2016 Northern Marianas College Combined Research and Extension Plan of Work

Status: Accepted

Date Accepted: 08/10/2015

I. Plan Overview

1. Brief Summary about Plan Of Work

On March 28, 1985, Governor Pedro P. Tenorio signed Public Law 4-34 entitled the Post Secondary Education Act of 1984 which gave Northern Marianas College (NMC) the commonwealth's blessing to pursue land grant designation. Also in 1984, Micronesia, American Samoa, and the Northern Marianas argued that the territories were "the only areas under the American flag which have not been allowed to participate in the land-grant college program." Their land-grant status was approved on August. 27, 1986 through PL 99-396. Through this act, NMC was authorized $3 million for an endowment instead of land or land scrip which was the norm in previous enactments. This event marked the actual beginning of NMC's Land Grant tradition in the Commonwealth of the Northern Mariana Islands as an 1862 institution. Although approved of its designation, the institution did not receive its $3 million endowment till November 5, 1996 through the passage of Public Law 104-208.

The Northern Marianas College-Cooperative Research, Extension and Educations Service, (NMC-CREES) is the present face of Land Grant, stemming from its original early days as Land Grant and followed by a transition to Agriculture & Life Sciences (ALS). Today, NMC-CREES provides outreach education and conducts research through its two divisions of Agriculture Research & Extension (ARE) and Family & Consumer Sciences (FCS). With continuous interaction, collaboration and a unified direction, both programs are dedicated to helping improve economic well-being, living conditions and overall quality of life within the Commonwealth of the Northern Mariana Islands (CNMI) Our key stakeholders include farmers, families, youth, individuals, government agencies, and various ethnic communities.

In relation to other land grant institutions, NMC-CREES is small in size with fewer than forty employees distributed amongst the three major islands, Saipan, Tinian, and Rota. To resolve the shortage of manpower, NMC-CREES relies on the key collaborations and partnerships with government agencies, non-profit organizations and other entities throughout the CNMI and region. Our interactions with collaborators enable us to promote our educational programs, extension services and research projects. NMC-CREES provides collaborators with knowledge and expertise to aid their respective organizations or agencies. Extension services and research projects are the result of the growing needs and challenges that the CNMI community faces.

For over 30 years of successful program existence, NMC-CREES is still adhering to its land-grant roots of teaching, research and extension while concurrently transforming into an interdisciplinary unit that is attracting a larger and more diverse group of clients. This 5-year Plan of Work is a cohesive vision for our preferred future in agricultural research and extension, and family and consumer sciences that addresses various aspects of the current USDA program priorities.

The inability to provide **all** of USDA's program priorities has much to do with a major change directed specifically towards this territory in regards to its recruitment and maintenance of its human resources. This significant change was Congress' passage of the Consolidated Natural Resources Act (CNRA).

On May 8, 2008, the CNRA extended most provisions of U.S. immigration law to the Commonwealth of the Northern Mariana Islands (the CNMI) for the first time in its history. The transition period for implementation of U.S. immigration law in the CNMI began on November 28, 2009, and is scheduled to end on December 31, 2014. Such an act significantly reduced NMC-CREES' ability to hire faculty

possessing the academic credentials needed to offer stakeholders with technical assistance in the various science disciplines. Although this enactment is not being seen as an impediment, it is currently affecting our recruitment efforts. Since the enactment we have faced one uncertaintity after another. We are truly struggling with this issue at the moment as:

- There is increasing demand for our services outside normal offerings due to the wide range of successful activities the department offers stakeholders;
- Limited professional resources to tap in the fields of agriculture and the family consumer sciences being so far away from the contiguous United States;
- Experiencing a turnover rate unwitnessed prior due to more enticing job offers elsewhere;
- Limited capacity building ability among present staff due to the general lack of educational attainment in the desired fields of study;
- Need to outsource human resources due to little or no pool of qualified applicants locally;
- Uncompetitive salary scale that is hampering our ability to entice professionals;
- An established salary cap that is far lower than what other institutions providing the same services pay their staff and faculty.

The aforementioned issues compiled make it increasingly difficult to entice the resident population, thus creating a mass migration of potential applicants. Because of this drain in the resident workforce, NMC-CREES relies on the use of foreign scientists and extension agents to provide the necessary services stipulated in its mission. With the enactment of CNRA, the ability to hire willing foreign scientists has come to a halt pending the full enactment of the law in 2014.

For this submission, we will continue to deliver services focused on delivering agriculture and the life sciences. The (ARE) Agricultural Research and Extension focuses on Aquaculture Development, Crop Improvement, Plant Protection, and Livestock Improvement Program. These programs are geared to improve Food Security and Hunger while promoting clean energy in order to tackle climate change not only in the CNMI but to other countries impacted by our success. On the other hand, Family Consumer Sciences (FCS) focuses on 4-H Youth Development, Food Safety and Quality, Expanded Food and Nutrition Education Program (EFNEP), Childhood Obesity, Community Development and Resource Management (CDRM). These programs aim to provide solutions to child obesity and food safety as part of the top prioroties set by USDA NIFA. The knowledge areas were selected for their significant potential for establishing mutually beneficial partnership with farmers, ranchers, homemakers, advisory councils, industry, and government agencies.

With the current economic downturn, increased pressure to innovate in order to mitigate problems that result from climate change and energy problems, and food security issues, this plan recognizes that NMC-CREES must be positioned to respond rapidly and effectively to emerging issues that affect the profitability and sustainability of the CNMI's agriculture, now and in the years ahead. This plan has grown out of discussions and listening sessions from people around the CNMI and emanated from reviews of the national goals of the United States Department of Agriculture (USDA), the needs of the commonwealth, faculty expertise and interest. Combining agricultural research and extension, and family consumer science into one unit will facilitate and strengthen this research-extension-client interaction to better focus the efforts of our scientists on high priority research problems and improve the level of technical competence of the extension staff.

The CREES portfolio sits on a solid foundation as it is held together through partnerships and collaboration with other land grant colleges and universities, as well as with stakeholders throughout the CNMI and the region. Our interactions with collaborators enables us to promote educational programs, extension services and our research projects that are the results of the growing needs and challenges that the CNMI community faces and must satisfy in order to improve the standard of living for its residents. NMC-CREES

is committed to enhancing the well-being and quality of life of the CNMI community through research and extension in agriculture, family and consumer science.

Estimated Number of Professional FTEs/SYs total in the State.

Year	Extension		Research	
	1862	1890	1862	1890
2016	25.0	0.0	9.0	0.0
2017	25.0	0.0	9.0	0.0
2018	25.0	0.0	9.0	0.0
2019	25.0	0.0	9.0	0.0
2020	25.0	0.0	9.0	0.0

II. Merit Review Process

1. The Merit Review Process that will be Employed during the 5-Year POW Cycle

- Expert Peer Review
- Other (Program Leaders and Stakeholders representative)

2. Brief Explanation

Since the number of CREES staff is relatively small, all non-instructional faculty are encouraged to participate in the Merit Peer Review. Also, external collaborators from other universities and research institutions send their comments prior to the Peer Review. A draft of the proposal to be reviewed is e-mailed to all of the CREES staff for suggestions and comments, well before the review meeting. The draft of the proposal is revised and made available to all of the staff for the merit or peer review. All available professional research and extension staff participates in the review. During the review, we assess 1) the priority of importance of the proposed project; 2) the relevance of the proposals; 3) the quality and scientific value of the proposed research or extension activities and 4) the opportunities for cooperation with others, and (5) available resources. The proposals are revised to incorporate the suggestions given during the merit review and approved by the Dean-Director prior to submission.

III. Evaluation of Multis & Joint Activities

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

The planned programs were based on input from stakeholder groups and/or local scientists who identified the most critical issues. They utilize and conduct a number of forums, client visitations, conferences and periodic meetings to solicit advice and input on agricultural and family consumer science research and extension needs and priorities.

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

The planned programs for both research and extension aim to increase promotion at the grass-root levels via program visibility and outreach through provisions of professional experts such as language interpreters, agriculture scientists and extension specialists, and through solicited input from key informants from the CNMI and off-island. The program will utilize survey results, needs assesments, comparisons, and scientific methodologies while considering intrinsic and extrinsic factors to optimize prioritization. Extension agents have established networkss with a diverse group of stakeholders, including those who are under-served and under-represented.

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

The planned programs developed specific outcomes that would occur over a period of 5 years through pre- and post evaluation (either short, medium and long term), changes in learning behavior, change in action and change in condition such as lifestyle, environmental improvement and positive economic impact.

