2017 Northern Marianas College Combined Research and Extension Annual Report of Accomplishments and Results

Status: Accepted

Date Accepted: 08/22/2018

I. Report Overview

1. Executive Summary

The 2017 Annual Report for Northern Marianas College Cooperative Research, Extension, and Education Service details the important accomplishments and results achieved by the different programs that comprise NMC CREES. The Program has made significant headway in research - the first, successful larval rearing of the indigenous forktail rabbitfish, for instance - and notable progress in extension, which includes the leadership training of hundreds of island youth. The report also provides details on NMC CREES' efforts to help farmers and ranchers increase their yields and maximize revenue through innovative methods; the provision of about 8,000 pounds of fruits and vegetables to support local nonprofit organizations and underserved sectors of the community; far-reaching progress in reducing childhood obesity; and the experience and knowledge gained from numerous crop trials and experiments.
At the same time, the Annual Report also notes several policy, programmatic and operational obstacles that have presented challenges, many of which are unique due to the CNMI's relative isolation in the Western Pacific. Despite these challenges, the hard working and capable team at NMC CREES look forward to reporting on even more accomplishments and greater impact on the populations that we serve in the coming year.

Total Actual Amount of professional FTEs/SYs for this State

Year: 2017	Extension		Research	
	1862	1890	1862	1890
Plan	8.0	0.0	4.0	0.0
Actual	12.7	0.0	11.5	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

All faculty are reviewed by the dean annually. Progress is evaluated based on work plans submitted by program leaders. The program plans reflect stakeholder input and needs identified by a broad group of stakeholders. Program Leaders were assigned by the dean to review and provide feedback to a particular program area as part of the peer review process.

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.

Stakeholder input was encouraged through the convening of local advisory groups. Topic-focused community non-profit groups are also consulted for input on a variety of extension areas.

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
- Use External Focus Groups
- Open Listening Sessions
- Needs Assessments
- Use Surveys

Brief explanation.

Local advisory group members are selected through a key-informant interview process. Key informants recommend individuals from their respective communities to advise on community relevant issues. Potential advisory council group members are then asked by research and extension personnel if they would be willing to be a member and provide input in group and individual settings. Extension and research personnel also use their knowledge and experience of local industry, farmers, health personnel, and those who actively participate in CREES program areas to recommend individuals for local advisory group membership.

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.

Conducted electronic surveys and face-to-face meetings with stakeholders and government officials.

3. A statement of how the input will be considered

- In the Budget Process
- To Identify Emerging Issues
- Redirect Extension Programs
- Redirect Research Programs
- In the Staff Hiring Process
- In the Action Plans
- To Set Priorities

Brief explanation.

Stakeholder input (clientele, government) was used to create yearly plans of work for each of the four program areas: Family, Community, and Youth Development, Nutrition and Health, Aquaculture and Natural Resources, and Agriculture. From these yearly plans of work, CREES Administration used these plans a s a guide for financial prioritization per plan of work.

Brief Explanation of what you learned from your Stakeholders

• Need active Agriculture Experiment Stations on Saipan, Tinian, and Rota.
• Hydroponic vegetable production educational programming is needed.
• Youth leadership development is needed.
• Nutrition security is an issue in the CNMI; around 90% of food is imported. A significant amount of produce (e.g. spinach, zuchini, melons, peppers) is imported.
• Youth Agricultural Education programming is needed; especially considering our aging farming population.

IV. Expenditure Summary

1. Total Actual Formula dollars Allocated (prepopulated from C-REEMS)			
Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
{No Data Entered}	{No Data Entered}	{No Data Entered}	{No Data Entered}

2. Totaled Actual dollars from Planned Programs Inputs				
	Extension		Research	
	Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
Actual Formula	545613	0	293503	0
Actual Matching	0	0	0	0
Actual All Other	0	0	0	0
Total Actual Expended	545613	0	293503	0

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

V. Planned Program Table of Content

V(A). Planned Program (Summary)

Program # 1

1. Name of the Planned Program

Global Food Security and Hunger: Livestock Improvement Program

☐ Reporting on this Program

Reason for not reporting

No FTE as of present.

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2017	Extension		Research	
	1862	1890	1862	1890
Plan	2.0	0.0	0.0	0.0
Actual Paid	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
Actual Volunteer	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
1862 Matching	1890 Matching	1862 Matching	1890 Matching
{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
1862 All Other	1890 All Other	1862 All Other	1890 All Other
{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}

V(D). Planned Program (Activity)

1. Brief description of the Activity

• Conduct farm training for small farmers- livestock enterprise and genetic upgrading, animal welfare, animal nutrition and husbandry management, etc
• Conduct animal health and management workshops

- Conduct mini-workshop on alternative livestock enterprise
- Grant writing workshop for research funding

§ Continue with breed improvement through artificial insemination Cattle, Swine, and Goats
§ Continued research into areas such as Integrated grass/legume patures and the effects on carbon sequestration and livestock production.

2. Brief description of the target audience

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

- Farmer Associations

3. How was eXtension used?

{No Data Entered}

V(E). Planned Program (Outputs)

1. Standard output measures

2017	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: 2017
Actual: {No Data Entered}

Patents listed
{No Data Entered}

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2017	Extension	Research	Total
Actual	0	0	0

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

Year	Actual
2017	0

Output #2

Output Measure

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

Year	Actual
2017	0

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
2017	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
{No Data Entered}

What has been done
{No Data Entered}

Results
{No Data Entered}

4. Associated Knowledge Areas

KA Code	Knowledge Area
{No Data}	null

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
2017	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
{No Data Entered}

What has been done
{No Data Entered}

Results
{No Data Entered}

4. Associated Knowledge Areas

KA Code	Knowledge Area
{No Data}	null

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

{No Data Entered}

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

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	40%		0%	
724	Healthy Lifestyle	40%		0%	
901	Program and Project Design, and Statistics	20%		0%	
	Total	100%		0%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2017	Extension		Research	
	1862	1890	1862	1890
Plan	5.0	0.0	1.0	0.0
Actual Paid	3.0	0.0	0.0	0.0
Actual Volunteer	12.0	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**
100269	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

