

Commonwealth of The Northern Mariana Islands (Northern Marianas College) Annual Report - FY2021

Report Status: Approved as of 02/16/2023

Contributing Organizations

Northern Marianas College

Executive Summary

Overview

Due to the current economic downturn and the subsequent challenges due to two destructive supertyphoons in August 2015 and October 2018 coupled with the COVID19 pandemic, there is increased urgency to provide innovative programs and services that prevent and mitigate problems that have or can result from climate change, food and biosecurity security issues, labor shortages, workforce development, and health issues. This plan describes the critical issues that Northern Marianas College (NMC) Cooperative Research, Extension, and Education Services (CREES) must be positioned to respond to in order to ensure the regeneration of the CNMI's agriculture, aquaculture, human capital, health, and economy. Faculty and staff from CREES' five program areas, Agriculture Production, Aquaculture and Natural Resources (A&NR), Family, Community, and Youth Development (FCYD), Nutrition and Health, and the recently added Food Sceince program, have formulated the critical issues effecting our community based on the community needs assessment, lessons learned from the COVID19 pandemic, stakeholder engagement, key informant interviews, and locally and regionally conducted research. Although our department has experienced major setbacks in the last several years, including reduced research and extension personnel, unanticipated leadership changes, the complete destruction of our main campus department building on Saipan in 2015 and 2018, and experiment station damage on Saipan, Tinian, and Rota, we remain inspired by the resiliency of our community and committed to positively impacting Agriculture, Community Development, Aquaculture, Food Ccience, and Human Nutrition & Health for the people of the Northern Mariana Islands.

Critical Issue: Biosecurity and Invasive Species

Northern Marianas College is in the process of hiring an entomologist. Due to challenges with COVID19 in 2021, the resident entomologist had to return to the continental United States.

Critical Issue: Climate Change Effects & Mitigation

In partnership with the CNMI Homeland Emergency Management Services (HSEM) and the CNMI Department of Fire and Emergency Medical Services (DFEMS), the MyPI (My Preparedness Initiative) NMI trains youth on disaster preparedness and community education. Since the program's inception in 2020, 48 youth have been CERT & CPR certified. Of the 48 youth trained, 38 (80%) expressed confidence in their families' preparedness level in responding to a natural disaster. Thirty-six (75%) trained youth provided additional support to camp counselors during the 4-H Camp Maga'lahi in 2021. Nineteen (40%) trained youth assisted MyPI instructors in conducting disaster preparedness presentations.

Critical Issue: Food Security

The use of the digital platforms like video conferencing, social media, and sms technologies were crucial for program delivery and engagement with stakeholders during and at the height of pandemic FY 2021. Using these platforms, programs like the Aquaculture and Natural Resources (A&NR) was able to provide ondemand, virtual, technicl support to clients and provide online, extension education through a series of webinars on various topics like aquaculture, farm biosecurity, non-circulating hydroponics, micro and macroalgae productions, marine finfish and shell fish productions to name a few. Feedback from participants of the webinars were positive as clients expressed their appreciation for the outreach and the opportuntiy to touch base with others, abeit, virtually. Results also showed knowledge gained and adoptions in using such platforms.

Northern Marianas College worked with the Tinian Cattlemen's Assocaition and the Mayor of Tinian and Aguigan's Office to obtain provisional USDA Slaughterhouse certification. This will provide other options for ranchers to sell their beef commercially to restaurants, catering companies, and supermarkets.

Critical Issue: High Cost of Production

Unable to provide face to face technical support to clients in FY 2021, as a result of the Covid-19 pandemic, the Aquaculture and Natural Resources (A&NR) program quickly pivoted to available online technology to continue engaging stakeholders in the safety of their own home and safety to others. The hallmark of this effort was the use of video conferencing technology like

"Zoom" to conduct webinars for new and ongoing clients. The program conducted webinars on food production methods like non-circulating, hydroponics, known for reducing the cost of energy by not using motorized pumps to grow high value, short term crops like lettuce or longer-term crops like cucumbers and tomatoes. Social media platforms were also utilized to inform attendees of webinars that resulted in hundreds of participants locally, regionally, and, in some cases overseas, logging on to the webinars. Results of the evaluations conducted before and after the webinars showed an increase in knowledge by those that attended, and, in fact, some participants adopted what they've learned and started their own non-circulating hydroponics food system.

