MICRONESIA 2000-2004 PLANS OF WORK

OVERVIEW STATEMENT

The 5-Year Plans of Work for the College of Micronesia (COM) is an integrated approach to addressing the critical issues of strategic importance to the entire Micronesia region. Issues identified are very broad, which requires that the different counties in Micronesia develop research and extension programs that address short term, intermediate, and long-term critical needs and problems that are unique to each of the islands. All programs are developed based on stakeholders' input and consistent with priority economic, social and ecological problems identified by the various islands through their Economic Development Plans. Implementation of programs will continue at locations currently served and will be extended to remote and isolated areas to reach people from all walks of life, including both the underprivileged and the underrepresented. The following tables show existing and potential research and extension programs associated with the five goal areas:

1862 Extension	
Goal 1	1. Marketing Information Systems 2. Sustainable Food Production 3. Lowland Agroforestry & Sustainable Sakau (Kava) Cultivation 4. Elementary School Sustainable Agriculture Program 5. Cultivation of Vitamin A-rich Banana Variety 6. Swine Improvement – Artificial Insemination, Breeding and Stock Selection, and Management 7. Tissue Culture and Banana Evaluation
Goal 2	1. Prevention of Food Borne Illnesses 2. Food Sanitation Certification Training 3. Food Safety Education Focusing on Safe Snack Lunch for Youth 4. Pesticide Applicators Training 5. Pesticide Impact Assessment
Goal 3	1. Family Food Production and Nutrition 2. Food Safety and Quality 3. Water Quality Program 4. Nutrition, Diet and Health
Goal 4	1. Water Quality and Nutrient Management 2. Changing Micronesian Landscape 3. Plant Protection and Quarantine 4. Waste Management 5. Lowland Agroforestry and Fruit Trees 6. Integrated Pest Management for Crops 7. Carbon Sequestration

	8. Aluminum Recycling and Environmental Education
Goal 5	1. Sewing and Handicraft Program 2. Professional Workforce Preparation 3. Workforce Transition 4. Home Gardening 5. Youth Summer Program

1862 Research	
Goal 1	1. Biological Control of Weeds and Other Pests of Crops 2. Integrated Control of Red Spider Mites Attacking Cassava 3. Identification and Cultivation of Suitable Marine Invertebrates for the Aquarium Trade 4. Shrimp Aquaculture 5. Cultivation of Scleractinian Corals for the Aquarium Trade 6. Determination of Soil Chemistry and Mineralization Rates of Various Atoll Plants 7. Tissue Culturing of Banana Variety Kufwafwa and Other Economic Crops 8. Search, Preservation and Propagation of Medicinal Plants 9. Evaluation and Propagation of Root Crop Varieties Adaptable under Palauan Environment 10. Artificial Insemination (Breeding Improvement & Evaluation) 11. Hardening Process (for Banana plantlets and other seedlings), Growth and Development in the Nursery 12. Feedstuff Quality on Growth, Development and Production Evaluation 13. Banana Trials for Disease Resistance
Goal 2	1. Identification of Patients Afflicted with Waterborne Diseases
Goal 3	
Goal 4	1. Integrated Pest Management (IPM)-Cultural methods, etc. 2. Pesticide Impact Assessment 3. Tissue Culturing of Banana and Other Economic Crops 4. Lowland Agroforestry and Fruit Trees

Goal 5	

1862 Joint Research/Extension	
Goal 1	1. Sustainable Taro Production Systems 2. Integrated Control of Taro Corm Rot 3. Sustainable Marketing Strategy in Micronesia
Goal 2	1. Pesticide Management and FQPA Implementation
Goal 3	
Goal 4	
Goal 5	

As can be noted in the tables above, not so much research and joint research/extension activities are planned for implementation in some of the goal areas. This is due to understaffing and the uncertainty of recruitment for expertise in those program areas.

Land and People: The geographic region served by the COM-LGP covers over 2 million square miles, an area larger than the continental United States. The Federated States of Micronesia (FSM) is comprised of the Western and Central Caroline Islands. These include 607 islands and atolls, 65 of which are inhabited, spread across an ocean area of more than one million square miles. Although the land area of this nation is only 271 square miles, there are also 2,700 square miles of lagoons.

The Republic of the Marshall Islands (RMI) consists of two north-to-south chains of islands. Together they include five single islands and 29 atolls. The coral atolls rise no more than 25 feet above sea level and average less than 1,000 feet in width. The island group lies on the eastern edge of Micronesia, 2,100 miles southwest of Honolulu.

The Republic of Palau (ROP) is a cluster of 343 islands in the southwest corner of the region, less than 500 miles east of the Philippines. These islands range from the hundreds of small limestone Rock Islands to the volcanic island of Babeldaop, second largest in Micronesia (Guam is largest).

The three island nations are inhabited by a heterogeneous mixture of people from more than six culturally distinct groups with different customs, traditions and languages. The population now stands at approximately 180,000.

The three nations, slowly developing from a subsistence economy to active participation in the world economic scene, face many new

social, economic and ecological problems. The challenge is to build a viable economy and ensure a constantly improving quality of life in Micronesia, while maintaining a strong cultural identity and a healthy environment. The COM-LGP must play an active role in the economic and social development of the three nations. The Micronesian region do not have the luxury of applying results from temperate zone agriculture research or use extension and teaching materials and methods developed for the mainland U.S. The COM-LGP must conduct applied research in the region and develop appropriate and effective extension and teaching materials and methods targeted for clientele in small island communities.

Stakeholders Input: The identification of issues and trends from which programs are developed involved the input of stakeholders and observations and findings of COM land-grant staff and staff from collaborating agencies. Government studies and publications were also used in the tracking of trends and identification of issues. The termination of the Compact of Free Association funding in the FSM and the RMI in 2001 is one of numerous issues that will have a major impact on the region in the coming years. Other important trends include: a rapidly increasing population and resulting pressures on land and environment, family financial resources, and social services; increasing out-migration of both young and adult Micronesians to adjacent U.S. population centers in search of economic opportunities; a slowly rising sea level as a result of the green house effect or global warming and other natural phenomena such as El Nino and La Nina that will have disastrous effect on small island nations; and increasing social pressures brought on by rapid development and declining cultural values, leading to children, youth and family problems.

Importance of Collaboration and Partnership: For programs to achieve their intended goals, COM-LGP supports extensive collaboration and partnerships with local, regional, and international organizations, both public and private. Through these collaborations and partnerships, COM-LGP will be able to maximize outputs in implementing these goals and other community-based programs to address priority needs and critical issues. It will also be in the best interest of all parties involved in this collaborative efforts as financial resources dwindled and everywhere, government and private organizations are going through the unpopular and painful task of streamlining services by reducing manpower. Collaboration is a common thread that runs through all of the programs. This will enable the different agencies to capitalize on existing resources by sharing information to avoid duplication of efforts, learning from each other, using local expertise to solve problems and to coordinate activities so that the limited fiscal resources are used appropriately.

The requirements for multi-institutional and multi-disciplinary approaches to program planning and implementation has been the thrust of a collaborative effort with other American Pacific Land Grant

institutions through the Agricultural Development in the American Pacific (ADAP) Project. Through ADAP, there are agreements with non-land-grant institutions like the Secretariat of the Pacific Community (SPC) and the University of the South Pacific (USP), which recognize the need to share expertise in collaborative activities and projects, joint participation in administrative and planning meetings, and sharing and use of networks for communication, collection and dissemination of information.

Sustainable Development: COM-LGP supports sustainable systems that improve and advance agricultural, human, community, and natural resource development. The sustainable systems must be economically viable, environmentally sensitive, socially acceptable, culturally appropriate, and technologically feasible. In addressing the five national goals, COM-LGP has put great emphasis on the preservation and protection of Micronesia's natural environment, a response that is necessary to sometimes ecologically unwise and unsustainable development efforts and a growing awareness that long term high quality of life is dependent on a healthy natural environment.

Sustainability is of the people, by the people and for the people. Micronesians should continue to use traditional methods of farming and they should be empowered to engage in agricultural production systems that will have long lasting impact on their communities. Micronesian farming systems are mostly subsistence and this is important as a contribution to the global economy.

In addressing the five national goals, regionally identified priority issues of the three Micronesian governments as communicated in Economic Summit Meetings, National Development Plans, National Environment Management Strategy, etc. were used. These government publications and some private papers all stressed the importance of developing an agricultural production system while maintaining a healthy environment, identifying appropriate mechanisms that will enhance economic opportunity and improve the quality of life, and provide for a healthy and well-nourished Micronesian population. Additional information were results of observation by Land Grant Program staff, collaborating agencies, and clientele.

Outreach Programs: Malnutrition and waterborne diseases are emerging problems in some parts of Micronesia. Population dynamics contribute to these problems by increasing the number of people to feed in the household. Impact of quality education is one that generates jobs with sufficient income for family support. Outreach programs will emphasize the need for a sustainable food production system, a balance diet, proper food handling and keeping water sources clean to lessen the chances of contracting food and waterborne diseases. Other issues associated with these problems, such as teen pregnancy, family planning, school dropouts, joblessness and alcoholism will be addressed.

Support on Information Delivery: To support the delivery of up-to-date information and to borrow from other successful programs throughout the Pacific Region and the U.S. Mainland, contact access to email and the Internet will be supported through satellite digital telecommunications and other carriers. The commitment made in this area strengthens delivery of higher education as well as providing support and focus in addressing malnutrition, sustainable agriculture, sanitation and population issues. Currently, all six COM sites have capability of accessing Internet and the World Wide Web. This new capability will undoubtedly contribute to innovative approaches to program development and implementation.

Human Resource Development: One constraint to sustainability is the lack of trained staff at the institutions. To strengthen, improve and increase the skills of institutional staff and those from collaborating agencies, in-service training will continue to be a major component in all programs. Only through these staff development efforts that a pool of local expertise can be developed in Micronesia.

Operationalization of Programs and Projects: Implementation of research and extension activities is through the Department of Cooperative Research and Extension (CRE) at the three national colleges; Palau Community College (PCC), College of Micronesia - Federated States of Micronesia (COM-FSM), and College of the Marshall Islands (CMI). Each college is financed and operated by its respective government. COM Land Grant Programs (COM-LGP) offices are also located in the FSM States of Yap, Chuuk, Pohnpei and Kosrae where COM-FSM has four mini-campuses.

FTE ESTIMATES FOR ALL PROGRAMS

Extension FTEs

Year	Professional			Paraprofessional		
	1862	1890	Other	1862	1890	Other
2000	20.57	0.0	0.0	41.01	0.0	0.0
2001	20.73	0.0	0.0	41.54	0.0	0.0
2002	21.51	0.0	0.0	42.12	0.0	0.0
2003	22.21	0.0	0.0	43.33	0.0	0.0
2004	23.51	0.0	0.0	45.60	0.0	0.0

Research SYs Only

Year	Scientist Years					
	1862	1890	Other	1862	1890	Other
2000	7.92	0.0	0.0	6.57	0.0	0.0
2001	9.56	0.0	0.0	7.17	0.0	0.0
2002	9.84	0.0	0.0	7.57	0.0	0.0
2003	10.31	0.0	0.0	8.22	0.0	0.0
2004	11.14	0.0	0.0	8.97	0.0	0.0

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

STATEMENT OF ISSUES

Agriculture, fishery, and tourism are important industries in the growth and development of Micronesia's economy. The Micronesian islands have developed an economically harmful reliance on imported foodstuff, especially fruits, vegetables, and other food crops. The increase in the consumption of imports has led to an overall decline in local food production. To illustrate the trade imbalance, the FSM exports about 30% of its Gross Domestic Product (GDP) and imports foodstuffs that equate to about 80% of its GDP. The contribution of Palau GDP from agriculture, aquaculture and marine resources declined from 9.9% in 1983 to 2.9% in 1992 while food importation in the Marshall Islands has accounted for 24% of the national debt in 1994. From inputs of the stakeholders and environmental scan, the following issues directly or indirectly led to the declining contribution of agriculture, aquaculture and marine resources to the Gross Domestic Product (GDP) in Micronesia:

- lack of available arable land due to low soil fertility
- low wages and image of farming
- lack of agricultural loans and crop insurance
- lack of infrastructure especially good roads, electricity and storage facilities in remote areas
- stiff competition between local and imported produce
- lack of marketing information and centralized marketing
- introduction of pests and diseases in agricultural commodities
- unstable supply of local produce
- rapid population growth
- lack of agricultural professionals
- limited skills and knowledge of producers in locally adapting technologies of crop farming, poultry and livestock production and aquaculture
- dependence on foreign labor
- lack of locally available techniques in aquaculture and fast propagation of economic crops
- few local businessmen engaged in aquaculture and livestock farming

Production and utilization of local food should be increased. The Economic Development Plans of Palau, Marshall, and FSM call for a market-oriented sustainable agriculture with emphasis on self-sufficiency, import substitution and export markets. The increase in local production should create surpluses that can be converted into value-added products for the export market. The introduction of tissue culture technology will result in the production of superior plantlets (disease free, uniform, high yielding) in sufficient quantities. Developing banana farms and other crops of production capability beyond subsistence is necessary to achieve the export goal aimed at economic development. New

techniques/methods of crop rapid propagation and production technologies of economic crops should be pursued. Other relevant issues and problem in crop production such as soil fertility, pest management, biological control of pest, marketing, cultural methods, post harvest handling practices, and processing will also be pursued.

Pork is one of the prime sources of protein in Micronesia. Swine raising has been a traditional activity in the islands and is one of the largest livestock industries in Micronesia. Pigs have cultural significance and roasted at funeral and feast. Improving the genetic make-up of the hog population in Micronesia through better breeding management practices and the introduction of artificial insemination (AI) is necessary to the improvement of the swine industry. Increasing the skills and knowledge of swine and other livestock producers will be addressed to increase production and utilization of local meat.

Most of the islands in Micronesia are atolls and atoll soil chemistry is yet to be understood. Without this knowledge, there is uncertainty as to the soil amendment recommendations that will satisfy the requirements imposed by conditions that may likely vary from the wet southern to dry northern atolls. The pH of the calcareous soils is high leading to the unavailability of iron and certain divalent cations. Besides understanding the soil chemistry basis imposed by these atoll conditions, to develop sustainable amendment recommendations also requires knowing mineralization rates of potential compost materials. These will be measured. Teaching the process in a manner that ensures adoption of the practice to improve subsistence agriculture may prove challenging. Numerous home gardening programs have been conducted in these atolls in the past. The benefits accrued from these programs are not clear.

