

2019 Annual Report of Accomplishments and Results

Micronesia

College of Micronesia

I. Report Overview

The NIFA reviewer will refer to the executive summary submitted in your Plan of Work. Use this space to provide updates to your state or institutions as needed.

1. Executive Summary

The geographic region served by the College of Micronesia land grant program (COM-LG) covers six counties over 2 million square miles. Four of the extension counties in the Federated States of Micronesia (FSM) are Yap, Chuuk, Pohnpei and Kosrae. These counties include 607 islands and atolls, 65 of which are inhabited, spread across an ocean area of more than one million square miles. The Republic of the Marshall Islands (RMI) is a county consists of two north-to-south chains of islands. Altogether it consists of 30 atolls each made up of many islets and 5 coral islands. The Republic of Palau (ROP) is a county consists of a cluster of 343 islands in the southwest corner of the region, roughly 500 miles southeast of the Philippines. In 2019, administration, research and extension staff continued to work within the approved plan of work. In addressing the wide range of issues identified by the stakeholders, our program gave emphasis to address national and local issues and priorities. While 5 out of 6 program addressed national priorities, one program area – aquaculture - specifically addressed a local priority area. In 2020, we reassessed our program areas that resulted in consolidation to further emphasize the issues of local significance and priorities.

Research and extension activities continued to improve agriculture and aquaculture productivity, tackle youth and family issues, address childhood obesity, enhance climate change adaptation strategies, enforce food safety measures, increase food security and self-sufficiency, and improve the quality of life.

Research and extension efforts to promote **aquaculture** and its economic potential for sustainable community development continued to be a priority. Areas addressed by research and extension projects include the development and refinement of techniques in the seed production and grow-out culture of traditionally and economically important aquaculture species such as mangrove crabs, rabbitfish, tiger shrimps, grouper, small clams, pearl oysters, giant clams and sea cucumber. Multispecies hatcheries served as locations for seed production activities, hands-on demonstrations, local and regional training, and capacity building. Successful seed production operations in Palau resulted in the production of 20,000 rabbitfish fingerlings and 3000 crablets that were delivered to grow-out farms. About 8 million larvae of mangrove crabs were released in conservations areas to enhance their population in the wild. Research efforts at Yap and Pohnpei hatcheries produced 19,690 sandfish sea cucumber juveniles for grow-out initially for three months in ocean floating hapa nurseries, then grown out to market sized animals in community or in protected area farms for about 18-24 months. Spawning and larval rearing of giant clams were demonstrated and hands-on training provided to various stakeholders in Micronesia. A research project in the Marshall Islands also focused on developing protocols for

hatchery, nursery and grow-out culture of small clams and groupers whereas extension program facilitated demonstration and training of grow-out maintenance of rabbit fish, tilapia, and pearl oysters. Altogether, the extension program reached 1505 stakeholders via direct contacts.

The traditional extended family system in Micronesia has changed significantly during the last 2 or 3 decades. Many of these changes are both profound and ominous. Today, Micronesian families face challenges in maintaining smooth relationships owing to outside influences and threats. Our extension programs strengthened families in Micronesia by helping in areas such as skills building activities, healthy physical activities, gardening, counselling, cultural activities, after school educational tutoring sessions and leadership development programs. Each of these emphasis areas impact communities and their well-being. Outreach sessions comprised of workshops to enhance life skills of youth in modern fishing methods, handcrafts making, weaving, sewing and business development skills such as business plan writing, marketing, pricing, and cash flows. These skills development training sessions empowered youth to engage in productive activities in the community. Tutoring and counselling sessions provided to school dropouts to stay away from substance abuse, engage in sports and fitness programs and successfully and complete the academic sessions. Through parental guidance and counselling sessions, young couples and families with relationship challenges learned about value of respect, proper communication, discernment of correct behavior, wise decision making in family resources management, solving conflicts, and experiencing a harmonious life. Outreach and educational activities under **Families, Youth and Communities** program reached 863 adults and 1570 youth.

