



## **AREERA POW REPORT**

**Agriculture Research, Extension and Education Reform Act of 1998**

### **Annual Report of Accomplishments and Results FY 2005-2006**

**Commonwealth of the Northern Mariana Islands (CNMI) USA**

## Table of Contents

	Page #
<b>1. Introduction</b>	<b>3</b>
<b>2. Programs</b>	<b>3</b>
<b>a. Agriculture, Research and Extension Programs</b>	<b>3</b>
<b>b. Family and Consumer Sciences Programs</b>	<b>4</b>
<b>3. Research and Extension Integration</b>	<b>4</b>
<b>4. FY 2006 Annual Report of Accomplishments and Results</b>	<b>4-29</b>
<b>4.1. Goal 1: An agricultural system that is highly competitive in the global economy</b>	<b>5</b>
<b>4.2. Goal 2: A safe and secure food and fiber system</b>	<b>14</b>
<b>4.3. Goal 3. A healthy, well-nourished population</b>	<b>17</b>
<b>4.4. Goal 4: Greater harmony between agriculture and the environment</b>	<b>21</b>
<b>4.5. Goal 5: Enhanced economic opportunity and quality of life for Americans</b>	<b>27</b>
<b>6. Stakeholder Input Process</b>	<b>32</b>
<b>7. Program Review Process</b>	<b>33</b>

---

Report: FY 2005-2006 Agriculture Research, Extension and Education Reform Act of 1998  
AREERA Report for the Commonwealth of the Northern Mariana Islands. Submitted by the Northern Marianas  
College Cooperative Research, Extension, And Education Service (NMC-CREES).

This report represents the combined Extension and Research programs of the Northern Marianas College as  
presented in the AREERA Plan of Work submitted in 1999 and subsequently revised in 2000.

## **1. INTRODUCTION**

The Northern Marianas College-Cooperative Research, Extension and Education Service, (NMC-CREES) provides outreach education and conducts research through its two programs of Agriculture Research & Extension (ARE) and Family & Consumer Sciences (FCS). With continuous interaction, collaboration and a unified direction, both programs are dedicated to helping improve the economic well-being, living conditions and overall quality of life within the Commonwealth of the Northern Mariana Islands (CNMI). Our key stakeholders include: farmers, families, youth, individuals, government agencies, and various ethnic communities.

The CNMI consists of a chain of 14 islands, north of Guam in the Western Pacific. However, only the islands of Saipan, Tinian and Rota, the main islands in the CNMI, are substantially populated. The total land area of the three islands is approximately 118 square miles. The CNMI population is about 66,000 with an indigenous population of 18,000, consisting of Chamorros and Carolinians. Although the major language for communication is English, more than 86% of the population speaks a language other than English. The diversity of cultures and languages creates numerous challenges for NMC-CREES. However, our programs are dedicated to serving the needs of our stakeholders.

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

Extension services and research projects are the result of the growing needs and challenges that the CNMI community must satisfy and faces. These programs are also in line with the mission of the Cooperative Research, Extension and Education Service and the Northern Marianas College.

## **2. PROGRAMS**

NMC-CREES programs in Agriculture Research & Extension (ARE) and Family & Consumer Sciences (FCS) include the following:

### **2.1. Agriculture, Research and Extension Programs:**

- Crop Production Improvement
- Livestock Improvement
- Plant Protection
- Aquaculture Development
- Water Quality Program

## **2.2. Family and Consumer Sciences Programs:**

- Expanded Food and Nutrition Education Program (EFNEP)
- Food Stamp Nutrition Education Project
- Nutrition, Diet and Health
- Healthy Living in the Pacific Islands
- Community Development and Resource Management
  - Family Financial Management
  - Sewing Program for Families with Limited Resources
  - 4H/Youth Development

## **3. RESEARCH & EXTENSION INTEGRATION**

NMC-CREES' integrates research and extension activities in an effort to deliver better information and resources that address our stakeholders' needs. The integration of these two components has encouraged multi-discipline and multi-level cooperation. The diverse educational backgrounds to working in unison promotes efficiency and better communication among faculty, scientists, and extension agents. ARE and FCS have also combined their efforts in addressing the five listed National Goals to ensure effective and efficient delivery of programs and activities ensuring compliance with the CSREES accepted NMC-CREES 5 year Plan of Work.

