafeteria with arrangements made through Principals. The program was also introduced and presented during the 17th Annual Pacific Educational Conference (PEC) at Palau Community College on July 25, 2000.

b). Impacts/Accomplishments – Sixty-two students between the age of 10 and 16 participated and completed the program. Thirty two percent (20 participants) of the program participants indicated plans to adopt recommended practices. Pre and post evaluation forms were used to validate the number of clients who planned to adopt recommended behavior. Twenty-three participants participated in the PEC presentation. Detailed lesson plans and activity material were distributed.

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

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

Key Themes - Food Safety

a). Description of Activity - Food Safety, Food Quality, and Food Security are special topics under the Nutrition program that is reaching out to different target groups in various presentation formats including lectures and cooking demonstrations. The main purpose of this program is to help program participants learn to select, prepare, and store food and utensils properly. Emphasis was on food sanitation and food storage, two concepts that are not very well understood by many families. Cooking demonstrations supports presentation and group discussions.

b). Impact – Program participants learned necessary skills on preparation and storage of food safely for the family. They also learned that unsafe food contributes to many of the existing non-communicable diseases that may lead to permanent disabilities and even death. To some extend, even those who uses refrigerators have fallen victims to food contamination due to lack of knowledge on food storage and handling. In recent years, there have been cases of malnutrition that were not the result of lack of food, but of food choices and poor food handling.

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

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

Key Theme – Food Safety

a). Description of Activity - Enrichment program integrating lessons on nutrition, food sanitation, food safety and cooking demonstrations on local and easy to make recipes were conducted in the schools. School visitations were made once a week for a length of 6-8 weeks. The length of each lesson is 30-45 minutes. EFNEP program is extended into the communities teaching mothers with kids, breastfeeding groups and interested families focusing on five major areas on nutrition (food nutrients, food purchasing, food safety and sanitation, meal planning and food preparation). Participants learned how to prepare balanced diets to improve nutritional status of families and to wisely use resources available on the island. 24-hour food recall and family checklist will be taken twice and compared at the end of each training to determine the progress of participants. Monitoring and evaluation of the program will be conducted three months after completing the program.

b). Impact/accomplishments -Twenty-five students ranging from 12-14 years old participated and completed the program. Parents reported that participating children increased their cooking skills as a result of attending. Parents also indicated that their children spent additional time cooking, and assisting in meal planning.

Twenty-five adults were provided with nutrition lessons, food sanitation, food safety and cooking demonstration on local recipes. Infant feeding, and breastfeeding lessons were also provided to pregnant and breastfeeding mothers. Cooking demonstration was on stuffed crabs, bele leaves, hibiscus flower drink, banana flower, kangkong, etc.

EFNEP staff conducted cooking demonstrations on local snacks, e.g. tapioca cake local drinks, banana chips at Land Grant demonstration room to COM students, staff and homemakers during World Food Day. Also conducted school enrichment program to two different schools with students ranging from 12-14 years old. There were twenty-seven students and four teachers participated in the program. Lessons provided to six graders were on nutrients, food safety, food sanitation, and cooking demonstrations. Recipes demonstrated were easy to make recipes such as taro sandwich, bele leaves in coconut cream, hibiscus flower drink and citrus drink. Parents also participated during cooking demonstrations.

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

d). Scope of Impact - County Specific(Kosrae, Micronesia)

Key Theme – Food Accessibility and Affordability

a). Description of Activity - The food production in Kosrae focuses on backyard garden and pig farm project. The program help established backyard gardens and

provide basic technical assistance in gardening to families and school programs. The pig project provided basic techniques on pig farming and hands on experience to the farmers in their respective farms. Weekly visits will be conducted to check and monitor progress of the projects.

b). Impacts - Several home gardening projects were in operation at the schools and in the communities. Extension staff had conducted training and workshops to students and teachers and parents in areas such as site selection, spacing between plants and rows, and maintenance of the gardens. The method of container gardening was also introduced and Extension staff demonstrated the use of simple farm machines like the hand tiller. Demonstrations were on composting, mulching, spacing between rows and plants, application of local pesticides. Chili pepper is effectively used on gardens by the clienteles. Chili pepper recipe called for a handful of chili pepper, crushed, shift and mix well in a gallon of water. Apply on fruits and underneath the leaves. Fruits can also be eaten one day after. Compost and chicken manure were used as sources of fertilizer in the backyard gardens. Wood-ash pesticides are also used in the backyard gardens.

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

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

Key Theme – Food Handling

a). Description of Program - Food Safety and Quality program integrated food safety concepts and food safety education with Adult Expanded Food Nutrition Education Program (EFNEP) and trained participants during EFNEP workshops.

b). Impacts/Accomplishments – Twenty participants from an under privileged community learned the importance on how to keep food safe and avoid food borne illness through proper storing, preparing, cooking, serving and handling of foods. Fifty five percent (11 participants) indicated plans to adopt recommended practices. Data obtained from post evaluation survey was used to validate the number of clients who planned to adopt recommended behaviors.

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

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

Key Theme - Food Security

a). Description of Activity – Two-hundred-twenty-seven youth and adult customers were assisted in starting and maintaining their own home gardens. Agriculture staff demonstrated how to prepare seedlings planted in a mixture of soil, manure, and sand. Particular emphasis was placed on the use of compost or organic matter, locating sites that have accessibility to a source of water, and on selecting acceptable vegetables to their taste. Extension agents also visited a special customer, John David, who was replanting his home garden. Mr. David was a special customer for the Home Garden

program because he was sick when he requested Extension staff to help start a home garden. Home Garden programs were also provided to 62 elementary school students and to students and staff of 8 Head Start Centers. Lessons included setting up the nursery, starting seedlings in seed boxes or on seedbeds, planting, and the use of animal manure and compost as fertilizer.

b). Impact – The impact of this program is evidenced by many more requests from individual and families, and from schools and head start centers for assistance in home garden. The special customer, John David, recovered from being half-paralyzed after Extension Agents help him start a home garden. During an interview, John David stated that he felt stronger and is actually doing more work in the garden and around the house. He believes incorporating vegetables in the diet contributed a lot to his health. Accordingly, he was very happy to have learned knowledge and skills that enabled him to have fresh vegetables every day; stating he is not only feeling better physically, but mentally because he has fewer anxieties.