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

NMC-CREES research and extension activities have always involved multi-disciplinary/multi-regional projects that have brought positive impacts locally and regionally. Due to our isolated physical location far from the US mainland, partnerships and collaboration play a major role in project success. Results are well advertised in media prints and television together with program updates that provides avenues for feedback mechanisms via e-mail, social media, and improved and updated websites.

IV. Stakeholder Input

1. Actions taken to seek stakeholder input that encourages their participation

- 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
- Targeted invitation to non-traditional stakeholder individuals
- Targeted invitation to selected individuals from general public
- Survey of traditional stakeholder groups
- Survey of the general public

Brief explanation.

The above listed activities have been the most effective tools to generate stakeholder input and participation. It also covers a broad range of targeted audiences. As the only post secondary institution in the CNMI with a research component, our visibility in the community can be attested to, by randomly asking community members if they have heard of NMC-CREES and what its role is in the community.

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 Advisory Committees
- Use Internal Focus Groups
- Use External Focus Groups
- Open Listening Sessions
- Needs Assessments
- Use Surveys

Brief explanation.

Individuals with experience relevant to NMC-CREES' mission, goals and objectives are selected to serve on Advisory Councils. Additionally, Extension Agents, who represent NMC-CREES on various councils and groups, solicit input from stakeholders in these venues. Focus groups have also been used to identify issues and concerns as well as potential ways to address issues to meet local needs. Program leaders regularly collect input from stakeholders and recipients of program services.

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

1. Methods for collecting Stakeholder Input

- Meeting with traditional Stakeholder groups
- Meeting with traditional Stakeholder individuals
- Survey of traditional Stakeholder individuals
- Meeting with the general public (open meeting advertised to all)
- Meeting specifically with non-traditional groups
- Survey specifically with non-traditional groups
- Meeting specifically with non-traditional individuals
- Survey specifically with non-traditional individuals
- Meeting with invited selected individuals from the general public
- Survey of selected individuals from the general public

Brief explanation.

Information/data from meetings, questionnaires, and surveys will be used as this has proven to be an effective method for collecting input/feedback from CNMI clientele and for identifying key informants and stakeholder groups.

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
- In the Action Plans
- To Set Priorities

Brief explanation.

Groups and program leaders base program needs on extension and research priorities and emerging problems and opportunities in the CNMI. We believe that stakeholder input plays an integral role in program planning, including how resources are allocated.

V. Planned Program Table of Content

V(A). Planned Program (Summary)

Program # 1

1. Name of the Planned Program

Global Food Security and Hunger: Plant Protection Program

2. Brief summary about Planned Program

The islands in the Commonwealth of the Northern Mariana Islands (CNMI), relatively isolated from large landmasses, evolved into an ecological system that is unique to the islands, with its biota having reached ecological balance. These islands systems are extremely fragile and vulnerable to the impacts of invasive species; therefore, any intrusion of alien species could be very devastating to the ecological balance. Ironically, technological development of the transportation system has brought these islands conceptually close to and easily accessible from large landmasses, from which biota from these large landmasses can be transported to the islands. Numerous invasive species that are already present in the CNMI and are seriously impacting agriculture development.

Our combined research and extension efforts are aimed at enhancing traditional agricultural practices, developing complementary methods of best management practices, and adopting already proven methods of addressing invasive species. Our program will attempt to catalog the pernicious invasive species that have already reached these islands and any future arrivals. In addition, we will develop reference collections of invasive species and general entomological specimen for educational purposes. We will continue to collaborate with regional expertise to develop systems to contain or to minimize the deleterious impacts of these invasive species on agriculture. We will continue to monitor ports of entries for early detection of invading unwanted plants and animals from without the CNMI. Our pest control program will enhance production of beneficial organisms that will be utilized by our integrated pest management program to minimize the need for pesticides. Early detection of crop pests and diseases is important to prevent the build up of pest populations and the spread of diseases. Our early detection and identification of insects, mites and other arthropods, plant pathogens, weeds, vertebrates, mollusks and other pests affecting plants will enhance our integrated plant protection programs and will result in preventing crop damage of epidemic proportion.

3. Program existence : Mature (More then five years)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : Yes

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
211	Insects, Mites, and Other Arthropods Affecting Plants	40%		40%	
213	Weeds Affecting Plants	10%		10%	
214	Vertebrates, Mollusks, and Other Pests Affecting Plants	5%		5%	
215	Biological Control of Pests Affecting Plants	20%		20%	
216	Integrated Pest Management Systems	25%		25%	
	Total	100%		100%	

V(C). Planned Program (Situation and Scope)

1. Situation and priorities

The CNMI has very limited agricultural resources. Most agricultural production is at subsistence level and any threat to these resources can seriously affect the livelihood of the CNMI community and its economy. Invasive species pose a serious threat to our limited resources and would, therefore, hinder sustainable agriculture development in the CNMI. There are already large numbers of invasive species in the CNMI. These must be controlled. Their impacts and damages to crops must be minimized. We will strive to increase our capability to address the problems of invasive species, to improve best management methods and to extend these methods to our full time and subsistence farmers and other interested stakeholders. An illustrated list of the invertebrate pest of the Mariana Islands is being developed. This will assist our stakeholders and agriculture professionals in identifying pest and applying appropriate control methods.

2. Scope of the Program

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

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

We assume funding will increase and additional FTEs will be available. External funding source will be secured. Farmers and other stakeholders will have sufficient information on invasive species and understand the relationship between invasive species and agriculture production. Farmers, with assistance from research and extension staff of NMC-CREES, will be able to minimize the impacts and damages of invasive species to their crops, and therefore their crop production will increase.

2. Ultimate goal(s) of this Program

The ultimate goals of our program are: 1) to identify invasive species and reduce their negative impact on agricultural crops, 2) to control invasive species, 3) strive for development of sustainable agriculture, 5) improve pest management practices, 6) provide environmentally-friendly and effective pest control practices, 7) increase farmers knowledge of invasive species and pest control through workshops, trainings, field days, extension publications, media and extension visits, 8) provide proven IPM practices that are economical, safe and sustainable.

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2016	5.3	0.0	5.3	0.0
2017	4.2	0.0	5.2	0.0
2018	0.0	0.0	0.0	0.0
2019	0.0	0.0	0.0	0.0
2020	0.0	0.0	0.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

Plant Protection staff will conduct research on biological and other methods of control against invasive weeds, insect pests, mollusks and plant diseases. As an example, the weed, *Mimosa diplotricha* which came to the Northern Mariana islands and became invasive. On the island of Saipan, Tinian and Rota this invasive species has invade the farm land and pastures areas by competing with the space and available foods for the cattle's and competing with the environment. This invasive species weed, can effectively control by the Mechanical/Physical control, Cultural control and the herbicide. The Biological control Heteropsylla spinulosa has been introduced to control this invasive weed, but impact has yet to be realized. Another example is the recently introduced Cuban slug, *Veronicella cubensis*, into the CNMI. It has become established on the island of Rota, has multiplied and has spread throughout most of the farm areas causing extensive damage to many crops. It has become a major agriculture pest and it has also become a threat to other islands in the CNMI where this pest is not yet present. We intend to continue to apply the best management methods of control and to find its natural enemies to supplement other methods of control. There are many more existing weeds, arthropods and other crop pests and diseases that require continuous application of best management methods. We will continue to improve on these methods and to extend the knowledge to our stakeholders. We will also continue to collect arthropods of economic importance, expand and enhance the economic insect collection, and the general invertebrate collection for reference, for taxonomic studies, and for educational purposes.

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

Extension

Direct Methods	Indirect Methods
● Education Class ● Workshop ● Group Discussion ● One-on-One Intervention ● Demonstrations ● Other 1 (Technical presentation)	● Public Service Announcement ● Newsletters ● TV Media Programs ● Web sites other than eXtension ● Other 1 (Free Air Time)

3. Description of targeted audience

Farmers, crop producers and farm helpers, business operators that promote or sell farm products, grade schools, high schools and college students interested in furthering their knowledge in agriculture, adult volunteer leaders (4-H Clubs) and the general public make up the target audience.

V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
  - Direct Adult Contacts
  - Indirect Adult Contacts
  - Direct Youth Contacts
  - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

☐ Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(H). State Defined Outputs

1. Output Measure

- Number of Research Projects completed on invertebrate pest, such as nematodes, invasive species such as scarlet gourd, melon fly, papaya mealy bug, and Cuban slug).

