

2007 College of Micronesia Combined Research and Extension Plan of Work

Brief Summary about Plan of Work

The 5-Year Plan of Work for the College of Micronesia Land Grant Programs (COM-LGP) 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 be at six counties in three different countries and will serve communities in remote and isolated islands and areas to reach people from all walks of life, including both the underprivileged and the underrepresented.

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 200,000.

The agricultural and aquaculture programs in the three nations are mostly subsistence in nature. Our continuing 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 will continue to 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 targeting clientele in small island communities.

The identification of issues and trends from which programs are developed involved the input of stakeholders and observations and findings of COM-LGP staff and staff from collaborating agencies. Government studies, reports and publications were also used in the tracking of trends and identification of critical issues. The extension of the economic provisions of the Compact of Free Association funding in the FSM and the RMI in 2004 provided these two countries with alternative scenarios for achieving economic growth and self reliance in the next 20 years. The Republic of Palau's Compact of Free Association with the U.S. Government is continuing. The Compact II with the FSM and RMI 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.

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 wide range of issues identified by the stakeholders, 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 and aquaculture production systems that will have long lasting impact on their communities.

Obesity, malnutrition, diabetes, 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, value-added and food processing, proper food handling and keeping water sources clean to lessen the chances of contracting food and waterborne related diseases. Other issues associated with these problems, such as teen pregnancy, family planning, school dropouts, joblessness and alcoholism and tobacco use will also be addressed.

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 effort 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 to enable the different agencies to capitalize on existing resources by sharing information to avoid duplication of efforts, learning from each other, using locally available 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 have 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.

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 e-mail and the Internet will be supported through satellite digital telecommunications and other carriers. The commitment made in this area will strengthen the delivery of higher education as well as providing support and focus in addressing nutrition related, sustainable agriculture, sanitation and population issues. Currently, all six COM sites have the capability of accessing Internet and the World Wide Web, which will undoubtedly contribute to innovative approaches to program development and implementation.

One constraint to sustainability is the continuing lack of trained staff at the institutions. We consider most of our indigenous staff at the level of professional due to the fact that they have long work experiences in their areas of performance and already have a good command of the local customs, cultures and languages of their clientele. We will continue to strengthen, improve and increase the skills of institutional staffs and those from collaborating agencies by providing in-service training programs. Only through these human resource and capacity building efforts that a pool of local expertise can be developed in Micronesia.

Estimated number of professional FTEs/SYs to be budgeted for this plan.

Year	Extension		Research	
	1862	1890	1862	1890
2007	49.1	0.0	11.9	0.0
2008	49.1	0.0	11.9	0.0
2009	49.1	0.0	11.9	0.0
2010	49.1	0.0	11.9	0.0
2011	49.1	0.0	11.9	0.0

Merit Review Process

The merit review process that will be employed during the 5-Year Plan of Work cycle

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

Brief explanation

The current standard procedure for program proposals is to subject each proposal to an internal review by an internal review team composed of researchers, specialists, extension agents and collaborating agencies. The review team edits and makes comments and suggestions on the program/project proposal before it is finalized. Once finalized, the program/proposal goes through a review process, this time with College administrators, the local College Board of Regents, through the College of Micronesia administrator, and finally through the COM Board of Regents before it is sent to the USDA or non-USDA funding agency.

Advisory or review committees established at the three colleges continued to review plans of work and proposals as they relate to agriculture, family and consumer sciences, and community economic development needs of the three nations under the College of Micronesia system. Advisory/review committees situated at the three colleges provide the review of programs based on the priorities of the governments and non-governmental organizations. The COM Board of Regents and the local Board of Regents at the three colleges were involved in these reviews, as they are also members of these advisory committees. The administrations of COM and the three local colleges and faculty served in these committees as resource persons. All attempts will be made to include a broad-based advisory group, which represents a multi-institutional and multi-disciplinary effort.

Scientific Peer Review

A scientific peer review process has been in use for research proposals. The peer review team includes administrators and researchers. They reviewed proposals for their technical merit and potential impact and relevancy to the needs of the communities and their fragile ecosystems.

A project proposal goes to the internal review team and outside experts who also specialized in the field of the proposed project. Once the comments and suggestions of the reviewers are included in the final project proposal, it goes through the college administrators to the AES Director at COM Central Office for final endorsement to the USDA for approval.

At the colleges, peer review teams have been organized. Other professionals at the land grant institutions through the Agricultural Development in the American Pacific (ADAP) coalition and other collaborating agencies with the Secretariat of the Pacific Community were always invited to review and comment on proposals, in order to satisfy the need for a multi-institutional and multi-disciplinary requirement.

Evaluation of Multis & Joint Activities

1. How will the planned programs address the critical issues of strategic importance, including those identified by the stakeholders?