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

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

Key Theme - Food Borne Illnesses

a). Description of Activity - A curriculum and lesson plans were developed to address problems related to food borne illnesses and food borne pathogen protection. Lesson plans include detailed messages to address these issues. Among the lessons developed to address food borne illnesses and pathogen protection were personal hygiene, disease organisms, proper food handling and preparation, safe food storage and service. These lessons also included actual demonstrations, after the lessons were developed. The extension staffs were trained on the delivery of the lessons. The staffs, then organized communities/households and conducted non-formal education programs and demonstrations.

b). Impact – Five-hundred-ninety adult home makers and four-hundred-seventy-eight youths, mostly from the high schools attended the program. Post-test showed marked improvement in their knowledge on the subjects discussed. Subsequent follow-up at the households showed improved sanitary practices both in household management and food handling

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

d). Scope of Impact – County specific (Chuuk, FSM)

D. ALLOCATED RESOURCES

Fiscal Resources

Extension

Year	Federal	State	Local	Other

2000	121,461	43,379	8,676	0
2001				0
2002				0
2003				0
2004				0

Research

Year	Federal	State	Local	Other
2000	71,807	15,071	1,773	0
2001	0	0	0	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	0.0	0.0	0.0	0.0	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					
	1862	1890	Other	1862	1890	Other
2000	1.94	0.0	0.0	0.3	0.0	0.0
2001	0.0	0.0	0.0	0.0	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 FY2000 total FTE of 82.03, 10.43 has been assigned under GPRA Goal 2, representing 13% of FTE input. The FY2000 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:

Food and Nutrition is an on-going program designed to assist families and individuals in acquiring the knowledge and skills necessary for a healthy diet. The program focused primarily on the basic tenets of variety, moderation, and a balance meal. It provided the participants information on how to plan their daily diet, following the Food Guide Pyramid. Participants found out they could eat almost any kind of food without worry or guilt.

By consuming sensible portions of food items from each food groups, participants of this program had learned that they would get all the nutrients they need. The program also taught its

participants to use foods to lower their risks of contracting common diseases and they learned to stay away from things that they can easily get sick from. Eating healthy foods shouldn't be an effort, it can be a pleasant experience.

Only twenty men and women from an underserved population group completed Adult EFNEP program and earned Certificates of Completion. Covered in the program were a series of 10 classroom lessons and the preparation of twelve different recipes. Sixteen participants showed improvement in one or more nutrition practices (i.e. planning meals, making healthy food choices, preparing foods without adding salt, reading nutritional labels, or having their children eat breakfast). Twelve of the participants showed improvement in one or more food resource management practices (i.e. planning meals, comparing prices, food budgeting, or using grocery lists when shopping).

CMI-CRE:

An Agricultural Extension Agent taught 88 students and staff from Rong Rong High School how to construct a smokeless oven. The smokeless oven was constructed using an empty 50-gallon fuel drum. It was heralded as a new and good invention as it reduces the amount of smoke as compared to an open fire and it cooked food much faster with less firewood. It can also cook more food with little amount of firewood.

The EFNEP Extension Agent joined the RMI Mobile Teams in their visits to several outer islands to conduct surveys on nutritional status of residents, which include the level of tobacco use. The RMI Mobile Teams consists of staffs from different disciplines, including Land Grant Program and from the Ministry of Internal Affairs and the Ministry of Health and Environment. Malnutrition surveys of last year had found that greater than 53 percent of the Marshallese children are affected by malnutrition. This year, 3000 children were included in the survey and measurement program.

An additional 462 adults participated in nutrition programs such as food demonstrations and health workshops.

COM-FSM/CRE:

Yap Site:

In Yap, malnutrition continues to be a health problem. Through YINEC (Yap Interagency Nutrition Education Council), nutrition education and physical fitness programs were initiated.

EFNEP staff provided food safety and sanitation lessons to Head Start staff from Rumung Municipality. The training program, which included cooking demonstrations, were attended by 23 Head Start teachers and parents of Head Start students. Twenty health and EFNEP lesson and 14 recipes, mostly on local agricultural products were part of the training program. Information on cancer, gout, diabetes, hypertension, obesity, alcoholism, liver problem, and tooth decay were also shared.

Seven persons completed a home gardening program and were awarded certificates. The 36-hour program included basic skills in home gardening. The home gardening program was intended to support on-going food demonstrations of a variety of recipes and to provide for the necessary ingredients of locally grown vegetables.

Chuuk Site:

Nutrition workshops were conducted in ten municipalities to farmers, homemakers, and youth. The training workshops included cooking demonstrations on green leafy vegetables and lessons on the use of local fruits. A total of 691 homemakers attended nutrition education programs on geriatric nutrition and other topics were discussed. Growth monitoring chart of children under five

years old were reviewed and appropriate advice were given. Women were also weighed to determine their "body mass index"

Programs on breastfeeding were provided to homemakers in 10 municipalities. It was emphasized in these training programs that breast milk and no other food should be given to babies that are six months and younger.

Pohnpei Site:

A setback in the EFNEP and other nutrition program to provide information and demonstration on recipes and food safety to clientele in Pohnpei was due to a cholera outbreak. Extension staffs were unable to visit individuals and community groups due to a declaration by the State Governor, prohibiting any and all forms of gatherings. As a result, only 41 of 44 recruited homemakers were trained. Of the 41, only one group of 9 homemakers completed the program. Lessons included reading and discussion on nutrition topics, and then followed by cooking demonstrations. Cooking demonstrations were made on 16 different recipes of local ingredients like, Chaya leaves, banana flower, tapioca and taro leaves, and kinking. Some local ingredients like cucumber, Chinese cabbage, bell pepper, oriental pea, bush bean, and tomato came from a garden planted and cared for by EFNEP staff. The nutrition topics discussed during EFNEP sessions included: (1) Introduction to the Three Basic Food Groups, (2) functions, deficiencies, and symptoms of Protein, Carbohydrates, and Vitamins and Minerals, (3) Food Safety and Quality, (4) Refrigeration and Food Storage, (5) Consumers education and Store brands, (6) Ingredients, (7) Nutrition related illness (8) Night blindness and sightlessness in young children, and (9) Nutrition for teenage pregnancy.

Kosrae Site:

World Food Day was observed with even greater enthusiasm as more people got involved in the different activities. EFNEP staff and clientele assisted in organizing the programs and did demonstrations on a variety of recipes.

EFNEP staff had also participated in the Kosrae State Fair, demonstrating sixty-two different recipes. Three sample menus were exhibited and different dishes were displayed. As a result of this fair, a local recipe book was developed. Copies of this recipe book were distributed to local restaurants and collaborating agencies. Some recipes, such as the taro sandwich, stuffed crab, vegetable omelets, and citrus drinks were already adopted and served in several restaurants around the island.

A six-month cooking class was provided to seven NCD workers and nine breastfeeding mothers. The course was conducted once a week for duration of six weeks and was a collaborative effort between Land Grant Program and Department of Health Services. Lessons included, meal planning, food storage and sanitation, and food preparation. An exit 24-hour food recall and food checklist was administered and results have shown improvement. In addition to the 24-hour food recall, casual discussions with homemakers revealed that progress were made. Progress included planning meals in advance and following the plan; shopping with a shopping list; save dollars by utilizing local foods, etc. In terms of food preparation, all sixteen participants indicated they have used less salt, less fat and served appropriate amount of food that contains a lot of carbohydrate.