Childhood obesity continues to be a major health problem in Micronesia. Modernization, dietary changes, and dependence on imported food products contributed toward the increase in obesity among the population. Presently Micronesians are among the top 10 obese countries in the world. A major effort of our extension program was to address diet and obesity promoting factors through culturally appropriate interventions. Consumption of high-calorie sugary drinks and lack of enough physical activity were identified as a major factor contributing to obesity. Therefore, training programs were focused on creating awareness about the causes of obesity, non-communicable diseases, prevention of obesity, importance of healthy diets and physical activities, gardening, consumption of nutritious vegetable, healthy recipes, and cooking demonstrations, among others. General recommendation was to increase consumption of local foods including school/home grown veggies and fruits in addition to incorporating other recommendations to reduce fat and calorie content of meals. Training programs also focused toward parental attitudes and actions on children's eating and exercise behaviors and delivery of culturally appropriate parental best practices. **Childhood Obesity** program reached 1182 adults and 2175 youth.

Building resilience of traditional island agriculture systems is a priority given the challenges facing from climate change. Seed system is an important area for enhancing such resilience as seed security has direct links to food security and resilient livelihoods of island communities in general. Resilient seed systems have the capacity to absorb shocks and reorganize to maintain seed security over time which has direct links to ensure food security. However, building resilient seed systems is unexplored in research and practice. A research project was initiated to introduce, evaluate, and distribute open pollinated seeds to meet small-scale growers' needs for planting material and to enhance their resiliency during times of stress. Outreach activities were conducted to spread awareness on the impacts of climate change to the environment, agriculture, and food production systems. Demonstration gardens maintained to showcase climate-smart production systems. Results of

research and extension programs were shared with stakeholders in meetings and through local outreach events. **Climate change** program reached 1214 stakeholders via direct contacts.

Lack of proper knowledge on food safety is attributed to high incidence of food and waterborne illnesses in Micronesia. This often results in communities exposed to unsafe processed and contaminated foods. Outreach and extension efforts to educate the target audience about food safety practices continued through awareness trainings, educational workshops, and hands-on demonstrations. Activities were focused on proper and safe food handling, understanding food labels, proper storage methods, adopt best practices and processing methods, food inspections to avoid contamination and sanitation requirements to reduce the risk of foodborne illnesses. **Food safety** program reached 2134 stakeholders through direct contacts and 4247 individuals through indirect contacts.

Micronesian islands have an economically detrimental reliance on imported foodstuff, especially fruits, vegetables, and animal products. The increase in the demand and consumption of imported foods has led to an overall decline in local food production and concomitant decrease in food security. Strengthening traditional agricultural systems using climate-smart adaptive methods as well as focus on local food production and processing methods was thus crucial to reduce poverty and to meet overall food security objectives. Our research programs utilized integrated research, extension, and education projects to provide knowledge, technical assistance, and methods to produce local foods and improve food products and processes for existing and expanded markets. Research project on black pepper and pineapple standardized the production methods and appropriate hands on training activities were provided to local farmers for adoption and expansion. New efforts initiated to control invasive insect pest such as coconut rhinoceros beetle, and information on control measures have been disseminated to farmers. Efficacy of a combination of nitrogen-fixing plants and seaweed compost is being tested to ameliorate the challenges with atoll soils. Extension efforts focused on providing swine husbandry training, soil management, vegetable gardening training in schools and communities, cooking demonstrations, preparation of healthy meals, and training on value-addition of local produce. There was a total of 5,866 contacts among adults and youth under **Global Food Security and Hunger** program.

Cost-sharing agreement with State Governments continued, whereby extension agents from the State agriculture departments collaborated with the cooperative extension service staff. Shortage of qualified staff remained a challenge and appropriate steps are being taken to fill vacant positions. Outreach activities in some of the remote atolls were hampered due to Dengue outbreak and associated travel ban.

II. Merit and Scientific Peer Review Processes

The NIFA reviewer will refer to your Plan of Work. Use this space to provide updates as needed or activities that you would like to bring to NIFA’s attention.