There is a need to understand the basic conditions of atoll soil chemistry in order to recommend appropriate amendments that lead to providing the correct balance of macro- and micronutrients while modulating pH, cation exchange and water availability in a manner that is sustainable. Certain general aspects are known but specifics have yet to be determined. The Marshall Islands is striving towards self-sufficiency while mindful of high malnutrition, vitamin A deficiency and an enormous trade imbalance in which 24% of the national debt was attributable to importing foods. The ability to successfully raise crops for sustenance is dependent on appropriately amending the soil to increase yield and to allow for the growth of a more diverse crop selection.

Ongoing research in atoll soil chemistry is addressing the need to: (1) identify the factors that are limiting plant production on the atolls; (2) determine the potential sources of compost material based on vegetation availability and their mineralization rates; and, (3) develop amendment recommendations that are sustainable. The results of these research projects will assist people on these atolls to produce higher yield of food crops that will help alleviate nutrition-related and economic issues.

PERFORMANCE GOALS:

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

2. To annually increase the effectiveness of constituent and citizen participation on public policy issues affecting the productivity and global competitiveness of the U.S. agricultural production system.

3. To annually increase agricultural producer awareness, understanding and information on improving the productivity and global competitiveness of the Micronesian agricultural production systems

4. To annually increase crop species/variety/cultivar propagation and/or production research and generate research results on tissue culture technique (micropropagation)/conventional method

5. To annually increase agricultural producer awareness, understanding and information regarding the production of crops technologies tried, refined and/or improved suitable and acceptable in Micronesia in support to production of new and value-added commodities and products in the Micronesian agriculture

6. To annually increase agricultural producer awareness, understanding and information regarding the production of livestock technologies tried, refined and/or improved suitable and acceptable in Micronesia in support to production of new and value-added commodities and products in the Micronesian agriculture

7. To develop a specific protocol for the reliable multiplication of dessert banana variety kufwafwa through tissue culture

8. To develop a medium specifically suited for micro-propagation of banana variety kufwafwa

9. To optimize nursery conditions to wean the micropropagated banana

10. To develop 10-15 model farms of small size 50-250 plants and make a comparative study of the field performance of micro-propagated kufwafwa banana in comparison with conventional sucker derived banana

11. To develop appropriate agricultural technology that is suitable for volcanic and coral atolls

12. Through research and experiment, develop alternative methods of farming including appropriate seeds and crop varieties that could weather natural disasters such as drought and storm

OUTPUT INDICATORS:

INDICATOR 1
Description of significant research underway or proposed that will result in/and/or in support to developing new and value-added commodities and products in the Micronesian agriculture.

INDICATOR 2
Description of research underway or proposed on crops and livestock propagation and/or productivity evaluation and bred improvement and health and disease production and management, respectively will be reported. CRIS approved projects and collaborative projects with other regional organizations (ADAP, SPC, etc) will be listed. This will include research in support to production of new and value-added commodities and products as well as improvement in productivity and global competitiveness of the US agriculture production system.

INDICATOR 3
From the approved soil chemistry analysis research under CRIS Accession No. 0178462, papers will be published in scientific journals reflecting the soil chemistry composition in the "A" and "C" layers, the distribution of atolls with respect to significant chemistry differences, mineralization rate of atoll plants that could serve as potential mulch/compost sources and the ability of these plants or other sources to appropriately amend the soil conditions.

INDICATOR 4

The total number of students enrolled in non-formal educational programs in agricultural production sciences that utilize modern educational strategies, distance learning technologies, and educational or internship experiences in real world learning environments will be recorded.

Year	Number of persons completing non-formal education program		Number who actually adopted recommended practices	
Baseline	500		300	
	Target	Actual	Target	Actual
2000	550		300	
2001	619		400	
2002	712		550	
2003	836		575	
2004	1003		750	
Total	**3720**		**2575**	

INDICATOR 5

The total number of students taught lessons in agriculture as part of agreements with State and Local Governments allowing such lessons be taught in the public elementary schools, and the number of students who actually adopt recommended practices.

Year	Number of persons completing non-formal education program		Number who actually adopted recommended practices	
Baseline	500		300	
	Target	Actual	Target	Actual
2000	550		300	
2001	619		400	
2002	712		550	
2003	836		575	
2004	1003		750	
Total	**3720**		**2575**	

INDICATOR 6
The total number of persons completing non-formal education programs on crops and livestock production improvements towards global competitiveness of the U.S. agriculture production system, and the total number of persons who actually adopted recommended practices will be recorded.

Year	Number of persons completing non-formal education program		Number who actually adopted recommended practices	
Baseline	0		0	
	Target	Actual	Target	Actual
2000	20		20	
2001	50		50	
2002	175		175	
2003	175		175	
2004	200		200	
Total	**620**		**620**	

INDICATOR 7
Number of reports or publications on local food production and marketing of local produce, suitable species in artificial rearing, local shrimp industry, coral and sponge farming, and medicinal plants

INDICATOR 8
Number of recipients of reports and publications on useful technologies like resistant varieties of plant and marine species and practical control measures

INDICATOR 9
Impact of sustainable taro production system on human health and on the local food production

INDICATOR 10
Impact of the integrated control of taro corm rot on the local production and marketing of local produce

INDICATOR 11
Number of recipients of reports, publications on improved species of corals, sponge, shrimp, and marine invertebrates

INDICATOR 12
Number of policies developed for improvement of local markets

INDICATOR 13
Number of people trained on useful technologies in food production and pest control and improvement in marketing of local produce

INDICATOR 14
Number of recipients of reports and publications on preservation of local indigenous plants and medicinal plants

OUTCOME INDICATORS:
INDICATOR 1
Total number of new and value-added uses for agricultural commodities and products introduced into domestic markets.

Year	# of new and value-added commodities	
Baseline	0	
	Target	Actual
2000	5	
2001	5	
2002	5	
2003	5	
2004	5	
Total	**25**	

INDICATOR 2
Total number of refereed journal citation annually on global competitiveness and germplasm preservation

Year	# of Referred Journal Citation

Baseline	0	
	Target	Actual
2000	2	
2001	2	
2002	2	
2003	2	
2004	2	
Total	**10**	

INDICATOR 3
The reduction of malnutrition, initially in the reduction of the recent and acute malnutrition incidence level as measured under the Waterlow Standard that combines weight per age and height per age indicators, then ultimately over time, a reduction of the severe and chronic malnutrition incidence level.

INDICATOR 4
The total number of families adopting the recommended practices leading to a measurement of the increased amount of food being consumed from their own production.

Year	Number of persons completing non-formal education program		Number who actually adopted recommended practices	
Baseline	500		300	
	Target	Actual	Target	Actual
2000	550		300	
2001	619		400	
2002	712		550	

2003	836		575	
2004	1003		750	
Total	**3720**		**2575**	

INDICATOR 5

Total number of persons completing non-formal education programs on crop production/propagation/information in support to developing and production of value-added commodities and products will be conducted to specific target numbers of individual. The actual number completing non-formal education programs and number adopting new techniques/product of the methods, etc will be recorded.

Year	Number of Persons completing non-formal education programs		Number of Persons Practice or Adopting technologies	
Base-Line	646		500	
	Target	Actual	Target	Actual
	Crops	Crops	Crops	Crops
2000	550		550	
2001	619		619	
2002	712		712	
2003	836		836	
2004	1003		1003	
Total	**3720**		**3720**	

INDICATOR 6

Non-formal education programs on livestock breed improvement information in support to developing and production of value-added commodities and products will be conducted to specific target numbers of individual. The actual number completing non-formal education programs and number adopting new techniques/product of the methods, etc will be recorded.

Year	Number completing non-formal education program		Number adopting new Techniques, etc.	
Basline	0		0	
	Target	Actual	Target	Actual
	Livestock	Livestock	Livestock	Livestock
2000	20		20	
2001	50		50	
2002	75		75	
2003	75		75	
2004	100		100	
Total	**320**		**320**	

INDICATOR 7

The total number of tissue culture banana produced and the total number of tissue cultured banana field-tested.

Year	Number of Banana Variety Kufwafwa Produced		Number of Tissue Culture Banana Field Tested	
BaseLine	0		0	
	Target	Actual	Target	Actual
2000	5000		0	
2001	1,500		1,500	
2002	2000		2,000	
2003	Experiment with other varieties		0	
2004	1000-5000		1000-5000	

INDICATOR 8
The total number of home gardens and commercial farms established.

Year	Number of Home Gardens Established		Number of Commercial Farms Established	
BaseLine	0		0	
	Target	Actual	Target	Actual
2000	25		2	
2001	30		3	
2002	40		4	
2003	50		5	
2004	60		6	
Total	**205**		**20**	

INDICATOR 9
The total number of referred and peer reviewed materials (referred or peer reviewed conference papers, books, book chapters, reports, studies and other materials) produced on public policy issues affecting the productivity and global competitiveness of the U.S. agricultural production system.

Year	Number of referred Materials	
Baseline	0	
	Target	Actual
2000	12	
2001	12	
2002	12	

2003	12	
2004	12	
Total	**60**	

INDICATOR 10
The total number of persons annually completing non-formal education programs in topics related to public policy issues affecting the productivity and global competitiveness of the U.S. agricultural production systems and the number of these persons who make use of such knowledge within six months after completing one or more of these programs.

Year	Number of Persons completing non-formal education programs		Number of Persons Utilizing Information	
Baseline	0		0	
	Target	Actual	Target	Actual
2000	100		50	
2001	100		65	
2002	100		75	
2003	100		75	
2004	100		100	
Total	**500**		**365**	

KEY PROGRAM COMPONENTS
One of the issues addressed is the ability to increase agricultural production at the subsistence level by completing research on the soil chemistry, mineralization rates of atoll plants and amending current recommendations. The collaboration with the University of Hawai`i Department of Agronomy and the Agriculture Diagnostic Laboratory provides the resources to generate the soil chemistry data required. Once this information is understood, recommendations to amend the soil in a sustainable manner will be undertaken. The probability of discovering which atoll plants can contribute to the amendment regimen is high. The ability to teach the process to have the recommendations adopted is the major challenge given the history of failure in this area. The extension efforts by COM Land Grant Program staff will incorporate the newly discovered information along with addressing teaching methods that outreach to the various Micronesian Islands learning styles.

The tissue culture tool as in micropropagation will be used to multiply plants to address lack, limited and unavailability of planting materials of rare species and economic crops. Research will focus on developing, refining and/or improving existing protocols/procedures, as there are expected species/variety/cultivar differences on the response to tissue culture system. The preparation of mother plants, in-vitro phases of growth and development and ex-vitro phase starting from hardening and acclimatization and the nursery/greenhouse-growing requirement will be determined. Field growing and productivity evaluation at different sites in the FSM interlocked with stakeholder needs are considerations involved in this applied research. Research results will be extended to extension agents and other target audience.

Publication (technical and popular versions) will be pursued as a medium for dissemination.

Towards ultimate goal of contributing to sustainable market economy and people with improved quality of life, efforts will be concentrated in global competitiveness and germplasm preservation. Specific

program activities will deal with technologies to support subsistence and small-scale commercial fisheries, crop and livestock farming through:

- aquaculture of fish and invertebrates including mallet, pearl oysters, crabs, lobsters sponges, giant clams and others
- tissue culture of disease-free economic crops
- evaluation of indigenous and introduced crops for medicinal, food, pesticides, botanical and craft values
- affordable, safe, and socially acceptable IPM tactics against pests of agricultural commodities
- animal health and nutrition of poultry and livestock

These aforementioned activities can be attained through these strategies:

- Adaptive research to develop locally adapted crop, animal and aquaculture technologies
- Higher education to develop well educated and highly trained graduates in agriculture and natural resources for better economic opportunities
- Extension to serve as a partner of research in disseminating up-to-date affordable, applicable and socially-acceptable technologies through training of extension staff and the public, farm visits, distribution of locally translated information about farm management, workshops and on-farm/on-station demonstrations.

INTERNAL AND EXTERNAL LINKAGES

Planning, implementation, monitoring and evaluation of activities will involve local ANR, AES, and CES staff and programs in the College of Micronesia campuses. Consultancy, collaboration and networking will be established or strengthened with local governments, NGOs and private sectors within Micronesia. Technical and funding assistance from regional and international organizations such as ADAP, AUSAID, ADB, etc. will be sought.

The present program activities on developing sustainable marketing strategy and taro corm rot control measures have collaborative tie-up with some local institutions. Among them are the Division of Agriculture and Mineral Resources, which permits the import of taro planting materials from other countries; Ministry of Education for joint community training; Ministry of State or its constituencies to involve local organizations/associations of men, women and youth in their communities and Business Association for promoting effective local market systems.

Assistance from the University of Guam and University of Hawaii is sought in obtaining elite taro varieties from tissue cultures for local testing in Palau; identification of some exotic pests and plants and analyses of soils for nutrient levels. The University of Hawai`i Department of Agronomy and Agriculture Diagnostic Laboratory is a key collaborator in determining the soil chemistry and plant mineralization rates in an Atoll environment. The PEACESAT central headquarters at the University of Hawai`i provides valuable technical support and program delivery for telecommunications, Internet access and distance education. The University of Guam conducts valuable distance education outreach to Micronesia.

MULTI-DISCIPLINARY LINKAGES

Entomologists, Plant Pathologists, Agronomists, Horticulturists, Education Extension Specialists and Aquaculturists from other American Pacific land-grant institutions, Coral Reef Foundation and UH Sea Grant, and agricultural entities in the South Pacific are helping each other in information sharing, peer reviews and collaboration in projects.

TARGET AUDIENCES

The present programs in research, extension and research/extension joint efforts generally focus on farmers, producers, businessmen, community, political and traditional leaders, members of women's, men's and youth's groups and associations. Some educational programs such as on-farm demonstrations and community training on sustainable agriculture and IPM have been extended to far-flung states and isolated areas.

To ascertain the participation of our target audiences, programs are announced through multi-media especially newspapers, farm visitations, letters of invitations and state liaison offices. The mechanism for bridging the gap in the transfer of technologies and information generated from research to the target audiences need to be improved. More people will be involved in planning, preparation and implementation not only of research but all programs.

Though the concentration now is on the improvement of subsistence and traditional farm technologies in root crops, medicinal plants and marine life, some efforts are also devoted to the needs of commercial farmers and producers. Both groups have crucial contributions to support and maintain Micronesia's goal of stable economic development.

Outer atoll subsistence farmers are also key beneficiaries of the direct information that will be generated. Should the practices be adopted and implemented, it is hoped that overall malnutrition will be reduced. If this desired outcome is achieved, then children from ages 0 to 7 will benefit through the reduction in malnutrition affecting this population segment.

Students in elementary schools, high schools and at the college level all over Micronesia will be taught lessons on agriculture.