• Facilitated the establishment of childhood overweight and obesity monitoring and surveillance in the CNMI and regionally in collboration with University of Hawaii Manoa, Public School System, Head Start, Early Head Start with enhancing and refining child growth assessments and BMI with the goal of establishing a regional monitoring system.
• Conducted anthropometric measurements on 400 early childhood students
• Collaborated with regional partners to develop "Unified Anthropometry Guide for Infants, Children, and Adults"
• Provided capacity building opportunities for the next generation of CNMI Nutrition & Health professionals
• Trained collaborators in providing basic nutrition education
• Collaborate with the Dept. of Public Health and Hardt Eye Institute & Diabetes Eductaion Center to implement PROA Diabetes Prevention Program
• Worked in partnership with Charter Day Committee to promote no sugar-sweetened beverages event
• Conducted work-place wellness presentations at Marianas Health Services
• Conducted nutrition training at Community Guidance Center
• Provided nutrition education classes at Area Health Education Center Summer Health Camp
• Provided training to 4-H volunteers on "Conducting Nutrition Education and Role Modeling at with 4-H Participants"
• Provided internship training opportunity for Northern Marianas College School of Education student
• Partnered with the MotherRead, FatherRead Program to provide Nutrition Education to their participants
• Worked with Agriculture Program to test produce palatability as part of their produce variety trials
• Conducted presentations at elementary schools as part of school curriculum enhancement efforts
• Collaborated with Tinian stakeholders to increase physical activity programs for Tinian residents
• Collaborated with Tinian stakeholders to decrease SSB consumption and increase water consumption

2. Brief description of the target audience

• Teachers and child care providers of young children
• Early childhood, elementary, and child care program administrators
• Parents of young children
• Sedentary adults
• Service providers who work with limited-resource families
• NMC program personnel

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2017	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	739	400	892	419

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

Patent Applications Submitted

Year: 2017

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2017	Extension	Research	Total
Actual	9	4	13

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of role models trained
  Not reporting on this Output for this Annual Report

Output #2

Output Measure

- Number of trainings on increasing physical activity
  Not reporting on this Output for this Annual Report

Output #3

Output Measure

- Number of trainings and meetings with/for role models
  Not reporting on this Output for this Annual Report

Output #4

Output Measure

- Number of role model initiated projects
  Not reporting on this Output for this Annual Report

Output #5

Output Measure

- Number of social marketing campaigns in identified villages
  Not reporting on this Output for this Annual Report

Output #6

Output Measure

- Number of new stores participating in Healthy Village Stores program
  Not reporting on this Output for this Annual Report

Output #7

Output Measure

- Number of child care centers that adopt nutrition and wellness policies
  Not reporting on this Output for this Annual Report

Output #8

Output Measure

- Number of elementary schools adopting nutrition and wellness policies
  Not reporting on this Output for this Annual Report

Output #9

Output Measure

- Number of participating early childhood programs and land-grant institutions in the region in regional monitoring and surveillance project (CHL-IMPAC)

Year	Actual
2017	5

Output #10

Output Measure

- Number of persons who were measured as part of CHL-IMPAC (anthropometry)

Year	Actual
2017	400

Output #11

Output Measure

- Number of nutrition education presentations conducted

Year	Actual
2017	17

Output #12

Output Measure

- Number of 4-H volunteers trained on how to conduct Nutrition Education with youth

Year	Actual
2017	14

Output #13

Output Measure

- Number of new physical activity programs in Tinian

Year	Actual
2017	2

Output #14

Output Measure

- Number of Nutrition & Health capacity building programs created for Northern Marianas College students

Year	Actual
2017	1

Output #15

Output Measure

- Number of events held where sugar-sweetened beverages were not allowed to be sold

Year	Actual
2017	1

Output #16

Output Measure

- Number of paleability tests conducted on new produce varieties

Year	Actual
2017	5

Output #17

Output Measure

- Number of people served as a result of PROA Project collaboration

Year	Actual

2017 12

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

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

Outcome #1

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
{No Data Entered}

What has been done
{No Data Entered}

Results
{No Data Entered}

4. Associated Knowledge Areas

KA Code	Knowledge Area
724	Healthy Lifestyle

Outcome #2

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
{No Data Entered}

What has been done
{No Data Entered}

Results
{No Data Entered}

4. Associated Knowledge Areas

KA Code	Knowledge Area
724	Healthy Lifestyle

Outcome #3

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
{No Data Entered}

What has been done
{No Data Entered}

Results
{No Data Entered}

4. Associated Knowledge Areas

KA Code	Knowledge Area
724	Healthy Lifestyle

Outcome #4

1. Outcome Measures

Two elementary schools adopt child wellness policy

Not Reporting on this Outcome Measure

Outcome #5

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
{No Data Entered}

What has been done
{No Data Entered}

Results
{No Data Entered}

4. Associated Knowledge Areas

KA Code	Knowledge Area
724	Healthy Lifestyle

Outcome #6

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Approximately, one in three children in the CNMI are overweight or obese. Among adults, the CNMI has one of the highest rates of Type II Diabetes. Despite this concerning data, the USAP, including CNMI, is not included in the National Health and Nutrition Examination Survey, or other population-level surveillance systems that provide anthropometric measures on young children despite the U.S.-affiliated Pacific Islands (USAPI) having some of the highest rates per capita of adult obesity and chronic diseases in the world. Monitoring and surveillance of young child health will allow programs to better target their activities and policies.

What has been done
In partnership with University of Hawaii Children's Healthy Living Program Center of Excellence, Northern Marianas College personnel worked directly with early childhood education programs and land-grant institutions in CNMI, Pohnpei, and American Samoa to enhance the current growth assessment measures and to establish and pilot a standardized system for collecting, analyzing, and disseminating child (ages 3-5) health data.

Results
There has been an increase in skill sets among personnel (n=4) at land-grant colleges and early childhood education programs in taking anthropometric measurements, data entry, analysis, and interpretation among the three projects sites (American Samoa, CNMI, and Pohnpei. The system for collecting this data in each site has also been enhanced and standardized. A total of 1594 children were measured in school year 2017-2018. The aggregated data at each site is now being used to guide program and policy level planning in the areas of child health and growth in early childhood and other service provider agencies.