☐ Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(I). State Defined Outcome

O. No	Outcome Name
1	Number of farmers using Integrated Pest Management to control invasive species
2	Decrease the population of the various invasive species (Cuban Slug, Melon Fly, Sweet potato Weevil, Whiteflies, and nematodes) by certain percentage:

Outcome # 1

1. Outcome Target

Number of farmers using Integrated Pest Management to control invasive species

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 213 - Weeds Affecting Plants
- 214 - Vertebrates, Mollusks, and Other Pests Affecting Plants
- 215 - Biological Control of Pests Affecting Plants
- 216 - Integrated Pest Management Systems

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 2

1. Outcome Target

Decrease the population of the various invasive species (Cuban Slug, Melon Fly, Sweet potato Weevil, Whiteflies, and nematodes) by certain percentage:

2. Outcome Type : Change in Condition Outcome Measure

3. Associated Knowledge Area(s)

- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 213 - Weeds Affecting Plants
- 214 - Vertebrates, Mollusks, and Other Pests Affecting Plants
- 215 - Biological Control of Pests Affecting Plants
- 216 - Integrated Pest Management Systems

4. Associated Institute Type(s)

- 1862 Research

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Populations changes (immigration, new cultural groupings, etc.)

Description

The Mariana Islands Archipelago, which includes the islands in the CNMI, lies in the path of tropical storms and typhoons, which are usually generated from east or south east of the archipelago. Several storms or typhoons pass the CNMI practically every year, some of which become super typhoons generating wind velocity as strong as 200 miles per hour. A number of these typhoons can inflict total damage to agricultural crops and various private and public facilities. These conditions definitely affect the outcomes of our programs. Government revenues are very low due to major airlines that have drastically decreased their flights into the CNMI, which has further decreased government revenue. The CNMI has not been succesful and economic diversification. These turn of events are reflected in the dismal economic conditions of the CNMI presently. As a result of the substantial decrease in government revenue, the local government has shifted its priorities. Government spending decreased substantially in 2006-2011. Even in 2014, governement revenue is much lower than the actual monies needed to effectively run the CNMI govenrment. Unfortunately, agriculture development is not considered one of the priorities of the government, therefore, local funding for agriculture development has been dismally lacking since 2006.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

Invasive species that are being managed will be monitored at various intervals before and after implementation of biological control methods, and or comprehensive integrated or best management practices. Insects and other arthropods entering the CNMI through air and ocean vessels on their cargoes and passengers will be monitored in collaboration with Agriculture Quarantine. Agriculture pest surveys, which were initiated in July 2006, will continue to monitor existing pests and will detect newly introduced invasive species through samplings, observations and survey questionnaires. Workshop participates and farmers will be monitored to determine if practices learned through the Plant Protection Program have been adopted.

V(A). Planned Program (Summary)

Program # 2

1. Name of the Planned Program

Global Food Security and Hunger: Livestock Improvement Program

2. Brief summary about Planned Program

Through partnerships and collaboration with other land grant colleges, local government agencies such as the Department of Land and Natural Resources (DLNR), federal organizations like Western Sustainable Agriculture Research and Education (WSARE), Farm Service Agency (FSA), Natural Resource Conservation Service (NRCS), Animal and Plant Health Inspection Service (APHIS), and regional organization such as the Secretariat of the Pacific Community (SPC) and the Agricultural Development in the American Pacific (ADAP), the Livestock Improvement Program (LIP) will improve the competitiveness of CNMI cattle, goat, swine and poultry produced, by reducing costs of production, increasing productivity and profits. The program will improve the safety of animal products by assisting in the development of suitable slaughter facilities and meat inspections. The program aims to adopt best management practices and promote sustainable agriculture. The program will focus on eradicating livestock diseases of economic and public health importance. It also aims to focus on offering new opportunities for alternative livestock enterprise such as duck, pigeon and rabbit production. Continued promotion and training of local paravets to assist the CNMI Veterinarian for effective and high quality veterinary services will also be a fcous of the program. Research and extension emphasis on the emerging CNMI Livestock industry will be strengthened through securing external funding from local and federal agencies. This will include improving animal products (before harvest), reproductive performance through genetic upgrading via Artificial Insemination in ruminants and swine, alternative animal feed nutrition, and alternative medicine for livestock health care. Supplemental local feed stuff and sustainable pastured beef and poultry will be continuously promoted and will be adopted by farmers. The program will also empower other producers as well as agricultural professionals to get involved in research, extension and education service through professional development programs and small research and educational outreach programs.

3. Program existence : Mature (More then five years)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : Yes

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
303	Genetic Improvement of Animals	40%		40%	
307	Animal Management Systems	40%		40%	
311	Animal Diseases	5%		5%	
312	External Parasites and Pests of Animals	5%		5%	
313	Internal Parasites in Animals	5%		5%	
902	Administration of Projects and Programs	5%		5%	
	Total	100%		100%	

V(C). Planned Program (Situation and Scope)

1. Situation and priorities

Livestock production is an important social and cultural component of our local food systems. Livestock raised and consumed here in the islands represents a respectable percentage of the overall amount of fresh meats and proteins consumed here, since most meats brought into the region are frozen, some for a considerable amount of time. Although many livestock producers have been in operation for decades, many have limited technical knowledge regarding topics such as animal healthy, breeding, pasture management, and many other topics. It is therefore the goal of the Livestock Improvement program to develop educational and capacity building programs that support and encourage livestock producers, contributing to the sustainability and financial viability of their operations. Our program uses a variety of methods and venues that serve to gather and disseminate information to livestock producers, to include, technical assistance, demonstrations, and locally appropriate research studies related to breed improvement, pasture management, feed processing, animal health, disease management, meat processing and value adding, herd surveys, waste management, and marketing. Although this program works with individuals and associations involved in livestock production, the goals of the program help to contribute to local and regional improvements in food security, access to fresh meats and proteins, increased agricultural commerce, and the adaptability of local agriculture to the affects of climate change.

2. Scope of the Program

- In-State Extension
- In-State Research
- Multistate Extension

- Integrated Research and Extension
- Multistate Integrated Research and Extension

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

Additional FTE's for other islands (inclusion of Extension agents)
Provision of new Veterinarian and Public Health veterinarian
Provision of slaughter house and meat inspector
Increase funding for animal health research and extension program
More Train the Trainers Programs
Provision of small scale feed mill industry
Feed Cost Regulation for legislation
Development of Alternative Livestock Enterprise
Increased research and extension collaboration with other universities, federal and local agencies
Funding will remain constant or increase.

2. Ultimate goal(s) of this Program

Improve the competitiveness of the CNMI cattle, goat, swine, and poultry produced, by reducing cost of production and increasing productivity and profits.
To ensure viability of small scale farmers engaged in alternative livestock enterprise
To train more permanent animal health technicians regarding animal health and production
To remain free of Avian flu
Reduced reliance on foreign meat imports
Improve the health of the people of the CNMI
To be able to produce locally made livestock feeds from available resources
Further promote the CNMI's livestock sector

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2016	2.0	0.0	1.0	0.0
2017	2.0	0.0	0.0	0.0
2018	0.0	0.0	0.0	0.0
2019	0.0	0.0	0.0	0.0

2020	0.0	0.0	0.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

• Conduct farm training for small farmers- livestock enterprise and genetic upgrading, animal welfare, animal nutrition and husbandry management, etc
• Conduct animal health and management workshops
• Conduct mini-workshop on alternative livestock enterprise
• Grant writing workshop for research funding
§ Continue with breed improvement through artificial insemination Cattle, Swine, and Goats
§ Continued research into areas such as Integrated grass/legume patures and the effects on carbon sequestration and livestock production.