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B. Performance Goals:

1 Improve the diet, nutrition and health of families

1. To annually reduce the health risk factors through non-formal educational programs to improve dietary habits and physical exercise practices

1. To annually increase consumer awareness and understanding on food choices, food selection, food purchasing, and appropriate sanitary practices

1. Reduce the health risk factors through non-formal education programs to improve dietary habits

C. Key Themes:

Key Theme – Human Nutrition

a). Description of Program - A short-term program on Food and Nutrition was conducted in one state of Palau to assist individuals and families in acquiring the knowledge and skills necessary for healthy diets. Its focus was mainly on the basic tenets of variety, moderation, and balance and teaches its participants to plan their daily diet in accordance with the Food Guide Pyramid. The Food and Nutrition program consisted of ten series of lessons on Food Guide Pyramid, safe food handling and storing, meal planning, food preparation methods, and ten healthy and nutritious recipes.

b). Impacts/Accomplishments - Out of twenty (3 men and 17 women) participants, sixteen (84%) showed improvement in one or more nutrition practices (i.e. plans meals, makes healthy food choices, prepares foods without adding salt, reads nutrition labels or has children eat breakfast) and twelve (60%) showed improvement in one or more food resource management practices (i.e. plans meals, compares prices, does not run out of food or uses grocery lists).

c). Source of Federal Funds – Smith Lever

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

Key Theme – Human Nutrition

a). Description of Activity - Nutrition program under EFNEP has been a lead program for more than 10 years. During fiscal year 2000, only forty-one (41) homemakers were recruited from three (3) villages in as many municipalities for EFNEP due to the outbreak of cholera on the island. Of the 41 only one group of nine (9) homemakers graduated. The others completed at the beginning of the next fiscal year. Program delivery include reading and discussing of nutrition topics, and then followed by cooking demonstration. Each of the groups would have gone through 16 different cooking demonstrations with recipes supporting the 12 lessons given during the course.

b). Accomplishments and Impacts – One important impact of the EFNEP training observed through 24-hour food recall, discussions, and behavior is the improvement of diet. Some participants expressed more physical strength after being in the program

that they attributed to proper diet and nutrition. The nutrition topics discussed during EFNEP sessions included: (1) Introduction to the Three Basic Food Groups, (2) More detail discussion including functions, deficiencies, and symptoms of Protein, Carbohydrates, and Vitamins and Minerals, (3) Food Safety and Quality, (4) Refrigeration and Food Storage, (5) Consumers education and Store brands, (6) Ingredients, (7) Nutrition related illness (8) Night blindness and sightlessness in young children, (9) Nutrition for teenage pregnancy. The improved diet as observed by means of the 24-hour food recall and other observations indicated impact on at least other 144 people including 103 children and program participants' spouses.

c). Source of Federal Funds – Smith-Lever (EFNEP)

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

Key Theme - Human Nutrition

a). Description of Activity - Extension assistants, armed with the lessons on dietary guidelines, macro and micro nutrients, and nutrition for preschoolers and geriatric nutrition organized communities and home makers and conducted nutrition education sessions. Sessions were accompanied by relevant cooking demonstrations. Pre and post-test were conducted along with EFNEP intake.

b). Impact - A total of 691 homemakers attended the nutrition education sessions where nutrition for preschoolers, geriatric nutrition and other topics were discussed. Women were weighed to determine the "body mass index". Growth monitoring chart of under five children were reviewed and appropriate advises were given. It was observed that a few of the obese women had lost weight and some underweight children had gained weight.

c). Source of Federal Funds: Smith-Lever

d). Scope of Impact – County specific (Chuuk, FSM)

Key Theme – Medicinal Plants

a). Description of Project - In Palau, medicinal plants and their traditional usage are gradually lost due to the highly guarded secrecy of passing on the knowledge and preparation for cures within the immediate family or clan. Furthermore, the fast economic development and extensive road construction pose threats to the wild plants in the rainforest. There is a need to provide local people with information to create awareness and sense of responsibility to protect these plants from destruction and loss. Researchers conducted literature search in local libraries in Palau and other countries on local, English and scientific names of plants with medicinal value as well as their botanical description, habitat, uses and preparation for curing various ailments. Leaves, flowers seeds and roots of these plants have been preserved in a herbarium for further identification and use as teaching materials for students and other interested individuals in the community. Live specimens will also serve as teaching tools and sources of planting materials for propagation and distribution to the public.

b). Impacts/Accomplishments - Impact - A draft manuscript on local names, botanical description, habitat, propagation, uses and preparation of 134 plants with medicinal vale in Palau and neighboring countries has been compiled for publication. This includes photographs of the plants in their natural habitat. This publication will be disseminated to serve as a guide to inform the public on the identification, availability, uses and preparation of local medicinal plants in Palau and neighboring countries. Planting materials of these medicinal plants will be distributed to interested parties.

c). Source of Fund - Hatch

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

C. ALLOCATED RESOURCES

Fiscal Resources

Extension

Year	Federal	State	Local	Other
2000	114,443	40,873	8,175	0
2001				0
2002				0
2003				0
2004				0

Research

Year	Federal	State	Local	Other
2000	71,807	15,071	1,773	0
2001	0	0	0	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	0.00	0.0	0.0	0.00	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	0.0	0.0	0.0	0.0	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 FY2000 total FTE of 82.03, 9.91 has been assigned under GPRA Goal 3, representing 12% of FTE input. The FY2000 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 extension efforts reached communities all over Palau bringing information on conservation areas, water quality and pesticides to people of Palau. Monitoring, training, public forums and publications were used to increase awareness about conservation areas, water quality and pesticides applications. Publications included the report, "Status of Coral Reefs of Palau" and "Crop Profile of Chinese Cabbage and Cucumber" were prepared to aid conservation efforts in Palau. Additionally, several water quality and Pesticide Applicator's Training brochures were prepared and

printed in several different language so that the farmers who do not speak English would be able to benefit from them.

Research efforts focused on increasing market opportunities for farmers, biological control of pest lower agricultural production. The control of the pest, *Mimosa diplotricha*, has been achieved using biological control agent. The gallflies used to control Siam weed has been established in Babeldaob.

Benefits to stakeholders include better management of conservation areas, increase knowledge about water quality and pesticides usage, and control of pest that lower agricultural production.

CMI-CRE:

Plant Protection/Quarantine programs have been strengthened through a collaborative project with the Secretariat of the Pacific Community (SPC) and the RMI Division of Agriculture. This project emphasizes precautions to keep serious pests and diseases out of RMI or to further limit the spread of those that have already occurred. The public is being educated about these important issues in an effort to limit pest entry through unofficial plant introductions. Certain control measures, like biological control agents, are being implemented whenever appropriate. Cultural practices intended to reduce the level of pathogens are being taught. These practices include crop rotation, use of organic manure or other soil amendments and sanitation, and other farming practices to raise the crops.

COM-FSM/CRE:

Yap Site:

A collaborative project with Yap State Department of Youth and Civic Affairs involved youth clubs throughout the State. Activities during the year included lectures and presentations on environmental issues and also featured quest speakers from the various governmental agencies. The Yap Youth Congress assisted in organizing workshops, which focused on environmental concerns like land erosion, location of farms, pesticides and fertilizer usage, and water pollution**.**

Extension staff participated in an IPM training conducted by IPM specialists from the South Pacific Community (SPC) and Dr. Javier from COM-FSM.

Chuuk Site:

Extension staff conducted sustainable agriculture programs aimed at increasing food production and at the same time protecting the fragile ecosystems on small islands and atolls. Combination of classroom lessons on sustainable agriculture program and hands on demonstrations provided clientele the knowledge necessary to produce food and remains vigilant in protecting the environment.