Critical Issue: Overweight and Obesity

As part of its long-term efforts to establish a child health and nutrition monitoring & surveillance system in the Northern Mariana Islands, program personnel contributed to the development of the anthropometric standardization and certification tracker. The tracker serves as a hub to document and track the number of infants, children, and adults that a person has measured and documents the points in time that the measurer was standardized against the lead measurer from the University of Hawaii Manoa.

The Nutrition and Health Program secured a subcontract with the University of Hawaii Manoa to conduct research on local Food Systems. Specifically, the project focuses on studying how and what parts of the Food System in the NMI influence children's nutrition and dietary intake.

Through the Children's Healthy Living Program Center of Excellence, program personnel co-authored two manuscripts focused on child diets and interventions to improve child health.

Critical Issue: PSEs Built & Food Environments

As a result of several commercial agriculture plots on Saipan having an inconsistent supply of government-piped water for crops, NMC CREES worked with the Dept. of Lands & Natural Resources Division of Agriculture and the Commonwealth Utilities Corporation to address the water distribution system.

Personnel focused on enhancing the college's procurement system in order to ensure more timely processing of purchase orders, request for proposals, and invitations to bid. Recommendations were generated after broad stakeholder input. Optimizing the procurement system

The Northern Marianas College Cooperative Research, Extension, & Education Services (NMC CREES) worked on ensuring compliance with the requirements for the Economic Development Administration grant which included environmental impact studies and land parceling. The EDA grant provides over \$12 million dollars for a resilient, state of the art research and extension building. Building construction must be completed by 2026.

Critical Issue: Workforce Development & Human Capital

The 4-H counselor summer program builds the capacity of the youth ages 15-19 by providing numerous workshops, "Train-the-Trainer" series, and hands-on training sessions to enhance their capacity and leadership skills to assist with program planning and implementation. Equipped with the necessary skills, these young leaders successfully engage campers between the ages of 7-14 by facilitating a plethora of activities that enhance learning and personal growth. IMPACTS: *5 youth serving organizations invited 4-H Marianas youth leaders to conduct workshops on public speaking, time management, goal setting, resume development & interview etiquette, and team building. *5 agencies expressed their commitment to integrate 4-H into their program delivery by having 4-H youth leaders assist with program planning and implementation.

Critical Issue: Youth Development & Advancement

The CNMI 4-H program reaches approximately 1,200 members a year, with the exception of 2020 during the global pandemic. The program was able to migrate to an online platform in March 2020 serving over 600 youth and was able to successfully implement a virtual camp engaging 100 youth across the CNMI. In 2021 the program slowly transitioned back to conducting in-person events thereby increasing trained youth volunteers, community and school clubs and creation of 3 new Special Interest clubs (SPIN clubs). 297 youths volunteered with the 4-H programs accumulating a total of 14,190 hours and a volunteer time contribution of \$102,877.50. Total return of initial investments is \$29,019.00. Growth in programming volunteer hours increased by 4,831.5 from FY20-21 to FY21-22.

Merit and Scientific Peer Review Processes

Updates

None.

Stakeholder Input

Actions to seek stakeholder input that encouraged their participation with a brief explanation None.

Methods to identify individuals and groups and brief explanation
None.

Methods for collecting stakeholder input and brief explanation
None.

A statement of how the input will be considered and brief explanation of what you learned from your stakeholders None.

Highlighted Results by Project or Program

Critical Issue

Food Security

Agriculture Production Program

Project Director
Virendra Verma
Organization
Northern Marianas College
Accession Number
7002173

★ **Technical assistance for farmers on research-based, locally appropriate farming techniques, climate-friendly strategies and sustainable agricultural practices**

In 2-3 sentences, briefly describe the issue or problem that your project addresses.