## **4. FY 2006 ANNUAL REPORT OF ACCOMPLISHMENTS & RESULTS**

### **4.1. Goal 1: An agricultural system that is highly competitive in the global economy**

#### **OVERVIEW**

Since the inception of NMC-CREES in 1987, it has been our department's priority to expand and enhance agriculture production in the CNMI. The importation of popular agricultural produce in large volumes from various sources outside the CNMI continues to compete, and therefore, impede the growth of the agriculture industry in the CNMI by underselling local produce. Additionally, the relatively low quality and the inconsistent supply of locally grown produce continue to be one of the major factors inhibiting and discouraging the development of agriculture. The heightened terrorist alerts and the war in Iraq together have compounded the unfavorable port conditions with increased security making it difficult to timely import agriculture supplies that local farmers need for cultivation, production and harvest. Immediately after the September 11 incident, the CNMI's economy has since plummeted and has yet to recover.

To confront these issues, NMC-CREES has made significant attempts to strengthen, as well as to create, new partnerships with other agencies to effectively meet the needs and challenges of stakeholders by combining resources. NMC-CREES has also maintained focus on areas that improve the marketability of agricultural products, including the introduction of niche crops.

Furthermore, NMC-CREES continues to apply concerted efforts at improving existing programs through stakeholder input and their participation in appropriate workshops and other information gathering sessions. These efforts particularly in assisting the community to understand the structure and nature of local agriculture activities and their relation to local economy, are presumed to help minimize importation of produce that are grown in large volume locally, increase exportation of these produce, and presumably this will ultimately stimulate the island's economy.

The NMC-CREES Programs that address Goal 1 include Crop Improvement, Aquaculture Development and Livestock Improvement

## **A. ACTIVITIES**

In FY 2006, NMC-CREES focused on improving the CNMI's agriculture industry by conducting research projects, workshops and presentations targeting on the needs of both commercial and subsistence farmers. NMC-CREES continues to conduct one-on-one and small group training sessions with farmers and other stakeholders to actively promote the added value concept through food processing and preservation technology.

The Agriculture Development in the American Pacific (ADAP) program in 2006 funded the purchase of selected seed varieties to introduce throughout the CNMI farming community via community outreach. The seeds purchased from this project are currently being tested on all three major islands in the CNMI.

The NMC CREES Crop Improvement and Plant Protection Program conducted on-farm demonstration trials of sweet corn varieties on the islands of Rota, Saipan and Tinian in collaboration with cooperating farmers. Fourteen growers comprised of commercial and subsistence farmers collaborated in these trials in hopes of improving crop production in the CNMI. Varieties of sweet corn were selected based on their possible resistance.

In FY 2006, the Livestock Improvement Program (LIP) leader conducted several hands-on, on-farm seminars and workshops that focused on establishing small-scale livestock enterprises i.e. (poultry layer/egg production and goat production), improving animal health conditions, promoting sustainable management practices in agriculture i.e. (dry litter system), re-sourcing affordable and alternative livestock feeds i.e. (imported and local feedstuff), and acquiring external funding for the improvement of quality and marketability of meat through the enhancement of breeding lines and utilization of local feedstuff. Also, collaborative works with Department of Land and Natural Resources (DLNR) is currently underway for sourcing affordable, yet quality imported livestock feeds. This short- term project will give farmers a driving force to engage in a viable livestock operation and creating an additional source of income. Different livestock feeds were submitted to USDA-APHIS and FDA for analysis and approval. NMC-CREES uses the rationale that by importing raw materials for feed and mixing it here locally, cost of production will be lowered extensively. Local feeds stuff was also promoted for effective and alternative nutrient utilization in animals as well as identification of poisonous plants affecting livestock through SARE funded workshops, on-farm seminars, and consistent client visitations.

The LIP also submitted jointly with the University of Guam and College of Micronesia a regional animal health survey proposal to Agricultural Development in the American Pacific (ADAP). A Hatch proposal to USDA-CSREES was also submitted this fiscal year focusing on animal diseases and its possible prevention and treatment in the CNMI. This proposal intends on providing our institution with a basal reference in hopes of venturing into bigger projects that would stimulate the livestock industry. A WSARE producer plus professional proposal on Livestock Genetic Improvement was recently submitted. This proposal's rationale is to further improve the genetic make-up of the current livestock in the CNMI. The introduction of genetically superior livestock strains through artificial insemination will allow for further paravet and farmer training thus improving stakeholder profitability.

## **B. HIGHLIGHTS**

The inter-island team collaboration contributed to the success of these programs through continuous workshops, extension visits, and one-on-one sessions with farmers. The project has created a prototype implement for tillage with the mould board or a single sided furrower plow. This implement initially designed to create ridges made with a scrap metal blade, galvanized iron pipes and deformed steel bars equipped with a front wheel mirror imaging a wheel barrow. This implement can ridge a ½ hectare in an 8-hour working day simply by pushing the light and easy contraption. Further uses of this equipment include weeding and furrowing for planting of sweet corn and other crops such as beans, tomato, and eggplant. This tested innovation eases the amount of labor by controlling weeds and loosening soil on CNMI farmlands.