Pohnpei Site:

The “Sustainable Kava Cultivation Under Lowland Agroforestry Systems” project is a partnership project with The Nature Conservancy Office, USDA Natural Resources Conservation Service, and Pohnpei State Government. Public education programs were conducted on the importance of this project in terms of reducing destruction to the forests, watershed areas, and negative impact it may have on other natural resources. The educational programs included: the distribution of 3,000 copies each of two posters, one on the forest and the other on local birds; 5,000 lowland kava logo stickers; more than 20 presentations made to community groups, traditional leaders, school children, and

private sector groups; and a video tape entitled "Grow Low" that represented interviews with 15 farmers. Education programs also were designed for school kids.

Extension staffs were involved in the training of 240 Community Conservation Officers, establishment of five commercial kava nurseries, development of a monitoring system on upland kava clearing, and distribution of extension materials.

In partnership with the Pohnpei Soil and Water Conservation District and USDA Natural Resource Conservation, six livestock waste management demonstrations were conducted by agriculture staff. All six sites have common functional designs, which collect and separate solid from liquid waste. The dried waste was used for compost and fertilizer and the liquid from these systems were used for irrigation of crops on land nearby. Some features of these demonstration projects was the use of shredded coconut husks that served as a deep litter which collected manure and thus eliminating the need to use water for cleaning the pig pen. The dried mixed of coconut husk and manure was later used as fertilizer or for growing medium. Other systems collected the manures and stored in compost bins while the effluent is drained into the farms. One very successful demonstration of this sort started in an area where previous attempts to grow any crop, including banana that grow in most soil, were unsuccessful. The clay soil cannot support any complete crop cycle. With the use of the wastewater as fertilizer, most of the 50 banana plants planted to the demonstration have began to bear fruits. The plants are very healthy and fruits have very many bunches and healthy fingers.

Kosrae Site:

The Agriculture Extension Agent had worked with farmers in Walung, providing information on safe use of chemicals and fertilizers and their negative impact on people's health and the environment. Reduction in the amount of commercial fertilizers is observed while there is an increase in the use of a local pesticide**.** This is an ash recipe used in the sustainable agriculture program (1/2 cup wood ash, ½ cup coral lime, 1 gallon water and two drops coconut oil as sticker). All these ingredients were mixed and allowed to stand for 24 hours. It can be applied as fertilizer after 24 hours without negative affect on the environment.

Dr. Josekutty has conducted a number of training programs, in which he had trained Extension Agents, farmers, and students to improve their income by enhancing the production of quality banana suitable for export. Recently, he had provided a 3-month course on the basics of agriculture to seven Extension Agents and one research aide. Dr. Josekutty, who is from India, had earlier conducted a one-month training to agriculture staff and farmers, focusing on field management of the banana *kufwafwa* variety.

Three livestock waste management projects were completed on Kosrae with common functional designs as those constructed in Pohnpei. The simple systems collect and separate solid from liquid waste. The dried waste was used for compost and fertilizer and the liquid from these systems were used for irrigation of crops on land nearby.

B. Performance Goals:

1 To annually increase research and knowledge-based available on environmental sciences and agriculture, including conserving, maintaining, and protecting ecosystem integrity and biodiversity.

1. To annually increase agricultural producer awareness, understanding, and information regarding the adoption of agricultural production practices that sustains and/or protects ecosystem integrity and biodiversity.

1. To annually increase producer adoption of agricultural production practices that conserve and/or protects surface and groundwater supplies on or adjacent to agricultural production sites or land uses.

1. To annually ensure ecosystem integrity and biodiversity (Pesticide Applications).

1. To develop, transfer and promote the adoption of efficient and sustainable agricultural, forestry and other resource conservation policies, programs, technologies and practices that ensure ecosystems integrity and biodiversity.

1. To develop, transfer and promote efficient and sustainable integrated crop (fruit, vegetables, and ornamentals) production and other resource conservation programs of endangered species and/or introduced exotic promising crops. It will consist of validated technologies and practices generated from research results involving variety/cultivars species, land preparation, plant nutrition, pest and disease management, crop rotation (for annual crops such as vegetables), etc.

C. Key Themes:

Key Theme – Agricultural Waste Management

a). This project was tailored to address issues concerning safeguarding the environment and sustainability of development of livestock in the American Pacific. Waste management systems that are known to be effective in safeguarding the environment will be adapted and implemented for small island conditions.

Potential farmers will be identified and set up demonstration projects/ analyze and evaluate the use of livestock waste as fertilizer and compost for vegetable, fruit trees and root crops.

b). Impact/Accomplishment - Six livestock waste demonstration sites were constructed on Kosrae and Pohnpei. All sites shared a common purpose, to separate the solid waste from the liquid. Among these six sites, four were situated in residential areas and as such there were always complains from the neighbors regarding the odor, noise and flies. After each of the demonstration site was completed and operational, neighbors stopped complaining. Each farmer was able to utilize the solid for composting and fertilizer on vegetable crops and the liquid was used for irrigating fruit trees and root crops. This improved the farmers lifestyle in that they were able to spend money on other family's necessity instead of commercial fertilizers, have better relation with their neighbors, and better sanitary residential area.

Even though only six livestock waste demonstration sites were constructed, about 95% of producers visited/surveyed (backyard, semi-commercial, commercial) have adapted at least in part ways to store or put to use livestock waste generated from their hogs.

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

d). Scopes of Impact – County specific (Pohnpei, FSM)

Key Theme - Natural Resource Management

a). Description of Project - The Marine Conservation project focuses on providing technical assistance and training to states in monitoring and management of their Marine Conservation Areas. This year saw the completion of the second year of monitoring for the Ngatpang State Marine Conservation Area. Training, workshops, and field activities on conducting quantitative assessment and monitoring also helped fifty-five individuals. The publication, "Status of the Coral Reefs of Palau", was completed this year to aid conservation efforts in Palau.

b). Impact-The information collected form the assessment and monitoring of the conservation area will be used to guide resource managers in managing the conservation area. The training will provide students as well as community members how to monitor areas to detect changes so that they can do their own monitoring. Conservation groups and donors to determine areas in need of immediate attention and the focus of conservation efforts will use the “Status of the Coral Reefs of Palau” publication.

c). Source of Funding: Smith-Lever, AusAid, Packard Foundation

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

Key Theme - Water Quality

a). Description of Project - Extension programs on water quality were created to increase awareness of fresh water related activities in Palau. Several programs were conducted this year to address pending water issues such as contamination, water use and conservation. The Ngerikiil and Ngermeskang Rivers monitoring project continued to collect and analyze water until the project termination in July 2000. Results of the water analysis are being compiled and will be published. To address fresh water issues, brochures written in English were translated to Palau, Filipino, Hatohobei and Sonsorol languages in hopes of reaching a majority of the under represented groups in Palau. These brochures are being printed and will be disseminated to Schools, State Offices, public/private organizations, as well as other Land Grant Institutions. A third program, PCC Drinking Water Sampling, continued throughout the year. Rainwater catchments at PCC Campus were tested for bacteria, turbidity, and lead on a semi-annual basis. Results are forwarded to school officials. The test results from this year indicated that during collection time one or more of the tanks were contaminated with fecal coliform bacteria. The dorm manager was instructed on how to clean and disinfect the catchments with Clorox. Lastly, a presentation to the Pacific Educational Conference was held which included topics on water issues in Palau. Participants were teachers/educators from the Pacific Region.

b). Impacts/Accomplishments - To date, activities around the Ngerikiil River has been modified to eliminate raw animal waste and pesticides from directly flowing into the river. A farmer has created a 50 feet buffer zone between his farm and the river.