4. Associated Knowledge Areas

KA Code	Knowledge Area
901	Program and Project Design, and Statistics

Outcome #7

1. Outcome Measures

Increase physical activity among 2-10 year olds

Not Reporting on this Outcome Measure

Outcome #8

1. Outcome Measures

Increase water consumption among 2-10 year old children

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
{No Data Entered}

What has been done
{No Data Entered}

Results
{No Data Entered}

4. Associated Knowledge Areas

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

Outcome #9

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
{No Data Entered}

What has been done
{No Data Entered}

Results
{No Data Entered}

4. Associated Knowledge Areas

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

Outcome #10

1. Outcome Measures

Increase physical activity among 2-10 year old children

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
{No Data Entered}

What has been done
{No Data Entered}

Results
{No Data Entered}

4. Associated Knowledge Areas

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

Outcome #11

1. Outcome Measures

Decrease overweight and obesity among children age 2-8 in village sites receiving programming.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	666

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Approximately, one in three children in the CNMI are overweight or obese. One statistical analysis, co-authored by this programming, estimated that around 45% of CNMI children are overweight or obese by age 8.Overweight or obese preschoolers are 5 times more likely than normal-weight children to be overweight or obese as adults. Childhood obesity may lead to social discrimination, heart disease, type II diabetes, sleep apnea and other health issues.

What has been done

The program partnered with community stakeholders who were from specific villages/sites to plan and implement various strategies to improve the environments that children live, learn, and play in. Strategies were developed based on science (comprehensive literature reviews), focus-group findings, and community meetings. Communities were randomly selected and assigned as either Intervention (primary intervention), Optimized (used at comparison communities & shorter optimzed intervenion), or Temporal based on established criteria. Child height and weight were collected, along with child diet (food logs), physical activity (6 days wearing acceleromter), and other health related data that parents/guardians of children age 2-8 provided at baseline (n=911) and 24-months (n=666). Programming included working with two stores to increase presence and marketing of produce and water, implementation of school-specific wellness policies, training for village role-models on motivational interviewing, community role model volunteers rebuilding two playgrounds, adding opportunities for physical activity and physical activity prompts at 3 schools, two Head Start Centers, and two parks, training for teachers, staff, and administrators on integrating physical activity into learning,food demonstrations at community events, and a health summer camp organized and run by village role models as well as village-specific social marketing campaigns.

Results
Categorical outcomes for the Northern Mariana Islands for overweight and obesity indicate a OWOB prevalence decrease from 29.95% at baseline and 27.46% post-intervention (24-months after baseline) in Intervention sites; a decrease of -2.49%. This is the first study of its kind for the Northern Mariana Islands thereby filling a void in the scientific literature. The findings are being used to guide project and programmatic approaches in the Public School System, Head Start Program, and Dept. of Public Health. The data has also been used to raise awareness about child OWOB issues and the importance and effectiveness of environmentally-focused, community-based engagement strategies to improve child health.

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior
724	Healthy Lifestyle
901	Program and Project Design, and Statistics

Outcome #12

1. Outcome Measures

Increase number of children who meet national recommendations for sugar-sweetened beverage consumption.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	265

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Regularly consuming sugar-sweetened beverages (SSB) is associated with weight gain, obesity, heart disease, type II diabetes, cavities, and other negative health effects. SSBs can be described as non-alcoholic beverages that contain added caloric sweeteners. SSBs contribute to children consuming more calories than are needed.

What has been done
The program partnered with community stakeholders who were from specific villages/sites to plan and implement various strategies to improve the environments that children live, learn, and play in. A key program message was replacing SSB consumption with water consumption. Strategies were developed based on science (comprehensive literature reviews), focus-group findings, and community meetings. Communities were randomly selected and assigned as either Intervention (primary intervention), Optimized (used at comparison communities & shorter optimzed intervenion), or Temporal based on established criteria. Child height and weight were collected, along with child diet (food logs), physical activity (6 days wearing acceleromter), and other health related data that parents/guardians of children age 2-8 provided at baseline (n=911) and 24-months (n=666). Programming included working with two stores to increase presence and marketing of produce and water, implementation of school-specific wellness policies, training for village role-models on motivational interviewing, community role model volunteers rebuilding two playgrounds, adding opportunities for physical activity and physical activity prompts at 3 schools, two Head Start Centers, and two parks, training for teachers, staff, and administrators on integrating physical activity into learning,food demonstrations at community events, and a health summer camp organized and run by village role models as well as village-specific social marketing campaigns. The social marketing messaging regarding SSB consumption was developed in partnership with village role models who were empowered to be health role models/leaders in their respective villages. Role models encouraged the replacement of SSB with water at family gatherings, school events, and community activities. The Childhood Obesity Program did demonstrations at Parent-Teacher-Student Meetings and school professional development trainings for teachers.

Results
There was a 5.51% increase in the number of children who met national SSB consumption recommendations based on baseline and post-intervention results. This translates into 265 children that reduced their SSB consumption.

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

{No Data Entered}

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Process evaluation was used to determine if the monitoring system and related skill-building activities were implemented as intended.
As a result of the process evaluation, the program realized the following successes:

- Conducted face-to-face meeting and training in CNMI with local and regional partners to plan Phase I of the project (outputs: core values adopted, plan and timeline for Phase I implementation, two news standardized measurers)
- All project partners completed CITI IRB certification by March 2017.
- Develop standardized anthropometry manual
- Developed project guidelines and procedures for data collection and handling
- Held all online meetings as planned
- Linked Pohnpei Early Childhood Education Program to the secure server
- Re-established secure server connects in CNMI and American Samoa
- Collected anthropometric data from 1594 children
- Entered all data into WHO Anthro

Had to adjust deadlines for the following objectives:

- Uploading data to secure server
- Extracting reports from WHO Anthro software
- Generating user-friendly two page results publication for each site
- Disseminating findings to key stakeholders

