

2014 Northern Marianas College Combined Research and Extension Annual Report of Accomplishments and Results

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I. Report Overview

1. Executive Summary

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 uncertainty 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 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 priorities 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 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.

Total Actual Amount of professional FTEs/SYs for this State

Year: 2014	Extension		Research	
	1862	1890	1862	1890
Plan	20.0	0.0	7.0	0.0
Actual	5.8	0.0	2.7	0.0

II. Merit Review Process

1. The Merit Review Process that was Employed for this year

- 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 process and approved by the Dean prior to submission.

III. Stakeholder Input

1. Actions taken to seek stakeholder input that encouraged 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.

NMC-CREES works with advisory councils composed of farmers, community members, community champions, youth development colleagues, and government entities, in particular, the Dept. of Land and Natural Resources (Agricultural Division), the Public School System, and Dept. of Public Health throughout the islands.

Input from the aforementioned groups is solicited at planned meetings. Research and Extension faculty have an open door policy with stakeholders and government agency representatives.

2(A). A brief statement of the process that was 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
- Needs Assessments
- Use Surveys

Brief explanation.

NMC-CREES identifies individuals and groups based on programmatic areas. An advantage of being geographically small is having direct access to all stakeholders. Our clientele work as a sounding-board prioritizing program needs and implementation. This strong cooperative working relationship with clientele and government entities creates needs-driven programming.

2(B). A brief statement of the process that was 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.

Meetings are set-up to solicit input on community needs for research and extension programming. Key leaders in these communities provide a collective voice for clientele. An example, in our FCS programming area NMC-CREES continues to seek input from our Local Advisory Council which is

composed of government, religious, and community representatives.

3. A statement of how the input will be considered

- To Identify Emerging Issues
- Redirect Extension Programs
- Redirect Research Programs
- To Set Priorities

Brief explanation.

The information derived through constant communication from our advisory council members allows extension and research faculty to design programs to meet the needs of the community. This is done in both Agriculture and Family and Consumer Sciences. The same methods are used in conducting applied research in both programmatic areas.

NMC-CREES is integrating new technologies for reaching communities and better understanding local issues and developing programs to meet those needs. Multiple forms of communication, both electronic and print, are used to solicit feedback and enhance NMC-CREES understanding of community needs.

Brief Explanation of what you learned from your Stakeholders

Through constant communication with stakeholder groups, NMC-CREES is able to create programs that meets the dynamics of the islands.

IV. Expenditure Summary

1. Total Actual Formula dollars Allocated (prepopulated from C-REEMS)			
Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
1043433	0	980714	0

2. Totaled Actual dollars from Planned Programs Inputs				
	Extension		Research	
	Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
Actual Formula	448641	0	54383	0
Actual Matching	0	0	0	0
Actual All Other	0	0	280000	0
Total Actual Expended	448641	0	334383	0

3. Amount of Above Actual Formula Dollars Expended which comes from Carryover funds from previous				
Carryover	390242	0	271123	0

V. Planned Program Table of Content

S. No.	PROGRAM NAME
1	Global Food Security and Hunger: Plant Protection Program
2	Global Food Security and Hunger: Livestock Improvement Program
3	Community Resource Development
4	Childhood Obesity
5	Food Safety
6	4-H Youth Development
7	Global Food Security and Hunger: Aquaculture and Fisheries Development Program
8	Climate Change
9	Crop Improvement

V(A). Planned Program (Summary)

Program # 1

1. Name of the Planned Program

Global Food Security and Hunger: Plant Protection Program

Reporting on this Program

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 (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2014	Extension		Research	
	1862	1890	1862	1890
Plan	5.3	0.0	5.3	0.0
Actual Paid	0.5	0.0	0.5	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
59997	0	7965	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

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* have introduced to control this invasive weed, but no impact yet. 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 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. Brief description of the target 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

3. How was eXtension used?

Information from eXtension was used for outreach education, flyers, brochures, and one-on-one extension visits.

V(E). Planned Program (Outputs)

1. Standard output measures

2014	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	0	0	0	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2014
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2014	Extension	Research	Total
Actual	0	1	1

V(F). State Defined Outputs

Output Target

Output #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).

Year	Actual
2014	1

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

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:
3	Number of clients learning Pesticide Safety

Outcome #1

1. Outcome Measures

Number of farmers using Integrated Pest Management to control invasive species

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Protection our natural resources and the environment is one of the NMC-CREES primary goal and objective to ensure the agriculture production and the environment are well protected from the others invasive species that are threatening our fauna, flora, agriculture production and the environment.

What has been done

The USDA-APHIS CAPS program funded NMC-CREES two year research project on two invasive species of fruit flies, *Bactrocera philippinensis* and *Bactrocera frauenfeldi*. These two invasive flies are among the major pests listed on the Guam Pest List. Guam categorized these pests are threatening pests for the Marianas Island. The project set a new lead to capture the invasive pest upon arrival. The establishment of the detection surveillance on Saipan and Rota is on-going for early detection and capture of these pest can lead to eradication before they become established.

USDA-APHIS also funded NMC-CREES Biological Control of Siam Weed in the Northern Marianas Island, the purpose of this project for releasing the Bio-control (*Cecidochares connexa*) on the two islands (Tinian and Saipan). The bio-control has been collected on Rota where the bio- control already established and the released have made on Tinian and Saipan.

Results

The plant protection program continued surveillance the invasive species at seaport, airport and farm areas. The team also continued distribute Bio-control agent, *Acythopeus coccinae* and *Cecidochares,connexa* to control invasive plants (*Coccinia grandis*) and *Chromolaena odorata* on the island of Saipan and Tinian. The new grant from USDA-APHIS will enhance the distribution of the bio-agent on the island of Tinian and Saipan.