Water Quality brochures are being distributed and put on displays during forums and meetings. Lastly, due to semi-annual samplings, the PCC Dormitory Manager have now learnt how to disinfect catchments and is practicing it during detection of fecal bacterial contamination of the dormitory catchments.

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

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

Key Theme - Sustainable Agriculture

a). Description of Project - In the Micronesian region, agricultural production systems are in better conditions than marketing of produce. Extension specialists are collating, updating and disseminating database to producers' organizations and memberships, local agricultural dealers and market outlets. Likewise, database on local crop production and domestic market capacity is being developed and analyzed by conducting monthly surveys of local farms and markets, hotels, restaurants and cafeterias. Contract growing in marketing of local produce is being pilot tested to tie up producers with the market. Furthermore, producers and other stakeholders are being trained on Best Management Practices, farm management and marketing.

b). Impacts/Accomplishments - A list of consumers and markets of local produce such as hotels, restaurants, major stores, markets and government and semi-government cafeterias have been obtained. Women's groups and small scale commercial vegetable farms producing agricultural commodities in Koror, the central/urban district, and two outlying rural areas, Airai and Aimeliik have been identified. Monthly surveys are being conducted on acreage planted and commodities being produced to come up with production statistics. In addition, monthly surveys are also being conducted on volumes, prices and value of each commodity consigned, imported and sold by local markets and consumed by hotels, restaurants and school cafeterias. These data are being consolidated on quarterly basis for dissemination to cooperators and other interested individuals. A workshop was conducted to train producer farmers on best management practices to alleviate common problems encountered on crop production. About twenty farmers attended lectures and demonstrations on soil conservation and erosion control, soil conditioning and control of pests and diseases.

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

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

Key Theme – Sustainable Agriculture

a). Description of Activity – Public education programs were conducted on the importance of this project in terms of reducing destruction to the forests, watershed areas, and negative impact it may have on other natural resources. The educational programs included: the distribution of 3,000 copies each of two posters, one on the forest and the other on local birds; 5,000 lowland kava logo stickers; more than 20

presentations made to community groups, traditional leaders, school children, and private sector groups; and a video tape entitled “Grow Low” that represented interviews with 15 farmers. Education programs also were designed for school kids. Extension staffs were involved in the training of 240 Community Conservation Officers, establishment of five commercial kava nurseries, development of a monitoring system on upland kava clearing, and distribution of extension materials.

b). Accomplishment and Impact – Of the 200 nurseries targeted for this fiscal year, nearly 300 community-based nurseries were established. Of that, 197 were started with the assistance of agriculture extension staff. The others were through the assistance of TNC and NRCS. Each nursery carries around 50 to 300 planting materials. Farmers reported higher success rate on planting materials that used the grow bags as oppose to those that were planted directly into the ground. However, some claimed that the use of the grow bag is labor intensive. The term “nursery” does not necessarily mean actual construction of nursery facilities. Most growers used temporary shade and usually placed nursery bags on the ground. Farmers involved were distributed a total of 40,000 grow bags. Procurement of the grow bags along with five 5 wheelbarrows, 20 shovels, 10 water hoses, 5 pruning shears, 50 watering cans, and 30 bags of fertilizers were done through other grants awarded to TNC.

c). Source of funds – Smith-Lever 3b&c/The Nature Conservancy

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

Key Theme – Biological Control

a). Description of Project – The Creeping Sensitive Weed , *Mimosa diplotricha* has taken over pasture lands, roadsides, uncultivated lands and even cultivated areas. As a result, three farms in one state had to be abandoned. Since it is a harmful weed, it was decided to import a biological control agent to manage the weed. A psyllid insect was collected from Pohnpei, FSM and reared to pure cultures at the Palau Community College Research and Development Station (R & D Station) Rearing Facility. Field releases of psyllid adults were done in 4 states in Palau that have the *Mimosa* problem.

b). Impacts/Accomplishments - Six months after their field release, the psyllid insects were firmly established and had moved naturally to nearby areas. The psyllid insects were credited in reducing the aggressiveness of the *Mimosa* weed. Natural vegetation such as grasses and shrubs started to reappear in these areas that used to have serious *Mimosa* problem.

c). Source of Funds – Hatch

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

Key Theme – Biological Control

a). Description of Project - Siam Weed, *Chromolaena odorata* is another invasive introduced plant that has been observed spreading rapidly in 5 of Palau's states. The weed interferes with farmer's activities and has, therefore, become the target of a biological control program for the Cooperative Research and Extension Department. A gallfly was imported from Guam and reared to pure culture in the Rearing Facility at the R & D Station in Ngermeskang, Ngaremlengui. Field release of the gallflies were done in Nizimatz, Ngaremlengui where the Siam weed was growing luxuriantly.

b). Impacts – Six months after release, the gallflies became firmly established as evidenced by the presence of 2 galls per stem on the Siam weed. The gallflies were found not to attack sweet potato, cassava, taro and 4 medicinal plants.

c). Source of Federal Funds - T-STAR

d). Scope of Impact - State Specific (Palau)
- Multi-State (Palau/Guam)

Key Theme – Biological Control

a). Description of Project - The fruit-piercing moth is a destructive pest of fruit trees. The moth pierces the fruit and sucks the sap. As a result of this feeding, the fruits become mushy, rot and fall to the ground. *Euplectrus materna* has been used as a larval parasitoid to control populations of the fruit piercing moth. In order to raise useful numbers of the parasitoid, fruit piercing moths needed to be harvested and raised in the rearing shed so that there would be larval stages of the moth for the feeding of the parasitoid. The collection of adult fruit piercing moth was done at night time on star fruits in 2 states.

b). Impacts - It was discovered that the moths would not lay eggs on the leaves of coral tree, *Erythrina* spp. In other Micronesian islands, the female moth does lay eggs on *Erythrina* indicating that the moth species in Palau did not originate from other Micronesian islands. The fruit piercing moths have been reported to lay eggs on viny plants belonging to the family *Menispermaceae.*

c). Source of Federal Funding - T – STAR

d). Scope of Impact - County Specific (Palau)
- Multi-State (Guam/Palau)

Key Theme – Biological Control

a). Description of Project - The taro leafhopper is an important pest of taro. Both nymphs and adults suck the sap of leaves and petioles causing the plant to look weak and sickly. The corms become small and unmarketable at harvest . In other Pacific Island countries, the leafhopper transmits Alomae and Bobone virus diseases.