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 3

1. Name of the Planned Program

Global Food Security and Hunger: Aquaculture and Natural Resources 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
301	Reproductive Performance of Animals	20%		20%	
302	Nutrient Utilization in Animals	20%		30%	
307	Animal Management Systems	20%		15%	
308	Improved Animal Products (Before Harvest)	10%		15%	
401	Structures, Facilities, and General Purpose Farm Supplies	16%		3%	
403	Waste Disposal, Recycling, and Reuse	10%		10%	
501	New and Improved Food Processing Technologies	2%		2%	
502	New and Improved Food Products	2%		5%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2017	Extension		Research	
	1862	1890	1862	1890
Plan	2.0	0.0	2.0	0.0
Actual Paid	1.0	0.0	2.6	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**
188424	0	150645	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 support of eventual commercialization of marine finfish culture in the CNMI, the A&NR Program:
- completed renovation of existing facilities to allow for marine finfish seed stock production that includes a hatchery, laboratory, and broodstock holding area
- conducted research on and recorded the first ever, successful larval rearing of the indigenous, Forktail Rabbitfish, Siganus argenteus, in the Marianas
- established capabilities to culture phyto and zooplankton. As a result, the A&NR program at NMC CREES will not only be able to perform larval rearing of Rabbitfish or any other marine finfish species but also rearing of other aquatic organism such as mollusk and crustacean. This will also help lower the cost of seed stock production as the need to import inputs are greatly reduced.
A&NR's extension efforts included,
- provided eight (8) training workshops on hydroponics production
- partnered or facilitated activities with NOAA, NMC Business School, and Western Pacific Regional Management Council

2. Brief description of the target audience

- Entrepreneurs
- Unemployed
- Underemployed
- Youth ages 10 -17
- Teachers
- Public & Private School Students
- Current Aquaculture Producers
- Recent Retirees
- Homemakers
- Underserved Populations
- Underrepresented Populations
- Non-profit Organizations
- Decision makers

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2017	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	118	1365	81	1136

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

Patent Applications Submitted

Year: 2017

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2017	Extension	Research	Total
Actual	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of producers learning how to culture Rabbitfish, freshwater prawns, milkfish, and giant clams

Year	Actual
2017	32

Output #2

Output Measure

- Number of producers learning how to add value to excess or non-marketable aquaculture commodities

Year	Actual
2017	25

Output #3

Output Measure

- Number of producers making and using local feed

Year	Actual
2017	2

Output #4

Output Measure

- Number of producers culturing fish in ocean cages

Year	Actual
2017	0

Output #5

Output Measure

- Number of producers sourcing inputs on their own

Year	Actual
2017	3

Output #6

Output Measure

- Number of producers learning aquaculture through audio visuals means

Year	Actual
2017	199

Output #7

Output Measure

- Number of extension publications and presentations
  Not reporting on this Output for this Annual Report

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of increased efficiencies
2	Number of Producers Indicating adoption of recommended practices
3	Number of producers reporting increased dollar return per acre or reduced cost per/acre
4	Number of new or improved value added products that can be sold by producers (and other members of the food supply chain)
5	Number of producers (and other members of the food supply chain) that have increased revenue
6	Percentage of youth who improved knowledge of food systems
7	Percentage of adults who improved knowledge of food systems

Outcome #1

1. Outcome Measures

Number of increased efficiencies

Not Reporting on this Outcome Measure

Outcome #2

1. Outcome Measures

Number of Producers Indicating adoption of recommended practices

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	11

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The high production cost, i.e, energy, feed, and labor is a major challenge in aquaculture for producers in the CNMI.

What has been done
As a result, NMC CREES' aquaculture program is constantly looking for ways to assist producers in addressing these challenges through knowledge and technology transfers. By securing funding and helping fish farmers get training in making aqua feed, some farmers are now capable of making their own feed using locally available resources as alternatives to imported, compound feed. At the same time, through extension efforts and technology transfers, fish farmers have been able to to reduce their energy cost through the use of alternative energy and innovative methods like airlifts pumps to circulate and aerate culture tank water.

Results
As a result of our knowledge transfer efforts, farmers have adopted these methods and recommendations. As a result, farms that have adopted our recommendations, were able to realize a reduction in their production costs by 30%.

4. Associated Knowledge Areas

KA Code	Knowledge Area
501	New and Improved Food Processing Technologies
502	New and Improved Food Products

Outcome #3

1. Outcome Measures

Number of producers reporting increased dollar return per acre or reduced cost per/acre

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	2

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
High cost and, at times, availability of processed fish food on island. The CNMI has one of the highest cost of energy in the nation at $0.33/kWh which is a major impediment to aquaculture especially since majority of the fish farming methods are RAS.

What has been done
One of the farmer client we have worked with has reduced his cost by adopting practices recommended by our program through the use effluent from the culture tank to grow high protein, aquatic plant that are fed back to the fish. The same farmer has solar panels installed to power the energy needs of his farm for most of the day while aerating with an innovative Venturi method using DC water pump.

Results
As a result, this producer has realized reduced cost/acre through adoption of these sustainable, cost saving practices in tune to 50% of the production cost.

4. Associated Knowledge Areas

KA Code	Knowledge Area
301	Reproductive Performance of Animals

307	Animal Management Systems
308	Improved Animal Products (Before Harvest)

Outcome #4

1. Outcome Measures

Number of new or improved value added products that can be sold by producers (and other members of the food supply chain)

Not Reporting on this Outcome Measure

Outcome #5

1. Outcome Measures

Number of producers (and other members of the food supply chain) that have increased revenue

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	3

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
On average, a fish grow out operation requires six months before the commodity is ready to be marketed. Growing other commodities that utilizes the same resources but gets to the market faster helps sustain the fish farm operation and generate additional revenue.

What has been done
Four trainings were conducted on soilless, plant culture on three islands that reached 93 adults in this reporting year

Results
Of the 93, two adopted this unique farming method and turned it into commercial operation marketing to hotels and restaurants generating $1000 additional farm income per month from crops on top of fish sales.

4. Associated Knowledge Areas

KA Code	Knowledge Area
308	Improved Animal Products (Before Harvest)
501	New and Improved Food Processing Technologies
502	New and Improved Food Products

Outcome #6

1. Outcome Measures

Percentage of youth who improved knowledge of food systems

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	2582

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
As the CNMI develops and becomes urbanized and the number of farms and farmers decline, engaging the youth in food production and the food system, is more important now than ever to ensure the food security of the territory.