PROGRAM DURATION

The research being conducted to determine the soil chemistry and mineralization rates of various atoll plants will be understood within the next two years. As such, the research component is short-term in nature. Teaching the recommendations will be an ongoing process. Since numerous home garden demonstration projects have been conducted in some parts of Micronesia without much success in terms of behavior adoption, it is recognized that this responsibility will be the hardest to ensure. Given the scattered nature of the atolls over a 750,000 square mile area, travel to the outer atolls in the Marshall to conduct training programs will take time, given that repetition and monitoring will be key features of the extension work. Other program activities are as follows:

Program Activities	**Duration**
Research	
1. Biological Control of Weeds and Other Pests of Crops	Intermediate
2. Integrated Control of Red Spider Mites Attacking Cassava	Intermediate
3. Identification and Cultivation of Suitable Marine Invertebrates for the Aquarium Trade	Intermediate
4. Shrimp Aquaculture	Intermediate
5 5. Cultivation of Scleractinian Corals for the Aquarium Trade	Intermediate

6. Determination of Soil Chemistry and Mineralization Rates of Various Atoll Plants — Intermediate

7. Tissue Culture of Banana and Other Economic Crops — Intermediate

8. Search, Preservation/Evaluation and Propagation of Medicinal Plants — Intermediate

9. Evaluation and Propagation of Root Crop Varieties Adaptable under Palauan Environment — Intermediate

10. (Artificial Insemination) – Livestock Breed Improvement — Intermediate

11. Hardening Process (for Banana plantlets and other seedlings), Growth And Development — Intermediate

Extension

1. Marketing Information System & Development — Intermediate
2. Sustainable Agriculture Approaches

3. Lowland Agroforestry & Sustainable Sakau (Kava) Cultivation — Intermediate

4. Elementary School Sustainable Agriculture Program — Intermediate

5. Cultivation of Vitamin A-Rich Banana Variety — Intermediate

6. Swine Improvement – Artificial Insemination — Intermediate

7. Tissue Culture of Banana and Evaluation — Intermediate

Joint Research/Extension Efforts

1. Sustainable Taro Production Systems — Intermediate

2. Integrated Crop Production & Management — Intermediate

3. Sustainable Marketing Strategy in Micronesia — Intermediate

ALLOCATED RESOURCES

Fiscal Resources

Extension

Year	Federal	State	Local	Other
2000	200000	14200	45600	0
2001	366600	26300	139200	0
2002	185100	30300	65200	0

2003	184700	70500	114200	0
2004	178200	70500	107700	0

Research

Year	Federal	State	Local	Other
2000	624000	20000	167000	0
2001	543000	45000	201000	0
2002	550000	60000	235000	0
2003	549000	200000	348000	0
2004	533000	200000	333000	0

Manner of Expenditures:

Budgets coming from the formula funds, competitive grants and other sources like local matching funds and 3(d) funds will be expended as planned in each specific research, extension and integrated research and extension projects. In general, these monies will be utilized for the salaries and wages and fringe benefits of the Vice Presidents/Dean, key program, research, extension and administrative staff. International travels are intended to 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 are for monitoring research progress in effectiveness of bio-control agents, different uses of local plants for medicines, integrated crop production and management technologies, field tests of selected local and introduced outstanding/elite plants, 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 are to be purchased as well. In some instances when local experts are not available like marketing, resource economics and sociology, some funds will be allotted to hire consultants from other land grant or other 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 are to be considered, too. Communication within the COM region and to offices collaborating with the College through phone calls, faxes, e-mails and regular mails is also budgeted.

Human Resources (FTEs)

Extension FTEs

Year	Professional			Paraprofessional		
	1862	1890	Other	1862	1890	Other
2000	4.73	0.0	0.0	17.43	0.0	0.0

2001	4.58	0.0	0.0	17.54	0.0	0.0
2002	4.63	0.0	0.0	17.66	0.0	0.0
2003	4.72	0.0	0.0	17.85	0.0	0.0
2004	4.82	0.0	0.0	19.07	0.0	0.0

Research SYs Only

Year	Scientist Years					
	1862	1890	Other	1862	1890	Other
2000	6.92	0.0	0.0	4.97	0.0	0.0
2001	7.09	0.0	0.0	5.31	0.0	0.0
2002	7.27	0.0	0.0	5.68	0.0	0.0
2003	7.57	0.0	0.0	6.29	0.0	0.0
2004	7.92	0.0	0.0	6.99	0.0	0.0

From the FY2000 FTE of 76.07, 34.05 FTE has been assigned to programs that support GPRA Goal 1, representing 45% 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.

STAKEHOLDERS INPUT

The College consults with its various stakeholders in manners considering primarily their convenience and accessibility. They are reached for their valuable comments, suggestions, views, feedback and opinions about existing programs and emerging problems related to program activities.

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.

In order to encourage the participation of local stakeholders, the College operates on a flexible time frame and brings the activities to where they are in order to cater to their needs in the offices, homes and the community. Stakeholders are informed about Land Grant Program activities through letters of invitation, announcements and feature articles in multi-media like newspapers, TV and radio, and liaison with states and local governments.

Other valuable local stakeholders with related programs are Ministries of Education, Resources and Development and quasi-governmental agencies like Community Action Agencies, Informal Employment and Sustainable Livelihood Task Force, Business Associations, Retirees' Association, Conservation Society, local community groups for men, women and youth and political, traditional and Church leaders.

This Plan of Work is not only based on issues and priorities set forth by the National Master Development Plans of the three governments of Palau, Marshall and FSM, but also on strategic planning meetings and needs assessments conducted throughout the islands in Micronesia.

EDUCATION AND OUTREACH PROGRAMS

Results of research will be conveyed to the intended users in various ways. These include participation of interested clientele in planning, implementation and evaluation of projects through the assistance of local state offices and entities with similar community activities. Other means are by including these target users as cooperators in research endeavor to facilitate transfer of knowledge and information to other users. The research results will be translated into simply understood English and local languages for publication in local newsletters, newspapers, brochures and reports for dissemination at open forums, meetings, workshop training and personal communications in farm and home visits for feedback on their usefulness and for improvement.

COM Land Grant staff have participated in the formulation of the Food and Nutrition National Policy. A key component in the policy is community participation in defining needs and roles in areas such as growing food. The current program will be supplemented with the new information that is being generated by the soil chemistry research. Taking this information into the communities will be monitored through counting the number of initial workshop participants, followed by repeated visits to determine if the recommendations are being practiced. Ultimately, the monitoring will determine whether increased food production results and whether overall malnutrition incidence in the communities decreases.

Agriculture Extension Agents have been working at several public elementary schools. Approximately 2,000 students are given lessons on agriculture with lessons designed to be imparted over an entire school year. Some schools are in the process of hiring qualified agriculture teachers who will be teaching full-time general agriculture courses at these schools.

A key component in the educational outreach is the ability to assess learning styles of Micronesian children. The history of extension programs broadly throughout the Micronesia conducted by numerous international aid agencies is one experiencing lack of adoption of recommended behavior. To become more effective in extension delivery, understanding Micronesian learning styles will be addressed.

PROGRAM REVIEW PROCESS

The merit and peer review at COM will involve examination of priorities to be included in the Plan of Work, selection of reviewers with expertise relevant to the effort, and appropriate scientific and technical standards.

Merit Review: At present time, the COM Board of Regents handles reviews of COM priorities. However, advisory groups are being organized at all six COM sites that will be composed of heads of

government agencies and non-governmental associations. These advisory groups will provide COM with direction as to the efforts/issues to be addressed, implementation and evaluation of programs.

Scientific Peer Review: The selection of reviewers is based on the expertise and/or experience related to the proposed activities. A built-in mechanism for reviewing research programs involved program colleagues within the COM system and staff from collaborating agencies. In addition, research scientists from the ADAP institutions are also requested for assistance. The Presidents of the three colleges and the Office of the COM Executive Director are also provided an opportunity to review research projects.

EVALUATION FRAMEWORK

The impacts of agriculture research projects implemented will be monitored to find out if farmers have adapted these local technologies developed by researchers at COM. Extension agents will evaluate the acceptance by farmers on brochures/extension materials, developed especially on how to grow crops/raise animals in a profitable way. Also some applicable parameters to be obtained before and after project implementation are number of local people, extension agents and researchers trained, number of demonstrations conducted, improvement in marketing of produces, number of farms started/expanded, new crops and aquaculture species grown, and number of new cooperating agencies. Level of productivity as a result of adopting what was learned will be determined by conduction economic analysis of successful enterprises.

Although efforts have been initiated in the integration of research and extension, a systematic evaluation mechanism needs to be developed. This will be a system that will deliver research results at appropriate time and implement guidelines considering profitability, environmental safety and acceptance by intended users. Essentially, a pre/post-evaluation mechanism to assess the impacts of program activities to target users. The basic steps in this approach are:

1. Obtaining benchmark information from target audience about their needs, problems and status of activities, knowledge, skills, technologies and behavior.

2. Participation and involvement of target audiences in the planning, development or modification and implementation through meetings, open forums, participatory rural appraisal, on-farm research and demonstrations and other appropriate motivation approaches.

3. Establishment of feedback mechanisms among researchers, extension staff and the target audience by farm visits and interviews at six months after specific programs are delivered to respective participants.

4. Development of practical, relevant and acceptable venues like field days and agricultural fairs for delivery of information, technologies and skills

5. Dissemination of reports, publications, brochures and other printed, electronic and videotaped educational materials to the intended users at appropriate time and venues.

Success in the production of superior plantlets (disease free, uniform, high yielding) in sufficient quantities can be evaluated by looking at tissue culture multiplication and field trial of different crops.

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

STATEMENT OF ISSUES

In Micronesia, food-borne illnesses continue to pose serious health care problems. The warm and highly humid climate in Micronesia provides a favorable environment for the growth and development of microorganisms, particularly microorganisms that are known to cause food and waterborne illnesses. In 1998, a total of 1192 cases of food-borne related illnesses were reported by the Palau Public Health, which is 6.89 percent of the total population of Palau. These cases included amoebiasis, food poisoning (bacterial), gastroenteritis and salmonellosis. In terms of affected population, these illnesses inflicted 6.35% of the present population in Palau (National Bureau of Census and Statistics, 1995). In the RMI, water-borne diseases affect 10% of the population, a level that continues to increase in recent years.

The persistence of the food-borne illnesses is attributed to the following: unreliable power and water supply cause food spoilage; lack of adequate kitchen facilities in several houses; inadequate knowledge, information and expertise on animal diseases as they relate to meat production and storage; vast distances among islands which limit access to programs and services of the people; inadequate knowledge and skills about food safety procedures and practices; and the weather pattern, which has been very unusual over the past years.

Palau is faced with low quality produce intended for the local population and tourists, due to the damage caused by pests, particularly insects and diseases. To cope with increasing demands for local produce and compete with import quality, local producers resort to the use of pesticides beyond the recommended doses and frequencies of application. Alarming concern is the practice of some foreign farmers of using non-English pesticides. Due to languages barrier, communication is very limited to explain the impact of their practices to the health and the environment. Other concerns are the sale of expired foods and medicines over the counter and the customary practice of feeding people during social activities such as house party, funerals, weddings, birthdays with more attention accorded to the amount of food served rather than food safety and proper handling and storage.

Although there has been a lot of improvement and progress on the health and environmental situation in the FSM, communicable diseases contributing to malnutrition continue to be a major problem in all the islands. Many of the environmental problems are due to overcrowding that created poor sanitary conditions, especially in the highly populated areas. For example, Chuuk, the most populated state in the Federated State of Micronesia, has a very high population density of 1081 persons per square kilometer. These overcrowding resulted in poor sanitation and hygiene, and unsafe food and water supply.

In addition, low standards of living, lack of reliable power sources and water systems, inadequate storage facilities and limited knowledge on the part of food handlers, policy makers and the general public contribute to the problem. Educating Micronesian families and policy makers on the importance of practicing food safety and quality control

measures is fundamental to the important task of promoting and maintaining a healthy society to live.

In the Marshall Islands, waterborne disease continues to increase at greater than the population growth. This is a situation that lends itself to intervention provided that basic issues in water quality, food handling and personal hygiene are understood. The fact that water borne disease incidence was lower during the 1998 El Nino drought when drinking water came from reverse osmosis argues that contaminated water catchments contribute significantly to the incidence rate. Fortunately, a mechanism exists to identify those affected by water borne diseases. The RMI Public Health performs data tracking daily for patients who visit the Majuro Hospital. In addition, a zonal nursing program sends groups of outreach nurses to the same community. By providing the patients with water borne disease information at the time of visit to the hospital followed by site visits a week later to determine whether the information was understood and to ascertain the disease source, the level of water borne disease incidence should diminish.

Data collected on waterborne disease incidence in the Marshalls has demonstrated that number of people affected is equivalent to ten percent of the population in magnitude. It is singularly the highest morbidity category of notifiable diseases reported. Each year the increase has an eighty seven percent correlation with the rate of population growth. Indeed, the epidemiological reports rely only on notifiable cases and the real situation is likely to be higher. The examined data from the direct files kept on record is somewhat incomplete. However, the trend as suggested appears to be consistent. When viewing a subset of data from 1990 through 1993, the correlation between waterborne disease incidence and population growth was found to be as high as ninety-seven percent. Since gastroenteritis, diarrhea, typhoid, paratyphoid, amoebiasis and hepatitis are collectively designated as waterborne diseases, the incidences relate to water quality, sanitation, and food preparation and storage issues. Moreover, the fact that there is such a high correlation with population growth suggests that current programs in these areas are having little impact in alleviating the problem.

Under the issue of food security, linkage with GPRA Goal 1 and 3 addresses the issue of malnutrition and how this may be alleviated. Accessibility to affordable food that is nutritionally appropriate is the main concern in this area. Many students come to school in the morning without eating a meal and cannot afford to purchase food throughout the day. Many students will share with one another a packet of dried ramen, popcorn sprinkled with kool-aide and will drink a cola. Some have resorted to eating raw turkey tails since affordable prepared foods are not readily available. Thus, food quantity and quality is a very real food security issue.

PERFORMANCE GOALS

1. To annually increase the research and knowledge-base available on food accessibility and affordability. In the Report, describe the most significant research completed during the report year and its impact.

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

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

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

OUTPUT INDICATORS

INDICATOR 1

In the Plan, describe significant research underway or proposed on food accessibility and affordability. In the Report, describe the most significant research completed during the report year and its impact.

INDICATOR 2

The number of patients given extension information on potential sources contributing to waterborne diseases will be recorded.

INDICATOR 3

The number of patients visited by zonal nurses and extension agents will be recorded and classified by those understanding the information provided, those that attempted to rectify their potential household problem(s) and those requiring assistance in understanding and correcting potential sources.

INDICATOR 4

The accessibility to affordable food is covered under GPRA Goal 1 in terms of the families adopting recommendations to produce their own food and under GPRA Goal 3 for nutritionally appropriate foods. The numbers of families reached to receive recommendations will be recorded.