{NO DATA ENTERED}

2. How will the planned programs address the needs of under-served and under-represented populations of the State(s)?

{NO DATA ENTERED}

3. How will the planned programs describe the expected outcomes and impacts?

{NO DATA ENTERED}

4. How will the planned programs result in improved program effectiveness and/or efficiency?

{NO DATA ENTERED}

Stakeholder Input

1. Actions taken to seek stakeholder input that encourages their participation (Check all that apply)

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

Brief explanation.

Strategic planning meetings were held at the county level that catered to participants from the various organizations, both public and private, that collaborate and cooperate on our programs.

Needs assessments were conducted throughout Micronesia in conjunction with assessments of other related programs funded by the governments, regional and international organizations.

Interviews with government officials, traditional and church leaders, farmers groups, NGOs and community based organizations were conducted and solicitation for inputs occurred.

Direct written invitations to elected officials at the local, state, and national levels and through announcements that were placed in the local newspapers and aired over the local radio stations in both English and the various local languages.

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

1. Method to identify individuals and groups

- Use Internal Focus Groups
- Use External Focus Groups
- Needs Assessments

Brief explanation.

If not all, a major portion of the Micronesian population is our stakeholders, having classified or identified as hailing from rural communities that consist mostly of subsistence farmers and fishermen who live well below the US poverty line and are under-represented and under-served. Our stakeholders are the same clientele of the local and state governments. Our programs are extended to supplement existing programs and are conducted separately or hand-in-hand with governments and regional organizations sponsored programs.

With assistance from political and traditional leaders in the communities, individuals were identified as stakeholders and from whom input were solicited from them. Inputs were also collected from individuals and organizations that collaboration and networking have been established.

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

1. Methods for collecting Stakeholder Input

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

Brief explanation

Local needs, priority issues and emerging or hot issues will definitely be considered in research and extension programs. Due to a very small and underdeveloped staff which mostly fall under the paraprofessional category with limited skills, input from

experts from our collaborating agencies will also be considered. These inputs will be evaluated for their relevance to the priority needs and concerns of the island governments and communities.

3. A statement of how the input will be considered

- In the Budget Process
- To Identify Emerging Issues
- Redirect Extension Programs
- Redirect Research Programs
- In the Staff Hiring Process

Brief explanation.

Inputs from clientele who have successfully adopted recommended practices will be considered and modification will be done to redirect research and extension program outputs. Likewise, negative experiences from clientele will also be considered in redirection of approaches.

Entrepreneurs who have adopted the food technologies on the developed products that were taught to them can give important suggestions in redirecting the extension and research programs on product development of local foods like root crops, fish, coconuts and bananas.

Advises, ideas, concerns and needs of political and traditional leaders will always be considered.

1. Name of the Planned Program

Aquaculture

2. Program knowledge areas

- 307 Animal Management Systems 20 %
- 301 Reproductive Performance of Animals 20 %
- 302 Nutrient Utilization in Animals 10 %
- 315 Animal Welfare/Well-Being and Protection 10 %
- 511 New and Improved Non-Food Products and Processes 10 %
- 135 Aquatic and Terrestrial Wildlife 10 %
- 308 Improved Animal Products (Before Harvest) 10 %
- 136 Conservation of Biological Diversity 10 %

3. Program existence

- Intermediate (One to five years)

4. Program duration

- Long-Term (More than five years)

5. Brief summary about Planned Program

The establishment of techniques for the spawning, larval and nursery rearing of rabbit fish will provide the necessary fingerlings of this species for grow-out operations in Micronesia. Moreover, a demonstration of the grow-out culture of rabbit fish in cages using locally available formulated feeds will institute its economic viability to interested fish farmers. In Micronesia, there is no feed mill operation so all feed requirements for poultry, hog, and fish feeds are entirely imported from other countries. This obviously resulted in unreliable supply and prohibitive costs of feeds resulting to uncompetitive cost of the produce. Efforts will explore the use of different locally available feed ingredients for the mass propagation of the giant freshwater shrimp, *Macrobrachium rosenbergii*.

The establishment of pearl aquaculture projects in the Marshall Islands and FSM will provide training and create opportunities for locals to generate alternate/supplementary incomes via sustainable aquaculture practices. It will also create employment opportunities in these islands and will generate foreign trade and thereby improve the socioeconomic conditions of people in these small island communities.

6. Situation and priorities

The abundant and extremely biodiverse coral reefs in Micronesia provide habitat for robust fish populations and other marine life which support subsistence and commercial fisheries and most importantly provide potential opportunity for multi-species aquaculture. Recently, there is growing emphasis on the development of marine resources, mainly marine aquaculture or mariculture, to meet future economic needs, provide for self-sufficiency and develop food and economic security for the small island communities whereby ensuring self sustainability.