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

Extension

Direct Methods	Indirect Methods
● Education Class	● Public Service Announcement
● Workshop	● Newsletters
● Group Discussion	● TV Media Programs
● One-on-One Intervention	● Web sites other than eXtension
● Demonstrations	● Other 1 (Video/Radio)
● Other 1 (Mini Workshops)	● Other 2 (Brochures/flyers/Calendar)
● Other 2 (Presentations)	

3. Description of targeted audience

• Youth and adult
• Ranchers/farmers
• Livestock producers
• Government agencies
• Leaders

- Retirees looking at new investment
- Entrepreneurs

- Farmer Associations

V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
  - Direct Adult Contacts
  - Indirect Adult Contacts
  - Direct Youth Contacts
  - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

☐ Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(H). State Defined Outputs

1. Output Measure

- Number of Research projects on Animal Diseases and management, Animal genetic upgrading, Animal nutrition, and Animal science
- Number of Workshops and professional development trainings for livestock program (Production, Animal Health, etc.)and sustainable agriculture program

☐ Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(I). State Defined Outcome

O. No	Outcome Name
1	Numbers of clients adopted livestock best management practices as well as sustainable agriculture that resulted to creation of alternative livestock enterprise
2	Numbers of new client gained knowledge and skills about animal science, production, health and management,animal husbandry and sustainable agriculture

Outcome # 1

1. Outcome Target

Numbers of clients adopted livestock best management practices as well as sustainable agriculture that resulted to creation of alternative livestock enterprise

2. Outcome Type : Change in Condition Outcome Measure

3. Associated Knowledge Area(s)

- 303 - Genetic Improvement of Animals
- 307 - Animal Management Systems
- 311 - Animal Diseases
- 312 - External Parasites and Pests of Animals
- 313 - Internal Parasites in Animals
- 902 - Administration of Projects and Programs

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 2

1. Outcome Target

Numbers of new client gained knowledge and skills about animal science, production, health and management,animal husbandry and sustainable agriculture

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 303 - Genetic Improvement of Animals
- 307 - Animal Management Systems
- 311 - Animal Diseases
- 312 - External Parasites and Pests of Animals
- 313 - Internal Parasites in Animals

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)
- Other (Cultural)

Description

There are numerous external factors that can create barriers to agricultural production. Despite this, there has never been a greater need to build up our agricultural base in the CNMI, in order to improve access to healthy and fresh foods, provide food security for our people, and improve our economic outlooks. It is therefore imperative that we work through any natural or manmade barriers to improve the likelihood of our producers to be successful in their agricultural endeavors.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

Our program will continue to assess and evaluate this programs performance through client, animal and pasture surveys, as well as, interviews with clients, numbers of clients (direct and indirect contacts), observation, and using any other assessment tools that become available to us.

V(A). Planned Program (Summary)

Program # 3

1. Name of the Planned Program

Community Resource Development

2. Brief summary about Planned Program

The Community Resource Development Program aims to decrease the Commonwealth of the Northern Mariana Islands' (CNMI) community reliance on outside sources for household good and daily family consumption via educating and providing hands-on-training/demonstrations in home-canning/food preservation, container gardening, money management for youth and adults, home arts and designs, local/traditional handicrafts, fruit and vegetable carving, basic hair and facial care, legal aspects facing older adults in the CNMI and sewing programs for families with limited resources.
The ultimate goal is to improve the quality of life for all CNMI residents by understanding and addressing our immediate community needs as well as breaking the cycle of social problems often caused by a lack of job skills and self-worth. The proposed activities aim to increase competency in life skills which would ultimately benefit the poverty stricken.

3. Program existence : Mature (More then five years)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : No

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
801	Individual and Family Resource Management	50%		0%	
802	Human Development and Family Well-Being	50%		0%	
	Total	100%		0%	

V(C). Planned Program (Situation and Scope)

1. Situation and priorities

The CNMI revenue continues to derive from tourism. The CNMI has recently entered into a contract agreement with third country investors to build and operate a Five Star casino on the island of Saipan, the most populated island in the entire CNMI. The island of Tinian is the only island to date that run and generated revenue from casino (Tinian Dynasty Casino).The CNMI next highest source of revenue is from

Casino.
In 2014, the Marianas Visitors Authority has reported a slight increase on the number of tourist vacationing in Saipan and taking advantages of the island hopping to the neighboring islands of Tinian and Rota. Couple of large airlines had ceased services mainly because they continue to fail to meet their expected number of passengers. The only CNMI passengers' airline is so unreliable and as a result, two cargo airlines agreed to transport passengers to and from the three most populated islands in the CNMI.
The CNMI unemployment rate is still very high due to many businesses closing down and skilled contract workers returning to their home for not being able to comply with the US Immigration Employment Regulations. Therefore, the people in the CNMI are thriftier and continue to look for ways to be more efficient with available resources.

The home canning and food preservation program will be combined with the container gardening program, so that interested individuals, regardless whether they are into commercial farming or small backyard gardening, can make use of the services and training that the CREES-CRD program has to offer.
Educational and useful information on money management will also be found throughout the community via a community wide campaign on "how to develop a budget, how to budget your food stamps and smart shopping".
Because of the continued high unemployment rate in the CNMI, the Community Resource Development Program has shifted gears and is now conducting mini workshops, teaching participants different ways to supplement their income and/or ways to make money.

2. Scope of the Program

- In-State Extension

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

Decreased reliance on outside sources for household items and daily family consumptions, i.e. more CNMI residents will be preserving food for home consumption, Residents will be encourage to attend workshops and training that CREES offers for free and those students who had successfully completed the sewing classes for beginners will be sewing cloths for their families.
Increased community knowledge on issues related to money management and hands-on training for developing skills in the art of making local handicrafts to be sold at the Street Market and in Gift Shops throughout the three most populated islands in the CNMI.

2. Ultimate goal(s) of this Program

The ultimate goal is to improve the quality of life for all CNMI residents by understanding and addressing our immediate community needs, as well as breaking the cycle of social problems often caused by a lack of knowledge and self-worth.

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890

2016	3.0	0.0	0.0	0.0
2017	3.0	0.0	0.0	0.0
2018	3.0	0.0	0.0	0.0
2019	3.0	0.0	0.0	0.0
2020	0.0	0.0	0.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

NMC-CREES, CRD program will coordinate training for certification in sewing, safe home canning and food preservation. NMC-CREES' Food Scientist will continue to conduct workshops and training on methods for safe home canning and food preservation on the three most populated islands in the CNMI. Numerous community workshops will continue to be provided by trained staff, and our Food Scientist will continue to play a major role in educating the community in applying value added for both crops and animal products. Sewing Classes for Beginners will continue to be offered on the three most populated islands and certificates of successful completion will be issued to those students who successfully complete the 12 sewing projects. Workshops on Money Management for Youth and Adults, Home Arts and Designs, and Legal Considerations Facing Older Adults in the CNMI will also be offered on the islands of Saipan, Tinian and Rota.

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

Extension

Direct Methods	Indirect Methods
● Education Class	● Public Service Announcement
● Workshop	● Newsletters
● Demonstrations	● TV Media Programs
● Other 1 (Village Meetings)	● Web sites other than eXtension
● Other 2 (Afterschool Activities)	● Other 1 (Telephone)

3. Description of targeted audience

- Kids (6-7)
- Youth (8-17)
- Youth Leaders (18-21)
- Adult Volunteers for Leaders
- Economically Disadvantaged
- Senior Citizens (Man Am'ko)
- Caregivers for the elderly
- General Public

- First Time Business Owner

V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
  - Direct Adult Contacts
  - Indirect Adult Contacts
  - Direct Youth Contacts
  - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

☐ Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(H). State Defined Outputs

1. Output Measure

- Number of Youth and Adults completing Money Management and Family Financial Management workshops.
- Number of established Entrepreneurs projects
- Number of participants that complete workshop and training on home canning and food preservation

☐ Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(I). State Defined Outcome

O. No	Outcome Name
1	Number of participants that complete workshop and training on home canning and food preservation.
2	Number of youths and adults successfully completing the Sewing for Beginners on the islands of Saipan, Tinian and Rota.
3	Number of youths and adults completing workshops on Youth and Adult Money Management.

Outcome # 1

1. Outcome Target

Number of participants that complete workshop and training on home canning and food preservation.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 801 - Individual and Family Resource Management

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 2

1. Outcome Target

Number of youths and adults successfully completing the Sewing for Beginners on the islands of Saipan, Tinian and Rota.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 801 - Individual and Family Resource Management

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 3

1. Outcome Target

Number of youths and adults completing workshops on Youth and Adult Money Management.

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 801 - Individual and Family Resource Management

4. Associated Institute Type(s)

- 1862 Extension

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Competing Public priorities
- Populations changes (immigration, new cultural groupings, etc.)

Description

Natural disasters such as typhoons, flooding, drought and other extreme weather conditions; extreme economic downturn, which might affect manpower availability; unavailability of needed facilities and equipment to conduct extension.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

Program evaluation will be done pre and post each planned activity. Periodic follow-up with workshop participants will take place to determine if desired program impact is achieved.