Year	Number of persons completing non-formal education program		Number who actually adopted recommended practices	
Baseline (1998)	410		350	
	Target	Actual	Target	Actual
2000	1435		820	
2001	1505		1000	
2002	1650		1030	
2003	1795		1140	
2004	1900		1250	
Total	**8285**		**5240**	

INDICATOR 5

The total number of persons completing non-formal consumer education programs on food access and food affordability, and the total number of these persons who actually adopted one or more recommended practices within six months after completing one or more of these programs will be recorded.

Year	Number of persons completing non-formal education program		Number who actually adopted recommended practices	
Baseline (1998)	410		350	
	Target	Actual	Target	Actual
2000	1435		820	
2001	1505		1000	
2002	1650		1030	
2003	1795		1140	
2004	1900		1250	
Total	**8285**		**5240**	

INDICATOR 6

Increase the effectiveness of constituent and citizen participation of public policy issues affecting food security (i.e., food access, affordability, and recovery), the total number of persons completing non-formal education programs on public policy issues affecting food security (i.e., food access, affordability, and recovery), and the total number of these persons who actually become actively involved on such issues within six months after completing one or more of these programs will be recorded.

Year	Number of persons completing non-formal education program		Number who actually become involved	
Baseline	0		0	
	Target	Actual	Target	Actual
2000	50		50	
2001	60		60	
2002	70		70	
2003	80		80	
2004	100		100	
Total	**360**		**360**	

INDICATOR 7
The total number of students taught lessons in food safety and nutrition under agreements with State and Local Governments to allow such lessons to be taught in the public schools.

Year	Number of persons completing non-formal education program		Number who actually adopted recommended practices	
Baseline (1998)	410		350	
	Target	Actual	Target	Actual
2000	1435		820	
2001	1505		1000	
2002	1650		1030	
2003	1795		1140	
2004	1900		1250	
Total	**8285**		**5240**	

INDICATOR 8
Total number of persons trained on safe use of pesticides and other pest control measures

Year	Number of persons completing non-formal education program		Number who actually adopted recommended practices	
Baseline	0		0	
	Target	Actual	Target	Actual
2000	50		50	
2001	50		50	
2002	50		50	
2003	50		50	
2004	75		75	
Total	**275**		**275**	

INDICATOR 9
Number of reports or publications on safe use of pesticides and other pest control measures

INDICATOR 10

The total number of persons completing non-formal consumer education programs on food safety and/or food borne risks and illnesses, and the total number of these persons who actually adopted one or more recommended food safety behaviors or practices within six months after completing one or more of these programs

Year	Number of persons completing non-formal education program		Number who actually adopted recommended practices	
Baseline (1998)	410		350	
	Target	Actual	Target	Actual
2000	1435		820	
2001	1505		1000	
2002	1650		1030	
2003	1795		1140	
2004	1900		1250	
Total	**8285**		**5240**	

INDICATOR 11

The total number of persons completing food handler certification programs.

Year	Number of persons completing non-formal education program		Number who actually adopted recommended practices	
Baseline (1998)	69		69	
	Target	Actual	Target	Actual
2000	50		50	
2001	75		75	
2002	75		75	
2003	90		90	
2004	90		90	
Total	**380**		**380**	

OUTCOME INDICATORS

INDICATOR 1

The reduction of the number of people contracting waterborne diseases. This should come from the elimination of causes thereby reducing the risk of exposure for household members. If action is taken quickly, the reduction in the number of affected people per month can be as large as: h(m-1), where h equals the average number of households per month having more than one member contracting waterborne disease and m equals the average number of household members affected per month. The overall rate reduction can be: [(h + p)/(h(m) + p)], where p equals the average number of people affected per month who are the only household member contracting a waterborne disease. The distinction with p suggests that these individuals did not contract the waterborne disease from some household cause. The relative distribution of h, m and p can be calculated with the monitoring process from the initial reductions measured.

INDICATOR 2

Further reduction of the number of people contracting waterborne disease through the translation of adopting the recommended water quality (mostly catchments), sanitation, food preparation and storage conditions practices by neighbors who witness the benefit accrued by households that have adopted these recommendations. In time, the direct contacts to households should begin to demonstrate a second level of reduction through prophylactic practices adopted by neighbors. It is suggested that this translation in adopting recommendations will decrease h above through lowering the probability of contracting waterborne diseases from household causes. The input from p above may even be reduced if it is found that current practices within a number of households rapidly respond to their first case by eliminating the causal situation, thereby limiting the number in the household contracting the waterborne disease to a single individual. If this action is found to be employed, not only would it support the contention of this proposal that rapid action can be a prophylaxis to other household members, it suggests that translation of the recommendations to neighbors can be a prophylaxis for even the first incidence.

INDICATOR 3

The effectiveness in changing public policy will be measured by the ability to return a food snack or lunch program in the public schools and the number of children served will be recorded.

INDICATOR 4

The effectiveness of the educational programs delivered to the target audiences will be monitored and evaluated as possible/appropriate to the local cultures and situation. Pre/post monitoring and evaluation will be conducted. Data to be gathered are number of local people, extension agents, teachers and students, and other trained; change in knowledge, skills and attitude of the trained participants. The progress and impacts made from these activities to the community will be reported on a monthly, quarterly and annual basis.

INDICATOR 5

Outcome indicators derived from the Food Safety and Quality Performance Monitoring Plan will be used to determine the overall impact of the program. An estimate of 50% of the participants will improve food

handling knowledge and practices, and an estimate of 10% of other States will adopt the program developed by the FSQ project. Food Safety and Quality Education include the following: practice safe food handling to prevent diseases; apply appropriate storage techniques; adopt recommended cooking times and temperatures; use of proper hygiene; us of careful food selection techniques at food establishments; IPM for growing crops; pesticide applicator training; and pesticide impact assessment.

INDICATOR 6
Qualitative measurements are number of reports and number of customers/clientele becoming aware in adopting recommended technological skills and knowledge in producing safe and affordable food.

KEY PROGRAM COMPONENTS

Various ways to deliver the program will be in the form of publication, workshops, meetings, public forums, lecture through short courses in or outside the classrooms, community outreach sessions, and distance education. Educational programs, including EFNEP, will be conducted where nutrition, food safety, and cooking demonstrations will be part of the lessons.

Toward the ultimate goal of contributing to the production of safer and affordable food sources, adaptive joint research and extension activities will be conducted. Appropriate information and technologies for the dissemination of information is through staff training, farm visits, workshops and production of educational materials. Regular food handlers training will be conducted and inspection and monitoring of food establishments will be made.

Through this program, a model for food sanitation certification will be developed and food safety educational materials will be developed. A Food Safety Recommended Package will also be developed which will include fact sheets relating to each key food safety concept and there will be hands-on activities to teach each concept. Food safety education that focuses on safe snack for lunch will be developed and presented to 4-H and Youth Development program participants.

Participation by the Public Health Service, the Environmental Protection Authority, and National Food Safety Program are important prerequisites in the implementation of this program. The issue has already been presented to each agency and others who are concerned with community health.

In the Marshall, it is expected that the current database management program can be more effectively utilized to target people who have contracted a waterborne disease. CMI-CRE has volunteered to write the database call program to identify patients who sought treatment as a result of water borne disease. First, doctors will be instructed to provide waterborne disease patients with brochures currently utilized by the RMI Environmental Authority, RMI Public Health, and Land Grant Extension that address water quality (mostly catchments), sanitation, food preparation and storage conditions. The database program will collect the weekly list of patients who have contracted waterborne diseases and the zonal nurses will be instructed to visit their respective patients in the week immediately following their diagnosis. Patients' understanding of the information provided plus household conditions will be monitored to determine if point sources contributed to contracting the disease and whether steps have been taken to eliminate potential causes. Extension agents will make site visits when it is determined that further reinforcement would provide additional benefit in the acceptance of the recommendations. New brochures will be prepared if it is determined that focusing on certain point sources is warranted.

INTERNAL AND EXTERNAL LINKAGES

Extension Agents under EFNEP, Water Quality and 4-H are equal partners in facilitating educational outreach programs and plus tracking implementation of this program with external collaborators.

The Public Health Service and Environmental Protection Authority are important collaborators for the success of this program. The PEACESAT central headquarters at the University of Hawai`i provides

valuable technical support and program delivery for telecommunications, Internet access and distance education. The University of Guam conducts valuable distance education outreach to Micronesia. Technical and funding assistance will be sought from local, regional and international agencies such as ADAP, UNICEF, SPC and Office of Agriculture and Forestry through existing collaborative efforts.

TARGET AUDIENCES

The target audience are families, teachers and students, food handlers, quarantine officers, policymakers, producers, and importers. Subsequently the entire Micronesian Island population will benefit from this program.

PROGRAM DURATION

The implementation of the selected research and extension programs will improve access to an affordable, healthful, and culturally relevant food supply and will improve food safety by controlling or eliminating food and water-borne risks. These following programs will also provide appropriate information to increase consumer awareness and understanding of food safety issues:

Program Activities	**Duration**
Research	
1. Identification of Patients Afflicted with Waterborne Diseases	Short Term
Extension	
1. Prevention of Food Borne Illnesses	Intermediate
2. Food Sanitation Certification Training	Intermediate
3. Food Safety Education Focusing on Safe Snack Lunch for Youth and 4-H	Intermediate
4. Risk Assessment and Management	Intermediate
5. Integrated Pest Management for Crops	Intermediate
6. Pesticide Applicators Training	Intermediate
7. Pesticide Impact Assessment	Intermediat
Joint Research/Extension	
1. Pesticide Management and FQPA Implementation	Intermediate

ALLOCATED RESOURCES

Fiscal Resources

Extension

Year	Federal	State	Local	Other
2000	224800	14200	53000	0
2001	146900	26300	40100	0
2002	223900	30300	85200	0
2003	228500	70500	158100	0
2004	227000	70500	156500	0

Research

Year	Federal	State	Local	Other
2000	0	0	0	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, competitive grants and other sources like local matching funds and 3(d) funds will be expended as planned in each specific research, extension and integrated research and extension projects. In general, these monies will be utilized for the salaries and wages and fringe benefits of the Vice Presidents/Dean, key program, research, extension and administrative staff. International travels are intended to 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 are 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 are to be purchased as well. In some instances when local experts are not available locally like marketing, resource economics and sociology, some funds will be allotted to hire consultants from other land grant or other 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 are to be considered, too. Communication within the COM region and to offices collaborating with the College through phone calls, faxes, e-mails and regular mails is also budgeted.

Human Resources (FTEs)

Extension FTEs

Year	Professional			Paraprofessional		
	1862	1890	Other	1862	1890	Other
2000	5.32	0.0	0.0	6.82	0.0	0.0
2001	5.45	0.0	0.0	7.03	0.0	0.0
2002	5.60	0.0	0.0	7.26	0.0	0.0
2003	5.84	0.0	0.0	7.64	0.0	0.0
2004	6.14	0.0	0.0	8.07	0.0	0.0

Research SYs Only

Year	Scientist Years					
	1862	1890	Other	1862	1890	Other
2000	0.0	0.0	0.0	0.0	0.0	0.0
2001	0.37	0.0	0.0	0.0	0.0	0.0
2002	0.41	0.0	0.0	0.0	0.0	0.0
2003	0.47	0.0	0.0	0.0	0.0	0.0
2004	0.54	0.0	0.0	0.0	0.0	0.0

From the FY2000 FTE total of 76.07, 12.14 has been assigned under GPRA Goal 2, representing 16% 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.

EVALUATION FRAMEWORK

The 24-hour food recall and food checklist will be administered at the beginning and at the end of program. Daily observations will be conducted at homes and during cooking demonstrations and these results will be documented. Number and kinds of crops grown and consumed by families will be recorded

and documented. Follow up visits to homes and food establishments will be conducted three months after the end of program. The documentation of observations and visits will validate how much clientele have adopted from new knowledge and skills acquired from the program. Collection of total participation record and assessment of impact of programs on clientele will be compiled.

STAKEHOLDERS INPUT

Input from collaborating agencies such as the Ministries of Education and Health, State Governors and traditional leaders were obtained for the planning of existing programs and emerging problems related to COM land-grant activities. Additional information from stakeholders were obtained through survey instruments, meetings, open forums and workshops, and field visits. TV and radio announcements were made in solicitation of inputs from the public.

PROGRAM REVIEW PROCESS

The merit and peer review at COM will involve examination of priorities to be included in the Plan of Work, selection of reviewers with expertise relevant to the effort, and appropriate scientific and technical standards.

Merit Review: At present time, the COM Board of Regents handles reviews of COM priorities. However, advisory groups are being organized at all six COM sites that will be composed of heads of government agencies and non-governmental associations. These advisory groups will provide COM with direction as to the efforts/issues to be addressed, implementation and evaluation of programs.

Scientific Peer Review: The selection of reviewers is based on the expertise and/or experience related to the proposed activities. A built-in mechanism for reviewing research programs involved program colleagues within the COM system and staff from collaborating agencies. In addition, research scientists from the ADAP institutions are also requested for assistance. The Presidents of the three colleges and the Office of the COM Executive Director are also provided an opportunity to review research projects.

Key program staff from the College and local agencies with known expertise and experience reviewed the proposed plan of work. The Three College Presidents and the local Board of Regents/Trustee and the COM Board of Regents also reviewed the draft POW.

EDUCATION AND OUTREACH PROGRAMS

Data collected by the RMI Public Health Service indicates the level of water borne disease incidence monthly over the past years from 1989. It is expected that the water borne disease incidence level will decrease significantly over time after initiation of this program. Effectively utilizing personnel and programs already in place under various departments is an expected outcome of this effort to alleviate waterborne diseases.

EFNEP Extension Agents have been working with students at several public elementary schools, providing lessons on food safety and nutrition with lessons designed to be imparted over an entire semester.

Repeated under this GPRA Goal is the critical issue of the ability to assess Marshallese learning styles. The history of extension programs broadly throughout the Marshalls conducted by numerous international aid agencies is one experiencing lack of adoption of recommended behavior. This is also reflected under formal education that finds 42% of the school-age children not in school, 45% of entering college

students being placed in a remedial program to bring their performance to college standards with some starting from the minimum threshold set at a fourth grade reading and math level, and the overall average grade-point-average in the college being a 1.81 on a scale to 4.0 being an "A." CMI-CRE extension agents also experience open challenges at their workshops, not because of the content being shared but more likely a result of a clash between learning styles of the presenter and certain members of the audience. To become more effective in extension delivery, understanding Marshallese learning styles will be addressed.

GOAL 3 - A HEALTHY, WELL-NOURISHED POPULATION.