4. Associated Knowledge Areas

KA Code	Knowledge Area
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

Outcome #2

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The CNMI had a very limited agriculture resources and the invasive pest that have already here causing serious impact to the agriculture production in the CNMI and additional pest can cause major problem to commercial and subsistence farming in the CNMI. The extension regularly visited farmers to educate the farmers and stakeholders to stop smuggle plant to the island for the benefit of the farming community and environment.

What has been done

The CREES extension agent regularly visited farmers to provide technical assistant to identify pests, pest scout and the recommendation to control pests using the IPM methods of control pests.

Results

NMC-CREES collaborated with numerous agencies in the CNMI and Western region on a pest issue, agriculture issue and environment issue. The agencies are CNMI-DLNR, BECQ, Pest net group, PIDDRS and USDA-APHIS.

4. Associated Knowledge Areas

KA Code	Knowledge Area
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

Outcome #3

1. Outcome Measures

Number of clients learning Pesticide Safety

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	20

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The NMC-CREES Plant Protection Program will continue provide extension service through our clients in regards with pest problems, invasive species through outreach education, training and research.

What has been done

The extension agent given the opportunity to attend the PPQ workshop at the University of Guam and the opportunity to attend the Western Region SHARE workshop training in Guam and PDP professional training on Saipan conducted by University of Guam to enhance the professional development through workshop and training.

Results

Some farmers on Saipan able to get grant from USDA EQUIP Program because of the help contributed from CREES extension agent through the IPM practices and conservation

4. Associated Knowledge Areas

KA Code	Knowledge Area
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

V(H). Planned Program (External Factors)

External factors which affected 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.)

Brief Explanation

The NMC-CREES Plant Protection division was challenged with replacing some FTE's and Program leader. On the island of Rota for example, we lost the Plant Protection Extension agent with cause lack of complete data for CAPS survey on Rota, related work on invasive species and field extension. No agriculture extension on Tinian.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

V(A). Planned Program (Summary)

Program # 2

1. Name of the Planned Program

Global Food Security and Hunger: Livestock Improvement Program

Reporting on this Program

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%		0%	
307	Animal Management Systems	40%		0%	
311	Animal Diseases	5%		0%	
312	External Parasites and Pests of Animals	5%		0%	
313	Internal Parasites in Animals	5%		0%	
902	Administration of Projects and Programs	5%		0%	
	Total	100%		0%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2014	Extension		Research	
	1862	1890	1862	1890
Plan	2.0	0.0	1.0	0.0
Actual Paid	0.0	0.0	0.0	0.0
Actual Volunteer	0.5	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
17702	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

The NMC-CREES Livestock Improvement Program aims 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, workshops, field days, 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. Brief description of the target audience

*Youth and adult agencies *Leaders *Ranchers/farmers *Retirees looking at new investment *Livestock producers *Entrepreneurs *Government

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2014	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	100	300	75	250

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2014
Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2014	Extension	Research	Total

Actual	0	0	0
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V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of Research projects on Animal Diseases and management, Animal genetic upgrading, Animal nutrition, and Animal science
Not reporting on this Output for this Annual Report

Output #2

Output Measure

- Number of Workshops and professional development trainings for livestock program (Production, Animal Health, etc.)and sustainable agriculture program

Year	Actual
2014	6

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

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 Measures

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

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	25

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Livestock Production is an important component of our local food systems. Livestock producers provide our communities with access to fresh meats that would otherwise not be available to the general public, due to the sheer distance from our islands to the Mainland USA. Many livestock producers have structured their production systems, based on outdated and unsustainable management practices, resulting in losses to production and created the threat of environmental damage.

What has been done

The NMC-CREES Livestock Improvement Program has been working in partnership with the University of Hawaii, University of Guam, and University of the Virgin Islands, and many other partners to conduct a series of training and capacity building opportunities for farmers in the CNMI and Guam, which has come to be known as the "Marianas Grazing Academy". We set up farmer advisory councils and met with producers throughout the region to guide our program planning efforts. We have developed the first publicly supported artificial insemination program for cattle, established grass and leucaena demonstration and research plots, and conducted workshops and field days on a variety of livestock production topics.

The NMC-CREES livestock Improvement program employs a variety of evaluation tools to assess our programs, to include pre and post-surveys, herd and livestock surveys, areas under pasture, pasture and legume data collection, numbers of clients applying and receiving EQIP and FSA funding, amount of USDA dollars applied for and spent on conservation practices, numbers of waste management systems constructed, number of clients adopting BEST management practices (such as composting), pre and post-tests, interviews, advisory councils, direct and indirect client contact numbers.

Results

Through the collection and analysis of data collected through a variety of methods, our program has observed increases in livestock production, pastured areas, meat processing activity and businesses, legislative support (imports to Guam), and increases in the interest levels of farmers in adopting BEST management practices, such as, weed suppression, pasture management, animal health, biomass and forage improvement, breed improvement, animal waste management, and overall community support for sustainable livestock production in the CNMI.

4. Associated Knowledge Areas

KA Code	Knowledge Area
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

Outcome #2

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	100

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Livestock Production is an important component of our local food systems. Livestock producers provide our communities with access to fresh meats that would otherwise not be available to the general public, due to the sheer distance from our islands to the Mainland USA. Many livestock producers have structured their production systems, based on outdated and unsustainable management practices, resulting in losses to production and created the threat of environmental

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Through the collection and analysis of data collected through a variety of methods, our program has observed increases in livestock production, pastured areas, meat processing activity and businesses, legislative support (exports to Guam), and increases in the interest levels of farmers in adopting BEST management practices, such as, weed suppression, pasture management, animal health, biomass and forage improvement, breed improvement, animal waste management, and overall community support for sustainable livestock production in the CNMI.