The LIP program received a grant award of \$10,000 from Western Sustainable Agriculture and Research Education (WSARE) for sustainable forage and livestock system design. The project intends to explore the efficacy of grazing goats and poultry on introduced and existing grass and legumes in the CNMI. The project will promote and facilitate the efficient adoption of forage-livestock systems and introduce the concepts of sustainable agriculture among Pacific farmers. By performing such practices, increased profits is foreseen through the increase in yield of animal products per acre, thereby reducing the cost of operating machinery and the need for fuel. Further benefits include the reduction of supplemental feeding and pasture waste; improved monthly distribution and pasture yield; improved animal waste distribution and use; improved pasture botanical composition; minimized daily fluctuations in intake and quality of feed, and the strategic allocation of pastures to animals more efficiently based on nutritional requirements.

Animal Health Extension personnel serviced almost 200 ranchers for 2006; the most common reasons for visits were for internal and external parasite control. Client visitation and consultation are being done on a regular basis covering such topics as animal production, husbandry, pasture management, disease prevention and treatment, livestock waste management, and other related fields. With the help of the 11 CNMI Paravets, services have improved on all three islands.

Three new local farmers are now engaged in poultry layer operation in Rota. The addition of these farms makes the CNMI less dependent on imported eggs. Their operations were initiated with 600 White Leghorn and Rhode Island Red day old chicks from Hawaii. Mortality of these chicks were found to be below the standard and expected value. Increased interest has arisen as a direct result of this project. There are still more farmers venturing into this quickly growing industry.

**C. IMPACT**

The islands' growers learned various management practices and techniques at increasing their production over the past year. Extension agents increased their efforts in convincing farmers of the benefits of modern agricultural practices in order to reduce labor costs, fuel requirements for tillers and preparation time by using a prototype plow for planting sweet corn and other farm grown commodities. This has resulted in an increase of the number of farmers interested in participating in this program and the increased corn output on CNMI farms. Estimated corn yield has increased by 40%, over the past year. This increase apparently resulted from the increased land usage made possibly from the use of the NMC-CREES prototype plow.

With improvements in the Animal Health services, it is estimated that animal production and efficiency has improved. The approximate increase in average income for a participating farmer is valued at \$10,000 per year as a result. In addition, more time and money have been saved through the adaptation of rotational grazing.

The promotion of the egg layer production and chicken grazing system has resulted in increased farmer participation with NMC-CREES. Farmers were made aware of both the advantages and disadvantages of each system being promoted. The number of farmers engaged in agriculture related businesses is now increasing in the CNMI. This can be quantified by the increase in number of agriculture based business licenses applied for during this fiscal year.

**D. ASSESSMENT**

The CNMI is in a period of recession making it practically or virtually impossible to hire permanent staff to accommodate some of the planned expansion of projects. Despite these hindrances, NMC-CREES continues to address key themes listed in Goal 1, and carrying out plans listed in the NMC-CREES approved 5 year Plan of Work.

Introduction of new affordable and efficient technology will likely support and continue the momentum of aggressiveness displayed by CNMI farmers. Finding ways to lower cost of production is necessary for successful operation in the CNMI. Future training of staff is seen for feed mill production.

**E. FUNDING AND FTE**

FTE's: 9.5	PROGRAM COSTS: \$399,031
------------	--------------------------

---

---

**Key Theme - Plant Production Efficiency**

- a. Papayas are popular crops for farmers and back-yard gardeners in the CNMI. Papayas grow well under the CNMI's climactic conditions and is a highly sellable commodity to hotels and for use in everyday cooking. Papaya growers have encountered difficulties in recent years mainly due to diseases, such as the Papaya Ring Spot Virus. Such a disease has the potential of reducing papaya production, thus creating a threat to our steadily growing industry. Although the availability of quality papaya seeds is extremely limited here, the Land Grant system combats such a threat through its research and extension integration. Researchers in the system have done much work as far as genetic enhancements which has resulted in papaya varieties that are resistant to diseases. With the use of high quality papaya seeds, growers can expect greater production, profitability and sustainability. However, growers here have traditionally shared seeds with one another with little or no information about the quality of the seeds they are using. This has also been a limiting factor for greater production for many growers.
- b. This year NMC-CREES identified a company out of Hawaii that sells high quality papaya seeds. 10 varieties of papayas were selected and used in variety trials on Saipan, Tinian and Rota with the help of farm collaborators. Agents and collaborators were able to grow and monitor the performance of these papaya breeds to determine suitable varieties for future papaya growing endeavors. As a result of the said trials, NMC-CREES has been able to determine that at least two varieties of papaya have great potential for improving papaya production in the Marianas. Farmer collaborators who were fortunate enough to have tried the Red Lady and Tainung #2 papaya varieties were able to enjoy high productivity and have marketed those commodities to bakeries, hotels and grocery stores. Word has spread to other farmers about the benefits of purchasing these high quality seeds and many growers are now purchasing seeds directly from companies abroad. All in all, production for these growers has improved and losses due to the occurrence of PRSV have decreased.
- c. Source of Federal Funding: Smith Lever
- d. Scope of Impact: State Specific