Process	Updates
<p>1. The <u>Merit Review Process</u></p>	<p>Extension programs were established based on the needs of the clients as identified by the agents through direct contacts and through community meetings as per the approved plan of work. Inputs were sought from the stakeholders, the state and national development plans, and policies. A strong collaboration is in place with local NGOS and government agencies. The proposals were submitted to review committees for comments and suggestions. Special project proposals were subject to peer review within and outside of the colleges by external stakeholders and also by advisory committees.</p>
<p>2. The <u>Scientific Peer Review Process</u></p>	<p>A scientific peer review process has been in use for research proposals. Project proposals were developed based on the outcomes of meetings with stakeholders, in line with the approved plan of work for research and extension. The proposals were submitted to review committees for comments and suggestions. Once comments are incorporated, the CRE administrators submit them for further review and approval at each college. Final proposals are submitted to the AES/CES Director for endorsement and submission to the NIFA.</p>

III. Stakeholder Input

The NIFA reviewer will refer to your Plan of Work. Use this space to provide updates as needed or activities that you would like to bring to NIFA’s attention.

Stakeholder Input Aspects	Updates
<p>1. Actions taken to seek stakeholder input that encouraged their participation with a brief explanation</p>	<p>Stakeholder inputs were gathered from local community groups, individual farmers, government, and non-governmental agencies. It has been a long-standing practice to invite stakeholders for various functions of the partner colleges and give them opportunities to express their needs in informal settings such as personal contacts with administration and extension staff. Inputs were also gathered during community outreach events. Being small counties with tightly knitted communities, formal and informal communication is a norm and partners understand each other’s needs and capabilities and the value of sustained relationships.</p>
<p>2. Methods to identify individuals and groups and brief explanation.</p>	<p>Stakeholders of our programs are well identified through advisory committees, needs assessments, personal contacts, friendships, individuals, agencies or recommended by peers. Stakeholders were notified via letters, radio or through personal visits when meetings or trainings were held.</p>
<p>3. Methods for collecting stakeholder input and brief explanation.</p>	<p>Some of the methods used for collecting stakeholder input were through one-on-one meetings, discussions, surveys, field observations, and interviews with community leaders. Youth programs were developed in consultation with schools, community groups and through government agencies such as the Early Childhood Education (ECE) programs. Stakeholders were directly involved in program needs and assessments during annual retreats, community meetings and student recruitment campaigns.</p>
<p>4. A Statement of how the input will be considered and brief explanation of what you learned from your stakeholders.</p>	<p>Stakeholder inputs have been used extensively in planning new programs and improving existing programs and projects. During meetings with stakeholders, suggestions and comments were sought and those with positive impacts to research and extension projects/programs were incorporated. It also helped with planning and prioritization of future planned activities. Administrators use stakeholder input to prioritize resource allocations. State agencies assisted in developing programs and provided budgets for field activities through matching funds.</p>

	<p>We learned that farmers, homemakers, fishermen, community groups and others are good sources of traditional knowledge which is useful to enhance extension program delivery. Small scale growers and entrepreneurs interested in business development lack marketing skills and strategies, and training is necessary for them to be successful.</p>
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IV. Planned Program Table of Contents

No.	Program Name in order of appearance
1.	Aquaculture
2.	Families, Youths and Communities
3.	Childhood Obesity
4.	Climate Change
5.	Food Safety
6.	Global Food Security and Hunger

V. Planned Program Activities and Accomplishments

Please provide information for activities that represent the best work of your institution(s). See Section V of the Guidance for information on what to include in the qualitative outcomes or impact statements. Add additional rows to convey additional accomplishments. You may expand each row as needed.

No.	Title or Activity Description	Outcome/Impact Statement	Planned Program Name/No.
1.	<p>What is the issue? Potential of aquaculture for economic development and conservation of aquatic species has not been adequately appreciated. Hatchery production and grow-out methods would demonstrate and promote sustainable economic opportunities of valuable marine species.</p> <p>Target audience Fishing communities, resource owners, entrepreneurs, government agencies, NGOs, students.</p> <p>What has been done? One-on-one meetings, field visits, on-site demonstrations, hatchery tours, and workshops were conducted on the grow-out culture of locally and regionally important aquatic species. Hatchery-based and site-specific trainings were provided in spawning and larval rearing techniques.</p> <p>Results Seven hundred and thirty-seven program participants increased their knowledge in important aquaculture species, increased skills in hatchery and grow-out techniques, sustainable aquaculture production, and marine resources management.</p>		Aquaculture