4. Associated Knowledge Areas

KA Code	Knowledge Area
303	Genetic Improvement of Animals
307	Animal Management Systems
311	Animal Diseases
312	External Parasites and Pests of Animals
313	Internal Parasites in Animals

V(H). Planned Program (External Factors)

External factors which affected 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)

Brief Explanation

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Through the collection and analysis of data collected through a variety of methods, our program has observed increases in livestock production, pastured areas, meat processing activity and businesses, legislative support (imports to Guam), and increases in the interest levels of farmers in adopting BEST management practices, such as, weed suppression, pasture management, animal health, biomass and forage improvement, breed improvement, animal waste management, and overall community support for sustainable livestock production in the CNMI.

Key Items of Evaluation

Leauceana/grass plots production and soil research data, farmer adoption of sustainable production practices and Breed Improvement data.

V(A). Planned Program (Summary)

Program # 3

1. Name of the Planned Program

Community Resource Development

Reporting on this Program

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 (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2014	Extension		Research	
	1862	1890	1862	1890
Plan	3.0	0.0	0.0	0.0
Actual Paid	1.0	0.0	0.0	0.0
Actual Volunteer	5.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
85557	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

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 along with the CRD Program Manager 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 offer on the three most populated islands and certificates of successful completion will be issued to those students who successfully completed the 12 sewing projects. Workshops on Money Management for Youth and Adults, Home Arts and Design, Fruits and Vegetable Carving, Making Custom Jewelry and Legal Aspects Facing Older Adults in the CNMI will also be offered on the islands of Saipan, Tinian and Rota.

2. Brief description of the target 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

3. How was eXtension used?

Disseminated information from eXtension on to external agencies, residential and to commercial farmers.

V(E). Planned Program (Outputs)

1. Standard output measures

2014	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	525	1800	2500	3000

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2014
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2014	Extension	Research	Total
Actual	2	0	2

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of Youth and Adults completing Money Management and Family Financial Management workshops.

Year	Actual
2014	280

Output #2

Output Measure

- Number of established Entrepreneurs projects

Year	Actual
2014	3

Output #3

Output Measure

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

Year	Actual
2014	200

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

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 Measures

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

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	200

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Majority of the workshops participants claimed that hands-on demo, is always more exciting and easier to follow than following recipes especially in making ice cream with locally grown fruits.

What has been done

CRD recruit and refer interested participants for mini workshop (mostly hands-on?demo) to CREES, Food Scientist.

Results

Majority of our participants does food processing and preservation for family consumption. A good number sell their value added produce to the Garapan Public Market, those who have an approved Food Handler Certificate, sell at retail stores and gift shops.

4. Associated Knowledge Areas

KA Code	Knowledge Area
801	Individual and Family Resource Management

Outcome #2

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	200

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Many unemployed women, especially single parents took up sewing in an effort to supplement the income that they earned from working part-time.

What has been done

CRD assist students in raising funds to purchase sewing machine during weekends. Those CRD sewing students who successfully completed the 12 required sewing projects, exist the program with a certificate of successful completion, their finished projects and 99% also walked away with a sewing machine.

Results

Owning a sewing machine enables students to continue applying the knowledge and skills that they have learned and enables them to also earn side-income.

4. Associated Knowledge Areas

KA Code	Knowledge Area
801	Individual and Family Resource Management

Outcome #3

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	275

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Social Services and government agencies providing public assistance such as food stamp, WIC referred their recipients to attend CRD Family Financial Management, simply to learn to budget their food stamps and WIC vouchers. The Probation Office, Parole and the Juvenile Detention also referred their clients. Attendance is not mandatory. Learning simple budgeting and smart shopping will hopefully be helpful for them.

What has been done

CRD continue to conduct Youth and Adult Money Management workshop. Since a good number of CRD, Family Financial Management workshops participants reported to be unemployed, CRD incorporated Ways to make/earned money as part of it Money Management workshops? activities.

Results

100% claimed to have increased knowledge in budgeting and go shopping with their shopping list. Food Stamp recipients learned to budget their coupons by being a smart shoppers. Many are taking the lessons on Needs and Wants seriously.

4. Associated Knowledge Areas

KA Code	Knowledge Area
801	Individual and Family Resource Management

V(H). Planned Program (External Factors)

External factors which affected 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)

Brief Explanation

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

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Evaluation Results for some CRD programs will be presented to the CREES Advisory Council sometime in 2016 and will be included in the 2017 reporting period.

Key Items of Evaluation

Obtained the numbers of participants' who claimed to be applying the knowledge, skills and lessons learned. CRD would also like to know if the knowledge, skills and lessons enabled them to generate side-income.

V(A). Planned Program (Summary)

Program # 4

1. Name of the Planned Program

Childhood Obesity

Reporting on this Program

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%		50%	
724	Healthy Lifestyle	50%		50%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2014	Extension		Research	
	1862	1890	1862	1890
Plan	2.0	0.0	0.0	0.0
Actual Paid	1.0	0.0	1.2	0.0
Actual Volunteer	7.0	0.0	7.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
64800	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	280000	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

In partnership with University of Hawaii Manoa, University of Alaska Fairbanks, University of Guam, American Samoa Community College, program personnel worked with community groups, Head Start

centers, Public School System Food and Nutrition Service, and elementary schools to implement multi-faceted, community planned and driven strategies to improve the health of children in the communities of Kagman and Tanapag, Achugao, San Roque, and As Matuis. Evidence-based and culturally appropriate leadership, motivational interviewing, and facilitation trainings were provided to community members, now known as "role models". The role models took a leadership role in planning and implementing the following activities: school wellness policy adoption, physical activity and academic integration training for all teachers, healthy village stores, youth summer camp, social marketing campaign, enhancements to the built environment to encourage physical activity, and food demonstrations at community events.