What has been done
The program continues to conduct school visits, participate in major public events, conduct workshops, and host summer camp attendees that educate participants in aquatic plant and animal food production.

Results
As a result, the program was able to each over 2,000 youths in the CNMI in FY 2017. On average, through our evaluation process which included tests and surveys, 80% of the youth that we engaged showed a gained in knowledge in aquaculture and the food system when we compared the pre and post surveys with the pre-survey knowledge at 30% on average on the subject matter versus 80% for the post survey.

4. Associated Knowledge Areas

KA Code	Knowledge Area

307	Animal Management Systems
403	Waste Disposal, Recycling, and Reuse

Outcome #7

1. **Outcome Measures**

Percentage of adults who improved knowledge of food systems

Not Reporting on this Outcome Measure

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Government Regulations
- Competing Public priorities

Brief Explanation

Government regulations and competing public priorities continue to be a challenge for aquaculture in the CNMI. The permitting process required to construct structures, import feed, seed stocks, and the like are cumbersome and results in missed opportunities for ongoing or new farms. Competing public priorities with the local government's focus on the visitor industry leaves little effort to promote and expand aquaculture in the territory. While there hasn't been a major storm since 2015, natural disasters will continue to be a threat to aquaculture in the foreseeable future.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

In the surveys that we administer for all planned activities, through a pre and post tests evaluation component, results on average, were significant when pre and post tests were compared. In all workshops that we conduct, we administer pre and post tests to measure the gain in knowledge by participants. For example, in FY 2017, we conducted 8 workshops on static hydroponics production. At the start of each workshop, we will administer the pre-test and results have shown that participants have little knowledge of the subject matter with scores at 30%. The post tests, on the other hand, showed significant gains with 80% of the same group of participants scoring in the 100%. Moreover, some participants have taken the next step and started growing hydroponics vegetables for personal consumption or commercial operation

Key Items of Evaluation

Key items were, as result of planned activities, clients are walking away with significant gains in knowledge, taking the knowledge and adopting at the farm and home site, and a change in behavior as a result.

V(A). Planned Program (Summary)

Program # 4

1. Name of the Planned Program

Agriculture Production

☑ 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
202	Plant Genetic Resources	65%		65%	
205	Plant Management Systems	25%		25%	
211	Insects, Mites, and Other Arthropods Affecting Plants	5%		5%	
216	Integrated Pest Management Systems	5%		5%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2017	Extension		Research	
	1862	1890	1862	1890
Plan	4.0	0.0	4.0	0.0
Actual Paid	3.5	0.0	6.5	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**
80711	0	142858	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

- Conducted research and extension projects utilizing disease and pest resistant crops varieties
- Conducted research and extension projects on animal management systems
- Conducted research and extension projects on plant management systems
- Conducted research and extension projects on Insects, mites, and other Arthropods Affecting Plants
- Conducted extension services on Integrated Pest Management
- Developed and disseminated extension & educational services
- Conducted trainings, workshops, meetings on knowledge areas listed
- Conducted needs assessments and program evaluations
- Provided consultations to our current and prospective clientele and stakeholders

2. Brief description of the target audience

- Ranchers
- Farmers
- Crop producers and farm laborers
- Students (k-12, college students, 4-H)
- Business operators that buy Agricultural products
- Retail business owners and homeowners
- Recreational gardeners
- Government agencies
- Non-governmental organizations, such as non-profit organizations

3. How was eXtension used?

Agriculture Production utilized eXtension for connecting with colleagues regarding plant diseases, vegetable pest outbreaks, and community garden development activities. We contacted others on issues with greenhouse cucumber production stemming from soil disease buildup, new fruit fly outbreaks affecting field tomatillo plants, and designs for institutional and other small space layouts such as school and local activity center gardens.

V(E). Planned Program (Outputs)

1. Standard output measures

2017	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	127	100	208	100

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

Patent Applications Submitted

Year:	2017
Actual:	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2017	Extension	Research	Total
Actual	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of vegetable variety trials completed

Year	Actual
2017	11

Output #2

Output Measure

- Number of plant management demonstrations completed

Year	Actual
2017	2

Output #3

Output Measure

- Number of livestock management systems demonstrations completed

Year	Actual
2017	0

Output #4

Output Measure

- Number of extension publications, brochures, & educational materials produced and distributed

Year	Actual
2017	0

Output #5

Output Measure

- Number of workshops and other educational events (field days)

Year	Actual
2017	9

Output #6

Output Measure

- Number of research projects completed on insect, mites, and arthropods affecting plants (invasive species)

Year	Actual
2017	3

Output #7

Output Measure

- Number of cover crop trials

Year	Actual
2017	11

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of farmers and ranchers adopting improved plant and animal management systems
2	Number of farmers adopting new Integrated Pest Management strategies to control the insects, mites and other arthropods affecting plants (Invasive species)
3	Number of newly introduced crop varieties being sold at local markets
4	Number of pounds of fresh produce donated for consumption by vulnerable populations

Outcome #1

1. **Outcome Measures**

Number of farmers and ranchers adopting improved plant and animal management systems

Not Reporting on this Outcome Measure

Outcome #2

1. **Outcome Measures**

Number of farmers adopting new Integrated Pest Management strategies to control the insects, mites and other arthropods affecting plants (Invasive species)

2. **Associated Institution Types**

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	15

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Our islands have several issues with managing pests, all possibly benefiting from integrated techniques. We have identified a prevalence with overusing older chemicals, emphasis on damaging techniques, and possible issues with banned substances or methods. Several options lose effectiveness when incorrectly applied, while there are also other management issues present apart from those related to chemicals. Another issue present is illegal use and import of banned substances.

What has been done
Because many producers do not have access to new or updated protocols, a major focus of agriculture production has been informational. This includes different chemicals to use, how to use new and existing chemicals differently, and what effects occur from the field level to the final marketed product.