The agricultural activities in the Commonwealth of the Northern Mariana Islands (CNMI) are mostly subsistence in nature. The continuing challenge is to ensure food security, build a viable economy and improve quality of life while maintaining strong cultural identity and a healthy environment. The limitations in production of staple food crops in the three main islands of CNMI include inadequate availability of disease-free seedlings, nutrient deficient and poor soils, and increased incidence of pests and diseases. The increase in the consumption of imported food has further led to an overall decline in local food production. The economic development plans of CNMI call for market-oriented sustainable agriculture production systems with emphasis on food security, self-sufficiency, import substitution, accessibility, and export markets.

Hence, there is an urgent need to increase local food production and provide technologies for food processing to ensure an adequate supply for the local population and meet the economic demands. The project aims to provide appropriate extension interventions focused on innovative climate-friendly strategies and sustainable agricultural practices. These will help the island communities to learn the needed skills to develop and sustain small farm enterprises to increase local food production, and thus enhance food security and create opportunities for income generation. The technical guidance will be provided to convert agricultural surpluses into value-added products for local use and for the export market.

Briefly describe in non-technical terms how your major activities helped you achieve, or make significant progress toward, the goals and objectives described in your non-technical summary.

The program has conducted randomized block design experiments on eight (8) varieties of cantaloupes (Superstar, Ambrosia, Athena, Maverick, Aphrodite, Cruiser, Shockwave, Sugar cube) and three (3) varieties of honeydews (Passport, Masada, Dream) in five (5) replications. The program has identified six (6) varieties of cantaloupes (Shockwave, Ambrosia, Aphrodite, Maverick, Athena and Superstar) and one (1) variety of honeydew (Passport) as most suitable and appropriate varieties to grow on CNMI islands. These varieties possess desired sweetness, color, flavor, and shelf life. The average weight of the fruit in recommended varieties ranges from 5 to 10 pounds, which can be harvested between 48 to 85 days. These recommended varieties proved more resilient among the tested ones to common diseases (leaf blight, anthracnose, gummy stem blight, powdery mildew, southern blight, bacterial wilt, cucumber mosaic and downy mildew), pest (aphids, cucumber beetles, melon worm and squash bug) and root knot nematodes.

All of the recommended varieties performed very well while using sustainable agricultural practices as compared to conventional practices. The program utilized applied sustainable agricultural practices to manage irrigation, nutrients, weeds, and pests and to examine optimal conditions to achieve maximum crop yields and performance. It was noticed that cantaloupes and honeydew grow best in organically rich and well-drained soil with a pH of 6.0-6.5. Therefore, the project recommended testing the soil for pH and fertilizer requirements. The use of reflective plastic mulch to control insects and weeds, and maintain humidity and soil temperature also proved beneficial, therefore, their use is encouraged among various stakeholders.

Outreach and education activities, virtual and face-to-face workshops, one-on-one training, and stakeholder's meetings are being organized at multiple sites to increase awareness and develop skills in the climate-friendly strategies and sustainable agricultural practices among farmers, ranchers, and backyard gardeners.

The outputs include providing technical assistance, and on-site and off-site recommendations to thirty (30) farmers and ranchers on research-based and locally appropriate farming techniques, innovative climate-friendly strategies and sustainable agricultural practices on various topics that include: soil preparation, sexual and asexual plant propagation, major nutritional deficiencies, organic and inorganic fertilizer application, cover crops, mulching, no-till, irrigation, compost preparation and application, organic and botanical insecticides, identification and management of abiotic and biotic stresses, post-harvest handling practices, crop rotation, data collection and data records etc. for sustainable production of vegetables and fruits.

Various seedling preparation, planting and distribution activities are being continued. The harvested fresh produce such as cantaloupes and honeydews produced during research experiments and extension demonstrations were donated to various local schools, dining halls, the Center for Living Independently, and to the vulnerable populations in the local communities for consumption to help meet the unprecedented challenges that COVID-19 pandemic has brought both for our people and broader society.