The rabbit fish, *Siganus fuscescens* and fresh water shrimp, *Macrobrachium rosenbergii* are indigenous in the islands of Micronesia and considered favorite fish for islanders. They are caught mainly from the wild in large quantities. In Palau, the government issued restrictions on catching some of these species of fish during their peak spawning months for fear of depletion of stocks due to over fishing. Furthermore, since their current source is from the wild, their supply as food fish is unreliable. The establishment of techniques for the spawning, larval and nursery rearing of rabbit fish and fresh water shrimp will provide the necessary fingerlings of these species for grow-out operations. Moreover, a demonstration of the grow-out culture of rabbit fish in cages using locally available formulated feeds will institute its economic viability to interested Palauan fish farmers.

A very important factor that is crucial in the culture of fish or shrimp is the availability of feeds to sustain their growth. With the absence of feed mill operation for feed requirements for poultry, hog and fish, feeds are entirely imported from other countries. This obviously results in unreliable supply and prohibitive costs of feeds resulting to uncompetitive cost of the produce. The project will explore the use of different locally available feed ingredients for the mass propagation of the giant freshwater shrimp and rabbit fish.

One form of aquaculture that offers excellent potential for sustainable economic development pearl farming of the black-lip pearl oyster (*Pinctada margaritifera*). The Micronesian nations are far behind the South Pacific nations who have been exporting over US \$120 million annually of cultured black pearls. The reasons for this are the facts that there is not sufficient number of the blacklip pearl oysters that could be collected from the wild to supply pearl farms on a regular basis, and lack of hatchery and grow-out technologies as well as human resources to support and maintain such a hatchery-based pearl industry.

There is also a strong desire by the Republic of the Marshall Islands government to develop revenue producing local industries based on available natural resources and to restock reefs where natural marine populations have declined. Hence focus is on site-specific sustainable hatchery and farming development of commercially important food and ornamental finfish and shellfish, mainly for stock enhancement purposes by sea ranching for species that have been exploited heavily for food and ornamental shell trade.

7. Assumptions made for the Program

- Local farmers and fishermen will adopt the techniques from the projects.
- Hatchery and grow-out technologies will improve supplies of targeted species to people who need to culture and/or consume it.
- Staff can be recruited and hired locally with necessary skills and abilities.
- Feeds will be available locally for culturing targeted species
- Supply and demand for the species
- Improve through basic and applied research on existing aquaculture programs
- Adaptation of new species of aquaculture to local conditions in a sustainable manner and they would be used for generating more income for the farmers.
- Adaptation of improved technologies thereby providing income to communities in the outer atoll islands.
- Research program to improve the wealth of the oceans by stock enhancing certain vulnerable species and other valuable aquaculture species in selected outer atolls.
- Highly skilled hatchery and grow-out technicians will be trained

Hatchery and farming protocols will be standardized for production of targeted species

8. Ultimate goal(s) of this Program

Transfer simple and appropriate feeding technology to shrimp and rabbit fish farmers who may want to culture the giant freshwater shrimp and rabbit fish and formulate and prepare their own feeds.

Initiate and improve sustainable site-specific multi-species aquaculture in the provision of alternate/supplementary income generation in the overall aim of improving the socioeconomic conditions of the islands.

Establish a new pearl industry based on the hatchery technology and transfer the farming technology to the local population.

9. Scope of Program

- In-State Extension
- In-State Research
- Integrated Research and Extension

Inputs for the Program

10. Expending formula funds or state-matching funds

- Yes

11. Expending other than formula funds or state-matching funds

- Yes

12. Expending amount of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2007	6.9	0.0	5.0	0.0
2008	6.9	0.0	5.0	0.0
2009	6.9	0.0	5.0	0.0
2010	6.9	0.0	5.0	0.0
2011	6.9	0.0	5.0	0.0

Outputs for the Program

13. Activity (What will be done?)

1. Establish techniques in the protocols on hatchery, nursery and grow-out culture of the rabbit fish, *S. fuscescens* and the blacklip pearl oyster (*P. margaritifera*).
2. Formulate a nutritionally balanced & economical feed for the nursery & grow-out culture of the rabbit fish, (*S.fuscescens*) and freshwater shrimp, (*Macrobrachium rosenbergii*) using locally available feed ingredients
3. Test the efficiency of the formulated diet based on the growth rate, digestibility & palatability to the rabbit fish and giant freshwater shrimp.
4. Demonstrate the economic viability of the cage grow-out culture of rabbit fishes.
5. Develop human resources for supporting and maintaining a pearl industry
6. Develop business models of the pearl farming and promote local interest and participation in the pearl industry
7. Demonstrate pearl production and improve pearl quality
8. Develop training and educational methods for the local Micronesians
9. Stake holder inputted research designing
10. Experimental trial initiation
11. Experimental monitoring and data collection
12. Data interpretation and analysis
13. Disseminate findings to existing and prospective farmers and individuals
14. Promote new and site-specific technologies to the outer-island communities
15. If interested then initiation of these small scale projects in the outer island communities
16. Frequent monitoring, data collection and evaluation of these projects

14. Type(s) of methods will be used to reach direct and indirect contacts

Extension	
Direct Method	Indirect Methods
<ul style="list-style-type: none"> ● Workshop ● Group Discussion ● Demonstrations 	<ul style="list-style-type: none"> ● Public Service Announcement ● Newsletters ● Web sites ● Other 1 (Brochures, leaflets, etc.)