**Key Theme – Innovative Farming Techniques**

- a. One of the Crop Improvement Program's functions is to develop innovative farming techniques. One of the constraints that local farmers have is the availability of tractor services. Because of such a need, the Crop Improvement team developed a plow that can be easily maneuvered through a field mimicking the design of the modern day wheelbarrow.
- b. The usefulness of such an innovation has farmers seeding fields at great speed, thus allowing them to perform other farm chores. As a result of such an innovation NMC-CREES has increased the potential of production efficiency of CNMI farmers.



- c. Source of Funding: Smith-Lever
- d. Scope of Impact: State Specific

**Key Theme – Aquaculture**

- a. The Aquaculture program’s main focus over the years has been to promote tilapia and shrimp production in the CNMI. The team has traditionally been responsible for conducting workshops, farm visitations and consultations in regards to aquaculture systems. One of the primary activities for the team has been to import and produce high quality tilapia fry (baby tilapia) that can be shared with farmers for grow-out of for their brood stock. With this in mind, the program invested in sending 2 extension personnel and 3 farmers to the Asian Institute of Technology to learn new methods of tilapia breeding. As a result, 3 aquaculture farmers have adopted the bottle hatching technique acquired from the aforementioned training and have reported less mortality than previous breeding attempts.
- b. In recent years, NMC-CREES has collaborated with Saipan Aquaculture Co. Inc. in establishing the CNMI’s first ever shrimp hatchery, which has laid the foundation for others to try their hand at shrimp production. Shrimp production has great potential in regards to marketability and value of the product. The impact of such extension efforts can be seen with the construction of 2 new shrimp farms and the expansion of Saipan Aquaculture’s brood stock grow-out facility in Lower base.
- c. Source of Funding: Smith-Lever
- d. Scope of Impact: State Specific

**Key Theme – Agricultural Profitability**

- a. The collaborative teams of NMC-CREES and Department of Lands and Natural Resources has had a significant impact on the rodent population in the commercial farming and ranching areas of Saipan with the implementation of the Rodent Control Program. Using the established methods devised by CREES researchers, and the creation of a revolving account to continue the program, a steady increase of farming output is foreseen.

In an attempt to open the program to more of Saipan’s 104 registered farmers and ranchers, attempts are being made to offer a simultaneous disbursement of 1000 packages of rodenticide. The precision baiting effort places the optimum amount of bait at the majority of the current breeding sites within a similar time frame at a general location thus having a major impact on the vector population.

This past year, NMC-CREES has conducted 4 workshops to instruct participants in the proper handling of rodenticides and the use of bait stations. The training was conducted in several locations with 73 participants attending at different intervals.

- b. As a result of our investigative efforts and input, farmers are now seeing a marked reduction in the rat population and improvements on crop production, especially in fields where watermelon, corn, and peanuts are grown.
- c. Source of Funding: State
- d. Scope of Impact: State Specific

**Key Theme: Animal Health**

- a. The Animal health program of NMC-CREES is in collaboration with the DLNR, and the 11 Paravets. With the supervision of the CNMI veterinarian, the program leader and the paravets worked on disease prevention and treatment as well as animal safety and welfare. Regular visits to the three islands are currently being done.
- b. External collaboration with University of Guam, ADAP and other federal agencies working on animal health surveillance.
- c. Source of Funding: Smith-Lever
- d. Scope of Impact: state and regional

**Key Theme – Invasive Species**

- a. The CNMI has very limited agricultural resources. Most agricultural production are at the subsistence level and any threat to these resources can seriously affect the livelihood of the CNMI community and economy. Invasive species of both plants and animals pose the most serious threat to our meager agricultural resources and would, therefore, seriously hinder sustainable agriculture development in the CNMI. There are already present in the CNMI numerous invasive species that are seriously impacting agriculture development. Our combined research and extension efforts are aimed at enhancing traditional agricultural practices, developing complementary methods of best management practices, and adopting already proven methods of addressing invasive species. We conduct farm visits throughout the islands of Saipan, Rota and Tinian. We assess pests' problems, conduct one-on-one discussions with farmers, show farmers how to recognize pest induced crop damage and recommend control measures. In addition to farm visits, we encourage the farmers to report problems on their farms and we then follow up by visiting the farms to conduct investigations. We will endeavor to increase our capability to address the problems of invasive species, to improve best management methods and to extend these methods to our fulltime and subsistence farmers and other stakeholders.