<p>2.</p>	<p>What is the issue? Communities and aspiring entrepreneurs are hesitant to participate and invest in aquaculture ventures due to limited skills, lack of site-specific information and demonstrated opportunities.</p> <p>Target audience Communities, resource owners, entrepreneurs, governments agencies, NGOs, students.</p> <p>What has been done? Hatchery-based hands-on trainings were provided in larval and nursery rearing methods, spawning, grow-out and farm maintenance. Demonstration farms were established in the communities. Technical assistance sessions, consultations and guidance sessions continued.</p> <p>Results Thirty-two participants successfully completed training and demonstrated increased skills, knowledge and motivation in aquaculture production and shown greater confidence to begin aquaculture venture.</p>	<p>Student interns showed enhanced skills to new aquaculture technologies to further their career. Two communities in Marshall Islands have established one giant clam farm and one rabbit fish farm.</p>	<p>Aquaculture</p>
<p>3.</p>	<p>What is the issue? Many aquaculture farmers who are in business were not able to optimize their production owing to limited source of seeds for stocking. Absence of reliable seed supply has been a bottleneck for commercial expansion of aquaculture operations.</p> <p>Target audience Fishermen, potential aquaculture farmers, resource owners, entrepreneurs.</p> <p>What has been done?</p>	<p>Two farmers and a community group were benefited with the hatchery-based production and supply of sea cucumber juveniles for stock enhancement and further growth in the wild. A non-governmental organization has established a small-scale hatchery for giant clam production, three communities selected protected areas for giant clam farming.</p>	<p>Aquaculture</p>

	<p>Hands-on training on the larval rearing and nursery management of commercially important aquaculture species were conducted. One-on-one technical advice sessions conducted and technical assistance program was extended to potential aquaculture farmers.</p> <p>Results</p> <p>Hatchery-based training and production of high value aquatic species juveniles facilitated farmers to manage grow-out operations efficiently and successfully harvest and sell their products.</p>		
<p>4.</p>	<p>What is the issue?</p> <p>Youths face many societal challenges to enhance their lifestyle and living opportunities in the islands. Despite challenges, they possess tremendous potential as a catalyst for a positive change. They need better awareness and exposure in social and moral skills to make positive contributions in families and communities.</p> <p>Target audience</p> <p>Youth, students, school dropouts, unemployed and underprivileged youth, homemakers, community groups.</p> <p>What has been done?</p> <p>Summer arts and crafts programs, technical assistance and hands-on trainings in vegetable gardening were conducted. Cooking demonstrations were conducted to promote healthy eating habits in the families. Youths were encouraged to attend sports and physical activities. Presentations were given during public events and at schools to promote cultural knowledge and promote awareness on the ill effects of tobacco and alcohol use. Training on sewing, culinary arts and handicraft making were provided to young women.</p>		<p>Families, Youths and Communities</p>

	<p>Results A total of 2440 youth received skills and awareness building training to enhance life strategies that helped them to make positive contributions in career activities. They showed competence in team building efforts, sports activities and progressively contributed to community development activities.</p>		
<p>5.</p>	<p>What is the issue? Limited income and lack of motivation often impedes efficient adoption of entrepreneurial skills by families and youths to deliver needed services or make positive contributions in the society.</p> <p>Target audience Youths, families, women’s groups.</p> <p>What has been done? Technical assistance and hands-on trainings were provided to youths and families to enhance entrepreneurial skills, establish homegardens, and boost sewing and handcrafts making. Technical assistance and outreach sessions were provided to women’s groups to encourage preparation sale of healthy meals.</p> <p>Results A total of 306 youths/families or women’s groups were engaged in social, moral, and entrepreneurial skills development activities. They established home vegetable gardens to provide fresh produce for their families and often sold surplus produce in the local market. There was significant increase in the number of families utilizing healthy recipes and cooking healthy meals. Families gained skills in sewing and handcrafts making and they were able to sell products in the local market as well as to off-island buyers.</p>		<p>Families, Youths and Communities</p>