Results
We were able to connect with fifteen individuals that verified a change in their knowledge base. These persons interacted directly with Agriculture Production through community events,

workshops, farm tours, and extension visits. We were able to demonstrate results of proper IPM in our research fields and provided this information to farmers as applicable. Because our context is isolated and farming community interconnected, we also understand that the fifteen persons also had direct and indirect contact with their networks, likely increasing the impact of their knowledge gained. For reference, Agriculture Production identified approximately 120 farming individuals across the three islands.

4. Associated Knowledge Areas

KA Code	Knowledge Area
211	Insects, Mites, and Other Arthropods Affecting Plants
216	Integrated Pest Management Systems

Outcome #3

1. Outcome Measures

Number of newly introduced crop varieties being sold at local markets

Not Reporting on this Outcome Measure

Outcome #4

1. Outcome Measures

Number of pounds of fresh produce donated for consumption by vulnerable populations

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	4000

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Availability of fresh produce is limited for many sectors of the population. One sector in particular, low income and vulnerable individuals, is a focus of our research production. These include elderly, families with small children, and domestic violence survivors. We are in a position to provide high quality foodstuffs that would otherwise be unavailable to to funding restrictions or

storage potential.

What has been done
Agriculture production identified multiple options for receiving produce in our community. These options included nonprofits and NGOs, social welfare organizations, and known distribution agencies serving vulnerable sectors. These serve in addition to local marketing recipients and in-kind partnerships, allowing a mix of potential recipients depending on need and availability.

Results
Approximate production for 2017 was over 8000 pounds from two cropping seasons. Of this, half became viable options to support local food banks and organizations serving vulnerable sectors. We were able to supply parochial and secular organizations, both with government and private support. In particular, we served four groups that catered inclusive of low income individuals and families with small children, one of which focused on meeting the needs of domestic violence survivors. Feedback from these recipients influenced both later crop choices and management options. Their suggestions also influenced how we approached interactions with potential future recipients (we now have seven organizations for the most recent cropping season).

4. Associated Knowledge Areas

KA Code	Knowledge Area
202	Plant Genetic Resources
205	Plant Management Systems

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

The CNMI is an isolated island territory subject to extreme weather events (most recently a major typhoon) while also heavily reliant on tourism and related economic activities. Goods are expensive for the average consumer and increase programmatic costs while also creating shortfalls when meeting various local, territorial, and federal regulations - decisions often come at the expense of one programmatic need or another. Further, population changes also affect labor availability for most operations. As such, agriculture as a whole is depressed in the Marianas, with a heavy reliance on imported and shelf-stable foods that lack proper nutrition content according to US federal standards. Because of this scenario, research is needed to increase agriculture in the CNMI. However, for part of 2017, Agriculture Production did not have a research scientist attached to the program, generally reflecting challenges across the college with regard to recruiting: several key positions remain vacant due to several factors including our isolated island context. In response, the focus of research, extension, and educational activities shifted to standardizing farming

protocols. As a prerequisite for knowledge transfer, market surveys and program reviews indicated a need for more emphasis on direct production of vegetables as well as conservation management to sustain and extend production. Thus planned knowledge transfer in Agriculture Production concerns horticulture and related crop sciences, with appropriate techniques and accurate data from production and cover crops trials as crucial first steps. These trials are ongoing and will be able to make recommendations to the farming community during the next growing season. Because of the change, areas such as animal production and integrated pest management did not have defined goals met for the year. Instead, focus on vegetable and cover crop varieties, precision agriculture methods, and conservation management including perennial crops, agroforestry, and site restoration is expected.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Evaluation results are based on: 1. Plant Genetic Resources; 2. Plant Management Systems; 3. Insects, Mites, and Other Arthropods affecting Plants; 4. Integrated Pest Management Systems; and 5. Animal Management Systems. The first two had the most emphasis due to the hire of a horticulture and crop scientist in Jul 2017, and absence of an entomologist and an animal scientist. Studies for the following genetics and required management include: cucurbits, nightshades, brassicas, sweet corn, common bean, okra, field greens, and alliums. Successes include increased pumpkin productivity per acre, tomato productivity per acre and per method, okra productivity for new cultivars, and unexpected bumper crops for certain cucurbits (zucchini and squash) as well as recovery plants (basil varieties). Following pumpkin loss in Aug 2017, soil testing and plant dissection informed variety changes while also suggesting new timing on nutrient delivery, irrigation, and pesticides; these allowed a modest increase of 10% over early 2017. On tomatoes, infections and support issues limited some varieties, while others doubled production due to experimental nutrient applications. A new okra variety, Red Velvet, dominated productivity at the plant level for standard and double-density plantings. With zucchini and squash, plants were subject to similar losses in August 2017 and again in January 2018. Management changes allowed two varieties to exceed survivorship and productivity expectations in the first two days of harvest. An unexpected success came from basil recovery plants: one variety became a consistent request by clients due to their unique flavor. We had moderate success in other areas, meeting past totals for most crops, while continuing to struggle with brassicas, alliums, and most field greens. Several management changes are in development.

Studies for cover crop genetic resources and methods included Sunn hemp, sunflower, millet, daikon radish, field mustard, soy bean, mung bean, black gram, adzuki bean, black-eyed pea, chickpea, lima bean, and buckwheat. Cover crop management influenced production that followed, and we conducted comparison studies for yield increases and labor decreases as well. University of Guam researchers assisted with soil testing, indicating a general lack of organic matter and available calcium. Further, weed suppression through applying compost, aged wood chips, and plastic mulch all contributed to yield increases even when including additional labor through maintenance. Additionally, support through small stakes, netting, large poles, and metal cages. Finally, IPM research projects included: surveillance of Philippine fruit Fly (Bactrocera philippinensis) and Mango fruit fly (Bactrocera fruenfeldi); surveillance of Solenopsis invicta in the CNMI; and Biological control Siam weed in the northern Marianas island. These were in addition to crop and technique trials.