- b. Farmers and other stakeholders are getting familiar with crop pests on their farms and are applying appropriate control measures. Farmers are also calling in to NMC-CREES to report pest problems that they are not familiar with. In such cases, Extension Agents and plant protection staff would schedule a visit to assess the problem and make recommendations. The farmers now have fairly good information on invasive species in order to minimize the impacts and damages to their crops, and therefore will increase their production.
- c. Source of Federal Funding: Smith Lever
- d. Scope of Impact: State Specific

**Key Theme: Plant Health**

- a. NMC-CREES continued to make strides at suppressing the outbreak of *Phytophthora meadii*, betel nut bud rot or crown rot disease. During this reporting year, NMC-CREES personnel have injected at least 9237 trees with the recommended special local need fungicide (Fosphite).
- b. The program has serviced 73 farmers at more than 117 locations and has seen a steady decline in reports of the bud rot disease since the inception of the fungicide injection program. Since the implementation of the fungicide injection program, there have not been any extensive outbreaks of the crown rot on Saipan. The areas that are serviced by the injection program have expanded to cover the entire island of Saipan, and the crop protection team continues reapplying in the most heavily infested locations.
- c. Source of Funding: State
- d. Scope of Impact: State Specific

**Key Theme: Plant Production Efficiency**

- a. NMC-CREES has implemented the plant promotion project to actively endorse economically viable plants to the CNMI farming community. The program was able to propagate close to 15,000 seedlings and cuttings of Noni, Da'ok, citrus, betel nuts, avocado, breadfruit, coffee, cacao, calamansi, mango, hot pepper, and many more. Approximately 7,000 seedlings were distributed to various farmers through out CNMI for planting and testing of new and existing varieties. Such recipients include backyard gardeners for subsistence use, as well as full time farmers taking advantage of a particular plant's traits that make it desirable for consumers. This project has become a great promotional tool for carrying out other CREES program activities. Referrals to other programs have been on the rise since the inception of this project.
- b. This program introduced to the farming community the concept of diversity. The farmers are now planting varieties of crops in their fields and are able to harvest different crops for the marketplace. The "Sabalu Market" (meaning "Saturday Market), which was initiated in

the year 1999, and operated by a farmers' organization in the island of Saipan, is now offering the community many varieties of farm produce. The market has become a popular place for the community to obtain fresh farm produce at least once a week, in addition to what they can purchase from commercial supermarkets.

- c. Source of Funding: Smith-Lever
- d. Scope of Impact: State Specific

**Key Theme: Plant Production Efficiency**

- a. In June 2006, a workshop on Nursery Management and Production was conducted with more than 21 NMC staff, government employees, and some farmers participating in the workshop. The participants learned various methods of nursery propagation, maintenance of nursery plants, proper nursery design and culminating with the transplanting of nursery plants in the field.
- b. This program enabled government and private plant nurseries to increase their nursery plant production. Farmers are also utilizing the knowledge gained to start their own seedling productions for planting in their fields. This will eventually reduce the dependence of farmers getting seedlings from government nurseries, while encouraging businesses to get into the propagation business.
- c. Source of Funding: WSARE PDP
- d. Scope of Impact: State Specific

**Key Theme: Plant Production Efficiency**

- a. The research team for crop improvement has continued testing varieties of high-priced vegetables. The team conducted variety trials of five varieties of sweet corn, tomato, onion, bell pepper and melon in the experimental field at the Kagman Agriculture Station. Onions were tested to identify varieties that will produce sellable bulbs at our tropical latitudes with short days. The Red Creole produced bulbs that were desired because of its size, became the most recommended variety. NMC-CREES conducted on-going trials on citrus to determine the suitability and marketability of 4 different sweet citrus cultivars namely Temple Tangor, Chironja Grapefruit hybrid, Temple X Dansey Mandarin, and Mars Early Orange on Saipan. These varieties were selected for their exceptional sweetness, flavor, size, color, and tropical origins. Other varieties have been identified for further research. Most or all of these varieties will be tested out at the new land in As Perdido.
- b. On tomato, the best variety was Daniella, the main gourmet type grown in Queensland, Australia in an environment similar to the CNMI. Cascade was also recommended because it displayed resistance to diseases and produced clusters of juicy, sweet, medium sized fruit.