15. Description of targeted audience

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

16. Standard output measures

Target for the number of persons(contacts) to be reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
2007	350	1000	150	1000
2008	375	1500	250	1500
2009	450	2000	300	2000
2010	475	2500	325	2500
2011	500	3000	350	3000

17. (Standard Research Target) Number of Patents

Expected Patents	
Year	Target
2007	0
2008	0
2009	0
2010	0
2011	0

18. Output measures**Output Text**

Number of demonstration farms established.

2007 Target: 6
 2008 Target: 6
 2009 Target: 6
 2010 Target: 6
 2011 Target: 6

Output Text

Number of publications for lay use.

2007 Target: 4
 2008 Target: 4
 2009 Target: 4
 2010 Target: 4
 2011 Target: 4

Output Text

Number of conference paper and publication/presentation.

2007 Target: 5
 2008 Target: 5
 2009 Target: 5
 2010 Target: 5
 2011 Target: 5

Output Text

Expected Professional Journal publications.

2007 Target: 3
2008 Target: 3
2009 Target: 6
2010 Target: 7
2011 Target: 4

Output Text

Expected Gray Literatures.

2007 Target: 6
2008 Target: 6
2009 Target: 6
2010 Target: 6
2011 Target: 6

Output Text

Expected publications for lay use.

2007 Target: 5
2008 Target: 5
2009 Target: 5
2010 Target: 5
2011 Target: 5

Outcomes for the Program

19. Outcome measures

Outcome Text: Awareness created

Outcome Text

Increase awareness in the communities and prospective and existing industry about sustainable, site-specific, and low energy aquaculture technologies.

Outcome Type: Short

2007 Target: 30
2008 Target: 55
2009 Target: 80
2010 Target: 100
2011 Target: 125

Outcome Text

Adoption of sustainable aquaculture technologies by commercial and community groups.

Outcome Type: Medium

2007 Target: 10
2008 Target: 15
2009 Target: 20
2010 Target: 25
2011 Target: 30

Outcome Text

Number of established aquaculture operations.

Outcome Type: Long

2007 Target: 3

2008 Target: 4

2009 Target: 5

2010 Target: 6

2011 Target: 8

20. External factors which may affect outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Public Policy changes
- Government Regulations

Description

Changes in the global and local economies can affect outcomes. Natural disasters and other major Government policy changes can alter outcomes or the timelines of outcomes in a minor or major way.

Natural disaster, economy and government regulations can hinder the data or sampling collection of the targeted species for the study. The external factors checked above could affect the number of participants or interested farmers to adopt the projects.

Population changes in the outer islands, particularly population flow of the youth from the outer islands to the main islands and rural areas to the capital city can negatively impact on the aquaculture development, extension programs and research work.

21. Evaluation studies planned

- Before-After (before and after program)
- During (during program)
- Time series (multiple points before and after program)
- Comparison between locales where the program operates and sites without program intervention

Description

Daily observation and monitoring will be done to improve and change the process of the study along the period of projects. Local operations will be evaluated before, after and during the program for their commitment and needs of the program. The program outcomes will be compared with sites without program intervention to evaluate the differences. A pre and post evaluation of the projects would be carried out with both in house and outside stakeholder participation. Time series evaluation would also be done to monitor the progress of the programs and evaluate weakness in implementing and maintenance a timely manner to determine solutions to any problem arising.

22. Data Collection Methods

- Sampling
- Whole population
- On-Site
- Structured
- Case Study
- Observation
- Journals

Description

Researcher or research assistant will monitor and collect data from the project sample (rabbit fish, shrimp or pearl oyster) for project improvement and effectiveness. Collection of data will also be done during onsite visit to established operations.

A journal will be kept as a reference for project improvements.

Sampling data collection method will be taken to get data from as wide a representation of the population as possible. Interviews and case studies would also be used to supplement the basic study and results would be used to compare and confirm results from other method of data collection and evaluation. All the data collected would be subjected to appropriate scientific statistical procedures to test their accuracy and validity and the results evaluated.

Community and commercial farmers would also assist the projects for keeping records and data.

Visual observation would also be used.