V(A). Planned Program (Summary)

Program # 4

1. Name of the Planned Program

Childhood Obesity

2. Brief summary about Planned Program

Approximately 25% of Commonwealth of the Northern Mariana Islands children that are 2 years old are overweight or obese. Research has shown that around 30% of 2-8 year olds in the CNMI are overweight or obese. One study suggests that overweight and obesity increases from around 25% at age 5 to 45% at age 8. Youth Risk Behavior Survey data collected from high school students in the CNMI indicates that 15.3% of males and 16.3% of females are overweight, while 20.1% of males and 13.6% of females are obese. Obese children are more likely to be obese adults compared to their non-obese peers and are at higher risk for heart disease, stroke, several types of cancer, and type 2 diabetes. Even in childhood, obesity can have immediate negative health repercussions including high blood pressure and/or high blood cholesterol, increased risk for prediabetes, increased likelihood for bone and joint problems, sleep disorders, and poor self-esteem

Although studies have shown overweight and obesity among children in the CNMI, there is currently no system to monitor prevalence and trends of childhood overweight and obesity (COWOB) at the population level. In addition to the scientific literature expounding on the need for robust surveillance systems to monitor COWOB at the population level, stakeholders have identified the need to develop a robust surveillance system that builds on the CNMI Public School System's efforts to collect height and weight data on students. Currently, the CNMI is not included in NHANES or PRAMS.

While building COWOB surveillance efforts, the Childhood Obesity program will use best practice recommendations/models and evidenced-based approaches that are culturally appropriate to bring about changes that are conducive to improved health among 2-8 year olds. An integral part of this effort involves working with and training role models and community champions from identified villages to take the lead in promoting child health and wellness. Interventions that focus on developing the community to take a leadership role in promoting policies and practices that improve child health and wellness, social marketing, and training of teachers and child care providers to increase movement and physical activity will be the focus of this program.

3. Program existence : Mature (More then five years)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : Yes

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
703	Nutrition Education and Behavior	50%		25%	
724	Healthy Lifestyle	25%		25%	
901	Program and Project Design, and Statistics	25%		50%	
	Total	100%		100%	

V(C). Planned Program (Situation and Scope)

1. Situation and priorities

While the scientific literature on the ill-effects of childhood obesity is relatively well documented, the educational, economic, social, and health issues that stem from childhood overweight and obesity and the actions that should be taken at the community and policy levels have not been tested or studied in the CNMI. There is a need for village residence to take the lead in advocating for and bringing about changes that are conducive to protecting the health of children and their families. It is necessary to work with communities to focus on enhancing environments that children live, attend school at, and play in, in order to influence desirable behavioral outcomes. This program will build on people from identified villages with the desire and willingness to improve the village and school environments through role modeling desirable behaviors, advocating for strategies to improve the health of children and their families, and taking the lead in carry-out village based projects that are conducive to improved health.

While "personal responsibility" continues to be pointed out as the solution to many health problems, including childhood overweight and obesity, the scientific literature continues to point out that the food and built environments play a tremendous role in shaping how and what we eat and how physically active we are. Policies that decrease undesirable nutrition and health behaviors and increase behaviors associated with improved health

2. Scope of the Program

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

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

The Childhood Obesity Program will work with various agencies and diverse stakeholders as well as with regional partners from Pacific institutions of higher learning and others who can contribute to bringing about healthier living. The program intends to use its policy and environmental intervention strategies to compliment the efforts of existing educational programs, such as EFNEP, Public School System, Head Start Program, Department of Public Health-Non-Communicable Disease Program, and Let's Move

Marianas. We assume that the aforementioned entities as well as village stakeholders will be willing to work with us.

2. Ultimate goal(s) of this Program

This program's ultimate goals of the program are to prevent and control obesity, to improve young child well-being, and to enhance the capacity of village communities to lead changes that are conducive to improving health.

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2016	4.0	0.0	1.0	0.0
2017	5.0	0.0	1.0	0.0
2018	5.0	0.0	1.0	0.0
2019	5.0	0.0	1.0	0.0
2020	5.0	0.0	10.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

- Identify potential role models from identified villages and conduct training on role-modeling and motivational interviewing for role models
- Provide follow-up and encouragement to current role model groups (TASA and Kagman)
- Initiate collaborative partnership with two additional role model groups to test interventions used in previous work with TASA and Kagman role models; TASA and Kagman role models to assist with setting up the new role model groups
- Conduct physical activity training for teachers and child-care providers of young children
- Conduct social marketing focused on the following behavioral outcomes: decreasing sugar-sweetened beverage intake, increasing water intake, increasing fruit & vegetable intake, increasing physical activity, decreasing leisure screen time, and increasing sleep.
- Include two new stores in healthy village stores program
- Conduct planting, harvesting, and eating local produce at one Head Start Center
- Assist Public School System, Head Start, Early Head Start with enhancing and refining child growth assessments and BMI with the goal of establishing childhood overweight and obesity monitoring and surveillance in the CNMI and regionally

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

Extension

Direct Methods	Indirect Methods
● Education Class ● Workshop ● Group Discussion ● Demonstrations	● Billboards ● Newsletters ● Other 1 (Culturally approp. brochures)

3. Description of targeted audience

- Potential role models and community champions from identified villages
- Current role models from TASA and Kagman
- Teachers and child care providers of young children
- Head Start, elementary, and child care program administrators
- Parents of young children
- Community groups concerned about child health

V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
  - Direct Adult Contacts
  - Indirect Adult Contacts
  - Direct Youth Contacts
  - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

☑ Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(H). State Defined Outputs

1. Output Measure

- Number of role models trained
- Number of trainings on increasing physical activity
- Number of trainings and meetings with/for role models
- Number of role model initiated projects
- Number of social marketing campaigns in identified villages
- Number of new stores participating in Healthy Village Stores program

☑ Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(I). State Defined Outcome

O. No	Outcome Name
1	Role models lead village projects as a result of programming received from Childhood Obesity Program
2	Teachers and child care providers integrate more physical activity into school/child care schedule
3	Environmental enhancements are made at two facilities that provide direct services to young children
4	Two elementary schools adopt child wellness policy
5	One child care center adopts at least two policies that enhance young child health and wellness
6	Establish infrastructure and programming for childhood overweight and obesity monitoring and surveillance building on current systems
7	Increase physical activity among 2-10 year olds
8	Increase water consumption among 2-10 year old children
9	Increase fruit and vegetable consumption among 2-10 year old children
10	Increase physical activity among 2-10 year old children

Outcome # 1

1. Outcome Target

Role models lead village projects as a result of programming received from Childhood Obesity Program

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 724 - Healthy Lifestyle

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 2

1. Outcome Target

Teachers and child care providers integrate more physical activity into school/child care schedule

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 724 - Healthy Lifestyle

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 3

1. Outcome Target

Environmental enhancements are made at two facilities that provide direct services to young children

2. Outcome Type : Change in Condition Outcome Measure

3. Associated Knowledge Area(s)

- 724 - Healthy Lifestyle

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 4

1. Outcome Target

Two elementary schools adopt child wellness policy

2. Outcome Type : Change in Condition Outcome Measure

3. Associated Knowledge Area(s)

- 703 - Nutrition Education and Behavior
- 724 - Healthy Lifestyle

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 5

1. Outcome Target

One child care center adopts at least two policies that enhance young child health and wellness

2. Outcome Type : Change in Condition Outcome Measure

3. Associated Knowledge Area(s)

- 724 - Healthy Lifestyle

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 6

1. Outcome Target

Establish infrastructure and programming for childhood overweight and obesity monitoring and surveillance building on current systems

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 901 - Program and Project Design, and Statistics

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 7

1. Outcome Target

Increase physical activity among 2-10 year olds

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 703 - Nutrition Education and Behavior
- 724 - Healthy Lifestyle

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 8

1. Outcome Target

Increase water consumption among 2-10 year old children

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 703 - Nutrition Education and Behavior

- 724 - Healthy Lifestyle

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 9

1. Outcome Target

Increase fruit and vegetable consumption among 2-10 year old children

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 703 - Nutrition Education and Behavior
- 724 - Healthy Lifestyle

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 10

1. Outcome Target

Increase physical activity among 2-10 year old children

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 703 - Nutrition Education and Behavior
- 724 - Healthy Lifestyle

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Other (lack of collaboration)

Description

• Collaboration is a key component of reaching our outcomes; this external factor involves interagency collaboration.
• Typhoon and other disaster damage that would shift priorities from improving child health to more immediate needs such as post-disaster safety and adequate housing.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

The ultimate evaluation of our planned interventions will not take place until 2015. In early 2015, 24-month anthropometric measurements on 2-8 year old children will take place. This will allow us to determine if the interventions on identified villages had an effect on young child Body Mass Index.