On melons, the best variety was the very sweet and early cantaloupe EarliDew. Though not as early, Eastern Eclipse gave high yields of excellent cantaloupe. Bell Pepper trials show that this crop does much better on Tinian and Rota with their better water conditions for irrigation and less-heavily cropped soils. The Valencia and Vidi bell peppers grew the best because they developed large fruit and possess thick walls that withstood viruses. The best displaying corn was from the University of Hawaii because of its resistance to diseases found within the Pacific Basin. The Hawaii No. 9 and No. 10 both silver and yellow sweet corn performed outstandingly. The Kalakoa Super Sweet can also be recommended because of its strong stature and resistance to high winds.

c. Source of Funding: WSARE PDP

d. Scope of Impact: State Specific

**Key Theme: Pasture Management:**

a. Maximizing natural resources coupled with proper conservation techniques are what the local ranchers are fundamentally requesting services in. Educational awareness accompanied with the promotion of USDA-NRCS' incentives were promoted to local ranchers. The program is assisting farmers to avail to USDA EQIP grants in order to promote soil conservation.

b. Increasing knowledge for local ranchers on pastured poultry and goat rotation grazing demonstration and the different grass and legumes mixtures ration.

c. Source of Funding: WSARE Research and Education

d. Scope of Impact: Regional

**Key Theme: Agricultural Profitability**

a. A Conservation Innovative Grant (CIG) titled: 'Modeling Resource Conservation Techniques through Innovative Farm Practices' was approved and implemented in 2005-06. The project is intended to enhance agricultural profitability on the islands and to develop the As Per Dido Agriculture Research Station in a manner fitting modern agricultural trends and efficiency in production. The project intent considered the benefits of both traditional and modern agricultural techniques with emphasis in the maximization of soil and water resources.

b. To reduce soil erosion and water overuse vetiver grass (*Vetiveria zizanioides*) was planted along the contours of the experimental field to serve as contour guidelines. Tillage and planting operations on the contours to increase water filtration and reduce concentrated water flow is progressing. Mulching, no-till vegetable production and crop trials of tomato, cucumber, bell pepper, hot pepper and okra are in progress. By using the no-till method, high labor input that comes with traditional farming methods will be saved. By

implementing both farming methods, the general public will be given the opportunity to compare and contrast between strategies.

c. Source of Funding: Natural Resources Conservation Services, USDA

d. Scope of Impact: State Specific

## **4.2 Goal 2: A safe and secure food and fiber system**

### **OVERVIEW**

Northern Marianas College's Cooperative Research, Extension, and Education Service (NMC CREES) was awarded a grant in 2005 from the Western Pacific Fisheries Management Council to conduct a traditional fisheries education program aimed at reviving, preserving, and promoting the traditional Chamorro fisheries practice of "Achuman" in the CNMI. "Achuman" is a traditional Chamorro fishing method in which fishermen "train" fish to leave the relative safety of the bottom of the water column and feed near the water surface where they can be easily caught with a fisherman's net. This method encourages fishermen to selectively catch the Fish and Wildlife approved sizes, while maintaining this Chamorro fishing practice.

This year, the Food Safety and Processing program was affected adversely due to the untimely departure of the Food Scientist from NMC-CREES. It was for this reason that limited activities in Goal 2 were conducted as described below under the Key Theme of Family Resource Management. The difficulty of finding a professional with the desired educational background is the basis for the lack of reporting. NMC-CREES anticipates the hiring of a replacement this fiscal year.

### **A. ACTIVITIES**

The Traditional Fishing project is divided into two phases. Phase I involves building a traditional fishing canoe for use in carrying out the actual off shore fishing practice. Phase II focuses on the extension and demonstration aspects. The extension model has received great reviews from other grant funding agencies because it provides a "hands on" approach to educating the end user. For this reason, this project was given consideration to provide outreach education to the Commonwealth's citizens. The funding source is one that NMC-CREES does not usually seek making it an additional external funding source that compliments our Smith-Lever allocations.

Thus far, the project is at its building stage which involves constructing the fishing canoe. This activity includes identifying, cutting, and shaping the log from a breadfruit tree. In the process of canoe building, participants also carved wooden paddles and wove ropes using fibers from local trees to fortify the canoe. At the same time, participants constructed a net out of nylon fibers, which will be used to catch the fish.

Even with the departure of our resident Food Scientist, certified food safety personnel continued providing services to other stakeholders sharing a common interest in the safety of

the CNMI community. The instructional courses developed targeted service providers such as the Nutrition Assistance Program, Public School System, and Bureau of Environmental Health. Providing such services to collaborating agencies not only strengthen our ties with them, but also included cohesive approach to service delivery.