1. Name of the Planned Program

Small Island Agricultural Systems

2. Program knowledge areas

- 601 Economics of Agricultural Production and Farm Management 10 %
- 212 Pathogens and Nematodes Affecting Plants 10 %
- 205 Plant Management Systems 10 %
- 136 Conservation of Biological Diversity 10 %
- 112 Watershed Protection and Management 10 %
- 102 Soil, Plant, Water, Nutrient Relationships 10 %
- 315 Animal Welfare/Well-Being and Protection 10 %
- 202 Plant Genetic Resources 10 %
- 216 Integrated Pest Management Systems 10 %
- 204 Plant Product Quality and Utility (Preharvest) 10 %

3. Program existence

- Intermediate (One to five years)

4. Program duration

- Long-Term (More than five years)

5. Brief summary about Planned Program

Agriculture is an important industry for the economic growth of small island communities in Micronesia. This program will address sustainable plants and animal production and their implications on the environment in both high islands and low atolls to include both subsistence and commercial agriculture. Emphasis will be on traditional production systems, conservation and development of natural resources, techniques that incorporate traditional practices into contemporary approaches, processing, and marketing of both crops and animal products. 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 the export markets. The increase in local food 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 problems 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.

6. Situation and priorities

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. Production of food crops and livestock are now placed high on economic development priorities by all governments and local animal and crop producers. For crops such as banana, taro, cassava and sweet potato, limitations are in the availability of disease free and elite seedlings. For livestock, a number of constraints include improved bloodline, lack of affordable feedstuff, diseases and lack of appropriate knowledge in animal husbandry.

There is an urgent need to increase local food production to ensure adequate supply for the growing demand for food security and to support the emerging tourism industry. From inputs of the stakeholders and environmental scan, the following are issues that directly or indirectly led to the declining contribution of agriculture: 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 dependence on foreign labor.

7. Assumptions made for the Program

- Affordable changes in technology and practices will become available
- Increase family income through sales of excess production.
- Less labor intensive production systems
- Improved family economy and living standards
- Reduction in pesticide use
- Increase profitability and job creation

8. Ultimate goal(s) of this Program

- Improved agriculture production systems
- Increased consumption of locally produced foods
- Improved quality of life for farmers and communities
- Increase employment opportunities
- Improve food security
- More sustainable development

9. Scope of Program

- In-State Extension
- In-State Research
- Integrated Research and Extension

Inputs for the Program**10. Expending formula funds or state-matching funds**

- Yes

11. Expending other than formula funds or state-matching funds

- Yes

12. Expending amount of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2007	19.8	0.0	7.0	0.0
2008	19.8	0.0	7.0	0.0
2009	19.8	0.0	7.0	0.0
2010	19.8	0.0	7.0	0.0
2011	19.8	0.0	7.0	0.0

Outputs for the Program**13. Activity (What will be done?)**

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

Research-based extension materials will be developed and distributed among the farming communities to increase awareness and generate interest in agricultural systems. Workshops, group discussions, demonstrations, farm-visits and field days/fairs

are other components of this program. Researchers will produce elite and disease-free seedlings through tissue culture and nursery techniques.

14. Type(s) of methods will be used to reach direct and indirect contacts

Extension	
Direct Method	Indirect Methods
<ul style="list-style-type: none"> ● Education Class ● Workshop ● Group Discussion ● Demonstrations ● Other 1 (Field Days/Fairs) ● Other 2 (Farm Visits) 	<ul style="list-style-type: none"> ● Public Service Announcement ● Newsletters ● TV Media Programs ● Web sites ● Other 1 (Hand outs, brochures, leaflets)

15. Description of targeted audience

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

16. Standard output measures

Target for the number of persons(contacts) to be reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
2007	600	3000	300	600
2008	600	3000	300	600
2009	600	3000	300	600
2010	600	3000	300	600
2011	600	3000	300	600

17. (Standard Research Target) Number of Patents

Expected Patents	
Year	Target
2007	0
2008	0
2009	0
2010	0
2011	0

18. Output measures

Output Text

Expected Professional Journal Publications.

2007 Target: 0
2008 Target: 0
2009 Target: 3
2010 Target: 3
2011 Target: 3

Output Text

Expected Gray Literatures

2007 Target: 0
2008 Target: 3
2009 Target: 3
2010 Target: 3
2011 Target: 3

Output Text

Expected publications for lay use.

2007 Target: 0
2008 Target: 3
2009 Target: 3
2010 Target: 3
2011 Target: 3

Output Text

Conference presentations

2007 Target: 0
2008 Target: 3
2009 Target: 3
2010 Target: 3
2011 Target: 3

Output Text

Conference publications

2007 Target: 0
2008 Target: 3
2009 Target: 3
2010 Target: 3
2011 Target: 3

Output Text

Number of publications for lay use.

2007 Target: 0
2008 Target: 6
2009 Target: 6
2010 Target: 6
2011 Target: 6

Output Text

Number of conference paper publication/presentations.

2007	Target:	0
2008	Target:	3
2009	Target:	3
2010	Target:	3
2011	Target:	3

Output Text

Number of demonstration farms established.

2007	Target:	0
2008	Target:	12
2009	Target:	12
2010	Target:	12
2011	Target:	12

Outcomes for the Program

19. Outcome measures

Outcome Text: Awareness created

Outcome Text

Number of persons with increased knowledge on appropriate production technologies.