Briefly describe how your target audience benefited from your project's activities.

The outreach, extension and education activities increased knowledge, created awareness, and developed skills of 100% participants in research-based and locally appropriate farming techniques, innovative climate-friendly strategies, and sustainable agricultural practices. Ultimately, various activities developed positive attitudes, zeal for learning and adoption of innovative techniques and farming aspects and changed the behavior of the participants. Also, planning is underway to organize additional extension and outreach activities to further promote adoption and sustainable cultivation of recommended varieties by our stakeholders and wider audience.

Briefly describe how the broader public benefited from your project's activities.

We have a responsibility to ourselves and our descendants to find methods of producing food that minimizes the damage to the farm ecosystem on our pristine islands otherwise we would not be able to keep farming indefinitely. Therefore, we have used sustainable agricultural practices for irrigation, nutrient, weed and pest management such as cover crops, crop rotation, natural and organic pesticides, green manure, composting and crop diversity etc. to achieve maximum crop yields and performance. The main targeted audience to use these results and information are extension professionals, smallholder or commercial farmers, homemakers, and backyard gardeners. Furthermore, this information can be utilized by anyone who is interested in growing crops for nutrition or subsistence. We have organized field days for our stakeholders to showcase and communicate results of our experiments. Also, planning is underway to organize additional extension and outreach activities to further promote adoption and sustainable cultivation of recommended varieties by our stakeholders and wider audience. The

harvested fresh produce such as cantaloupes and honeydews produced during research experiments and extension demonstrations were donated to various local schools, dining halls, the Center for Living Independently, and to the vulnerable populations in the local communities for consumption to help meet the unprecedented challenges that COVID-19 pandemic has brought both for our people and broader society.

Critical Issue

High Cost of Production

Sustainable Hydroponic Production for Limited Resource Producers

Project Director

Michael Ogo

Organization

Northern Marianas College

Accession Number

7002795



Sustainable Hydroponic Production for Limited Resource Producers

In 2-3 sentences, briefly describe the issue or problem that your project addresses.

The cost of production using the conventional recirculating hydroponic system is prohibitive considering the high energy cost in the CNMI and the need to operate electrical equipment 24/7. Like many other island jurisdictions, the CNMI imports over 90% of the food it consumes. Externalities like natural disasters and global events like the COVID-19 pandemic exposed the territory's vulnerability to disruptions in the supply chain and its food security. The high rates in NCD can be addressed with consumption of healthy and fresh food grown locally.

Briefly describe in non-technical terms how your major activities helped you achieve, or make significant progress toward, the goals and objectives described in your non-technical summary.

With higher vaccination rates in FY 2021, the Aquaculture & Natural Resources (A&NR) program began the process of adopting a hybrid, extension delivery mode of one-on-one visits with clients while still making use of the virtual platform when necessary. As a result of this adaptation, the program was able to teach farmers non-circulating hydroponics production using this hybrid method. As a result, A&NR successfully helped a business learn non-circulating hydroponic for lettuce and tomato production for use in their restaurant. Another business adopted the same production method for growing cucumber. While a third, elderly farmer used this method to start and successfully produce cucumber on his roof top that he later sold at the local farmers market to supplement his limited income. These producers were able to utilize a growing method that requires no electricity to grow while making productive use of limited space and marketing commodities close to the intended consumers.

Briefly describe how your target audience benefited from your project's activities.

A&NR's limited resources clients were able to grow food for personal consumption and to supplement their meager income while entrepreneurial clients of the program with limited space utilized this production method to reduce imports while offering fresh produce to their customers.

Briefly describe how the broader public benefited from your project's activities.

As a result of the many outreach that the A&NR program conducted, may it be one on one extension visits, webinars, workshops and the likes, there is an increased awareness in general, that an alternative production method exist using noncirculating hydroponics. With the population expected to increase coupled with limited space, future housing developments in the CNMI will require that buildings go vertical with more people living in condominiums and apartments. The increased awareness will allow this segment of the population to grow fresh food in a limited space while not investing too much of their limited resources.