## **B. HIGHLIGHTS**

After the canoe building phase of the Traditional Fishing project, the work shifted to finishing the fish “training” device or “poi”. This included carving the limestone rock that were identified and collected earlier into its proper spherical shape, cutting the coconut shell in half and fitting one half of the shell on top of the spherical rock and putting these together. The device works as follow; the rock acts as a sinker and the coconut shell, which sits on the top half of the rock acts a storage place for fish bait. As the device is lowered into the water at the desired depth, the fishermen then rocks the line tied to the shell and, as this take place, bits of bait falls out of the poi and the resulting noise from the shell and rock hitting each other attracts the fishes to the bait of ground coconut meat. Over a period of time the depth is adjusted until the fish are near the surface and are caught by scooping with the nylon net. Prior, to actual demonstration of this technique in the open ocean, participants were introduced to the type of fish species that this fishing technique was design for, the water safety measures that they need to cautious of, and respect and appreciation for the environment.

The Food Safety and Quality Program conducted training for the Public School System Food Safety Inspectors (PSS-FSI). PSS-FSI are tasked with inspecting vendors that provide breakfast, lunch, and snacks to the public and private school systems in the CNMI. The week-long training focused on providing safe food, microbial contaminants, contamination, food allergies, and food-borne illness, safe food handling, purchasing and receiving safe food, keeping food safe in storage, protecting food during preparation, protecting food during service, principles of a HACCP system, sanitary facilities and equipment cleaning and sanitizing, integrated pest management, food safety regulations and standards (local and Federal), and employee food safety training.

In school year 2005-2006, NMC-CREES in collaboration with the Bureau of Environmental Health and the Head Start Program, conducted a mini-workshop for Head Start teachers, Head Start parents, and day-care providers on food safety. The workshop was conducted in response to a questionnaire filled out by Head Start parents, in which “Food Safety” was considered an area of concern. Topics covered in the workshop included why young children are at increased risk for food-borne illness and poisoning, time and temperature abuse and proper hand-washing principles. Additionally, extension agents continue to provide outreach educational activities to low income families by teaching them proper sanitation measures, safe handling procedures, and choosing of foods that are inline with the 2005 Dietary Guidelines for Americans.

## **C. IMPACT**

This project's completion date has been extended for a full year and will now end on January 2008. The remaining funds will are currently being allocated to the development of a video series to increase the potential impact of the grant. At this point of the project cycle, we have no quantifiable impact till the actual extension efforts have begun. We anticipate reporting impact on the next reporting cycle.

PSS-FSI pre and post test scores indicate an average 50% improvement in food safety knowledge areas. Participants also reported feeling more confident when doing inspections. Negotiations are in the works for NMC-CREES to provide HAACP training to Public School System food vendors in the area of HACCP plan development.

Approximately 60% of parents and educators who attended workshops and presentations on proper thawing indicated that they no longer thaw frozen meats at room temperature. Another 40% of participants also indicated that they no longer leave cooked food in the "danger zone" for more than 2 hours. Results from pre and post 24-hour food recalls indicate that nearly 55% of Head Start families increased fruit and/or vegetable consumption by at least 1 serving.

**D. ASSESSMENT**

Over fishing continues to be a problem within the CNMI. With the implementation of the Traditional Fishing Project, NMC-CREES feels that we are aggressively addressing this impending concern. In FY2007, it is the department's goal to provide the community with an aggressive outreach campaign the puts focus on alternatives to existing non-discriminatory harvesting practices.

With the hiring of a replacement for the recent departure of our resident food scientist this coming August, we project that an increase in services provided to our constituents will occur. Such efforts at this point in time are difficult, forcing us to limit the exposure of the program.

**E. FUNDING AND FTE**

FTE's: 3.5	PROGRAM COSTS: \$169,860
------------	--------------------------

---

**Key Theme: Food Safety**

- a. PSS-FSI attended a week-long training on "Food Safety" and food preparation facility inspection.
- b. Children were shown how to wash hands properly using soap, water, and clean towels or paper towels. Children were also shown in which situations hand washing is necessary.
- c. Scope of Funding: Smith Lever;



d. Scope of Work: State Specific

**Key Theme: Food borne Illness**

a. PSS-FSI were trained on identifying symptoms of food borne illness and identifying areas within the flow of food where food contamination may be likely to occur.

b. Since young children are at increased risk for food borne illness, extension educators focused on families and educators of young children.

c. Source of Funds: Smith-Lever, USDA National Integrated Food Safety Initiative

d. Scope of the Work: State Specific

**Key Theme: HACCP**

a. The PSS-FSI have been trained on the importance of each food vendor and school having a HACCP plan.