Focus groups, questionnaires, and sessions to solicit feedback from stakeholders will take place at pre-determined intervals to determine how successful planned activities were and what can be done to improve them.

The establishment of policies and procedures to guide childhood overweight and obesity anthropometric measurements data entry, collection, and analysis in partnership with relevant programs will be established.

V(A). Planned Program (Summary)

Program # 5

1. Name of the Planned Program

Food Safety

2. Brief summary about Planned Program

Even if a wide variety of agricultural produce are harvested in the CNMI, these local produce are sold in local markets for only domestic consumption as fresh fruits and no fruits and vegetables are exported to outside markets due to quarantine restrictions from the melon fly, which is found on all of the islands in the CNMI. For this reason, the Food Safety Program of NMC-CREES has endeavored to establish food quality laboratory. The food quality laboratory will provide NMC-CREES with a facility to conduct basic and applied research on alternative food processing technologies and to develop value-added products using local agricultural commodities. These alternative food processing technologies could easily be developed and gradually transferred to local processors in order to create additional profits for local farmers and producers. The food quality laboratory could provide basic food processing equipment, including a heat processing retort, juice making press, evaporator, convection drying machine, fermenter, and packaging machine.

Even if the production of value-added fruit products is still undeveloped and limited in the CNMI, it can be a promising industry to generate a beneficial economic influence and key element for local economy by increasing producers' income and providing jobs to this community. In addition, the Food Safety Program has provided hands-on practical value-adding processing and food safety workshops to farmers, producers, food processors, and to people who are involved in food preparation. These workshops have been conducted on all of the three major islands. As a continuous outreach educational activity, the Food Safety program helps low-income households in the CNMI to consume safe and quality food by teaching stakeholders proper sanitation measures and safe handling procedures. Furthermore, basic research on good post harvest practices and technologies are also necessary to prolong the shelf life of fresh fruits and vegetables produced in the CNMI. The major factors affecting food deterioration during the post-harvesting period include growth and activities of microorganisms, activities of enzymes and other chemical reaction, gain or loss of moisture, inappropriate temperature, reaction with oxygen, light, physical stress or damage, and time. The results of such research are analyzed and released to the public through the cooperative extension system. All the information obtained from these activities will be published in internationally peer-reviewed scientific journals and presented in international food safety conference. It is our goal that these efforts of the Food Safety program will increase the local farmers and producers' income.

3. Program existence : Intermediate (One to five years)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : No

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
501	New and Improved Food Processing Technologies	10%		10%	
502	New and Improved Food Products	20%		20%	
503	Quality Maintenance in Storing and Marketing Food Products	20%		20%	
504	Home and Commercial Food Service	20%		20%	
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources	20%		20%	
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	10%		10%	
	Total	100%		100%	

V(C). Planned Program (Situation and Scope)

1. Situation and priorities

Recently, consumers around the world look for more convenient, fresh, low-calorie, and healthy natural food, thus creating potential markets for well-being foods. Fortunately, a wide variety of fresh agricultural, environmentally-friendly grown produce are harvested in the CNMI. Major Asian cities, such as Tokyo, Seoul, and Shanghai, can be unlimited markets for these value added products, since these cities are geographically close and have huge populations. The military build-up in Guam may provide additional markets for these export products. However, these local produce are sold in local markets for only domestic consumption. It is essential to develop various value-added food products using local fresh produce such as noni, bananas, papayas, soursops, lemons, coconuts, pineapples, mangos, guavas, and so forth. Unique value-added products can be developed and exported using exotic tropical fruits in the CNMI although the production of value-added fruit products is still undeveloped and limited in the CNMI. Value-added food production can be a promising industry to generate beneficial economic influence. These food processing operations could contribute to local economy by creating producers' additional income and providing jobs to this community. For these reasons, the Food Safety program has been assisting local farmers and producers to develop value-added products using local produce.

In addition, concerns within the CNMI about the security of its food supply have risen to new historic levels. Changing patterns of consumption, an aging population, more persons with chronic illness, and a wide variation in food handling and preparation practices are some of the factors affecting the increased vulnerability of the population. Food importation from neighboring developing countries is also a growing problem. Therefore, the Food Safety Program needs to teach and assist individuals in the areas of basic food microbiology, processing and preservation, and post harvest biology. The program will concentrate primarily on public education about basic food safety issues in order to prevent potential food borne illnesses and ensure public health. Furthermore, the program will provide useful information to maintain food quality, properly handle food materials, and prepare healthy food through the extension outreach activities such as workshops and public presentations.

2. Scope of the Program

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

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

We assume funding will remain constant or increase and thatdditional FTE's will be available. Basic food processing equipments and facilities will be established for the program.

2. Ultimate goal(s) of this Program

The program will be conducted to develop value-added products using local agricultural commodities and to lead people in the CNMI to consume safe and wholesome food.

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2016	2.0	0.0	2.0	0.0
2017	2.0	0.0	2.0	0.0
2018	2.0	0.0	2.0	0.0
2019	2.0	0.0	2.0	0.0
2020	0.0	0.0	0.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

- Establishment of good post-harvest practices
- Establishment of outstanding food safety training programs
- Development of various value-added food products using local produce
- Introduction of new food processing technologies to the CNMI
- Conduction of basic and applied research to intensify the Food Safety and Quality Program

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

Extension

Direct Methods	Indirect Methods
● Education Class ● Workshop ● Group Discussion ● One-on-One Intervention ● Demonstrations	● Public Service Announcement ● Newsletters ● TV Media Programs ● Web sites other than eXtension

3. Description of targeted audience

* Farmers, other crop producers, and farm helpers
* Individuals involved in food industry such as processors, managers, food handlers, vendors
* Grade schools, high schools and college students interested in food safety and quality
* Government agencies/collaborators

V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
  - Direct Adult Contacts
  - Indirect Adult Contacts
  - Direct Youth Contacts
  - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

☐ Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(H). State Defined Outputs

1. Output Measure

- Number of novel food processing technology workshops
- Number of workshops related with food safety and quality
- Numbers of newly developed value-added products

☐ Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(I). State Defined Outcome

O. No	Outcome Name
1	Numbers of farmers/producers that develop value added products
2	Number of farmers/producers implementing good post-harvest practices

Outcome # 1

1. Outcome Target

Numbers of farmers/producers that develop value added products

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 501 - New and Improved Food Processing Technologies
- 502 - New and Improved Food Products
- 504 - Home and Commercial Food Service

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 2

1. Outcome Target

Number of farmers/producers implementing good post-harvest practices

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 501 - New and Improved Food Processing Technologies
- 503 - Quality Maintenance in Storing and Marketing Food Products
- 711 - Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Description

The CNMI is located in the path of tropical storms and typhoons, some of which may cause severe damage to agricultural crops and various properties. The economy of the CNMI heavily depends on other Asian countries, as well as the mainland United States. Economic challenges in the CNMI will affect the achievement of the program.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

Periodic visits will be made to various farms and processing facilities to observe their post-harvest practices, food handling procedures, and other operations related to food processing. If there are problems in the field, program extension and reserach personnel will inspect and provide on-site consultation. In order to improve the quality of agricultural crops in the CNMI, scientific studies will be needed to get practical data on post-harvest practices and food qualities of various agricultural commodities.

V(A). Planned Program (Summary)

Program # 6

1. Name of the Planned Program

4-H Youth Development

2. Brief summary about Planned Program

The CNMI 4-H Program aims to develop the local youth by linking children with caring adults in order to foster relationships that encourage the youth to envision their potential and acquire positive attitudes towards themselves and others. 4-H Program activities, such as gardening, canoeing, traditional fishing, self-esteem building and much more, will provide the children with a multitude of educational, vocational and fun activities such that participants can strengthen their ability to make intelligent decisions, solve problems and obtain life skills that are relevant to life on the islands, are culturally appropriate and serve to embrace and preserve the island culture whenever possible. As club activities take place and relationships and positive attitudes are reinforced, children will begin to improve their skills in personal communication and self-expression, building leadership skills and capabilities. With physical and mental health as a basic principle within all 4-H program activities, children will begin to envision their role in the community and will be encouraged to take involvement in public affairs, ultimately taking a leadership role of their own lives and contributing to the well-being of the community as a whole. The CNMI 4-H Program will place some emphasis on student high school achievement and developing programs for children at risk in the community.