Key Items of Evaluation

An essential finding from our evaluations concerns matching planted species to conditions appropriate for growth. Most crops preferred in the CNMI are tropical plants themselves, but often cultivars bred for production in temperate climate summers. Further, many plant types are close to the limits for potential growth even apart from selection, framing management requirements as two-fold: nutrient availability and microclimate control. On the former, cover crop emphasis provided ample opportunity to both rebuild capacity at our research facilities while showcasing untested species as valuable contributions to a producer's operation. We are also evaluating new management techniques, effectively treating cover crops as production species. On microclimates, our program recognizes the need for new methods to increase productivity and labor efficiency, relevant to small producers and community gardeners that form most of our public stakeholders. As our farming community ages, those that maintain their operations into retirement age can benefit from cover crop management, scalable mechanization, and increased cost efficiency comparisons between management techniques. Our conditions are considered 'ideal' by some, but many weedy species and pests counter that potential. Climate change and its effects on increasing temperatures, fluctuating water availability, and more frequent and severe extreme weather events forces producers to rethink production strategies to recover losses and ultimately decrease effort. Simple investments in IPM, drip irrigation systems, plastic mulch, and timed nutrient delivery tend toward a few percent above initial costs, but can result in full investment recovery and several times beyond for a single season alone. Identifying nutrient, pest, and other precluding issues such as our eight-to-one zucchini crop increase or our success with expired mammoth basil serve as critical reminders that continual research is needed to inform extension and education in the community and unlock the potential afforded by our growing conditions.

V(A). Planned Program (Summary)

Program # 5

1. Name of the Planned Program

Family, Community and 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
801	Individual and Family Resource Management	20%		0%	
802	Human Development and Family Well-Being	15%		0%	
803	Sociological and Technological Change Affecting Individuals, Families, and Communities	10%		0%	
805	Community Institutions and Social Services	10%		0%	
806	Youth Development	30%		0%	
901	Program and Project Design, and Statistics	15%		0%	
	Total	100%		0%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2017	Extension		Research	
	1862	1890	1862	1890
Plan	3.0	0.0	0.0	0.0
Actual Paid	4.5	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**
176209	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

Building Partnerships
The FCYD program established a Local Advisory Council (LAC) comprised of a diverse group of individuals from different professions, expertise, age, ethnicity, and educational background. The LAC members provide impartial, objective and strategic advice to the program to perform more efficiently and to meet the most pressing needs of the community. There are six (6) members representing each of the islands: 1 from Tinian, 1 from Rota, 3 from Saipan and 1 youth member. Each LAC member serves a 3-year term with the exception of the youth. This member serves a one-year term as the position is rotated amongst the three islands.
To ensure sustainability of efforts, the program established formal partnerships with various organizations such as the Youth Affairs Office (YAO), Department of Community & Cultural Affairs - Division of Youth Services (DCCA-DYS) Kagman Community Center and the Municipality of Tinian. The working agreements delineate the roles and responsibilities of each partner agency. The FCYD program provides capacity development trainings; support community and youth led programs; and provide technical assistance in facilitating and/or convening key stakeholders while our partners provide the venue for established 4-H clubs; monitor volunteers, program implementation and data collection; evaluate program implementation and inform FCYD program of any new development or emerging need.
Building capacity of 4-H volunteers as well as community partners
Number of trainings provided - 6
CPR/First Aid Certification Training on Saipan & Tinian: 47
Adult and youth volunteers learned life-saving skills necessary to respond to emergency situations while working with young children during summer camps and after-school programs.
EFNEP Curriculum Certification Training: 15 4-H youth counselors
4-H youth counselors were trained and certified using the Expanded Food & Nutrition Education Program [EFNEP] curriculum. Counselors were equipped with the necessary skills to facilitate the nutrition education classes and cooking demonstrations during the summer camp.
Leadership & Teambuilding: 25 4-H youth counselors
4-H youth counselors learned leadership skills and the importance of teamwork. With the training, head counselors were able to facilitate peer orientations, training, and daily activities with 4-H kids.
Community Gardening using Learn, Grow, Eat & Go (LGEG) curriculum: 2 community partners total of 20 participants
With the assistance of a Local Advisory Council member, community partners were trained on using the LGEG curriculum. The community partners will take the lead in implementing the LGEG curriculum within their centers.
Raised Bed Gardening [done in collaboration with the Agricultural Production Program]: 1 community partner total of 8 participants

With the assistance of the Agricultural Production Program, participants were trained on raised bed gardening. The staff of the various youth centers will take the lead in implementing and maintaining the community gardens within their respective areas.

1. **4-H/EFNEP Camp Magalahi - Two (2) three-week sessions**

Camp Maga'lahi successfully engaged 85 youth between the ages of 7-to-14 in learning about agriculture, aquaculture, healthy living, disaster preparedness, music and culture, the environment and marine life. Twenty-five (25) 4-H youth counselors facilitated the daily activities with participants. At the conclusion of the summer camps, parents shared how much their kids enjoyed the sessions and are looking forward to the following year.
In an effort to expand Camp Magalahi to the islands of Rota & Tinian, 2 youth representatives from each island participated as a "youth counselor in training" by shadowing the seasoned youth counselors for one week. As a result of the mentorship, the youth representatives from Tinian were able to formally established a Tinian 4-H Club.
School enrichment program: Embryology
120 6th and 7th grade students at Dandan Middle School through the STEM class observed chicken eating, sand bathing, mating, and laying eggs. They have collected eggs and on occasion candled them to determine their development status. The unhatched eggs have also been opened for observation and compared to the growth chart to see at what stage they expired as well as speculate on the reasons they might have not hatched. Students watched chicks crack from the shell and go from wet to dry and transferred to a brooding cage. They designed the coop and the brooding cages. Pupils have successfully collected over 240 eggs, hatched 118, and sold 7.
Number of schools participating in school gardens - 1 Saipan Community School
In collaboration with the Agricultural Production program and DLNR Specialty Crop Block Grant, we have managed to assist one school with establishing its school garden as well as incorporating the LGEG curriculum to enhance student learning.