Program personnel worked closely with University of Alaska, Fairbanks to refine data collection manual for food cost survey data collection. Food cost survey data was collected, entered, and analyzed. Data will be used to inform food policy in the CNMI.

2. Brief description of the target audience

Children between the ages of 2-8 years old, parents of 2-8 year old children, early childhood teachers, elementary teachers,

3. How was eXtension used?

eXtension was used as a resource to consider extension programs and outcomes that could be adapted for use in CNMI.

V(E). Planned Program (Outputs)

1. Standard output measures

2014	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	700	2000	200	600

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2014
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2014	Extension	Research	Total
Actual	61	7	68

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Greater understanding of diet, physical activity, and health
Not reporting on this Output for this Annual Report

Output #2

Output Measure

- Increase opportunities for physical activity
Not reporting on this Output for this Annual Report

Output #3

Output Measure

- Improve nutrient intake of school meals among students at one elementary school
Not reporting on this Output for this Annual Report

Output #4

Output Measure

- Enhance built environment for physical activity

Year	Actual
2014	6

Output #5

Output Measure

- Develop evidence-based healthy stores program for small grocery stores

Year	Actual
2014	1

Output #6

Output Measure

- Enroll two stores in healthy village stores program

Year	Actual
2014	2

Output #7

Output Measure

- Create nutrition and wellness policy for elementary school

Year	Actual
2014	2

Output #8

Output Measure

- Work with school and community leaders to implement school nutrition and wellness policies in two elementary schools

Year	Actual
2014	2

Output #9

Output Measure

- Implement evidence-based social marketing campaign with input from community role models and stakeholders

Year	Actual
2014	2

Output #10

Output Measure

- Provide training to teachers and childcare providers on integrating physical activity into academic teaching

Year	Actual
2014	3

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Pilot "Recess Before Lunch" at one public elementary school
2	Lighting system will be turned on and available for use by the general public one night a week.
3	Social marketing/awareness campaign on the burden of non-communicable diseases/lifestyle diseases and role of diet and physical activity
4	Quantify progress in schools that participate in Youth Engaged in Advancing Health Project.
5	Increase the number of community members empowered to lead and carry-out actions that improve health at the village level in two communities
6	Increase physical activity among 2-10 year olds
7	Decrease overweight and obesity among 2-10 year olds in two communities
8	Increase integration of physical activity into the school day among teachers and childcare providers who teach 2-10 year olds.
9	Increase access to fruits and vegetables in two villages

Outcome #1

1. Outcome Measures

Pilot "Recess Before Lunch" at one public elementary school

Not Reporting on this Outcome Measure

Outcome #2

1. Outcome Measures

Lighting system will be turned on and available for use by the general public one night a week.

Not Reporting on this Outcome Measure

Outcome #3

1. Outcome Measures

Social marketing/awareness campaign on the burden of non-communicable diseases/lifestyle diseases and role of diet and physical activity

Not Reporting on this Outcome Measure

Outcome #4

1. Outcome Measures

Quantify progress in schools that participate in Youth Engaged in Advancing Health Project.

Not Reporting on this Outcome Measure

Outcome #5

1. Outcome Measures

Increase the number of community members empowered to lead and carry-out actions that improve health at the village level in two communities

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	20

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Through the facilitation of community meetings and trainings use the Children's Healthy Living Programs Role Model Guide, two groups of community members (volunteers) have been formed to lead projects and activities in the communities of Kagman and Tanapag, Achugao, San Roque, and As Matuis (TASA).

What has been done

TASA role models have established themselves as a non-profit group. To date, they have influenced the passage of one elementary school-level nutrition and wellness policy, approached store to join the healthy village stores programs, painted physical activity prompts (ie hopscotches) at three public places that previously did not have physical activity equipment/prompts for young children

Kagman role models have

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior
724	Healthy Lifestyle

Outcome #6

1. Outcome Measures

Increase physical activity among 2-10 year olds

Not Reporting on this Outcome Measure

Outcome #7

1. Outcome Measures

Decrease overweight and obesity among 2-10 year olds in two communities

Not Reporting on this Outcome Measure

Outcome #8

1. Outcome Measures

Increase integration of physical activity into the school day among teachers and childcare providers who teach 2-10 year olds.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	20

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Students spend a significant part of the day in school. Teachers face increasing pressure to ensure student learning and to ensure satisfactory performance on standardized tests. In some cases, 60 minutes of moderate-intensity physical activity a day is not always prioritized.

What has been done

Three workshops were provided to child care providers, early childhood educators, and elementary teachers from child development centers that focused on age and developmentally appropriate physical activity based on the SPARK curriculum. SPARK is a research-based approach to increasing physical activity among children through teacher training.

Results

Teachers at one elementary school have reported significant use of training concepts and strategies to increase physical activity and learning. The school has made a significant change in how holidays and events are celebrated. Water and physical activities are now used for celebrations as opposed to previous practices of candy and sugar-sweetened beverages. Teachers are now using more physical activity to reinforce Common Core-related academic

lessons.

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior
724	Healthy Lifestyle

Outcome #9

1. Outcome Measures

Increase access to fruits and vegetables in two villages

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The food environment, specifically the availability of food, influences purchasing and consumption.