<p>6.</p>	<p>What is the issue? Families and communities are not fully utilizing their relevant skills and potential to generate income and improve financial stability. Many program participants had not fully benefited from learned skills due to limited financial resources and capital to expand small businesses.</p> <p>Target audience Families, communities.</p> <p>What has been done? Technical assistance programs and business planning and marketing training sessions conducted. Coordinated activities conducted to encourage families and community groups to undertake small business development strategies based on leaned skills. Guidance and recommendations were given through follow-up visits.</p> <p>Results A total of 193 participants showed increased involvement in promoting healthy food choices and livelihood development opportunities. They benefited from guidance and focused training sessions that helped to sell their garden produce during public and community events. Survey showed organized trainings and outreach activities empowered families and communities actively engaged in income generating activities.</p>	<p>Three community groups participated in healthy cooking events and earned a combined total of \$1,500 extra income for their families. Five families earned more than \$5,000 from sewing. Sale of vegetables provided additional monthly income to a few youth club members.</p>	<p>Families, Youths and Communities</p>
<p>7.</p>	<p>What is the issue? Overweight and obesity is prevalent among children and youth populations in Micronesia. Children lack appropriate knowledge on the importance of maintaining good health, healthy food</p>		<p>Childhood obesity</p>

	<p>preparation methods, significance of good nutrition, and physical activity.</p> <p>Target audience School children, parents, food handlers.</p> <p>What has been done? Altogether 135 outreach and awareness training sessions and 2 summer agriculture camp meetings conducted on topics such as childhood obesity, body mass index, healthy food choices, human nutrition, and importance of physical activities. Cooking demonstrations emphasized using fresh garden produce, less salt, sugar, and fats. Students were encouraged to undertake gardening activities as part of increasing physical activities.</p> <p>Results Outreach and training sessions helped 2434 program participants with increased and improved knowledge on obesity related health issues, importance of healthy lifestyle, balanced diet, nutrition, and physical activities.</p>		
<p>8.</p>	<p>What is the issue? Many families depend on convenience food such as noodles and processed foods. This along with sedentary lifestyles makes children and adolescents overweight or obese, which in turn lead to many forms of non-communicable diseases as they grow up.</p> <p>Target audience School children, parents.</p> <p>What has been done? Outreach and education activities on school gardening, healthy meal preparation and physical activities were organized in schools to increase the adoption of best practices. Hands-on trainings</p>		<p>Childhood obesity</p>

	<p>provided to encourage students to establish school gardens and homegardens. Additionally, healthy meal preparation classes were conducted to demonstrate cooking healthy dishes using locally grown vegetables.</p> <p>Results About 916 program participants showed increased participation in school gardening programs, and engaged in regular exercise or physical activities sessions. Participants increased consumption of locally grown vegetables and fiber-rich local foods.</p>		
<p>9.</p>	<p>What is the issue? Limited reduction in the percentage of childhood obesity is attributed to the lack of technical support, continued dependence on convenience foods, poor lifestyle, unbalanced diets coupled with lack of physical activities result in obesity. Many families are still unaware of the relationship between unhealthy food choices and obesity.</p> <p>Target audience School children, families</p> <p>What has been done? Follow-up trainings, one-on-one interventions, nutrition surveys and counseling sessions were conducted in schools and communities to provide additional recommendations and guidance to school children and their families. They were encouraged to engage more in school/home gardening activities, carryout physical activities and eat healthy meals.</p> <p>Results</p>	<p>Follow up assessments showed significant improvement towards attaining ideal BMI among 291 program participants (school children).</p>	<p>Childhood obesity</p>

	<p>Increased home gardening activities and healthy eating habits were noticed among 291 participating school children. They showed significant improvement in reducing body weight.</p>		
<p>10.</p>	<p>What is the issue? Traditional agriculture systems are highly vulnerable to changes in climatic conditions with outcomes affecting food security. Communities lack awareness and skills in safeguarding food sources from impacts of climate variability.</p> <p>Target audience Island communities</p> <p>What has been done? Workshops, hands-on trainings, and field demonstration activities were conducted to increase awareness on climatic stresses and location-specific adaptation and mitigation strategies.</p> <p>Results A total of 1097 participants increased their knowledge in climatic challenges and gained skills in identifying location-specific climate change adaptation and mitigation measure. Their confidence level to solve community food security challenges increased.</p>		<p>Climate change</p>
<p>11.</p>	<p>What is the issue? Who cares and why? Effect of climatic stresses and extreme weather events are severe in small islands and atolls. Communities lack knowledge on appropriate adaptation methods to combat the effects.</p> <p>Target audience Island communities</p> <p>What has been done? Hands-on training and demonstrations were conducted focused on site-specific adaptation strategies.</p>		<p>Climate change</p>