STATEMENT OF ISSUE

Micronesia has a uniform temperature all year round and known for its abundance of locally grown nutritious foods like taro, breadfruit, yam, banana, sweet potato, fresh fruits and vegetables. The islands are surrounded by ocean which provides good protein and calcium sources such as fish and other seafood that can always be harvested fresh. Despite these resources, Micronesian families have developed high preference of low nutritious imported foods such as frozen and canned meat, turkey tail, chicken, corned beef and polished rice. Micronesian families choose imported food based on convenience of obtaining, cooking, storing and taste preference, which is associated with limited knowledge in meal planning, food preparation and food choices.

Malnutrition continues to be a major health problem in Micronesia today due to the following reasons:

1. New lifestyles which shift from subsistence economy to a wage economy
2. High preference of low imported food over locally grown nutritious food.
3. Convenience in obtaining, cooking and storing of imported food.
4. Socio-economic and cultural restrictions.
5. Illiteracy
6. Geographical distances between the islands.
7. Lack of knowledge in planning and preparing nutritious meals for the families and children.

In the past, Micronesians worked hard to obtain their nutritious and fresh food by farming and fishing. Nowadays, people only buy food that is too rich in saturated fat, sugar, salt and preservatives. In the 1996 FSM Analysis Report on women and children, it was reported that 50% of the household income goes to food, of which 37% goes to foodstuff like rice, canned fish, canned and frozen meat, 4% to beverages and 5% to tobacco. Only 12% go to local food. These have contributed to an increased risk for malnutrition and diet-related illnesses among adults such as hypertension, cardiovascular diseases, diabetes, liver diseases and kidney diseases. In 1996, the reported prevalence rates of individuals with these diet-related diseases recorded by the Ministry of Health in Palau were: hypertension at 4.1 per 1,000, diabetes mellitus at 25.3 per 1,000, cerebrovascular diseases (stroke) at 8.9 per 1,000 and other cardiovascular diseases at 5.1 per 1,000 (Lerago and McCready, 1996). According to the 1992

FSM/UNICEF Nutrition Report, the nutritional problem among women is not only obesity and overweight, but also underweight and anemia. In children, the problem is low-birth weight, vitamin A deficiency, iron deficiency and anemia. According to the 1992 study of Mahoney, 14% of the sampled children showed severe vitamin A deficiency while 48% showed moderate deficiency. One important cause noted is the decline in breast-feeding. Children were also found to have low consumption of green and leafy vegetables and a moderate intake of fruits although fruits are seasonal. Among the adult population, overweight and obesity are major concerns.

From the work of Gittelsohn et.al. 1998, it is understood that nutrition related dynamics in the Marshalls shows a high level of discordance in nutritional status (39%) that appears to fall under two broad categories: undernutrition (stunting&wasting) among young children up to 5 years of age and overnutrition (obesity) in adults over 18 years of age. A recent 1996/97 survey found a significant number of children under 5 years of age during the critical growth years to be classified as wasting (low weight-to-height, 7%) or stunting (low height-for-age, 39.6%). The prevalence of overnutrition is 56.5% in adults with a higher incidence among females over age 20 years (61.6%) compared to males (50.5% where rates rise sharply after age 40 years). The most prominent household discordance pattern (30%) is that of concurrent adult overnutrition and child undernutrition. Given that overweight and obesity are precursors to diabetes and other chronic illnesses, these situations indicate a public health issue of importance.
Analysis of the survey data demonstrates differences in nutritional status by locale and household economic status. Majuro (Capital City of RMI) households have higher rates of obesity in all age groups than do outer atoll households. In Majuro, lower economic status is associated with higher rates of obesity except in the elderly. Rates of stunting do not appear to differ by locale, but do differ by economic status within locale. In Majuro, after age 5 wealthier households have less stunting but before age 5 the opposite pattern is seen.

Diet plays a key role in explaining some of these differences including the contraindicatory patterns for the young in Majuro. Majuro households consume store bought foods high in fat and low in fiber much more frequently than in remote atolls. Majuro households are also much more likely to fry foods in oil. The reverse pattern is more frequently observed in the outer atolls in which locally produced foods comprise a larger portion of the diet and are generally lower in fat with higher fiber content.

Appropriate nutrition education remains an important issue including the benefits of increased physical activity. How this education is delivered to affect a change in behavior is noted as the major challenge for this program.

PERFORMANCE GOALS

1. To annually increase the research and knowledge-based made available on health sciences and health promotion.

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

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

4. To reduce the prevalence of low birthweight and improve the nutritional status of infants.

5. To prevent undernutrition and micronutrients deficiency among the children.

6. To prevent overweight and obesity among adults including pregnant mothers thereby reducing their risk to NCD, i.e. diabetes, hypertension and heart diseases.

7. To improve nutritional status of pregnant and nursing mothers.

8. To annually increase the availability of health education programs to communities

OUTPUT INDICATORS

INDICATOR 1

In the Plan, describe significant research underway or proposed on health science and health promotion. In the Report, describe the most significant research completed during the report year and its impact.

INDICATOR 2

The number of children/communities measured to determine the extent of malnutrition will be recorded.

INDICATOR 3

The total number of persons completing non-formal nutrition education programs that provide dietary guidance to consumers, the total number of these persons who plan to adopt one or more recommended Dietary Guidelines, and the total number of these persons who actually adopt one or more recommended Dietary Guidelines within six months after completing one or more of these programs will be recorded.

Year	Number of persons completing non-formal education program		Number who actually adopted recommended practices	
Baseline	500		300	
	Target	Actual	Target	Actual
2000	550		300	
2001	619		400	
2002	712		550	
2003	836		575	
2004	1003		750	
Total	**3720**		**2575**	

INDICATOR 4

The total number of students taught lessons in food safety and nutrition under agreements with State and Local Governments to allow such lessons to be taught in the public schools.

Year	Number of persons completing non-formal education program		Number who actually adopted recommended practices	
Baseline	500		300	
	Target	Actual	Target	Actual
2000	550		300	
2001	619		400	
2002	712		550	
2003	836		575	
2004	1003		750	
Total	**3720**		**2575**	

INDICATOR 5

Total number of persons completing in non-formal education programs on food selection, food choices, food purchasing, the total number of these persons who plan to adopt practices, and the total number of these persons who actually adopt one or more recommended practices.

Year	# of persons completing non-formal nutrition education program.		# who plan to adopt recommended practices.		# who actually adopt practices.	
Baseline	0					
	Target	Actual	Target	Actual	Target	Actual
2000	550		550		300	
2001	619		619		400	
2002	712		712		550	
2003	836		836		575	
2004	1003		1003		750	
Total	**3720**		**3720**		**2575**	

OUTCOME INDICATORS

INDICATOR 1

The immediate outcome from this program is the number of families adopting the recommended practices leading to a measurement of the increased amount of food being consumed from their own production.

Year	Number of persons completing non-formal education program		Number who actually adopted recommended practices	
Baseline	500		300	
	Target	Actual	Target	Actual
2000	550		300	

2001	619		400	
2002	712		550	
2003	836		575	
2004	1003		750	
Total	**3720**		**2575**	

INDICATOR 2
The effectiveness in changing public policy will be measured by the ability to return a food snack or lunch program in the public schools and the number of children served will be recorded.

INDICATOR 3
The larger outcome targeted is the reduction of malnutrition, initially in the reduction of the recent and acute malnutrition incidence level as measured under the Waterloo Standard that combines weight per age and height per age indicators, then ultimately over time, a reduction of the severe and chronic malnutrition incidence level.

KEY PROGRAM COMPONENTS

Towards development of a healthy and well-nourished population, this program considers educational approaches that are appropriate for diverse age, cultures, race and level of preparedness and covering home, school, work and community to reach all people.

Essential components to effectively deliver the program are training of staff and local volunteers, strengthening collaboration with programs and agencies with related activities, and developing appropriate educational materials, including the following:

a). Pre/post test, 24-hour food recall, family behavior checklist and EFNEP lessons. With the existing lessons in Food and Nutrition, Meal Planning, Preparation and Purchasing, Food Sanitation and Home Gardening the following will be added: lessons on breastfeeding, weaning food, focusing on local food, Vitamin A to be addressed with high emphasis on local green leafy vegetables because there is an abundance of it, and Non-Communicable diseases.

b). Using any or combination of the following to reach out to target audiences: awareness meetings, publications, video, TV and radio programs, workshops, seminars and training.

c). As an effort to update and upgrade the technical capability of the staff in nutrition, the following strategies will be adopted: a lesson plan addressing the local issues and problems will be used; formal workshops will be organized and coordinated on staff development effort; and regular staff development meeting will

continuously be done monthly, quarterly and annually with focus on organizational development, motivation and group dynamics.

Health and nutrition staff will continue to work closely with community leaders, men and women groups, youth groups, and inter-agency groups in the planning and implementation of health and nutrition activities. EFNEP lessons on Food and Nutrition, Meal Planning and Purchasing, Food Sanitation, Food Preparation, Breastfeeding and Home Gardening will be part of the emphasis of this program. Programs will be delivered directly to the clientele in small groups and through community workshops and seminars.

Collaboration with the numerous programs in Micronesia which are addressing nutrition and health issues will continue with the focus on changing perception and behavior. It is understood that the amount and type of available foods affect part of youth malnutrition. It is hoped that the process of raising local foods will not only help directly through providing increased amounts and types of quality foods, but will lessen the demand on the family income allowing supplemental foods to be purchased.

INTERNAL AND EXTERNAL LINKAGES

This program will work closely with other CES programs that promote growing and use of locally nutritious foods. These include Sustainable Agriculture, EFNEP, FSQ, CRD, and 4-H.

Collaboration with the Ministry of Health and Environment, Division of Human Nutrition of the Department of International Health of Johns Hopkins University, Ministry of Internal Affairs, Municipal Governments, policymakers, and men and women's groups will continue as part of the educational outreach. The PEACESAT central headquarters at the University of Hawai`i provides valuable technical support and program delivery for telecommunications, Internet access and distance education. The University of Guam conducts valuable distance education outreach to Micronesia.

Collaboration with regional and international organizations such as ADAP, UNICEF, SPC, etc. is important for the technical and funding aspect of the program.

TARGET AUDIENCES

Families throughout the Micronesian region are the beneficiaries of this outreach. Food handlers, young mothers, and students in elementary schools will be taught lessons on food safety and nutrition.

PROGRAM DURATION

GPRA Goal 3 is closely tied to the expected outcomes under the EFNEP program and GPRA Goals 1 and 2. The measurement of the extent of malnutrition in the school children will be short-term in nature. However, the overall issue has been an ongoing program addressing concerns in the area of nutrition and it is expected that it will be long term in nature as a result of the need to continually reinforce information on nutrition shared broadly throughout the community. Some programs developed to address food safety and nutrition issues are as follows:

Program Activities	**Duration**
Research (No Research Program)	
Extension	
1. Family Food Production Program	Intermediate
2. Food Safety and Quality	Intermediate
3. Water Quality	Intermediate

4. Nutrition, Diet and Health — Intermediate
5. EFNEP — Long Term

ALLOCATED RESOURCES

Fiscal Resources

Extension

Year	Federal	State	Local	Other
2000	139400	14200	27700	0
2001	107600	26300	22300	0
2002	137900	30300	40900	0
2003	138900	70500	68400	0
2004	157100	70500	86600	0

Research

Year	Federal	State	Local	Other
2000	0	0	0	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	3.30	0.0	0.0	5.04	0.0	0.0
2001	3.38	0.0	0.0	5.15	0.0	0.0
2002	3.45	0.0	0.0	5.35	0.0	0.0
2003	3.55	0.0	0.0	5.59	0.0	0.0
2004	4.25	0.0	0.0	6.15	0.0	0.0

Research SYs Only

Year	Scientist Years					
	1862	1890	Other	1862	1890	Other
2000	0.0	0.0	0.0	0.0	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

ALLOCATED RESOURCES

From the FY2000 FTE total of 76.07, 8.34 has been assigned under GPRA Goal 3, representing 11% 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

EVALUATION FRAMEWORK

The progress and impacts of the various educational programs to the targeted audience will be monitored and evaluated on monthly, quarterly, and annual periods. The change in attitudes of the program participants and the communities they live in will be documented at the beginning and six months after the program delivery. Measurable information such as number of trained local volunteers, extension agents and participants, number of collaborators involved, diets before and after training, anthropometric measurement of mothers and children before and after the training, and incidence of diet-related illness in respective communities will be compiles. The health and nutrition program will be evaluated after the lessons are completed, after three months, 6 months and one year thereafter. To determine knowledge impact, a pre/post test will be administered. A 24- hour food recall and family food checklist will be taken twice, at the beginning and at the end of program. Interviews and visitation to homes will be conducted to determine changes in food and dietary pattern. The participants together with children under six years of age will be weigh before and after the lessons and during follow-ups.

STAKEHOLDERS INPUT

Previous plans of work for Cooperative Extension Service for Micronesia and the GPRA Performance Plans were consulted. Review of National Master Development Plans of the three nations, UNDP reports, and survey results were used as references. This 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 the local

newspapers and were aired over the radio stations. The announcements were in English and the vernacular. Public meetings were held to discuss the U.S. Federal Requirements, stakeholder input and the implementation role by COM Land Grant Staff.

PROGRAM REVIEW PROCESS

The merit and peer review at COM will involve examination of priorities to be included in the Plan of Work, selection of reviewers with expertise relevant to the effort, and appropriate scientific and technical standards.

Merit Review: At present time, the COM Board of Regents handles reviews of COM priorities. However, advisory groups are being organized at all six COM sites that will be composed of heads of government agencies and non-governmental associations. These advisory groups will provide COM with direction as to the efforts/issues to be addressed, implementation and evaluation of programs.

Scientific Peer Review: The selection of reviewers is based on the expertise and/or experience related to the proposed activities. A built-in mechanism for reviewing research programs involved program colleagues within the COM system and staff from collaborating agencies. In addition, research scientists from the ADAP institutions are also requested for assistance. The Presidents of the three colleges and the Office of the COM Executive Director are also provided an opportunity to review research projects.

EDUCATION AND OUTREACH PROGRAMS

Measurement of undernutrition and overnutrition in the youth and adult categories will be continued to compare changes in profile.

EFNEP Extension Agents will be working in the communities with young mothers and with students at public and private elementary schools, providing lessons on food safety and nutrition with lessons designed to be imparted over an entire semester.

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

STATEMENT OF ISSUES

The expansion of agriculture within Micronesia must be done with careful consideration for the fragile environments of its island members. Eco-friendly approaches and practices for agriculture must be selected carefully to ensure harmony between farming and the environment; for example pesticide use, deforestation, and topsoil erosion. Implemented practices should not only conserve the local natural resources in all islands, but also enhance their positive environmental effects. The importation of non-biodegradable materials and packaging such as aluminum cans, pampers, plastics and styrofoam products have led to environmental degradation. Small islands cannot survive for long if ecologically unhealthy agricultural practices are carried out. Blending traditional wisdom and practices with improved technologies may serve as a solution to the problem of increasing ecological disturbances as a result of unhealthy agricultural practices.