What has been done

Program personnel and village role models were able to engage one store. The store, a popular shopping destination for village residents, previously did not carry any fresh fruits or vegetables.

Results

The store now has an entire section of local and imported fruits and vegetables. The store manager has reported increased profits as a result of the newly established produce section.

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior
724	Healthy Lifestyle

V(H). Planned Program (External Factors)

External factors which affected 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)

Brief Explanation

V(I). Planned Program (Evaluation Studies)

Evaluation Results

We are currently collecting post-programming/intervention data on physical activity, fruit and vegetable consumption, and BMI among other measures. The quantitative data analysis comparing pre and post behavioral and anthropometric measures will be ready for the next accomplishment report.

Key Items of Evaluation

Working with motivated community members (role models) at the village level has proven effective in implementing programming. Empowering role models to take the lead in improving the health of the village(s) and people in those villages has proven effective as evidenced by improvements to the built and food environments. This program received a "Best Practice" award from the World Health Organization for the work and outcomes accomplished in collaboration with TASA role models.

V(A). Planned Program (Summary)

Program # 5

1. Name of the Planned Program

Food Safety

Reporting on this Program

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
502	New and Improved Food Products	50%		50%	
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources	50%		50%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2014	Extension		Research	
	1862	1890	1862	1890
Plan	2.0	0.0	2.0	0.0
Actual Paid	0.2	0.0	0.8	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
35763	0	24987	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

In the NMI, after produce is harvested, the quality is deteriorated significantly because there is a lack of awareness of the significant break troughs' in science and such can be credited to our somewhat new presence as a program under NMC-CREES. In order to develop unique value-added product using local produce, the demands and needs of local farmers should be understood and also the most interested produce and value-added products should be identified prior to developing value-added processing. The program helps farmers and producers to select the most characteristic tropical produce in the CNMI in order to develop desirable value-added products.

The following are the specific activities performed:

- 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
- Conduction of basic and applied research to intensify the food safety program

2. Brief description of the target audience

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

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2014	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	130	950	700	1500

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2014

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2014	Extension	Research	Total
Actual	0	2	2

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of novel food processing technology workshops

Year	Actual
2014	3

Output #2

Output Measure

- Number of workshops related with food safety and quality
Not reporting on this Output for this Annual Report

Output #3

Output Measure

- Numbers of newly developed value-added products

Year	Actual
2014	2

Output #4

Output Measure

- Number of technical information provided to the public

Year	Actual
2014	2

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

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 Measures

Numbers of farmers/producers that develop value added products

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	3

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

It is difficult to ship any fresh agricultural product off island as a potential export due to lack of fumigation and food irradiation facilities. Consequently a large portion of these produce is either fed to livestock or given away. Thus there is need to for local farmers and producers to utilize fresh produce in order to create additional profits for small and mid-sized farms in the NMI.

What has been done

Extensive outreach efforts have been made to help local farmers and producers to develop value-added products. 2 value-added process workshops were held to teach how to make coconut wine using fresh coconut water and how to preserve the quality of wine in Saipan and Rota. These workshops also provided basic safe food handling process for safe processing. The Food Safety Program Leader also visited producers to give them pertinent consultation on site.

Results

We have three individuals interested in processing coconut wine processing for sale with the potential to last beyond current standards. The program provided these producers technical advices to obtain suitable containers, equipment, and ingredients as well.

4. Associated Knowledge Areas

KA Code	Knowledge Area
502	New and Improved Food Products

Outcome #2

1. Outcome Measures

Number of farmers/producers implementing good post-harvest practices

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	3

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Due to tropical climate and high electricity charge, it is very difficult for local farmers and producers to maintain the quality of fresh produce in the region. Most of them are not aware of the importance of post-harvest practices based on the physiological characteristics of various produce harvested in the region.

What has been done

?Information to reduce produce respiration and undesirable ethylene gas level was disseminated.
?It was taught that the ethylene gas release rate varies on different fresh produce and produce releasing high level of ethylene gas should be separated with others.
?It was also informed that proper air circulation and moisture control also help to maintain the freshness of different produce.
?Information on optimum storage temperatures and maturation conditions on different crops were provided.

Results

4 farmers applied a method to reduce ethylene gas level in storage room atmosphere and found that the ethylene gas remover sachets were effective to maintain the freshness of produce. In addition, farmers and producers learned that cardboard packaging boxes should have several holes ventilating ethylene gas produced.

4. Associated Knowledge Areas

KA Code	Knowledge Area
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711

Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

V(I). Planned Program (Evaluation Studies)

Evaluation Results

- 1 research was conducted to improve food quality and shelf-life tests for 3 commercial products such as cookies, hot pepper pastes, and noni leaf tea were provided.
- 3 value-added processing workshops, 2 coconut wine making workshops in Saipan and Rota, and 1 bread fruit flour making workshop in Saipan were conducted. 3 food manufacturers are trying to start their small businesses with this coconut wine processing.
- 1 intensive HACCP workshops for restaurant and food services were provided and 2 safe food handling workshop for general public were provided. As a result, one of local food service provider, Herman's Bakery updated their quality assurance procedure.
- Information for modified atmosphere packaging and vacuum frying technologies were introduced to the public. With information on these new cutting edge technologies people begins to understand how oil oxidation and rancidity affects the quality of fried products such as sweet potato chips, taro chips, and so on.