3. Program existence : Mature (More then five years)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : Yes

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
802	Human Development and Family Well-Being	10%		0%	
803	Sociological and Technological Change Affecting Individuals, Families, and Communities	10%		0%	
805	Community Institutions and Social Services	10%		0%	
806	Youth Development	70%		0%	
	Total	100%		0%	

V(C). Planned Program (Situation and Scope)

1. Situation and priorities

The Commonwealth of the Northern Marianas Islands is located thousands of miles from the U.S. mainland in the middle of the Western Pacific Ocean, closer to the Philippines than it is to the closest State of Hawaii. The sheer distance from the NMI to the rest of the nation and other countries results in an enormously high cost of living since nearly all goods and resources must be imported. Further compounding the issue is that resources such as land, water and electricity are limited in quantity, driving prices higher and decreasing opportunities for the communities to be self-sustaining. Ultimately, financial resources are stretched to the limit in order to fund essential programs, such as medical care and public safety, with little left over for youth programs. This phenomenon poses serious risks for youth as they are forced to grow up in an environment with little personal space, support, resources, and guidance. This program aims to create and sustain programs that engage the youth and support them in essential areas of their lives. The CNMI 4-H program serves to improve upon the health of the youth and the communities that grow them.

2. Scope of the Program

- In-State Extension

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

Funding will remain constant or increase.

2. Ultimate goal(s) of this Program

To provide community and culturally-focused experiential learning opportunities that encourage youth development and build capacity amongst children in order to foster in them a desire to learn, love life, lead and meet their potential. To build and strengthen relationships between youth and caring adults in order that they may take a positive leadership role in their future and contribute to the community in a positive way.

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2016	3.0	0.0	0.0	0.0
2017	3.0	0.0	0.0	0.0
2018	3.0	0.0	0.0	0.0
2019	3.0	0.0	0.0	0.0
2020	0.0	0.0	0.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

The CNMI 4-H program will collaborate with other government and non-government groups to develop relationships and design programs for youth development. Funding will be sought through proposal development and other efforts in order to support staffing and program facilitation. Volunteers will be recruited and clubs formed as a venue for 4-H curricula and programming. Information on the CNMI 4-H programs will be developed and continuously disseminated through publications and other media.4-H programs will sponsor experiential learning opportunities for youth and parents such as workshops, field days, and hands-on activities related to the 4-H mission and purpose. 4-H is targeting projects that promote healthy living and help to reduce the likelihood of childhood obesity.

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

Extension

Direct Methods	Indirect Methods
● Education Class ● Workshop ● Group Discussion ● One-on-One Intervention ● Demonstrations	● Public Service Announcement ● Newsletters ● TV Media Programs ● Web sites other than eXtension

3. Description of targeted audience

- Government Officials/Agency Collaborators
- Business operators
- Grade school, High School and College students, teachers and staff
- Adult Volunteer Leaders (4-H Clubs) from the general public

V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
  - Direct Adult Contacts
  - Indirect Adult Contacts
  - Direct Youth Contacts
  - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

☐ Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(H). State Defined Outputs

1. Output Measure

- Number of youth participating in 4-H sponsored events

☑ Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(I). State Defined Outcome

O. No	Outcome Name
1	Number of 4-h volunteers recruited
2	Number of youth participants attending 4-H workshop activities

Outcome # 1

1. Outcome Target

Number of 4-h volunteers recruited

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 2

1. Outcome Target

Number of youth participants attending 4-H workshop activities

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Competing Public priorities

Description

• Natural disasters such as typhoons, flooding, drought and other extreme weather conditions

• Extreme economic downturn which might affect manpower availability; excessive turnover of technical staff involved in this program; and unavailability of needed facilities

- Competing public priorities

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

Our 4-H staff and volunteers will conduct pre and post surveys and questionnaires of participants attending our various trainings and events. In some of our programs, we will follow-up with periodic surveys and reports that provide updates and longterm progress on effectiveness of the programs.

V(A). Planned Program (Summary)

Program # 7

1. Name of the Planned Program

Global Food Security and Hunger: Aquaculture and Fisheries Development Program

2. Brief summary about Planned Program

The Commonwealth of the Northern Mariana Islands (CNMI) is going through one of its most difficult economic times in its young history as a territory of the United States. In its effort to revive the economy, the CNMI government has identified aquaculture and fisheries as one of four industries to develop. At the same time, a meeting prior to the publication of the CNMI, 5-year, Strategic Development Plan, 2011 - 15 was convened to gather feedback from stakeholders on challenges and opportunities to aquaculture development. Out of this meeting, six priority species were identified for further development. The species identified were Tilapia, shrimp, marine finfish, prawn, giant clam, and milkfish. Additionally, challenges were identified as constraints to further expansion of aquaculture in the CNMI. Those constraints were, production costs (31.6%), financing (21.1%), marketing (15%), permitting, regulations, and technical assistance (12.1%), socioeconomic (4.8%), and biosecurity (3.3%).

Based on these findings, the Aquaculture & fisheries Development Program (A&FDP) will focus its attention on enhancing Tilapia (1) and marine shrimp (2) production, which are already established and conduct research on the next species on the list, marine finfish (3), Rabbitfish, in particular both in closing the life cycle of the indigenous Forktail Rabbitfish and grow out of the said species. Within the next few years, the A&FDP will begin research on near shore production of giant clams for food and the ornamental trade and possibly as a component in a Integrated, Multi-Trophic Aquaculture (IMTA) system in the grow out of Rabbitfish. The island of Rota with its excellent freshwater and ample, undeveloped land holds promise for research and development in the production of giant prawn of the Macrobrachium rosenbergii species.

In its efforts to address constraints raised by stakeholders, the A&FDP will allocate resources to investigate ways to reduce the high production cost of Recirculating Aquaculture Systems (RAS) with the integration of alternative energy sources. The program will also investigate the economics of producing local feed using locally available ingredients to address the high cost and availability of imported feed. Collaboration and partnerships with federal, regional, and local agencies and NGOs will be encouraged to address the marketing, financing, permitting, technical capacity, biosecurity, and socioeconomic issues identified by the stakeholders.

3. Program existence : Mature (More then five years)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : Yes

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
102	Soil, Plant, Water, Nutrient Relationships	25%		25%	
111	Conservation and Efficient Use of Water	25%		25%	
112	Watershed Protection and Management	25%		25%	
135	Aquatic and Terrestrial Wildlife	25%		25%	
	Total	100%		100%	

V(C). Planned Program (Situation and Scope)

1. Situation and priorities

With the expected increase in the world's population and declining wild caught fisheries, aquaculture will continue to grow and provide more and more of the seafood supply needs of consumers. This situation is no different in the CNMI, where most of the seafood consumed is imported. It is ironic that these islands are surrounded by the vast Pacific Ocean, yet it imports seafood. There is a huge opportunity to reduce these importations and improve the food security situation through aquaculture. Aquaculture can then help revive the economy, provide employment for local residents, and improve supply and quality of locally available seafood.

2. Scope of the Program

- In-State Extension
- In-State Research

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

- Production cost reduced and availability improved as a result of the production of local feed using locally available ingredients
- Increased production of aquatic species and increase in the number of farms as a result of the availability of juveniles for grow out from a new hatchery
- Improved services to aquaculture farmers as a result of the increased in the number of personnel, capacity building, and professional development programs
- Continued technology and knowledge transfer to aquaculture farmers through improved and increased outreach programs

2. Ultimate goal(s) of this Program

- To reduce reliance on imported seafood and improve food security in the CNMI
- To reduce production costs at the farm and increase profitability
- To introduce knowledge and technology in the farms that are environmentally friendly,

economically sound, and sustainable
- To improve health of the CNMI community through increased consumption of healthy seafood products
- To make aquaculture a contributor to the CNMI economy through job creation and tax collections
- Overall, to improve the quality of life of the people in the CNMI

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2016	3.0	0.0	1.0	0.0
2017	3.0	0.0	2.0	0.0
2018	3.0	0.0	2.0	0.0
2019	4.0	0.0	2.0	0.0
2020	0.0	0.0	0.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

- Conduct survey on quantity and availability of local aquaculture feed ingredients
- Conduct survey on the origin, quantity, and quality of imported aquaculture feed
- Conduct small scale feed milling operations and perform a cost/benefit analysis
- Conduct research on grow out of Rabbitfish and other marine finfish in RAS using commercial feed and aquatic plants
- Conduct research in growing milkfish for food and bait
- Conduct research in the use of Bio-floc in shrimp production
- Conduct research to improve the line of Tilapia that leads to monosex culture
- Incorporate aquaponics technology into Tilapia production
- Start process in the construction of a multi-species hatchery on the CNMI
- Conduct research into technology that can reduce the cost of energy in production
- Incorporate into program elements and recommendations from the CNMI, 5-year, Strategic Development Plan