The Economic Development Plans for Palau, Marshall and FSM identified agriculture and forestry, tourism and fisheries as important areas to develop in order to attain economic self-sufficiency. However, economic activities will always pose threats to the environment. On some islands, large-scale development programs are being planned to accommodate the increasing tourism industry and the increase in the population. Terrestrial habitats are being destroyed as a result of road building, hotel construction, and commercial agricultural

activities. Deforestation for developmental projects and agricultural programs not only destroys the habitat, but also reduces the quality of the soil and increase soil erosion. Additionally, sedimentation resulting from erosion will negatively impact aquatic resources. The increase in demand for water could also lead to dam building, which will affect the ecology of rivers and lakes. On low-lying islands, the depletion of fresh water supply has led to the intrusion of salt water into the water lens. The rise in the sea level also cause saltwater intrusion into taro farms on many small islands.

Balance between agriculture and the environment concerns communities. And as the pursuit towards industrialization becomes dynamic, issues and problems relating to threatened loss of endemic, indigenous species and introduced exotic promising plants are major concerns to tackle. Lack of public awareness about conservation, monitoring and management of plants will be addressed. The importance of environmental preservation is clearly stated in Palau's Economic Development Plan which states, "the preservation of Palau's natural resources and biodiversity, including both flora and fauna, is a critical component to achieving the goals of economic, social and cultural development." Many areas that have been identified for economic development also threatened the coastal marine environment. These activities should be monitored closely and proper planning should be adopted to ensure that economic development activities do not destroy the marine environment.

There is limited or even lack of knowledge about pests, damage to crops, control and IPM methods/tools/practices considered effective in reducing pest, but still get the economic yield with chemical control. There is a recognized need to protect Micronesian environment through the strengthening of its quarantine process. The continuing influx of pests and diseases is of great concern as reliance on subsistence agriculture to supply the necessary foods based on edible aroids, sweet potato, breadfruit, bananas, coconuts, a variety of vegetables and tropical fruits is made vulnerable. The nature of the small subsistence holdings exacerbates the ability to control pest and disease outbreaks. The use of chemical pesticides is further prohibited by legislation in some places, like the Marshall Islands. The results of regional projects and institutions, other than some biological controls, on plant protection have yet to make a noticeable impact. This Strengthening of Plant Protection/Quarantine Services Project intends to address this issue in collaboration with the Secretariat for Pacific Communities (SPC) and the Agriculture Divisions in each of the Island States.
Other control measures will be implemented whenever appropriate. Cultural practices intended to reduce the level of pathogen will be taught. These include crop rotation, the use of organic manures or other soil amendments and sanitation. Crop rotation introduces non-host plants thereby limiting the available pathogen niche. Antagonistic microbes may be introduced through the use of organic manures, limiting the survival of soilborne pathogens. Mineral ash can alter soil pH creating a non-permissive environment for certain pH sensitive pathogens. Sanitation practices remove plant residues that support the survival of pathogens. These sanitation practices include pruning, burning or deep burial of host plants, removal of weeds or alternative host plants that can act as pathogen reservoirs, and disinfecting tools between usage to lessen direct inoculation transfer. Finally, if disease resistant varieties can be identified, their introduction will be promoted to reduce the spread of ongoing infection on a case by case basis.

RMI recognizes its commitment to Biodiversity with the adoption of a vision that states that, "RMI's Ecosystem will become more sustainable with a clean environment, sufficient marine resources, and with healthy people working together. Traditional customs learned from ancestors will continue to be practiced."

The availability of toilets continues to be of concern not only for the comfort and well being of homes, but the impact on the environment can be an issue given the lack of infrastructure to manage sewage

outflow. The desire for flush toilets has been repeatedly expressed for households that are located beyond the urban systems. The environmental impact of this situation and its connection to overall health remains a sensitive issue that will be addressed.

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.

2. To annually increase agricultural producer awareness, understanding, and information regarding the adoption of agricultural production practices that sustain and/or protect ecosystem integrity and biodiversity.

3. 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.

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

5. 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.

6. 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/cultivar species, land preparation, plant nutrition, pest and disease management, crop rotation (for annual crops such as vegetables), etc.

7. To annually increase agricultural producers awareness, understanding and information regarding the adoption of agricultural production practices of specific crops that sustain and/or protect ecosystem integrity and biodiversity in which CSREES partners and cooperators play an active extension role.

OUTPUT INDICATORS:

INDICATOR 1

In the Plan, describe significant research underway or proposed on environmental sciences and related topics. In the Report, describe the most significant research completed during the report year and its impact.

INDICATOR 2

Number of publications, technical reports, public forums, training workshops, people trained, news articles, brochures, and pamphlets.

INDICATOR 3

The number of agents trained in quarantine issues will be recorded.

INDICATOR 4

The total number of persons completing non-formal education programs on public policy issues affecting agricultural production and ecosystem integrity and biodiversity, and the total number of these persons who actually become actively involved in one or more public policy issues within six months after completing one or more of these programs will be recorded.

Year	Number of persons completing non-formal education program		Number who actually adopted recommended practices	
Baseline	500		300	
	Target	Actual	Target	Actual
2000	550		300	
2001	619		400	
2002	712		550	
2003	836		575	
2004	1003		750	
Total	**3720**		**2575**	

INDICATOR 5

The total number of persons completing non-formal education program on sustaining and protecting ecosystem biodiversity while improving the productivity of the U.S. agricultural production system, and the total number of these person who actually adopt one or more recommended practices after completing one or more of these programs.

Year	Number of persons completing non-formal education program		Number who actually adopted recommended practices	
Baseline (1998)	442		400	
	Target	Actual	Target	Actual
2000	550		550	
2001	619		619	
2002	712		712	
2003	836		836	
2004	1003		1003	

Total	**3720**		**3720**	

INDICATOR 6
The total number of students taught lessons in agriculture, biodiversity and ecological/environmental concerns under agreements with State and Local Governments to allow such lessons to be taught in the public schools.

Year	Number of persons completing non-formal education program		Number who actually adopted recommended practices	
Baseline (1998)	442		400	
	Target	Actual	Target	Actual
2000	550		550	
2001	619		619	
2002	712		712	
2003	836		836	
2004	1003		1003	
Total	**3720**		**3720**	

INDICATOR 7
Yield and dollar value of selected crops that utilize the state's or territory's minimum set of recommended integrated pest management practices would be gathered. Target figure will be indicated.

INDICATOR 8
The number of commercial farm and home gardens established, and how many of these farms and gardens use ecologically friendly technologies.

Year	Number of farms and home gardens established		Number of farms and home gardens using ecologically friendly techniques	
Baseline	0		0	
	Target	Actual	Target	Actual
2000	50		50	
2001	50		50	
2002	72		72	
2003	72		72	
2004	75		75	
Total	**319**		**319**	

INDICATOR 9

The number of atolls/small islands demonstration home garden established, and number of family/household adopting eco-friendly practices and management.

Year	Number of atolls/islands demo gardens established		Number of family/households adopting eco-system practices	
Baseline	0		0	
	Target	Actual	Target	Actual
2000	5		100	
2001	5		100	
2002	5		100	
2003	5		100	
2004	5		100	
Total	**25**		**500**	

INDICATOR 10
The number of commercial farms assisted to adopt production management using IPM approaches (on vegetables)

Year	Number of commercial farms helped adopt IPM approaches		Number of commercial farms willing to adopt IPM approarches	
Baseline	0		0	
	Target	Actual	Target	Actual
2000	2		2	
2001	2		2	
2002	2		2	
2003	2		2	
2004	2		2	
Total	**10**		**10**	

OUTCOME INDICATORS
INDICATOR 1

Awareness and adoption of technologies, practices, and policies that help ensure the balance between human activities and ecosystem integrity.

INDICATOR 2
The initiation of environmental monitoring to determine incidence and levels of exotic pests will set a baseline for current conditions and the extent to which a quarantine program is effective will be measured by controlling the introduction of new exotic pests.

INDICATOR 3
The reduction of waterborne disease incidence as an outcome is addressed under GPRA Goal 2.

INDICATOR 4
The total number of persons completing non-formal education programs on sustaining and/or protecting the quantity and quality of surface and ground water supplies, and the total number of persons who actually adopt one or more water management practices after completing one or more of these programs.

Year	Number of persons completing non-formal education program		Number who actually adopted recommended practices	
Baseline (1998)	442		400	
	Target	Actual	Target	Actual
2000	550		550	
2001	619		619	
2002	712		712	
2003	836		836	
2004	1003		1003	
Total	**3720**		**3720**	

INDICATOR 5
The total number of persons completing non-formal education programs on sustaining and protecting ecosystem biodiversity while improving the productivity of the U.S. agricultural production system, and the total number of these persons who actually adopt one or more recommended practices within six months after completing one or more of these programs.

Year	Number of persons completing non-formal education program		Number who actually adopted recommended practices	
Baseline (1998)	442		400	
	Target	Actual	Target	Actual
2000	550		550	
2001	619		619	
2002	712		712	
2003	836		836	
2004	1003		1003	
Total	**3720**		**3720**	

KEY PROGRAM COMPONENTS

Education is maybe the most effective way of alleviating public awareness of environmental destruction in Micronesia. Lack of awareness regarding basic ecological system and sustainable development is a problem at all levels in government and at the community. Land Grant staff will work closely with state and local governments to effectively manage their natural resources by providing technical assistance, information, and advice based on research results. Training programs, public forums, publication of research results will be made to increase awareness with regards to public policy issues that will help sustain, conserve and protect the environment.

In the areas of plant quarantine and bio-diversity, close collaboration with the Chiefs of Agriculture Stations will continue. Addressing waterborne disease will be continued through collaboration with the Public Health Service. The waterborne disease issue has been addressed under GPRA Goal 2 to reduce this disease incidence level. It is expected that the current database management program can be more effectively utilized to target people who have contracted a waterborne disease. CMI-CRE has volunteered to write the database call program to identify patients who sought treatment as a result of water borne disease. First, doctors will be instructed to provide waterborne disease patients with brochures currently utilized by the RMI Environmental Authority, RMI Public Health, and Land Grant Extension that address water quality (mostly catchments), sanitation, food preparation and storage conditions. The database program will collect the weekly list of patients who have contracted waterborne diseases and the zonal nurses will be instructed to visit their respective patients in the week immediately following their diagnosis. Patients' understanding of the information provided plus household conditions will be monitored to determine if point sources contributed to contracting the disease and whether steps have been taken to eliminate potential causes. Extension agents will make site visits when it is determined that further reinforcement would provide additional benefit in the acceptance of the recommendations. New brochures will be prepared if it is determined that focusing on certain point sources is warranted.

Agriculture Extension Agents have been working with students in several public elementary schools, providing lessons on agriculture, bio-diversity and ecological/environmental concerns with lessons designed to be imparted over an entire semester. Model farms will be developed to educate farmers on Eco-friendly and sustainable agriculture.

The National Environmental Strategy for Palau cites monitoring and reporting as the most significant strategy for environmental protection and management. Land Grant Program staff will work closely with state and local governments in monitoring and identifying areas for focus and studies. Information gained will be made available to the public and resource managers so those appropriate plans can be put in place to ensure the sustainability of resources.

Integrated crop production and management technologies and practices for specific crops (endangered and/or introduced promising exotic crops) to include seed and clonal means of perpetuation, gene pool site to be established with simultaneous crop productivity evaluation.

IPM approaches to crop production of economic crops (fruits, vegetables, ornamentals) including biological control for pests will be conducted. Cost effective IPM tools (simple/practical) easily adaptable to stakeholders will be determined. Experimental demonstration plots will be at stakeholders' field. Variety/cultivar/species trials in Pohnpei and other FSM states under integrated crop production and management scheme with evaluation of productivity involve stakeholders input (crops/practices).

Workshops/meetings with extension agents and target audience on IPM approach(es) generated technologies on specific crops will be pursued for extension. Publication (technical and popular versions)

will be done for documentation. Gathering information and dissemination of knowledge on pesticide usage will be pursued (closely linked with IPM project(s) aimed at facilitating impact assessment by proper authority/agency.

INTERNAL AND EXTERNAL LINKAGES
Agriculture, water quality, EFNEP and 4-H will work in close collaboration to deliver important programs to protect the environment. Project planning will be closely linked with other units within the COM System.

Linkages and collaborative efforts will be established with the USDA-NRCS, Office of Agriculture and Forestry, Soil and Water Conservation District, Ministries of Works, Resources and Development, EPA, Resource and Conservation Offices, and Health and Environment. The PEACESAT central headquarters at the University of Hawai`i provides valuable technical support and program delivery for telecommunications, Internet access and distance education. The University of Guam conducts valuable distance education outreach to Micronesia and provides laboratory services.

TARGET AUDIENCES
The Micronesian public as a whole will receive outreach for the importance and implementation of quarantine practices. Both commercial and subsistence farmers will be taught the benefits of biodiversity. Other targets are extension agents, students and teachers who can influence farmers to use IPM techniques and increase awareness on biodiversity and ecological/environmental concerns. Government Conservation Officers and Policy Makers will enforce laws protecting the environment.

EVALUATION FRAMEWORK
Key research and extension staff of COM Land Grant will monitor, evaluate and record results on the projects that are being carried out in agriculture that are compatible with the environment. Extension staff will also evaluate whether the projects are accepted by farmers/businessmen through site visits, interviews and meetings. Data on exotic pest introduction will be followed to determine whether the emphasis on quarantine lessens the introduction of further pests. Data collected by Public Health Divisions indicate an increase level of water borne disease incidences over the past years from 1989. It is expected that the water borne disease incidence level will decrease significantly over time after initiation of this program.

Applied research on integrated crop production and management involving IPM approaches (to include possibly biological control of pests on specific crops) will be evaluated based on regular monitoring and gathering of data on specific crops as regards productivity, pest infestation and control measures and other productivity and production parameters.

Research results will be extended to extension agents and information will be disseminated to stakeholders through farm visits, meetings and conferences.

Success of this program can also be measured by looking at the number of people getting training on Eco-friendly agriculture and sustainable agriculture.

PROGRAM DURATION
Implementation of training for quarantine agents is short-term in nature. The monitoring and management of quarantine is long term requiring reinforcement, updating with new information regarding the identification of potentially new pests and monitoring the impact on environment through determining the incidence levels of exotic pests.

The aspects targeting waterborne disease is addressed under GPRA Goal 2. The implementation of the call program to identify patients afflicted with waterborne diseases and to prove its value as an important

outreach protocol is short-term in nature. Once the value of this process is recognized, responsibility will be transferred to the Public Health Department. The monitoring process and oversight is considered intermediary in nature to ensure that the routine is implemented and adopted. Since patients' data is routinely collected and archived in a database, the ability to determine the impact is facilitated through a T-test comparison. Hence, measurement of program outcome can be statistically validated. The challenge comes from adopting a potentially valuable and proven process.