Key Items of Evaluation

- Workshops provided by the program
- Developed value-added products
- Information provided by the program
- Technical advice to the local farmers and producers

V(A). Planned Program (Summary)

Program # 6

1. Name of the Planned Program

4-H Youth Development

Reporting on this Program

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	25%		0%	
803	Sociological and Technological Change Affecting Individuals, Families, and Communities	25%		0%	
805	Community Institutions and Social Services	25%		0%	
806	Youth Development	25%		0%	
	Total	100%		0%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2014	Extension		Research	
	1862	1890	1862	1890
Plan	3.0	0.0	0.0	0.0
Actual Paid	2.0	0.0	0.0	0.0
Actual Volunteer	5.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
82456	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

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. Our CYFAR project has community engagement projects in which our children participants renovate local facilities on island. We have chosen to focus on the Children's park, High School basketball court, etc...

2. Brief description of the target 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

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2014	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	120	300	550	600

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2014
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2014	Extension	Research	Total

Actual	0	0	0
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V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of youth participating in 4-H sponsored events

Year	Actual
2014	550

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of household recycling aluminum cans or other recyclable commodities such as paper and plastic
2	Number of 4-h volunteers recruited
3	Number of youth participants attending 4-H workshop activities

Outcome #1

1. Outcome Measures

Number of household recycling aluminum cans or other recyclable commodities such as paper and plastic

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	60

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The impacts of non-point source pollution are hard-felt in island communities where land based activities ultimately affect reef communities. Thus, recycling promotion and education is one way to encourage citizens to care about their environment and manage their waste appropriately.

What has been done

Recycling is promoted and encouraged at all of our events and functions. We also host beach and park clean-ups. We also conduct mini-trainings and forums on recycling, re-using, and watershed education.

Results

Encouraging the youth of the CNMI to recycle and reuse as much as possible has a profound effect on the level of appreciation and concern they have about their environment. Furthermore, with children urging others in their households or circle of friends to recycle or discard trash appropriately, others are likely to follow suit.

4. Associated Knowledge Areas

KA Code	Knowledge Area
805	Community Institutions and Social Services
806	Youth Development

Outcome #2

1. Outcome Measures

Number of 4-h volunteers recruited

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	20

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The success of any non-profit organization is based on its ability to encourage volunteerism in their respective communities. Recruiting and enlisting volunteers serves to enhance community buy-in and overall support for youth programs.

What has been done

Program personnel placed much effort in the recruitment process. With the help of existing CYFAR volunteers we increased community participation based on an event basis. We have found that volunteers tend to continue participating if the event is of interest to them.

Results

As a result of increased volunteerism, we have increased the number of events, increased event topic offerings, and have seen an overall increase in the overall number of volunteers participating in program functions.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #3

1. Outcome Measures

Number of youth participants attending 4-H workshop activities

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	650

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

As a result of increased volunteerism, we have increased the number of events, increased event topic offerings, and have seen an overall increase in the overall number of volunteers participating in program functions.

What has been done

We have conducted numerous workshops, camps, civic engagement activities, and social events for children to participate in.

Results

With the financial support from CYFAR, we gained greater community interest, increased participation from students, and have witnessed greater participation on the side of adult volunteers.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Based on post activity surveys conducted on students evaluating the overall performance of the program, most students believe that activities:

- are relevant to our community.
- teach an important life skill;
- encourage social growth through team building activities;
- teach the importance of agriculture and recycling.

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 7

1. Name of the Planned Program

Global Food Security and Hunger: Aquaculture and Fisheries Development Program

Reporting on this Program

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	30%		30%	
111	Conservation and Efficient Use of Water	30%		30%	
112	Watershed Protection and Management	10%		10%	
135	Aquatic and Terrestrial Wildlife	30%		30%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2014	Extension		Research	
	1862	1890	1862	1890
Plan	1.0	0.0	1.0	0.0
Actual Paid	0.5	0.0	0.5	0.0
Actual Volunteer	4.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
61890	0	21431	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

NMC CREES' Aquaculture & Fisheries Development Program (A&FDP) has become a major focal point in our program delivery. Although the actual personnel dedicated towards this program are fairly small when compared to many well-established Land Grant colleges offering such similar services, the A&FDP has been instrumental in the revival of the agriculture industry in our small locale. The following activities highlight the major undertakings and noteworthy accomplishments the program has made during this reporting cycle;

1. **Hydroponics in CNMI Public Schools:** With funding from the United States Department of Agriculture's (USDA) Specialty Crop Block Grant (SCBG) program awarded to the CNMI Department of Lands & Natural Resources (CNMI DLNR) and in cooperation with the CNMI Public School System (CNMI PSS) with technical assistance provided by NMC CREES Aquaculture & Fisheries Development Program (A&FDP), vegetable production using hydroponics technology were introduced to 12 public schools in Saipan, Tinian, and Rota with close to thousand students participating. The project aims to encourage local production and consumption of vegetables and address health issues related to sedentary lifestyles.

2. **Tilapia Feed Project:** On top of the capacity building training in Thailand for 8 Tilapia farmers on 2013, three workshops on Farm Made Tilapia Feed production were held in Rota, Saipan, and Rota on August of 2014. The workshops were intended to engage and transfer the knowledge to more individuals in the CNMI who were unable to participate in the training in Thailand because of funding restrictions. Forty-two (42) individuals attended the workshop, which included lectures on feed formulation using various methods, i.e., Pearson Square, and actual hands - on Tilapia feed making using local banana as one of the key ingredients. Of the 8 farmers, one has already started using his knowledge from the training in making feed for his backyard Tilapia grow-out production.