Critical Issue

Building local capacity - 2021 Camp Maga'lahi (Counselors)

Project Director

Tayna Belyeu-Camacho

Organization

Northern Marianas College

Accession Number

7002174



4-H Camp Maga'lahi

In 2-3 sentences, briefly describe the issue or problem that your project addresses.

Building local capacity is extremely critical as the CNMI has been mandated by the U.S. Government to replace all of its nonU.S. foreign workers with U.S. workers by 2029. Investing in developing the capacity of our youth allows us the opportunity to open doors and create career pathways eventually leading into the local workforce. "...investing in youth is not only smart, doing so recognizes that youth success is critical to a nation's society, economy and democracy. Failure to invest in youth triggers substantial social problems, leading to negative youth outcomes. Some of these negative outcomes are surely to increase because of COVID-19, such as lack of workforce opportunity and entry, school disengagement, poor mental health, violence, and substance abuse." (Arnold, 2020 p.25). Hence, providing quality positive youth development programs involving the active participation of the youth will increase the likelihood of young people being "firmly set on positive pathways as workers, parents, and community members" (McLaughlin, 2000).

Briefly describe in non-technical terms how your major activities helped you achieve, or make significant progress toward, the goals and objectives described in your non-technical summary.

The 4-H Camp Maga'lahi program aims to build the capacity of the youth ages 15-19 by providing numerous workshops, "Train-the-Trainer" series, and hands-on training sessions to enhance their capacity and leadership skills to assist with program planning and implementation. In doing so, the youth will be equipped with the necessary skills to successfully engage and lead their peers in meaningful ways. These skills will enhance their ability to secure employment as employers are seeking well-rounded employees with so skills.

Briefly describe how your target audience benefited from your project's activities.

As a result of the various training sessions, participants had the necessary skills to successfully facilitate and implement 4-H Camp Maga'lahi across the NMI. This was the first time the 4-H Camp Maga'lahi has been implemented in the islands of Rota and Tinian. Through the leadership of the eight (8) lead camp counselors across the islands, they were able to train and mentor their peers in addition to planning and facilitating the 2021 4-H Camp Maga'lahi. This included counselor recruitment presentations for camper and camp counselors, promotion of the summer camp, parent engagement and business sponsorships. Sharing a quote from one of the 4-H Camp Counselors: "I noticed my self-motivation improve and built up my critical thinking skills. I also learned just how much work it takes to be a leader." Seventy-four (74) youth ages 15-19 were able to enhance various skill sets. 61% reported having the confidence to speak in front of other groups. 71% reported being able to work with others to solve problems. 81% reported being able to make decisions. 100% reported being able to take responsibility for their actions. Additionally, 100% reported wanting to help others, 99% of participants felt that they were part of the community and 98% felt they could make a difference in the community.

Overall, we have seen a \$13,780.88 return on our investment throughout this program (see chart below).

Volunteer hours converted to monetary amount	\$67,849.13
Total investment in youth volunteers	\$54,068.25
Initial Return on Investment	\$13,780.88

We have not only been able to quantify the return of our initial investments and value of our 4-Hers' through their time and effort, but more importantly, we are seeing the positive outcomes as a direct result of their involvement with

4-H - increased confidence, heightened awareness of self worth, passion to help other youth to reach their full potential, and sense of connectedness to the CNMI community.

Briefly describe how the broader public benefited from your project's activities.

In a small community like ours, having accessibility to additional resources like content experts is quite challenging due to our remote location. Building the capacity of our community is vital. The youth is an underutilized population; however, with proper guidance and training they elevate the resources available within the community. As these trained youth continue to practice their skills through various outlets within 4-H Marianas and other school related and community based organizations, they will be great assets to the general public in providing additional support to implement essential services.

Describe and explain any major changes or problems encountered in approach. Additionally, note opportunities for training and professional development provided, how results have been disseminated to communities of interest, and any new details regarding what the project or program plans to do during the next reporting period to accomplish the goals.