The AES researcher collected predatory mirid bugs from Pohnpei, FSM in September, 2000. The mirid bug is prey specific and effective predator of the leafhopper. It was

released in Micronesia in the 1940s but became established only on Pohnpei. Since then, the leafhopper has never become a problem pest of taro in that island. At present, it is being reared to increase their number in the Rearing Facility at the PCC R & D Station.

b). Impact - The predatory mirid bug (*Cyrtorrhinus fulvus)* had been successfully reared on potted taro plants infested with leafhopper. About 100 mirid bugs were collected from existing cultures and released in field plantings of taro at the Experiment Station, primarily to be the source of future releases in farmer's taro plantings.

c). Source of Federal Funds – Hatch

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

Key Theme – Pesticide Application

a). Description of Project - Chemical and Non-Chemical Pesticides in Orange Cucumber Beetle Integrated Pest Management (IPM). A field experiment laid out in a Randomized Complete Block Design in 4 replications was conducted to determine the effectiveness of Diazinon, Malathion and Carbaryl and one non-pesticide , wood ash and lime for controlling the beetle attacking cucumber. This experiment was done primarily to find a replacement for carbaryl in case this pesticide will be removed from the market.

b). Impacts - Results of the first trial done on a farmer's field showed that Diazinon was effective in reducing beetle damage on leaves as compared to other spray treatments. However, the farmer interfered in the harvesting and yield data could not be taken. The second trial was conducted at the PCC R & D Station and showed that diazinon again proved effective in controlling the beetle followed by carbaryl and malathion. Wood ash and lime caused phytotoxicity on leaves aside from being ineffective in controlling the beetle. Diazinon-sprayed plants also gave the highest yield of fruits.

c). Source of Federal Funds - Western Region Pesticide Impact Assessment (WRPIA)

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

Key Theme – Pesticide Application

a). Description of Project - Development of Crop Profile For Chinese Cabbage and Cucumber in the Republic of Palau. To get information on how farmers successfully grow these crops, farmers in 16 farms were individually interviewed, aside from actual farm observations. These information were entered in the survey form which contained information on acreage, production figures, production region, horticultural practices, pest problem, control measures (chemical, biological, cultural), as well as dosage and frequency of sprays (chemicals).

b). Impact - A report on Crop Profile of Chinese Cabbage and Cucumber was developed using the above information. The report was finally printed in Guam. About 200 copies of the publication were distributed to farmers, government officials, extension workers, traditional leaders and interested individuals.

c). Source of Federal Funds - Western Region Pesticide Impact Assessment (WRPIA)

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

Key Theme – Pesticide Application

a). Description of Project - Development and Dissemination of Brochures in Support of Pesticide Applicator's Training (PAT). A brochure containing information on types of pesticides (based on what pest to developed in English. The brochure was translated to Filipino and three major Palauan languages (Palauan, Hatohobei and Sonsorol). This brochure in 5 languages were pre-tested to 5 individuals who have knowledge of the language and those engaged in agriculture and agriculture-related activities.

b). Impacts - The brochure on Knowing Pesticides in 5 languages (English, Filipino, Palau, Hatohobei, and Sonsorol) were printed in Guam. The printed brochures were distributed initially to 20 individuals who were interested in Knowing Pesticides

c). Source of Federal Funds - Pesticide Applicator's Training

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

Key Theme - Integrated Pest Management

a). Description of Program - The AES researcher (Horticulture) initiated projects collaboration with LGP institutions/non-LGP in the Pacific region to address challenges on crop production through IPM-based pests/crops approaches. Pest approach development of IPM program on leaf-footed bug of cucurbits (cucumber) was submitted to a non-federal funding. Crop approach towards 'plant health' practices and management and sharing generated research results at AES LGP were pursued. Knowledge on IPM related crop practices and management on specific crops or group of crops for semi-commercial and commercial production to expand and depart or expand and still adopt traditional subsistence practices are crucial in small islands States.

b). Impact – Recently approved (Development of IPM Program for Leaf-footed Bug); IPM Stronghold (just commenced in December 2000)

c). Source of Federal Funds - Smith–Lever & non-Federal fund, American Farmland Trust (AFT)

d). Scope of Impact – Micronesia (FSM)

Key Theme – Endangered Species

a). Description of Program - The AES researcher is trying to address as part of conservation/preservation of the rare/endangered banana varieties and recently analyzed for vitamin A. These bananas were found rich in vitamin A. While 51% of Micronesia children is suffering from the disorder promotion towards consumption of these local bananas is important. The rare banana could be multiplied faster using tissue culture technique. Collection area is to be established in the lowlands and within the campus for student awareness and instruction purposes. Another area is the State Agriculture for accessibility and assured source of mother plants and conventional planting materials. The knowledge and materials generated from the project is in support to facilitating promotion and awareness. Protocols however, in micro propagation of the rare bananas will be determined as there are differences and modification/refinement needed for different species.

b). Impact/Accomplishment – Initiated cultures in vitro of difficult to source and rare vitamin A rich banana varieties with limited number of explants. Slow tissue response was observed but considered promising.

c). Source of Federal Funds – Hatch

d). Scope of Impact – Micronesia (Pohnpei)

1 ALLOCATED RESOURCES

Fiscal Resources

Extension

Year	Federal	State	Local	Other
2000	197,037	70,370	14,074	0
2001				0
2002				0
2003				0
2004				0

Research

Year	Federal	State	Local	Other
2000	254,588	53,432	6,286	0

2001					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, 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	0.00	0.0	0.0	0.00	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	2.40	0.0	0.0	2.67	0.0	0.0
2001	0.00	0.0	0.0	0.00	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

From the FY2000 FTE of 82.03, 19.67 has been assigned under GPRA Goal 4, representing 24% of FTE input. The FY2000 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:

Three staff members were trained by one other staff to become trainers on family finances while five volunteers assisted in the program implementation. Two articles on personal money management entitled, “Holes in Your Pocket” and “Control Your Money” were published in the Palau Community College newsletter, *Mesekiu*, which has a circulation of 500 copies. Excerpts of the first article were reprinted in the Palau Horizon (a local newspaper) that has a minimum circulation of 1,800 copies.

The Science and Technology Literacy for K-12 program provides a unique opportunity for students to work in the science laboratory and perform science experiments to reinforce what they have learned in their classroom lectures. 4-H extension agents facilitated science activities at the request of teachers. The enrichment activities covered many areas of science ranging from life to earth sciences.

The personal sewing program offers training in basic sewing skills and techniques that will help participants in making simple clothes that can help them defray the high cost of buying retail clothing. The skills learned can also be used to generate additional income to participants and their families. Projects that were completed included blouses, skirts, muumuus, dresses, and shorts.

A workshop that encouraged and motivated students’ interest in the conservation and preservation of Palau’s precious natural resources was conducted as part of the Summer Wildlife Experience Program. The 5-day training program brought students into the forests of Palau for a closer observation of terrestrial plants. A total of 17 students participated and successfully completed all the workshop requirements. The training provided students with a better understanding and knowledge of the importance of plants in their lives, the different types of forests found in Palau, and common trees found in the different areas of forests. Participants learned to identify common and endemic trees in Palau by their local name and scientific names, causes and threats to forests, and what the students can contribute to the conservation and preservation of our trees.