3. **Community-based, Rabbitfish Development Project:** We recorded multiple spawns from our Rabbitfish broodstock in April, May, July, and August of 2104. After observation under a microscope and counting, we found 50% of the eggs spawned were fertile. Unfortunately, we have not to date successfully reared the Rabbitfish larva to the juvenile stage and, as such, will be the focus of an upcoming Hatch funded project due to the termination of the current project funded by the Marine Conservation Plan (MCP), which ended in September of 2014.

4. **A&FDP Outreach:** To ensure the sustainability of the aquaculture industry in the CNMI, the A&FDP continues to conduct numerous outreach activities in the community throughout the year. One of these events, where large crowds can be engaged and educated about the activities of the program, were the annual, CNMI-wide, Agriculture Fairs. In these Fairs, displays were erected to highlight, promote, and educate the public on ongoing projects like aquaponics; Tilapia feed making, and Rabbitfish hatchery production. Additionally, the program welcomed and gave tours to adults and youths alike from such organizations like the Empty Vessel, 4-H Summer Program, Saipan Summer Fisheries Program, and so forth to the A&FDP wet laboratory on campus where visitors can observe the actual research projects being investigated or technology being demonstrated. In-classroom presentations, may it be on campus or in the schools, were also undertaken. The program conducted many workshops throughout the program year to improve the knowledge base of aquaculture farmers and the community in hopes of improving production at the farm site.

5. **New Farms:** The A&FDP helped Mr. Will Hinson built an aquaponics system at his farm in Papago, Saipan. The system included to Tilapia grows out tanks and two. 32 square feet grow beds, for leafy vegetable production. Mr. Hinson's aquaponics system was the first in Saipan to integrate the one pump system using airlift technology borrowed from Olomana Gardens in Hawaii.

2. Brief description of the target audience

Youth and Adult
Aquaculture Producers
Government Agencies
Non Governmental Organizations

Business Community
 Retirees looking at new investment

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2014	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	0	0	0	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2014
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2014	Extension	Research	Total
Actual	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of aquaculture workshops

Year	Actual
2014	9

Output #2

Output Measure

- Number of aquaculture research project

Year	Actual
2014	1

Output #3

Output Measure

- number of short course/training

Year	Actual
2014	9

Output #4

Output Measure

- Number of aquaculture demonstration project

Year	Actual
2014	4

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

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 Measures

Number of farmers familiar with Recirculating Aquaculture Systems

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	555

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Due to the CNMI's stringent waste discharge regulations, limited space, and mostly limestone-based soils, Recirculating Aquaculture System (RAS) is the preferred culture method for the production of aquatic animals and plants.

What has been done

Outreach in major public events, workshops, aquaculture wet laboratory visits, and trainings were some of the efforts undertaken to increase knowledge in RAS among the farmers.

Results

As a result of these extraordinary measures taken by the program, a new farm was started in the island of Saipan.

4. Associated Knowledge Areas

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

Outcome #2

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	42

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Feed availability and cost has been identified by stakeholders as one of the constraints to expansion of the aquaculture industry in the CNMI.

What has been done

The A&FDP submitted and was awarded an external grant to build up capacity among CNMI farmers in the production of Tilapia feed using locally available ingredients. To this end, the program brought eight (8) farmers to the Asian Institute of Technology (AIT) in Thailand for hands-on training on Tilapia feed making. Moreover, in 2014, 42 additional individuals in the CNMI learned how to make Tilapia feed using locally available ingredients through workshops held in Saipan, Tinian, and Rota.

Results

As a result, one of the farmers that participated in the Tilapia feed training in Thailand has started using his newly, learned skill making feed using local ingredients like banana for his small scale Tilapia operation.

4. Associated Knowledge Areas

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

Outcome #3

1. Outcome Measures

Number of youths familiar with aquaculture and aquaponics

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	1000

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The longevity and sustainability of the aquaculture and aquaponics industries in the CNMI will largely depend on the next generation of farmers. To this end the A&FDP is very active in engaging youths in activities that promotes and educate on aquaculture, aquaponics, and hydroponics production.

What has been done

The A&FDP has been actively promoting aquaculture, aquaponics, and hydroponics to the youth by way of school presentations; on-site school technology demonstrations, agriculture fair displays, field trips to active farms, and visits to the NMC CREES Aquaculture Wet laboratory.

Results

As a result, the A&FDP is entertaining requests by schools for onsite aquaculture, hydroponics, and aquaponics demonstration systems where the units will be used as science teaching tool.

4. Associated Knowledge Areas

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

Outcome #4

1. Outcome Measures

Number of individuals that will venture into aquaculture

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	3

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

All indicators are pointing to the continued expansion of aquaculture worldwide as wild fisheries catch continues to decline. Half of seafood consumed today comes from fish farming. The situation in the CNMI is no different as growth in population has reduced the number wild fish catch and demand for seafood growing, opportunities abound for aquaculture expansion in the CNMI.

What has been done

The ongoing activities that A&FDP is investigating in areas such a lowered feed and energy costs, capacity building, and new species development is providing the current and potential farmers the sense of optimism that results in further investment and industry expansion.

Results

As a result of the program?s outreach and the dynamics in the CNMI aquaculture industry itself, i.e., first CNMI shrimp farm acquired by multi-national, more entrepreneurs are seriously looking into investing in aquaculture, mariculture, aquaponics, and hydroponics.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management

V(H). Planned Program (External Factors)

External factors which affected 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.)

Brief Explanation

The CNMI has been fortunate because it has not had a major storm in recent years. Unfortunately, it is also located in what's called "Typhoon Alley" so typhoons are a major threat to any agricultural activity in the Marianas and farmers are advised on the appropriate technology to address these concerns. Government regulations and competing public priorities are the only other externalities that are considered constraints to further expansion of the industry especially when it comes to permitting and allocation of government resources mostly going to the visitor industry.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

The tremendous growth of aquaculture in the CNMI in the last several years is testament to the efficacy of the program in knowledge and technology transfer to the farmers. Farmer sentiment, positive feedbacks, and word of mouth that result in referrals are proof of the strength of program delivery to the client.