The next steps would be to provide year-round inter-island training opportunities leveraging trained youth leaders to spearhead various activities across the islands. The program will continue to disseminate results through key stakeholders such as the Local Advisory Council, 4-H Marianas Youth State Council and Board of Directors, youth leaders, and governmental and non-governmental organizations.

Critical Issue

Youth Development & Advancement

4-H Camp Maga'lahi (Campers)

Project Director

Tayna Belyeu-Camacho

Organization

Northern Marianas College

Accession Number

7002191



4-H Camp Maga'lahi (Campers)

In 2-3 sentences, briefly describe the issue or problem that your project addresses.

4-H Camp Maga'lahi aims to provide opportunities for youth ages 7-14 to learn about cultural values, environmental awareness, and local history while building their social emotional skills. Research has shown the value of the camp experiences as an avenue for positive youth development (Garst, et al, 2011). Studies have revealed attending summer camps increases a camper's level of social capital, supportive relationships, social skills, and emotional intelligence (Carruthers, 2013). As campers bond with others they increase their social capital as well as their independence as they build relationships with other participants. Participating in social activities will aid in enhancing their emotional intelligence abilities. Additionally, the interaction with camp counselors allowed the younger youth opportunities to develop a mentor-mentee relationship thereby increasing their confidence and self-worth. As a result, the youth participants were able to make positive behavior changes and improve their skills.

Briefly describe in non-technical terms how your major activities helped you achieve, or make significant progress toward, the goals and objectives described in your non-technical summary.

The 4-H Camp Maga'lahi provides youth ages 7-14 with a plethora of quality programs to explore and excel in areas of interest. In doing so, this program will spark their curiosity through learning by doing that will enable them to value the importance of civic engagement, citizenship, and responsibility. These opportunities will enhance their ability to work well with others in achieving a common goal, increase their confidence and self-esteem, and overall self-worth.

Briefly describe how your target audience benefited from your project's activities.

Through the leadership of the 4-H Camp Maga'lahi camp counselors, we were able to see growth within the camp participants. The data from their efforts revealed that one hundred and thirty-four (134) youth ages 7-14 across the CNMI were able to develop their skills through the summer program. 92% of youth reported they work well with other youth, 97% of youth reported wanting to help others, 71% of youth reported they built their confidence during camp, and 98% of youth reported that they take responsibility for their actions.

Furthermore, parents expressed their appreciation for 4-H Camp Maga'lahi as they noticed their child's growth as a result of their experiences from camp. One parent mentioned that the variety of activities exposed their children to new experiences, learned new things and were able to connect with people from different cultures. Another parent stated "My children were able to socialize and develop social skills--some of which were lost during the pandemic." Additionally, another parent expressed that "this was the most organized and differentiated camp I have ever seen. It had activities for kids of all ages and abilities. My daughter loved the camp and she's not normally fond of attending these types of activities."

Briefly describe how the broader public benefited from your project's activities.

The pandemic has forced youth to be home quarantined which limited the amount of face to face engagement in school and public settings. This limited the growth of social skills that are normally practiced within those social environments. As the youth transition from home quarantining to face to face, 4-H Camp Maga'lahi offered youth an opportunity to reestablish their social skills, self esteem, and confidence while expanding their experiences. Youth who attended the summer program would be more engaged and socially aware as they re-enter face to face settings. The communication tools the youth learned through this summer program will benefit the community by applying their newly acquired skills in different settings (i.e. organized sports, community events, school events, etc.).

Describe and explain any major changes or problems encountered in approach. Additionally, note opportunities for training and professional development provided, how results have been disseminated to communities of interest, and any new details regarding what the project or program plans to do during the next reporting period to accomplish the goals.

The next steps would be to provide year-round programming that offer younger youth across the islands the opportunity to continue to practice their leadership, citizenship, and social skills. The program will continue to disseminate results through key stakeholders such as the Local Advisory Council, 4-H Marianas Youth State Council and Board of Directors, youth leaders, and governmental and non-governmental organizations.

Type

Projects / Programs

Projects / Programs without a Critical Issue

0

Not Provided