A Summer Marine Science Workshop was held for students who demonstrated regards and concern for the Palauan marine environment. During the workshop, students were provided with information to increase their knowledge and understanding of Palau's unique and diverse marine ecosystems. Field activities were exhilarating experiences for the students. It provided them with an opportunity to encounter first-hand Palau's diverse marine ecosystems.

CMI-CRE:

Seventy-one boys and girls completed an Internet/Computer training. The summer program had three different sessions as the number of interested students was very high. Following the program, many students continue to visit the computer lab to send e-mail messages and to check for messages from their on-line friends.

Two-hundred 4-Hers from both the public and private schools had completed a Smokeless Oven workshop. The students were provided hands-on experience in the use of the smokeless oven. The workshop also included other topics in nutrition, malnutrition, safety in school, abuses such as alcohol, child, and drug abuses, population increase, diseases such as Aids and diabetes, and the environment.

A women's support group has been organized to provide support on various topics, with major emphasis on violence against women. The group, which comprised of ladies from the college met once a week to discuss important issues on selected topics and share experiences and information with one another.

Numerous efforts were made to enhance the quality of life for individuals and families throughout the communities in the Marshall Islands. Some of these efforts included radio programs and informal discussions among women's groups on a variety of topics ranging from violence against women to health of adolescent. Meetings were also held with government officials from different sectors of the society and with visiting experts/scholars from outside in areas such as water quality, agriculture, community development, resource materials, and waterborne diseases.

The Community Liaison Extension Agent attended the South Pacific Commission Sub-regional Technical Meeting on issues relating to violence against women. In this meeting, the Marshallese Women Group developed and presented a Plan of Action of their program and discussed strategies on the ratification of the CEDAW.

The women's groups have been very active in their involvement on important events and social activities, which is abundantly clear in the fact that March 4th has been designated as a Women's Day. March 4th of this year was observed with parades, games and entertainments.

Other meetings were held with representatives from the South Pacific Applied Geosciences Commission (SOPAC) during UN World Water Day celebration, UN Population Fund, and National Institute for Health and Safety Limited.

COM-FSM/CRE:

Yap Site:

Through the Children, Youth and Families At Risk (CYFAR) project, programs such as computer literacy, reading readiness, aquaculture, and cross cultural awareness continued with youths in Yap.

Throughout the Municipalities, sports programs were organized with the assistance of Extension staff and youth from all over had participated in games like track and field, volleyball, basketball, and wrestling.

Students from Ba'el Elementary School had made some money from the sale of vegetables from their gardens. The meager amount of cash they had made from selling vegetables to Ganir Restaurant has gone a long way to support their families**.**

Chuuk Site:

Training programs on sewing were conducted for women and youth groups in different municipalities. Participants learned the different parts of the sewing machine, how to operate it, and they learned to make patterns for adult and children dresses and shirts. The end results of their projects helped different individuals and families through the sales of what they had accomplished.

Programs on leadership development and parenting skills were also conducted. The leadership development program included lessons on values, roles of parents and children, trust, setting goals, planning for the future, self-esteem, respect, cooperation, and communication skills. Parenting skills program included lessons on cultural perspectives, diversity, values, controlling anger, obedience, level of expectation, and respect.

Pohnpei Site:

Fifty individual "how to" show as well as pointers were provided to banana growers as best management practices in the cultivation of banana. These included selection of planting materials, field planting, and maintenance of already fruit-bearing banana plants. Besides weeding, which most farmers know as an essential part in the up-keeping of their plants, staff showed the importance of desuckering, detrashing, and the removal of the banana flower. Although use of chemical fertilizers is not recommended, the use of organic matter and compost are. Some of the program contacts were made during visit to farmers for other program activities, e.g. swine improvement programs - artificial insemination, management of young litters, and during waste management program activity visits. Others were made during home garden demonstrations and field visitations.

With funding assistance from the Australian Embassy in the amount of US $1,000, a Banana Project was started in the municipality of Kitti. An initial 50 plants from the introduced banana, which is locally known as "Manila" and 10 of the local variety "Karat" were planted. The agriculture extension agent in this municipality had trained 10 farmers on all aspects of banana production, including the selection of planting materials, proper size of seedlings, fertilization practices, and field maintenance.

Kosrae Site:

Eight Elementary School students from Walung had completed a 6-week Computer Literacy Course conducted by 4-H program staff and a college work-study student. The course was an introduction to word processor and the use of the different function keys. Students were also introduced to the use of the Internet by composing and sending short messages to their friends. As a direct result of the program, two of the students were enrolled into the Upward Bound Program and are having closer access to computers. (Walung is only accessible by small outboard motor boats and program staff sometimes stayed overnight to present their lessons).

Basic, intermediate and advanced sewing lessons are still being conducted with individuals and groups of women around the island. Sewing is taught to young mothers as a way of offsetting the high cost of ready-made clothes. Home economic staff taught village women how to cut various patterns and adjust patterns to different sizes. Nine women are now running their own tailor shops and are making modest income from their sewing.

Extension staff had assisted teachers and students at Utwe Elementary School on their handicraft program. They demonstrated to the students the shredding of pandanus leaves into small pieces and then smoothen them out so they can be easily woven into a small purse.

2 Performance Goals:

1. Develop economic well-being of communities and their citizens.

1. Improve the financial status of families through financial management education programs

1. Increase the incidence of strong families resulting from non-formal education programs.

1. To annually increase understanding of roles of parents and their children

1. To provide positive impact activities that will enable families to share

1. To create and strengthen networking and collaboration for program support

C. Key Themes:

Key Theme - Jobs/Employment

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.

b) Accomplishments and Impacts - FY2000 was filled with obtaining stakeholders' input, literature review, developing proposals and assigned duties. This is the first full year the position has been staffed and the 5-year plan of work for the position was recently developed. Seven ideas were developed into preliminary or full proposals. One Hatch Proposal *Water Quality of Pohnpei Island Lagoon Adjacent to Nett Point* has been prepared and is awaiting peer review. *Capture and Culture of Coral Larva; Optimization of Culture Methods for Endemic Macrobrachium Shrimps;* and *Capture of Juvenile Coral-reef Fish Using Crest Nets* were sent to the Center for Tropical and Subtropical Aquaculture (CTSA) for review. The *Capture of Juvenile Coral-reef Fish* proposal has been resubmitted after revision but the may not be funded with the revisions. *Polyculture of Coral Reef Fishes and Invertebrates* and *Growth Affects of Marine Algae on Tropical Agriculture Crops* were sent for review to Hawai'i Sea Grant. The marine algae proposal received some promising feedback and linked proposals for Sea Grant project development funds and Hatch research are being written (both Drs. Javier and Brookins would be involved as a researcher team on the project). *Ecological and Fishery Impacts of Water Withdrawals from Kosraen Streams* is in preparation for submission to the USDA National Research Initiative. In addition to proposals, one major purchase to equip the Nett Point Marine Research Facility was made, and approval for using COM-FSM instructional equipment and boats were secured. Preliminary research to gather data for proposals has been started on

ornamental fish and corals. A research assistant was added to the program in March. Improvements were made to a COM-FSM boat to improve sampling capability. Organizing, outfitting and construction of temporary office space and the Nett Point Marine Lab required a great deal of time that is not included in the Plan of Work.

c) Funding Source – Hatch 3b&c

d) Scope of Impact - The work applies to islands in Micronesia and tropical islands globally. The coral, fish and algae work can be utilized by tropical Pacific islanders for aquaculture development and job creation. The shrimp proposal would benefit high islands throughout the tropical Pacific. The Pohnpei water quality work will directly benefit the new marine lab and thus help the Export Aquaculture projects in general. The Kosraen Stream proposal will directly benefit industry development in Kosrae and will provide a baseline study for other islands to utilize as a standard.