2. Brief description of the target audience

- Government officials / agency collaborators
- Grade school; middle school; high school; college students; teachers, staff
- Economically disadvantaged
- Single parents

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2017	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	104	248	377	600

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

Patent Applications Submitted

Year:	2017
Actual:	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2017	Extension	Research	Total
Actual	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of volunteers trained

Year	Actual
2017	47

Output #2

Output Measure

- Number of training provided for volunteers

Year	Actual
2017	6

Output #3

Output Measure

- Number of new schools participating in school enrichment programs

Year	Actual
2017	1

Output #4

Output Measure

- Number of partnerships established

Year	Actual
2017	7

Output #5

Output Measure

- Number of newly established entreprenuers

Year	Actual
2017	0

Output #6

Output Measure

- Number of youth and adults completing money management

Year	Actual
2017	122

Output #7

Output Measure

- Number of youth and adults completing life-skills training

Year	Actual
2017	28

Output #8

Output Measure

- Integrated plan for youth development

Year	Actual
2017	1

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Program participants will have the knowledge to assist with program planning and implementation
2	Trained volunteers and program participants conduct training, workshops, and demonstrations

Outcome #1

1. Outcome Measures

Program participants will have the knowledge to assist with program planning and implementation

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Rebuilding the community and youth development programs within the CNMI requires programming efforts to be community/youth driven. We partner with communities to create a meaningful and sustainable development that is relevant to their context. Providing opportunities for their involvement in the initial process will assist with developing programs that resonates with the stakeholders. Program participants recognize the strengths and limitations within their respective communities. Additionally, their knowledge of and relationship with the community members will be helpful with this effort. According to Ensor and Berger (2009), "communities need to be able to combine their own knowledge of what works, with new knowledge in tune with their culture and values" (p173). Empowering participants to make decisions in a meaningful way toward their own future will give them a sense of ownership resulting in creating sustainable programs. This is extremely important as we understand the significance of empowering communities to take an active role in shaping their environment thereby reducing their reliance of outside programming efforts.

What has been done
We have been able to establish key partnerships with the various organizations providing programs within the various villages. Utilizing the existing venues have enabled us to recruit members that live in these areas to participate in identifying possible programs that they feel will enhance and/or complement the existing efforts of other groups. Based on the feedback received, we were able to tailor our plans to meet their specific needs. Youth volunteers were also able to provide input. The information was helpful in determining the best methods for increasing the youth's participation. Some of the participants have been able to assist with implementing programs geared toward 7-to-15-year-olds.

Results
Working collaboratively with partnering organizations, community members and the youth on

refining the plan of work made buy-in easier. Expectations and clearly defined roles were established and communicated with everyone involved. This was done to avoid any confusion in the future. Relationships are extremely important so it was critical to begin on a solid foundation of understanding. As programs were implemented, debrief meetings were conducted to discuss the components that were working while identifying opportunities for continued improvement. This was done using a two-tier system. The first tier engaged the partnering organizations that were assisting with providing educational presentations. This enabled the programs to make adjustments in their approach such as the teaching strategies and hands-on activities that complimented the lessons. The second tier involved the youth volunteers that were assisting with implementing the various activities. The feedback they provided helped to improve the effectiveness and efficiency of completing the sessions.

4. Associated Knowledge Areas

KA Code	Knowledge Area
802	Human Development and Family Well-Being
806	Youth Development
901	Program and Project Design, and Statistics

Outcome #2

1. Outcome Measures

Trained volunteers and program participants conduct training, workshops, and demonstrations

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2017	28

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
One of the key elements to economic development is human capital. The skills and knowledge of the people play a substantial role in the development of one's economy. "Building community capacity, or the ability of the people of a place to work together toward common goals, is one critical stepping stone in community"(Elmendorf, 2008, p154). Investing in developing the local capacity will enhance our ability to effectively utilize the skills, talents and resources to support sustainable program development.

What has been done

The program provided multiple training opportunities for 4-H volunteers and community partners. The training sessions ranged from CPR/First Aid Certification to Leadership and teambuilding. It also included community gardening using the Learn, Grow Eat & Go (LGEG) curriculum and raised bed gardening. Other community workshops were also provided. These workshops focused on Youth Money Management and Family Financial Management.

Results

Trained volunteers and program participants were able to utilize newly gained skills to plan, implement and evaluate various activities during the 2017 4-H Camp Magalahi. Volunteers learned life-saving skills necessary to respond to emergency situations while working with young children during summer camps and after-school programs. 100% of those trained expressed confidence in their ability to respond to an emergency situation. Volunteers were also trained in facilitating nutrition education coupled with cooking demonstrations using the Expanded Food & Nutrition Education Program (EFNEP) curriculum. 100% of the participants articulated they had the necessary skills to train others as well as the ability to modify lessons as necessary. Furthermore, 4-H volunteers were able to apply their leadership skills to facilitate peer orientations, training, and daily activities with 4-H kids. By investing in developing the capacity of our local volunteers and program participants, we have been able to rely on them to implement various programs which allows program staff to focus on other projects.

4. Associated Knowledge Areas

KA Code	Knowledge Area
802	Human Development and Family Well-Being
806	Youth Development

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Other (competing institutional priorities)

Brief Explanation

The program was unable to launch a social marketing campaign due to reorganization and limited staffing. We are currently working on recruiting a communications person who will assist with this effort. That said, we have had to reevaluate our implementation timeline.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Post surveys were conducted after each training session. 100% of the participants indicated the training enhanced their decision making ability and are confident in applying newly gained skills. One participant stated that the training was a great learning experience and it is something he will carry with him for the rest of his life.

During the 2017 4-H Camp Magalahi, pre and post surveys were conducted prior to each educational session. One session was held at the NMC-CREES As Perdido Research Farm. Prior to the fieldtrip, 21% of the campers were aware of the proper steps of farming. After the fieldtrip, 52% of campers were aware of the proper steps of farming. In addition, there

was a 33% increase in participants' knowledge about plant propagation. (Survey results are readily available upon request.)

Key Items of Evaluation

After each training session conducted, 100% of the participants indicated the training enhanced their decision making ability and are confident in applying newly gained skills as well as a 33% increase in participants' knowledge during the 2017 4-H Camp Maga'lahi about plant propagation.

VI. National Outcomes and Indicators

1. NIFA Selected Outcomes and Indicators

Childhood Obesity (Outcome 1, Indicator 1.c)	
450	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 whit 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.