Key Items of Evaluation

Surveys, technology adoption, increased in knowledge through pre & post-tests, and extension visits.

V(A). Planned Program (Summary)

Program # 8

1. Name of the Planned Program

Climate Change

Reporting on this Program

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 (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2014	Extension		Research	
	1862	1890	1862	1890
Plan	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
Actual Paid	0.2	0.0	0.0	0.0
Actual Volunteer	1.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
940	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Demonstration and research projects were 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 were 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 whenever 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 was promoted and encouraged through capacity building, outreach and education.

2. Brief description of the target audience

Government /Agency Collaborators, University of Hawaii-CTHAR program, all farm crop producers and farm helpers in the CNMI Business operators that promote or sell farm produce, grade school, High School and College students, Adult Volunteer Leaders (4-H Clubs), and consumers.

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2014	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	150	200	50	75

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2014

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2014	Extension	Research	Total
Actual	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of research projects completed on Soil and Water issues

Year	Actual
2014	1

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of farmers or members of the community learning to compost animal wastes, yard scraps, etc.
2	Number of famers using sustainable agriculture techniques, such as cover cropping, mulching, rotational grazing, no-till farming, composting, etc.

Outcome #1

1. Outcome Measures

Number of farmers or members of the community learning to compost animal wastes, yard scraps, etc.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Composting of yard scraps represents an important paradigm shift in the way people view organic materials. Often times, yard scraps are simply burned, rather than composted and used as a fertilizer, soil stabilizer, and soil amendment.

What has been done

Workshops and one-on-one consultation (through extension visits) on how to compost yard scraps and stabilize soils.

Results

Some members of the community have begun to compost yard scraps or utilize yard scraps as mulching around planting areas.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
111	Conservation and Efficient Use of Water

Outcome #2

1. Outcome Measures

Number of famers using sustainable agriculture techniques, such as cover cropping, mulching, rotational grazing, no-till farming, composting, etc.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	100

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Sustainable farming practices strengthen local farming systems, making them more adaptable to climate change and often times, adding to their financial viability.

What has been done

Workshops, Demonstrations, and field days on topics such as animal waste, pasture management, and sustainable farming practices have been conducted.

Results

Many farmers are adopting sustainable farming systems as a means of improving their productivity and the sustainability of their farms.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
111	Conservation and Efficient Use of Water

V(H). Planned Program (External Factors)

External factors which affected 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.)

Brief Explanation

V(I). Planned Program (Evaluation Studies)

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

V(A). Planned Program (Summary)

Program # 9

1. Name of the Planned Program

Crop Improvement

Reporting on this Program

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%		0%	
204	Plant Product Quality and Utility (Preharvest)	50%		0%	
205	Plant Management Systems	25%		0%	
	Total	100%		0%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2014	Extension		Research	
	1862	1890	1862	1890
Plan	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
Actual Paid	0.2	0.0	0.0	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
39536	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Extension personnel worked with local government entities, the University of Hawaii Pacific Business Center, and Agronomy experts to conduct a two-day Breadfruit Workshop to address improved breadfruit production, food security, value added production, and introduction of non-endemic varieties of breadfruit to the CNMI.

Extension agents also worked with commercial farmers to improve dragon fruit and row crop production.

2. Brief description of the target audience

Farmers, business people, general public

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2014	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	150	50	60	50

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2014

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2014	Extension	Research	Total
Actual	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Test new varieties of bread fruit in the CNMI (3-4 years for the tree to fruit)

Year Actual

2014 3

Output #2

Output Measure

- Extension visits with farmers to improve crop production

Year	Actual
2014	20

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Increase dragon fruit income among commercial dragon fruit farmers
2	Increase breadfruit harvests

Outcome #1

1. Outcome Measures

Increase dragon fruit income among commercial dragon fruit farmers

Not Reporting on this Outcome Measure

Outcome #2

1. Outcome Measures

Increase breadfruit harvests

Not Reporting on this Outcome Measure

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Other (Lack of full-time program leader)

Brief Explanation

Due to transitions in leadership, the department was not able to hire a full-time program leader to provide leadership for this program.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Acting program leader was able to obtain 3 varieties of bread fruit for testing. It is anticipated that it will take 3-4 years for these varieties to fruit.

Key Items of Evaluation

VI. National Outcomes and Indicators

1. NIFA Selected Outcomes and Indicators

Childhood Obesity (Outcome 1, Indicator 1.c)	
0	Number of children and youth who reported eating more of healthy foods.
Climate Change (Outcome 1, Indicator 4)	
0	Number of new crop varieties, animal breeds, and genotypes with climate adaptive traits.
Global Food Security and Hunger (Outcome 1, Indicator 4.a)	
0	Number of participants adopting best practices and technologies resulting in increased yield, reduced inputs, increased efficiency, increased economic return, and/or conservation of resources.
Global Food Security and Hunger (Outcome 2, Indicator 1)	
0	Number of new or improved innovations developed for food enterprises.
Food Safety (Outcome 1, Indicator 1)	
0	Number of viable technologies developed or modified for the detection and
Sustainable Energy (Outcome 3, Indicator 2)	
0	Number of farmers who adopted a dedicated bioenergy crop
Sustainable Energy (Outcome 3, Indicator 4)	
0	Tons of feedstocks delivered.