Outcome Type: Short

2007	Target:	2400
2008	Target:	2400
2009	Target:	2400
2010	Target:	2400
2011	Target:	2400

Outcome Text

Number of program participants adopting recommended practices.

Outcome Type: Medium

2007	Target:	1200
2008	Target:	1200
2009	Target:	1200
2010	Target:	1200
2011	Target:	1200

Outcome Text

Number of established farms and farm related businesses by individuals and cooperatives.

Outcome Type: Long

2007 Target: 0

2008 Target: 18

2009 Target: 18

2010 Target: 18

2011 Target: 18

20. External factors which may affect outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Public Policy changes
- Government Regulations

Description

The occurrences of droughts or strong typhoons, which are common in the Micronesian region will greatly affect outcome and such would influence the success in food production technologies. Favorable public policy changes and governmental regulations, e.g. lessen the competition of domestic and imported commodities, will encourage for more production.

21. Evaluation studies planned

- Before-After (before and after program)
- Time series (multiple points before and after program)
- Case Study
- Comparisons between program participants (individuals, group, organizations) and non-participants

Description

Evaluation on research progress will be done from time-to-time on each proposed objective as per approved projects and for Extension evaluation, it will be done at multiple points before, in-between and after program. Case studies and comparisons between program participants (individual, group, organization) and non-participants will be done to see real impact of organized extension activities.

22. Data Collection Methods

- Sampling
- Whole population
- On-Site
- Structured
- Unstructured
- Case Study
- Observation

Description

Pre and post tests will be conducted for short term results. During program delivery, evaluation will be carried out for specific programs requiring periodical measures. Case studies will be done individually for programs or farming operations to shed more light on successes and problems associated with current practices. Structured and unstructured interviews and observations will be conducted whenever appropriate. Whole population data collection will be used for specific programs such as distribution of cultivars and varieties to selected farmers. Data will also be collected through assessments and unstructured interviews during on-site visits.

1. Name of the Planned Program

Families, Youths & Communities

2. Program knowledge areas

- 801 Individual and Family Resource Management 10 %
- 806 Youth Development 20 %
- 608 Community Resource Planning and Development 30 %
- 804 Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures 10 %
- 802 Human Development and Family Well-Being 30 %

3. Program existence

- Intermediate (One to five years)

4. Program duration

- Long-Term (More than five years)

5. Brief summary about Planned Program

This program will address the rapid social and economic changes affecting communities, families and youths. With a growing population and a stagnant economy, the island governments face the daunting task of providing the necessary services, including community development and employment opportunities. Drug and alcohol abuse, school dropouts, teenage pregnancy and unemployment are social problems that have been escalating at an alarming rate in our communities over the past decade. Leadership, civic and life skills programs are important for the success of families and youth development endeavors.

With the change from subsistence to cash economy, everyone expects compensation for whatever that they do and volunteerism is becoming a thing of the past. The Micronesian family system was used to be a closely knitted institution where everyone share and assist one another. It is no longer true and this program is part of the ongoing effort to instill in the minds of youths the values of love, respect, sharing and helping each other. It will also provide information to help them to become good citizens, to learn how to behave in a law abiding way and respecting basic societal norms and values.

6. Situation and priorities

Traditionally, Micronesian families were supported by a very intricate but strong and sustainable socio-economic system that kept the families together and allow them to share and help one another. It is no longer true. There is a breakdown in the traditional support system that resulted in family and youth friction and misunderstanding, which resulted in negative family and social problems. There is also a shift from subsistence to a cash economy, which has resulted in the erosion of the extended family structure, which usually 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 rate 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 three Micronesian nations must implement stringent policies and strategies that will improve well-being of families and youths by employment and other essential services.

7. Assumptions made for the Program

- increasing abilities of families and youth to cope with social issues
- reduce teenage pregnancy and suicide rate among youths
- decrease drug and alcohol abuse among both adults and youths
- decrease truancy

8. Ultimate goal(s) of this Program

- Improved livelihood of families, youth, and communities
- Decrease incidence of abuse

9. Scope of Program

- In-State Extension
- In-State Research
- Integrated Research and Extension

Inputs for the Program

10. Expending formula funds or state-matching funds

- Yes

11. Expending other than formula funds or state-matching funds

- Yes

12. Expending amount of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2007	12.4	0.0	0.0	0.0
2008	12.4	0.0	0.0	0.0
2009	12.4	0.0	0.0	0.0
2010	12.4	0.0	0.0	0.0
2011	12.4	0.0	0.0	0.0

Outputs for the Program

13. Activity (What will be done?)

Cultural arts and crafts training sessions targeting adults and youth will be conducted in the communities. Youths will be encouraged to participate in various community programs like beautification, gardening, and World Clean Up day. Life skills, sports and physical fitness are components of youth programs.