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

Extension

Direct Methods	Indirect Methods

● Education Class	● Public Service Announcement
● Workshop	● Billboards
● Group Discussion	● Newsletters
● One-on-One Intervention	● TV Media Programs
● Demonstrations	● Web sites other than eXtension
● Other 1 (Presentations)	● Other 1 (Video/Radio)
● Other 2 (Short Courses)	● Other 2 (News Articles)

3. Description of targeted audience

Youth and Adult
Aquaculture Producers
Government Agencies
Non-Governmental Organizations
Business Community
Retirees at new investment
Health-conscious Individuals
Extension

V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
  - Direct Adult Contacts
  - Indirect Adult Contacts
  - Direct Youth Contacts
  - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

☐ Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(H). State Defined Outputs

1. Output Measure

- Number of aquaculture workshops
- Number of aquaculture research project
- number of short course/training
- Number of aquaculture demonstration project

☐ Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(I). State Defined Outcome

O. No	Outcome Name
1	Number of farmers familiar with Recirculating Aquaculture Systems
2	Number of farmers learning how to use locally available ingredients in the on-island production of feed
3	Number of youths familiar with aquaculture and aquaponics
4	Number of individuals that will venture into aquaculture

Outcome # 1

1. Outcome Target

Number of farmers familiar with Recirculating Aquaculture Systems

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 135 - Aquatic and Terrestrial Wildlife

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 2

1. Outcome Target

Number of farmers learning how to use locally available ingredients in the on-island production of feed

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 135 - Aquatic and Terrestrial Wildlife

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 3

1. Outcome Target

Number of youths familiar with aquaculture and aquaponics

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 135 - Aquatic and Terrestrial Wildlife

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 4

1. Outcome Target

Number of individuals that will venture into aquaculture

2. Outcome Type : Change in Knowledge Outcome Measure

3. Associated Knowledge Area(s)

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 135 - Aquatic and Terrestrial Wildlife

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

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

- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Description

The CNMI is located in what is called "Typhoon Alley", and, thus, prone to storms. The recent implementation of U.S. immigration policies may also affect the population as nearly half of residents are guest workers that may have to be repatriated to their homeland in the coming years. Stakeholders have identified permitting and government regulations as challenges, which restrain aquaculture growth that leads to less than desired outcomes.

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

Evaluation is an ongoing process at this instititon and is done to ensure that clients are provided the best possible services. It is standard operating procedure in this program to conduct pre and post test to evalaute the level of knowledge gained as a result of outreach activities. Surveys and on site observations are performed to evaluate the rate of adoption of knowledge over a given period of time.

V(A). Planned Program (Summary)

Program # 8

1. Name of the Planned Program

Climate Change

2. Brief summary about Planned Program

The NMC-CREES Climate Change Program aims to develop and facilitate programs that serve to prepare our citizens and communities for the changes that are expected to come about as a result of global climate change. A primary focus of our programs will be to support local crop, livestock, and aquaculture producers in their endeavors, in an effort to improve the sustainability, financial viability, and overall productive capacity of our local food systems. Our programs provide educational and capacity building opportunities that introduce new production technologies, information, food processing techniques and sustainable agricultural systems that contribute to the overall adaptability of local agriculture production, in order to mitigate against the negative affects of climate change. Some of the goals of the program will be to offset imported food commodities with locally grown foods, reduce the overall negative impacts of local food production systems on the environment, and to work with local government and non-government entities in planning, developing, and implementing strategies for dealing with climate change issue.

3. Program existence : New (One year or less)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : Yes

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
102	Soil, Plant, Water, Nutrient Relationships	20%		0%	
111	Conservation and Efficient Use of Water	20%		0%	
132	Weather and Climate	20%		0%	
133	Pollution Prevention and Mitigation	20%		0%	
403	Waste Disposal, Recycling, and Reuse	20%		0%	
	Total	100%		0%	

V(C). Planned Program (Situation and Scope)

1. Situation and priorities

The Commonwealth of the Northern Marianas Islands is located thousands of miles from the U.S. mainland in the middle of the Western Pacific Ocean, closer to the Philippines than it is to the closest State

of Hawaii. None the less, the great majority of food and other commodities are shipped in from the United States and other countries, at an enormous environmental and financial cost. Furthermore, many predict that the affects of climate change on Pacific Islands will take place earlier and with a greater magnitude, compared to other regions of the world. It is therefore the mission of the CNMI climate change program to diversify and strengthen our agriculture, aquaculture, and local food systems overall, making them more adaptable to the affects of climate change, offsetting imported goods with locally produced goods, and providing citizens with information and resources, in order that they may make informed decisions about climate change issues.

2. Scope of the Program

- In-State Extension

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

Funding will remain constant or increase.

2. Ultimate goal(s) of this Program

The ultimate goal of the CNMI Climate Change Program will be to provide information and resources to the general public regarding opportunities for increasing their understanding of climate change issues and providing strategies for community action that serve to prepare our communities to meet climate change challenges straight on.

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2016	1.0	0.0	0.0	0.0
2017	1.0	0.0	0.0	0.0
2018	1.0	0.0	0.0	0.0
2019	1.0	0.0	0.0	0.0
2020	0.0	0.0	0.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

Demonstration and research projects will be applied as learning tools for educating farmers and the community in regards to climate change and the importance of strong agriculture systems in mitigating against the impacts of climate change on our island communities. Sustainable farming systems, such as the Dry Litter Waste Management system, rotational grazing, improved pasture grasses and legumes, composting and others will be demonstrated, documented, and shared through education and outreach

efforts. .Farmer-type gatherings such as association meetings, soil and water conservation district meetings and forums will target students from the grade school, high school and college will also be involved in activities and presentations when ever possible. Soil sampling has been conducted as part of the improved pasture grasses and legumes trials to determine the levels of carbon sequestration occurring in our tropical cattle pasture systems. Variety trials that evaluate crops and fruit trees for resistance to wind, salinity, drought and other factors has been conducted in order to strengthen local agricultural production systems and keep them adaptable to changes in the climate and other environmental factors. As a pollution prevention activity, recycling will be promoted and encouraged through capacity building, outreach and education. Agents will work with local climate change working groups and others that are engaging in activities that are consistent with the mission of the climate change program.

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

Extension

Direct Methods	Indirect Methods
● Education Class ● Workshop ● Group Discussion ● One-on-One Intervention ● Demonstrations	● Public Service Announcement ● Newsletters ● TV Media Programs ● Web sites other than eXtension

3. Description of targeted audience

- Government Officials/Agency Collaborators
- Business operators
- Grade school, High School and College students, teachers and staff
- Volunteers Leaders from the general public

- Farmers and environmental groups and associations.

V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
  - Direct Adult Contacts
  - Indirect Adult Contacts
  - Direct Youth Contacts
  - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

☐ Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(H). State Defined Outputs

1. Output Measure

- Number of projects and programs that serve to diversify and strengthen local agricultural systems

☐ Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

V(I). State Defined Outcome

O. No	Outcome Name
1	Number of farmer adopting sustainable farming systems
2	Number of participants attending workshops on climate change, local action strategies, and sustainable farming systems

Outcome # 1

1. Outcome Target

Number of farmer adopting sustainable farming systems

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 2

1. Outcome Target

Number of participants attending workshops on climate change, local action strategies, and sustainable farming systems

2. Outcome Type : Change in Action Outcome Measure

3. Associated Knowledge Area(s)

- 132 - Weather and Climate
- 133 - Pollution Prevention and Mitigation
- 403 - Waste Disposal, Recycling, and Reuse

4. Associated Institute Type(s)

- 1862 Extension

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Competing Public priorities

Description

- Natural disasters such as typhoons, flooding, drought and other extreme weather conditions
- Extreme economic downturn which might affect manpower availability;
- Turnover of technical staff involved in this program
- Lack of availability of needed facilities
- Stakeholders might have other priorities which could effect their perceptions of the importance of climate change issues and steps they can take to mitigate climate change impact

V(K). Planned Program - Planned Evaluation Studies

Description of Planned Evaluation Studies

Our Climate Change staff and volunteers will conduct pre and post surveys of participants attending our various trainings and events. In some of our programs, we will follow-up with periodic surveys and reports that provide updates and long-term progress on effectiveness of the programs. Evaluations will include farm visits and surveys that document sustainable farming activities that have been implmented due to Climate Change programming.