	<p>Results A total of 123 participants adopted appropriate production methods such as container gardening and raised beds to grow crops for family consumption. Communities also used salt tolerant varieties of crops in low lying areas.</p>		
<p>12.</p>	<p>What is the issue? Lack of proper information and awareness on food safety contributes to high incidence of food and waterborne illnesses, especially in young children. Target audience Parents, cooks in schools and restaurants, food handlers What has been done? Hands-on trainings and presentations were conducted on practicing personal hygiene, food selection and safe food handling, avoiding cross contamination, and proper cooking methods. Results A total of 2029 program participants increased their knowledge and awareness on health issues resulting from consumption of unsafe food and water, lack of personal hygiene, improper food safety measures and practices in the community.</p>		<p>Food safety</p>
<p>13.</p>	<p>What is the issue? Families and communities are concerned about the continued occurrence of food and waterborne illnesses resulting from limited adoption of food safety skills and methods by food handlers. Target audience Families, communities, food handlers What has been done?</p>	<p>Participants were able to identify, understand and address issues related to unsafe food handling practices; barriers to adopt safe food handling practices significantly reduced. Communities experience better food safety measures in schools and food establishments.</p>	<p>Food safety</p>

	<p>Follow-up trainings for food handlers continued in conjunction with inspection visits and meetings to provide additional recommendations, guidance and follow proper food handling procedures and methods.</p> <p>Results Observations and results from food safety surveys indicated over 100 program participants adopted food safety recommendations and proper food handling practices.</p>		
<p>14.</p>	<p>What is the issue? Food insecurity has adverse consequences for the livelihoods and economic capabilities of small-scale growers and vulnerable island population. Island communities have limited knowledge and skills in crop production methods, plant, and animal management practices. Providing appropriate outreach, technical assistance and education is crucial to help the communities to enhance food production and ensure food security.</p> <p>Target audience Small-scale growers, farmers, youths, students, and island communities.</p> <p>What has been done? Conducted presentations, field demonstrations, workshops, outreach events and hands-on trainings in soil management practices, climate-smart production crop production methods, swine and poultry production and management and food processing techniques.</p> <p>Results Awareness activities, outreach programs and hands-on trainings increased the knowledge and skills of 5,366 program participants in</p>		<p>Global food security and hunger</p>

	sustainable agriculture methods and identifying appropriate production methods to enhance food production.		
15.	<p>What is the issue? There is limited knowledge on food processing and value-addition techniques that can contribute to income generation.</p> <p>Target audience Homemakers, farmers, small scale growers, communities.</p> <p>What has been done? Hands-on trainings were provided on various processing techniques and value-addition methods.</p> <p>Results Participants gained necessary skills and knowledge in food processing techniques and to add value to local farm produce.</p>	Participants utilized the skills from trainings to make tomato puree, fruit preserves, oils, teas, cassava flour, banana chips and pumpkin jam for the local market.	Global food security and hunger
16.	<p>What is the issue? There are limited number of established farms or gardens to produce sufficient quantity of produce for local market demands.</p> <p>Target audience Farmers, small scale growers.</p> <p>What has been done? Training and technical assistance programs were extended to the target audience on improved staple crop production and animal husbandry trainings.</p> <p>Results Adoption of improved crop production and animal husbandry methods supported target audience' staple food and protein requirements.</p>	Trainings helped four clients to regularly produce and sell Chinese cabbages worth over \$200 (per month) in the local market. Six egg producers continue to provide fresh eggs in the local market with a combined earning of over \$2000 per month. Animal husbandry trainings helped farmers to increase the market value of swine.	Global food security and hunger

External factors

Extension program services to some outer islands and remote atolls were hampered for almost 7 months due to travel ban instituted after Dengue fever outbreak in RMI county. In the FSM, extension services delivery greatly affected due to tropical storms. Bad weather frequently delayed inter-island travel and program delivery.