Volunteers will be recruited to serve as liaisons between the colleges and their respective communities and will assist as clientele recruiters. Other volunteers from collaborating agencies in Micronesia will serve as resource persons, mentors and youth leaders in the youth development programs, and lecturers where their expertise is needed.

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.

14. Type(s) of methods will be used to reach direct and indirect contacts

Extension	
Direct Method	Indirect Methods
<ul style="list-style-type: none"> ● Workshop ● Group Discussion ● Demonstrations ● Other 1 (Field Days/fairs/festivals) 	<ul style="list-style-type: none"> ● Public Service Announcement ● Newsletters ● TV Media Programs ● Web sites ● Other 1 (Hand outs, brochures, leaflets)

15. Description of targeted audience

Families, youths and communities.

16. Standard output measures

Target for the number of persons(contacts) to be reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
2007	900	2700	1200	3600
2008	900	2700	1200	3600
2009	900	2700	1200	3600
2010	900	2700	1200	3600
2011	900	2700	1200	3600

17. (Standard Research Target) Number of Patents

Expected Patents	
Year	Target
2007	0
2008	0
2009	0
2010	0
2011	0

18. Output measures

Output Text

Number of training conducted targeting youths.

2007 Target: 12
 2008 Target: 12
 2009 Target: 12
 2010 Target: 12
 2011 Target: 12

Output Text

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

2007 Target: 6
 2008 Target: 6
 2009 Target: 6
 2010 Target: 6
 2011 Target: 6

Output Text

Total number of youth clubs organized.

2007 Target: 3
 2008 Target: 3
 2009 Target: 3
 2010 Target: 3
 2011 Target: 3

Outcomes for the Program

19. Outcome measures

Outcome Text: Awareness created

Outcome Text

Number of youths with increased awareness and understanding of roles and relationship with parents.

Outcome Type: Short

2007 Target: 900

2008 Target: 900

2009 Target: 900

2010 Target: 900

2011 Target: 900

Outcome Text

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

Outcome Type: Medium

2007 Target: 300

2008 Target: 300

2009 Target: 300

2010 Target: 300

2011 Target: 300

Outcome Text

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

Outcome Type: Long

2007 Target: 300

2008 Target: 300

2009 Target: 300

2010 Target: 300

2011 Target: 300

20. External factors which may affect outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Government Regulations

Description

Travel to outer islands may become risky during natural calamities thus services are disrupted. Increase or decrease of funding will influence planned activities.

21. Evaluation studies planned

- Before-After (before and after program)
- Comparisons between program participants (individuals, group, organizations) and non-participants

Description

Pre and post assessments will be conducted to program participants to determine level of knowledge gained. Comparison between participants and non-participants will be made to determine impact of program.

22. Data Collection Methods

- Sampling
- Whole population
- On-Site
- Structured
- Observation

Description

Both sample and whole population data collection methods will be used to ensure accuracy of data. Data collection will be done on-site utilizing structured interview enabling for future reference. Visual observations will be made to determine improvement in the family and youths interpersonal relationships.

1. Name of the Planned Program

Food, Nutrition & Health

2. Program knowledge areas

- 724 Healthy Lifestyle 20 %
- 702 Requirements and Function of Nutrients and Other Food Components 20 %
- 703 Nutrition Education and Behavior 10 %
- 711 Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources 20 %
- 701 Nutrient Composition of Food 10 %
- 712 Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins 20 %

3. Program existence

- Mature (More than five years)

4. Program duration

- Long-Term (More than five years)

5. Brief summary about Planned Program

Micronesia has an abundance of locally grown nutritious foods like taro, breadfruit, yam, banana, sweet potato, and fresh fruits and vegetables. The islands are surrounded by oceans, which provide good protein and calcium sources such as fish and other seafood that can always be harvested fresh. Despite these resources, Micronesian families have developed a high preference of low nutritious imported foods such as frozen and canned meat, turkey tail, chicken leg quarter, corned beef and polished rice.

This program will continue to address nutrition and health related issues and provide appropriate nutrition education programs in the communities, including the benefits of proper diet and physical activities. It will also strengthen existing collaborations on programs that provide information to stakeholders on healthy lifestyle and consumption of healthy local foods.

It will be a major challenge on how this program is delivered to illicit a change in behavior.

6. Situation and priorities

Diabetes, obesity, heart related problems, and other nutrition related illnesses continue to be major health problems in Micronesia today as a result of changing lifestyle and a high preference for imported processed food over locally grown nutritious foods. There is also an overall decline in production of local foods that are found to have high content of carotene or Vitamin A. This program is part of the ongoing effort in reversing this trend through the provision of knowledge and skills necessary for families to plan and prepare nutritious healthy meals with the use of locally produced foods.

Diet plays a key role in explaining the continuing upward trend in the deteriorating health condition of so many people in our communities. Cases of nutrition related illnesses continue to rise as families and governments are challenged with the ever rising cost related to referral of patients to off island medical facilities. Many households and individuals continue to consume imported processed foods that are high in fat and low in fiber and people are still unaware of proper food selection, preparation, handling, and storage.