The two programs in Palau: Water Quality and Nutrient Management and Changing American (Micronesian) Landscape are intermediate.

Program Activities	**Duration**
Research	
1. Integrated Pest Management (IPM)-Cultural Methods	Intermediate
2. Integrated Crops Production and Management	Intermediate
3. Tissue Culturing of Banana and Other Economic Crops	Intermediate
4. Pesticide Impact Assessment	Intermediate
Extension	
1. Water Quality and Nutrient Management	Intermediate
2. Changing Micronesian Landscape	Intermediate
3. Strengthening of Plant Protection/Quarantine Services	Intermediate
4. Waste Management	Intermediate
5. Lowland Agroforestry and Fruit Trees	Intermediate
6. Carbon Sequestration	Intermediate
7. Aluminum Recycling & Environmental Education	Intermediate
8. Conservation Practices	

ALLOCATED RESOURCES

Fiscal Resources

Extension

Year	Federal	State	Local	Other
2000	140300	14200	27900	0
2001	125800	26300	30500	0
2002	141100	30300	42600	0
2003	144800	70500	74300	0
2004	144200	70500	73700	0

Research

Year	Federal	State	Local	Other
2000	89000	5000	22287	0

2001	171000	7000	69572	0
2002	163000	10000	77387	0
2003	165000	48000	116596	0
2004	180000	48000	132596	0

Manner of Expenditures:

Budgets coming from the formula funds, competitive grants and other sources like local matching funds and 3(d) funds will be expended as planned in each specific research, extension and integrated research and extension projects. In general, these monies will be utilized for the salaries and wages and fringe benefits of the Vice President, key program, research, extension and administrative staff. International travels are intended to 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 are 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 are to be purchased as well. In some instances when local experts are not available locally like marketing, resource economics and sociology, some funds will be allotted to hire consultants from other land grant or other 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 are to be considered, too. Communication 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 are also budgeted.

Human Resources (FTEs)

Extension FTEs

Year	Professional			Paraprofessional		
	1862	1890	Other	1862	1890	Other
2000	3.32	0.0	0.0	5.92	0.0	0.0
2001	3.42	0.0	0.0	6.02	0.0	0.0
2002	3.53	0.0	0.0	6.05	0.0	0.0
2003	3.70	0.0	0.0	6.10	0.0	0.0
2004	3.90	0.0	0.0	6.16	0.0	0.0

Research SYs Only

Year	Scientist Years	

	1862	1890	Other	1862	1890	Other
2000	1.00	0.0	0.0	1.60	0.0	0.0
2001	2.10	0.0	0.0	1.86	0.0	0.0
2002	2.16	0.0	0.0	1.89	0.0	0.0
2003	2.27	0.0	0.0	1.93	0.0	0.0
2004	2.68	0.0	0.0	1.98	0.0	0.0

From the FY2000 FTE of 76.07, 11.84 has been assigned under GPRA Goal 4, representing 16% 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.

STAKEHOLDERS INPUT

Previous plans of work for Cooperative Extension Service for Micronesia and the GPRA Performance Plans were consulted. Review of National Master Development Plans of the three nations, UNDP reports, and survey results were used as references. This 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 the local newspapers, TV stations, and were aired over the radio stations. The announcements were in English and the vernacular. Public meetings were held to discuss the U.S. Federal Requirements, stakeholder input and the implementation role by COM Land Grant Staff.

In Palau, the President of the College has made State Visits to the different States to meet with State leaders and community members to solicit input on State needs and issues.

EDUCATION AND OUTREACH PROGRAMS

Data on exotic pest introduction will be followed to determine whether the emphasis on quarantine lessens the introduction of further pests. Data collected by the RMI Public Health Service indicates the level of water borne disease incidence monthly over the past years from 1989. It is expected that the water borne disease incidence level will decrease significantly over time after initiation of this program.

Agriculture Extension Agents have been working at several public elementary schools, providing lessons on agriculture, biodiversity and ecological/environmental concerns with lessons designed to be imparted over an entire semester.

Repeated under this GPRA Goal is the critical issue of the ability to assess Marshallese learning styles. The history of extension programs broadly throughout the Marshalls conducted by numerous international aid agencies is one experiencing lack of adoption of recommended behavior. This is also reflected under formal education that finds 42% of the school-age children not in school, 45% of entering college students being placed in a remedial program to bring their performance to college standards with some starting from the minimum threshold set at a fourth grade reading and math level, and the overall average grade-point-average in the college being a 1.81 on a scale to 4.0 being an "A." CMI-CRE extension agents also experience open challenges at their workshops, not because of the content being shared but more likely a result of a clash between learning styles of the presenter and certain members of the audience. To become more effective in extension delivery, understanding Marshallese learning styles will be addressed.

PROGRAM REVIEW PROCESS

The merit and peer review at COM will involve examination of priorities to be included in the Plan of Work, selection of reviewers with expertise relevant to the effort, and appropriate scientific and technical standards.

Merit Review: At present time, the COM Board of Regents handles reviews of COM priorities. However, advisory groups are being organized at all six COM sites that will be composed of heads of government agencies and non-governmental associations. These advisory groups will provide COM with direction as to the efforts/issues to be addressed, implementation and evaluation of programs.

Scientific Peer Review: The selection of reviewers is based on the expertise and/or experience related to the proposed activities. A built-in mechanism for reviewing research programs involved program colleagues within the COM system and staff from collaborating agencies. In addition, research scientists from the ADAP institutions are also requested for assistance. The Presidents of the three colleges and the Office of the COM Executive Director are also provided an opportunity to review research projects.

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

STATEMENT OF ISSUES

The main and the most significant source of revenue for the three independent countries--Federated States of Micronesia (FSM), the Republic of the Marshall Islands (RMI), and the Republic of Palau (ROP) -- in Micronesia is the transfer of payments under the Compact of Free Association (COFA) with the United States of America. The COFA funds started to diminish in 1991 for the Federated States of Micronesia and Republic of the Marshall Islands. Their Compact Treaties with the U.S. went into effect on November 3, 1986, and will be terminated in the year 2001. The Republic of Palau entered into its Compact Treaty on October 1, 1994 and will end in the year 2009. The decline of the COFA funds has had a severe impact on the economic developments of the island nations in Micronesia.

Three of the four states in the Federated States of Micronesia, in attempting to conserve operating expenses, have implemented a 32-hour workweek due to shortage of funding. Kosrae State began the 32-hour workweek on January 26,1995, according to an Administrative Directive from the Governor of Kosrae. Chuuk State's 32-hour workweek began after the effective date of Chuuk Public Law No. 3-95-19. Pohnpei State's Compensation Restructuring Act of 1996 (S.L. No. 4l-25-96) put the executive branch employees on a 32-hour workweek, commencing on March 31, 1997. Yap State is the last of the four States in the FSM that is not on a 32-hour workweek.

The three Micronesian Nations (FSM, RMI, & ROP), must implement stringent policies and strategies that will enable employment, and provide essential services to their respective growing populations. The financial crisis in Micronesia can be alleviated through the development of the private sector and the enhancement of self-employment activities (UNDP 1995).

The National Development Plans of the three nations provide the strategic framework for their development over the COFA period. The governments aim to develop a self-sustaining national economy capable of replacing Compact revenues from their domestic sources, while promoting a high level of human development. Training people with relevant skills to utilize their potentials through income generating activities will improve their financial status and increase their family or individual economic stability, and therefore lead to improved quality of life.

In Micronesia today, many youth between the ages 10-18 are challenged with the rapid social and economic changes, and thus problems such as drug abuse, school dropout, unemployment, and involvement with crimes ranging from minor to more serious ones had been escalating during the past decade. In Palau, 4% of the youth between age 6-13 were not attending school, 17% of those aged 14-17 were not attending school, and 61% of those aged 18-19 were not in school (1990 US Census). In RMI, students begin dropping out of school from the first grade onward leading to a severe attrition, starting from 2,400 students in kindergarten and ending with 170 graduating from high school. The overall formal education delivery is further exacerbated by having 51% of the teachers without a professional certificate and approximately 100 more required by the year 2000 as a result of the continued population growth. As a young nation with a median age of 28, the Republic of Palau is now confronted with a rapidly increasing population at a 2.64% annual growth, and an unemployment rate of 7.0%. The per capita income in 1994 was $3,526 with 60.6% of the Palauan families living below the poverty level (1995 Palau Census).

Traditionally, Micronesian families were supported by a very intricate but a strong and sustainable socio-economic system that kept the Micronesian families together and allowed them to share their wealth among relatives. Micronesia has survived the influence of foreign colonialism with only remnants of its unique culture of shared wealth, adulterated with foreign influences and values. Although still alive today, the customs on childbirth rituals, marriages, and funerals are becoming great financial burdens on families because of excessive spending which robs the families of meager means necessary for the raising of small children, putting them through school, and providing them with preventive health care. The excessive and extravagant spending for customs need to be cut down for the long-term survival of the three developing nations.

The breakdown of the traditional support system also resulted to youth friction and negative social problems. There is also a shift from subsistence to cash economy, which has resulted in the erosion of the extended family structure, which gives support to all family members. Teenage pregnancy is increasing at an alarming rate and has resulted in the complication during parturition and low birth weight and undernourished children. One of the most alarming youth problems is the high number of youth suicide. This social problem is so deeply rooted and so complex that there is a need for a comprehensive and individualized approach to this very serious problem.

The U.S. Department of Interior Insular Areas Office issued a recent evaluation of the Compact of Free Association's impact noting that economic development has not occurred as envisioned. This affects the average purchasing power of families for food. Management of family economics to factor in budgets sufficient to purchase the right types and amounts of foods will be taught as one of the contributors to malnutrition. Population dynamics contribute to nutritional issues directly by increasing the number of people to feed and indirectly through the delivery of quality education leading to jobs generating sufficient income for family support. Topics along these lines will be addressed including teen pregnancy, family planning, school dropouts, joblessness and alcoholism.

One major issue that confronts the disadvantaged populations at all levels (national, state, and rural communities) is the lack of employment opportunities in the government and in the private industries. The lack of national policy to address this issue is intensified by the government's heavy dependence on the U.S. federal funding that is now being tapered off. The Micronesian governments will not be able to employ, remunerate and provide essential services to Micronesia's growing population with the diminishing U.S. funding support. This impending financial situation can be avoided through enhancing the development of the private sector and self-employment activities (UNDP 1995).

The College is cognizant of the vital role that the rural and subsistence sectors play as viable safety nets in providing sustainable livelihood opportunities both for customary obligations; and for social and family aspirations–e.g. health, education, source of cash to augment income, youth and women participation, etc.

PERFORMANCE GOALS

1. To annually increase research and knowledge-based available on the economic well being of communities and their citizens.

2. To annually improve the financial status of families through financial management education programs implemented in which CSREES partners and cooperators play an active research, education, or extension role.

3. To annually increase the incidence of strong families resulting from non-formal education programs in which CSREES partners and cooperators play an active research, education, or extension role.

4. To annually increase the research and knowledge-based available from COM-CRE and collaborators on the economic well being of the island communities and their citizens.

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

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

7. To improve knowledge and skills that generate income and activities to improve economic status of families

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

9. To conduct meetings, youth rallies, assembly, training workshops on substance abuse, mental health, responsible parenthood, and value of self-esteem.

OUTPUT INDICATORS

INDICATOR 1

In the Plan, describe significant research underway or proposed on economic well being of consumers, families, and communities. In the Report, describe the most significant research completed during the report year and its impact.

INDICATOR 2
The linkage of resources from various government agencies, NGOs, women's groups and churches addressing outreach to women subjected to domestic violence will be recorded.

INDICATOR 3
To increase the capacity of communities, families, and individuals to improve their own quality of life, the number of people participating in workshops to address harmony in the family will be recorded.

Year	Number of persons completing non-formal education program		Number who actually adopted recommended practices	
Baseline	500		50	
	Target	Actual	Target	Actual
2000	550		55	
2001	619		77	
2002	712		107	
2003	836		146	
2004	1003		201	
Total	**3720**		**586**	

INDICATOR 4
To increase the capacity of communities and families to enhance their own economic well-being and to annually improve the financial status of families through financial management education programs, the number of persons completing non-formal financial management education programs, and the total number of these persons who actually adopt one or more recommended practices to decrease consumer credit debt or increase savings within six months after completing one or more of these programs will be recorded.

Year	Number of persons completing non-formal education program		Number who actually adopted recommended practices	
Baseline	500		50	
	Target	Actual	Target	Actual

2000	550		55	
2001	619		77	
2002	712		107	
2003	836		146	
2004	1003		201	
Total	**3720**		**586**	

INDICATOR 5

The total number of students taught lessons in topics generally covered in 4-H under an agreement with Majuro Local Government to allow such lessons to be taught in the public schools.

Year	Number of persons completing non-formal education program		Number who actually adopted recommended practices	
Baseline	500		300	
	Target	Actual	Target	Actual
2000	550		300	
2001	619		400	
2002	712		550	
2003	836		575	
2004	1003		750	
Total	**3720**		**2575**	

INDICATOR 6

The number of participants completing programs on financial management education programs, the number of these persons who plan to adopt one or more recommended practices to decrease consumer credit debt or increase savings, and the total number of these persons who actually adopt one or more recommended practices to decrease consumer credit debt or increase savings within six months after completing one or more of these programs.

Year	# of persons completing programs		# who plan to adopt recommended practices		# who actually adopt recommended practices	
Baseline	0		0		0	
	Target	Actual	Target	Actual	Target	Actual

2000	150		125		85	
2001	200		175		125	
2002	250		225		200	
2003	250		225		200	
2004	250		225		200	
Total	**1100**		**975**		**810**	

INDICATOR 7
The total number of persons completing programs on youth development, the number of these persons who plan to adopt one or more youth development principles, behaviors, or practices, and the total number of these persons who actually adopt one or more youth development principles, behaviors, or practices within six months after completing one or more of these programs.

Year	# of persons completing programs youth development		# who plan to adopt youth development principles, behaviors, & practices		# who actually adopt youth development principles, behaviors & practices	
Baseline	0		0		0	
Baseline	Target	Actual	Target	Actual	Target	Actual
2000	550		350		300	
2001	619		375		400	
2002	712		450		550	
2003	836		500		575	
2004	1003		675		750	
Total	**3720**		**2350**		**2575**	

INDICATOR 8
Number of participants involved in youth rallies, meetings, sports, and community activities will be recorded.

OUTCOME INDICATORS
INDICATOR 1
The number of women who avail themselves of help provided by "crisis teams" will indicate the level of credibility gained by mechanism put in place.