Key Theme – Children, Youth and Families at Risk

a). Description of Project - In response to a national need to upgrade science literacy among Palauan kids, programs were developed and implemented in cooperation with Palau's Ministry of Education, Palau Community College' Education and Training Department, Palau Division of Agriculture, Palau Coral Reef Research Foundation, Palau Environmental Quality Protection Board, and Agricultural Development in the American Pacific (an agency of the University of Hawaii at Manoa). Program areas included biological science, food science, physical science, food safety & quality, environmental education and earth science, weather and climate, agriculture in the classroom, aerospace, summer wild life, summer 2000 extension apprentice and marine science 2000.

b). Impact – Sixty-two percent (62%) of all elementary schools and eighty-three (83%) of all high schools (public and private elementary and high schools) participated in the programs with 750 students (non-duplicated count) attending the classes.

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

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

Key Theme – Family Resource Management

a). Description of Program - Personal sewing has been one of the main training areas to help families defray the high cost of retail clothing and to develop a skill to generate additional income. Two lessons on personal money management were developed and three other extension staffs were trained as trainers for both adult and youth. Copies of the lessons were modified and published in the Palau Community College newsletter "Mesekiu" that has a circulation of 500 copies. Excerpts of the first article Holes in Your Pocket were reprinted in a local newspaper, Palau Horizon (at their request), that has a minimum circulation of 1,800 copies. Eleven other lessons on consumer education including consumer rights and responsibilities, various aspects of marketing, and planning and control of activities were completed.

Sewing programs were also conducted in Chuuk and Kosrae on how to operate the sewing machine and making different patterns for adult and children dresses and skirts.

b). Impact – Only three women enrolled in the sewing program this year in Palau. There were four (4) former clients who asked for a variety of assistance including basic maintenance of their sewing machines, cutting dresses using sewing patterns, and for additional sewing techniques. As a result of news articles on personal money management, two (2) have actually adopted recommended practices, and more requests for training are coming in. As a result of the marketing and planning/control lessons, one (1) woman has started a business and two persons were hired as store clerks for the business.

One hundred three individuals attended sewing programs in Chuuk and Kosrae. Family members have enjoyed new and decent clothes and avoided purchasing expensive ready-made clothes.

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

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

Key Theme – 4-H Youth Development

a). Description of Activity – As a way of keeping children in school and to get them involved in community activities and at the same time stay healthy, sports activities and home gardening programs were organized by 4-H Extension staffs at the schools. Extension staffs and Elementary School teachers joined efforts in providing school children home gardening lessons and supervised sports activities.

b). Impacts/Accomplishments – 4-H trophies were awarded to volleyball teams from Gagil, Colonia, and St. Mary's schools. Two other 4-H clubs with seventy members have been organized for the next round of basketball and volleyball games.

Vegetables such as cabbage, eggplant, cucumber, and green onion were harvested from the school plots. The children took most of the harvest home, while a small portion of it was sold to a nearby restaurant.

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

d). Scope of Impact – County Specific (Yap, Micronesia)

Key Theme - Home Based Business Education

a). Description of Activity - With technical assistance from staffs of the Department of Commerce and Industry, a curriculum was developed to assist women to start their own business at home and to support those who have already started a business. Lessons on small business included entrepreneurship, competency of a successful

entrepreneur, identifying business opportunities, different aspects of business planning, marketing, production, technical and financial aspects of a business venture.

b). Impacts – The Chuuk Women Business Association was organized and a total of 198 women from all over Chuuk attended training programs on small business management. The program is hailed as a good opportunity for women to develop their income generating capability and to provide for economic stability in the family. Most importantly, the program has heighten the level of self-esteem and self-confidence in the women that they could always do something better with meager resources.

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

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

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D. ALLOCATED RESOURCES

Fiscal Resources

Extension

Year	Federal	State	Local	Other
2000	139,005	49,645	9,929	0
2001				0
2002				0
2003				0
2004				0

Research

Year	Federal	State	Local	Other
2000	65,781	13,806	1,624	0
2001	0	0	0	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	3.0	0.0	0.0	7.30	0.0	0.0
2001	0.0	0.0	0.0	0.00	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	Professional			Paraprofessional		
	1862	1890	Other	1862	1890	Other
2000	1.01	0.0	0.0	0.3	0.0	0.0
2001	0.0	0.0	0.0	0.0	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

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From the FY2000 FTE of 82.03, 11.61 FTE has been assigned to programs addressing GPRA Goal 5, representing 14% of FTE input. The FY2000 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 contact person for Micronesia has developed a Performance Plan to cover the period fiscal years 2001-2004. 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 last Civil Rights/EEO Conference in Washington, D.C. 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 last Civil Rights/EEO Conference in Washington, D.C. in August of 2000. 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 major focus 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: In the Marshall Islands, this is being addressed through the digital upgrade of the PEACESAT system using satellite communication to the central hub at the University of Hawaii. Distance education will be greatly enhanced by this commitment. The CMI-CRE's contribution to upgrading the PEACESAT system and the establishment of a local area network at the college has been recognized internationally through the election of the Dean of CRE/CMI to the International PEACESAT Incorporated Board of Directors and as President of IPI. In Palau and FSM, access to the Internet is through the local Telecommunication Corporations. Most land-grant offices 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:

Public meetings were held to discuss the U.S. Federal Requirements, stakeholder input and the implementation role by COM Land Grant staff. 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. Twenty-seven issues ranging from food security to women issues were noted in the Republic of the Marshall Islands. These were ranked from one to twenty-seven with one being the highest priority. Values for each were also assigned with one hundred designating the highest value. By dividing the rank order by the value assigned and multiplying this quotient by 100, a weighting factor was developed that allowed the overall ranking of the issues.

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 the radio stations. The annouPrevious 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. Thincements were in both English and the vernacular.

The three College Presidents and the Vice Presidents 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 act as an advisory body to the COM land-grant program. The board met twice during the year and accomplishment reports is always an item in their meeting agenda.

4-H clubs have met on several occasions and part of their meeting agenda usually would cover community and family programs. During workshops, conferences, and meetings, discussions were held on program priorities of the different island groups and community groups.

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:

The merit and peer review processes involved research and extension staff at the six COM sites and the College of Micronesia Board of Regent members from the three governments of ROP, FSM, and RMI. Experts from the ADAP institutions, SPC, University of the South Pacific, and other land-grant institutions collaborated very closely with COM staff and faculty.