7. Assumptions made for the Program

- Improved eating habits
 - Decrease in nutrition related illnesses
 - Decrease in off-island referrals
 - Decrease in family and government medical costs
- Decrease in infant mortality

8. Ultimate goal(s) of this Program

The ultimate goal of this program is to have healthy people and healthy communities.

9. Scope of Program

- In-State Extension
- In-State Research
- Integrated Research and Extension

Inputs for the Program

10. Expending formula funds or state-matching funds

- Yes

11. Expending other than formula funds or state-matching funds

- No

12. Expending amount of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2007	10.0	0.0	0.0	0.0
2008	10.0	0.0	0.0	0.0
2009	10.0	0.0	0.0	0.0
2010	10.0	0.0	0.0	0.0
2011	10.0	0.0	0.0	0.0

Outputs for the Program

13. Activity (What will be done?)

This program will address major health problems relating to malnutrition and nutrition related illnesses in Micronesia resulting from the following:

- New lifestyles which shift from subsistence economy to a wage economy
- High preference of low nutrition value imported food over locally grown nutritious food.
- Convenience in obtaining, cooking and storing of imported food.
- Socio-economic and cultural restrictions.
- Geographical distances between the islands.
- Lack of knowledge in planning and preparing nutritious meals.

Community workshops will be carried out in all counties. Collaboration with Public Health, Agriculture, Education, and other organizations will continue to communicate health and agriculture messages related to improving health and increase production of nutritious local foods. Face-to-face counseling and small group training will be conducted to homemakers, other individuals, and children with special health care needs.

14. Type(s) of methods will be used to reach direct and indirect contacts

Extension	
Direct Method	Indirect Methods
<ul style="list-style-type: none"> ● Workshop ● Group Discussion ● Demonstrations ● Other 1 (International events) 	<ul style="list-style-type: none"> ● Public Service Announcement ● Newsletters ● TV Media Programs ● Web sites ● Other 1 (Hand outs, brochures, leaflets)

15. Description of targeted audience

Homemakers, farmers, young mothers and students.

16. Standard output measures

Target for the number of persons(contacts) to be reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
2007	600	3000	300	1500
2008	600	3000	300	1500
2009	600	3000	300	1500
2010	600	3000	300	1500
2011	600	3000	300	1500

17. (Standard Research Target) Number of Patents

Expected Patents	
Year	Target
2007	0
2008	0
2009	0
2010	0
2011	0

18. Output measures

Output Text

Number of community workshops conducted.

2007 Target: 12
 2008 Target: 12
 2009 Target: 12
 2010 Target: 12
 2011 Target: 12

Output Text

Number of coalitions strenghten.

2007 Target: 6
 2008 Target: 6
 2009 Target: 6
 2010 Target: 6
 2011 Target: 6

Output Text

Number of intervention conducted to individuals or small groups.

2007 Target: 134
2008 Target: 134
2009 Target: 134
2010 Target: 134
2011 Target: 134

Outcomes for the Program

19. Outcome measures

Outcome Text: Awareness created

Outcome Text

Number of program participants who increase awareness of nutrition related health issues.

Outcome Type: Short

2007 Target: 900
2008 Target: 900
2009 Target: 900
2010 Target: 900
2011 Target: 900

Outcome Text

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

Outcome Type: Medium

2007 Target: 600
2008 Target: 600
2009 Target: 600
2010 Target: 600
2011 Target: 600

Outcome Text

Annually increase the number of healthy food snacks or lunch programs in schools and communities.

Outcome Type: Long

2007 Target: 6
2008 Target: 6
2009 Target: 6
2010 Target: 6
2011 Target: 6

20. External factors which may affect outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Public Policy changes
- Government Regulations

Description

Drought condition will limit outcome of program in communities with high population densities where water resources will be a limiting factor during cooking demonstrations. Public policies requiring training in food, nutrition and health in schools, communities and for food establishments will encourage more people to enroll and complete nutrition programs.

Government regulations that discourage importation of unhealthy foods should be enforced.

21. Evaluation studies planned

- Before-After (before and after program)
- During (during program)
- Comparison between locales where the program operates and sites without program intervention

Description

Pre and post tests will be conducted to program participants. Evaluation during program includes observation and group discussions on subject matters. Visual observation will be made to compare health status in communities where the programs are conducted as opposed to those without. For NCDs clinical information will be used to compare outpatient information from communities with and without intervention actions. In schools, pre and post-tests results will reflect students level of learning in nutrition and health.

22. Data Collection Methods

- Whole population
- On-Site
- Structured
- Observation
- Tests

Description

Data will be collected from all program participants. Survey will be conducted on site during program delivery and follow-up visits. Structured interviews will be conducted for specific reasons, e.g. for families and youth with special needs. Visual observation will be made during the duration of program and after completion of program delivery.