INDICATOR 2
The overall reduction of violence against women will measure the success of these efforts.

INDICATOR 3
Ratification of CEDAW by RMI.

INDICATOR 4
The number of new businesses starting resulting from economic development programs and the number of existing businesses maintaining or expanding operations will be recorded.

INDICATOR 5
The number of persons completing youth development programs, the number of students completing after school programs and the number of adults completing sewing program.

INDICATOR 6
Well-informed clientele who contribute and participate in the decision making process in the family and community will be recorded.

KEY PROGRAM COMPONENTS
The goal of the of this program will be achieved through non-formal education and training to be provided by Extension staff in collaboration with researchers and other professionals of the College of Micronesia. Critical issues and needs that have been identified will be addressed with the support of partners and cooperators who play an active role in extension programs. As a result of their experiences, families, individuals, and youth will become better resource managers; will improve decision-making skills; and will become self sufficient.

Educational outreach will teach families to become better resource managers, initially focusing on reducing malnutrition while informing of the availability of help to explore small scale development. Decision-making skills, self-reliance, and resource management will be taught. Collaboration with ADB, the University of Hawai`i Sea Grant Program will continue. Delivery of distance education especially from the University of Guam that has conducted courses in business plan development will continue.

Ministries of Health and Environment and Internal Affairs who have responsibility in the area of women's issues, NGOs, women's groups and churches who have expressed concern about resolving the issue of violence against women will participate in formulating and implementing a strategy to alleviate this problem.

Agriculture Extension Agents have been helping students at several public elementary schools, providing lessons on topics generally covered in 4-H with lessons designed to be imparted over an entire semester. Some other aspects of the program that may guarantee its success are:

> **Curriculum Development:** Curriculum materials currently available will be reviewed for their suitability for this program and may be used as is or revised and translated into the vernacular to meet the needs of the target populations. Other potential sources of materials such as the Ministry of Education, University of Guam and the University of Hawaii will be contacted for existing curriculum materials that may be used to save staff effort and the College's limited resources.
>
> **Staff Training**: It may be necessary to have staff training as new technologies become available within the next five years.
>
> **Volunteer Recruitment**: Volunteers will be recruited to serve as liaisons between the College and their respective communities and will assist as clientele recruiters. Other volunteers from collaborating agencies in Micronesia will serve as mentors and youth leaders in the youth development programs, and lecturers where their expertise is needed.

INTERNAL AND EXTERNAL LINKAGES

Agriculture, water quality, EFNEP and 4-H will work in close collaboration to deliver important programs to address family resource management, food availability, youth issues and small scale development possibilities.

The Asian Development Bank has expressed a direct interest in utilizing the mechanism in operations to facilitate the implementation of Land Grant Support in the Marshalls to introduce their small-scale development program. The University of Hawai`i Sea Grant Program through their business development extension supports the development of aquaculture enterprises in the Marshalls under a Micronesian Regional Collaboration with CMI-CRE as an active participant. The Ministries of Works, Resources and Development and Internal Affairs continue as key collaborators in program delivery. The PEACESAT central headquarters at the University of Hawai`i provides valuable technical support and program delivery for telecommunications, Internet access and distance education. The University of Guam conducts valuable distance education outreach to Micronesia.

Further assistance will be solicited from local collaborating agencies including the local banks, the Chamber of Commerce, Community Action Agency, and Ministries of Education and Health to strengthen the partnerships for this program.

Joint efforts with other agencies, individuals and private businesses are an integral part of the implementation plan for the youth programs. Extension staff will team up with peers and colleagues from collaborating agencies to deliver community outreach programs. The successes of these programs are possible because of a strong partnership with external agencies and institutions. The following are examples of the joint efforts:

Ministry of Education: Will assist with the youth development programs in providing personnel assistance, serve as liaison between Extension agents for youth and the schools.

Ministry of Health: Will assist in health lectures and provide health data showing relationship to alternative practices families can do to reduce trips to the hospital and reduce medical bills.

University of Guam: May assist in curriculum development, conduct peer reviews for programs and curriculum development, and or provide available curriculum materials to be used as is or as adapted to fit the local situation.

Local Banks: May assist in providing information regarding services available to individual customers, credit debt reduction, and the best ways to save money in the bank.

Chamber of Commerce: May assist in helping clients get appropriate training for entrepreneurship of their choice and record keeping of personal finances and business activities.

Community Action Agency: May assist in conducting community needs assessment and may provide data not available at the College.

TARGET AUDIENCES

Women, youths, families and potential entrepreneurs will be targeted for outreach in this area. Students in elementary schools in Micronesia will be taught lessons on topics generally covered in 4-H. Community leaders, policy-makers, church groups, and all levels of government will be involved in program development and implementation.

PROGRAM DURATION

Conducting workshops to allow the community to define inputs, connections and mechanisms to alleviate violence against women is short-term in nature. Implementing a process that gains credibility to

ultimately reduce the incidence level will be long term in effectively instilling trust in the process and having all components understand their roles and responses.

Teaching the rationale behind a small-scale development revolving fund is short-term while facilitating the implementation of small-scale development is long term.

Outreach to Micronesian youth will be a continuous process and, as such, long term in nature. Following are programs addressing family social issues in Micronesia:

Program Activities	**Duration**
Extension	
1. Sewing and Handicraft Program	Short Term
2. Professional Workforce Preparation	Intermediate
3. Workforce Transition	Intermediate
4. 4-H and Youth Development Program	Long Term
5. Home Gardening	Intermediate
6. Youth Summer Program	Short Term
7. Small Business Development	Intermediate
8. Aluminum Can Recycling Program	Intermediate
9. 4-H Science and Technology	Long Term
10. Personal Money Management	Long Term
11. 4-H Health & Nutrition Education	Long Term

ALLOCATED RESOURCES

Fiscal Resources

Extension

Year	Federal	State	Local	Other
2000	164800	14200	35200	0
2001	121200	26300	28500	0
2002	171900	30300	58400	0
2003	172200	70500	102100	0

2004	162700	70500	92100	0

Research

Year	Federal	State	Local	Other
2000	0	0	0	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, competitive grants and other sources like local matching funds and 3(d) funds will be expended as planned in each specific research, extension and integrated research and extension projects. In general, these monies will be utilized for the salaries and wages and fringe benefits of the Vice President, key program, research, extension and administrative staff. International travels are intended to 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 are 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 are to be purchased as well. In some instances when local experts are not available locally like marketing, resource economics and sociology, some funds will be allotted to hire consultants from other land grant or other 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 are to be considered, too. 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 is also budgeted.

Human Resources (FTEs)

Extension FTEs

Year	Professional			Paraprofessional		
	1862	1890	Other	1862	1890	Other
2000	3.9	0.0	0.0	5.8	0.0	0.0
2001	3.9	0.0	0.0	5.8	0.0	0.0
2002	4.3	0.0	0.0	5.8	0.0	0.0
2003	4.4	0.0	0.0	6.15	0.0	0.0

2004	4.4	0.0	0.0	6.15	0.0	0.0

Research SYs Only

Year	Scientist Years					
	1862	1890	Other	1862	1890	Other
2000	0.0	0.0	0.0	0.0	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 FTE of 76.07, 9.7 FTE has been assigned to programs addressing GPRA Goal 5, representing 13% 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.

EVALUATION FRAMEWORK

In order to review the success of achieving the performance goals each fiscal year, evaluation tools will be developed to measure the level of success of the expected program impact or result after program delivery. Pre-and post-tests will be conducted; accomplishment reports citing the progress and problems encountered will be provided on a timely basis. Other data generating documents will be used. List of participants will indicate rate of participation. Both oral and written surveys will be used by Extension to determine benefits received by clients and degree of success of program to meet performance goals with expected results and output indicator. Measurement mechanisms for increase in household revenue for individuals and families participating in the program will be used.

Target communities will be nurtured to increase the likelihood of recommended behavior adoption. This will be monitored through counting the number of initial workshop participants, followed by repeated visits to determine if the recommendations are being practiced. Ultimately, the monitoring will determine whether increased food production results and whether overall malnutrition incidence in the communities decreases.

At the start of the non-formal education program, a survey questionnaire will be administered to all youth participants. The results of the survey will be analyzed. After graduation, follow up visit will be made to individual student, where a checklist will be used as a guide.

EDUCATION AND OUTREACH PROGRAMS

Target communities will be nurtured to increase the likelihood of recommended behavior adoption. This will be monitored through counting the number of initial workshop participants, followed by repeated visits to determine if the recommendations are being practiced.

Distance education classes will be facilitated from the University of Guam on establishment of small-scale businesses and the components of developing a business plan.

Agriculture Extension Agent have been students at several public elementary schools, providing lessons to approximately 2000 students on topics generally covered in 4-H with lessons designed to be imparted over an entire semester.

STAKEHOLDERS INPUT PROCESS

Previous plans of work for Cooperative Extension Service for Micronesia and the GPRA Performance Plans were consulted. Review of National Master Development Plans of the three nations, UNDP reports, and survey results were used as references. This 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 the local newspapers and were aired over the radio stations. The announcements were in English and the vernacular. Public meetings were held to discuss the U.S. Federal Requirements, stakeholder input and the implementation role by COM Land Grant Staff.

Representatives from the RMI Ministries of Works, Resources and Development, Education, Health and Environment and Internal Affairs along with NGOs , church groups and others were invited to define and rank issues of concern for RMI. Twenty-seven issues were noted. 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.

PROGRAM REVIEW PROCESS

Programs were developed by Land Grant Staff after consultation with stakeholders to have issues defined by the community as a whole, merging these inputs with GPRA Goals, factoring individual staff members' experiences and expertise. The local Board of Regents/Trustee who not only selected the defined areas of research reviewed and approved the recommendations. Currently, under the Overall College Strategic Plan for Institutional Development, Merit Review Committees will be assigned. This process will emerge from a situation that had not granted tenure as a matter of course and, thus, had not formalize a merit review to one that will incorporate the concept of tenure and the value of review for future programs.

MULTISTATE RESEARCH AND EXTENSION ACTIVITIES

Access to the global information infrastructure to support programs: Every GPRA Goal identifies the desire to strengthen the capacity of higher education institutions through the use of distance learning technologies. In line with this performance goal, management of the PEACESAT system has been emphasized to provide the mechanism for distance learning technologies and access to the global information infrastructure. The satellite antenna must be realigned once a month. This routine ensures the continued ability to use the satellite communication technology. CMI-CRE continued to provide technical support in handling incoming and outgoing PEACESAT teleconferences and traffic for students and community members in the health, education, fisheries, environment, and agriculture fields. To support the delivery of up-to-date information and to borrow from other successful programs throughout the Pacific Region, contact access to email and the Internet will be supported through satellite digital telecommunications. The commitment made in this area strengthens delivery of higher education as well as providing support and focus in addressing malnutrition, sustainable agriculture, sanitation and population issues.

COM participates in and facilitates distance education delivery from the University of Guam for a variety of topics including nursing, small business development, agricultural economics, how to write a business plan, backyard aquaculture and the requirements to participate in the marine and freshwater aquarium market. Such distance education augments the extent of courses that can be directly taught given the limited resources in the region along with our physical scattering and isolation.

INTEGRATED RESEARCH AND EXTENSION ACTIVITIES

The overview defines programs that integrate research and extension to alleviate malnutrition as one of the major issues afflicting the Marshalls. Recent data demonstrates a high level of discordance in families (39%) with children suffering from undernutrition at the same time that the household adults are classified as overnutrition. With greater than 40% of the children in certain communities suffering from chronic and severe malnutrition over many years or from recent and acute undernutrition in the past few months, the ability of these children to learn in school is affected. CMI-CRE reported the need to determine an appropriate indicator for malnutrition in its review of the 1991 RMI National Nutrition Survey. The unfortunate real conclusion that is drawn from the 1991 RMI National Nutrition Survey is that an appropriate indicator of malnutrition has yet to be determined because it could not identify any two indicators ranking communities in the same order of malnutrition severity. We are left to surmise that either the indicators used were not appropriate or that the measurements taken were questionable. Only recently has CMI-CRE been granted the right conduct malnutrition surveys in communities to first settle on an appropriate indicator, next to determine the magnitude of malnutrition in the Marshalls and finally to recommend plans to alleviate this condition.

CMI-CRE integrates its sustainable agriculture efforts with malnutrition alleviation in recommending conditions to improve the ability generate more food because it is recognized that having more food is one of the necessary components in resolving this issue. Efforts under GPRA Goals 1 and 4 focus on increasing food production in a sustainable manner that doesn't adversely impact the environment. Understanding soil chemistry to be able to confidently recommend sustainable amendment protocols will

be determined through current research in this area. Managing family budgets to allocate sufficient funds for purchasing appropriate foods is being addressed under GPRA Goals 5 and 3.

Waterborne diseases represent the largest category of affliction within the Marshalls and the number of people affected appears to be growing at the same rate of population growth. Research has been proposed to determine whether point sources are the most prevalent causes and whether a short-term direct intervention to households having waterborne disease patients can be an effective mechanism to reduce the incidence level. Since food handling, basic hygiene and water storage impact the incidence rate, combined outreach under GPRA Goals 2 and 4 integrates efforts under the program to alleviate waterborne disease incidence in the Marshalls.

Participation with SPC in their study on the prevalence and frequency of different forms of violence against women in Pacific Island countries will be an important undertaking to address this serious quality-of-life issue. It has been estimated that the violence against women prevalence level adversely visits 50% of the women in the region. The SPC study will look at the risk and protective factors concerning the issue of violence against women, health and legal consequences, strategies and interventions to prevent violence, and the impact of attitudes on the prevention and intervention of the social problem. CMI-CRE believes that these are worthy objectives given the high incidence rate here. A program is being developed to share this information with the hopes that both prevention and intervention mechanisms will gain credibility to the extent that the incidence level will diminish. Related to this are the United Nations Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW) and the need to seek the participation of RMI as a signatory. Gaining this support from RMI for CEDAW will lend credibility to the efforts to implement prevention and intervention in the area of violence against women.

Repeated under every GPRA Goal is the critical issue of the ability to assess Marshallese learning styles in order to increase the effectiveness of extension teaching. The history of extension programs broadly throughout the Marshalls conducted by numerous international aid agencies is one experiencing lack of adoption of recommended behavior. This is also reflected under formal education that finds 42% of the school-age children not in school, 45% of entering college students being placed in a remedial program to bring their performance to college standards with some starting from the minimum threshold set at a fourth grade reading and math level, and the overall average grade-point-average in the college being a 1.81 on a scale to 4.0 being an "A." CMI-CRE extension agents also experience open challenges at their workshops, not because of the content being shared but more likely a result of a clash between learning styles of the presenter and certain members of the audience. To become more effective in extension delivery, understanding Marshallese learning styles will be addressed.