b. As a result, negotiations are being made with NMC-CREES to provide comprehensive HACCP training to Public School System food vendors.

c. Source of Funds: Smith-Lever

d. Scope of Work: State Specific

**Key Theme – Family Resource Management**

a. The project began in January of 2006 with the recruitment of program participants, which includes a cross section of the community of students, fishermen, and community members. To prepare for the actual demonstration of the project, participants were taught how to identify the right limestone rock for use in the fishing device called “poi”, trees to harvest fibers from to be used in the making of this device, and coconut shells to top off the fishing device. Next, participants were taken and shown the fish aggregating sites where the target species for this particular type of fishing method can be found.

b. Two more canoes were carved out in the remainder of 2006 and Phase II is now in progress due to extension of the project. Phase II involves the actual hands-on fishing practice for the program participants.

c. Source of Funding: National Oceanic and Atmospheric Administration

d. Scope of Impact: State Specific

---

---

### **4.3 Goal 3: A healthy, well-nourished population**

#### **OVERVIEW**

Asian and Pacific Islanders are experiencing a drastic rise in the prevalence of obesity and related disease compared to persons of Caucasian background. Additionally, the indigenous Chamorro and Carolinian populations of the CNMI continue to rank third in the world per capita among adult populations with Type 2 Diabetes (*source: World Health Organization*). Equally alarming is the rate of childhood overweight and obesity that, according to the CNMI Department of Public Health, 1 in 3 or thirty percent (30%) of children up to age fifteen are diagnosed as either overweight or obese. A school-wide survey conducted by the Public School System shows that the most commonly eaten snack foods are chips, cookies, and candy.

In 2005, 420 children, ages six months-10 years old were studied for indicators of nutrition and health in the CNMI using a two-stage random cluster survey method. Of the study population, 50% had an income of \$385-\$576 for one bi-weekly pay period. Diet data for children one-year old-9 years old show protein and sodium consumption well above dietary reference intakes. Furthermore, 26% of children under 5 years old who were surveyed had < 11 gm/dl (anemia), whilst 17% of children 5 -11 yrs old had hemoglobin < 11.5 gm/dl (anemia). This is one example of several examples that illustrates that the CNMI is experiencing the double-burden of malnutrition.

According to United States' Census data from 1999, 30.6% of the CNMI population is below the poverty level. Due to the recent decline in the CNMI economy, this number is expected to rise. The Nutrition Assistance Program also reports an increase in the number of new food stamp clients. There is an urgent need for physical activity and nutrition interventions as research shows that socioeconomic status at or below the poverty level means an increased risk for unhealthy lifestyles and chronic diseases.

#### **A. ACTIVITIES**

Extension educators and program assistants went on a campaign to raise awareness about the risks of unhealthy lifestyles (poor diet and absence or lack physical activity), with an emphasis on reaching out to economically challenged families.

The two main areas of focus in awareness raising efforts are decreasing “bad” fat consumption, while encouraging 5-9 servings of fruits and vegetables daily and at least 30 minutes of moderate intensity physical activity for adults and 60 minutes of moderate intensity physical activity for children, in addition to regular daily movement. Extension educators and program assistants continue to use the, “Where’s the Fat and Sugar?” presentation as a means of showing people how much fat and sugar is in some of the more commonly consumed foods: soda pop, boxed fruit drinks, chips, cookies, candies, corned beef, luncheon meat, and others. Participants are shown healthier cooking options and displacement food options through displays, samples, and food demonstrations.

Food stamp recipients and Head Start parents were enrolled in an eight-hour long program designed to increase positive nutrition-related behavior changes. A prime concern of that needing nutrition intervention is the cost of healthy food in the CNMI. In lieu of this, nutrition educators also focused on “Shopping Healthy on a Limited Budget”; there is a focus on encouraging the purchase of local produce, which, in most cases, costs more than imported produce.

Public School System administrators and teachers have attended various nutrition and physical activity-related presentations and mini-workshops put on by extension educators. As a result of this, program personnel are also asked to be guest speakers at Head Start through high school classes. Additionally, teachers and principals request program staff to present on the importance of healthy living at CPIC and Parent-Teacher Association meetings.

During the month of March, NMC-CREES collaborated with the Department of Community and Cultural Affairs- Nutrition Assistance Program and Child Care Licensing Program, the Public School System-Food and Nutrition Service, the Ayuda Network, Department of Public Health-Diabetes Prevention and Control Program, Diabetes Coalition, and the Women’s Affairs Office, on a campaign to encourage healthy living among the family. The month’s theme, “Step Up to Healthy Living: It’s a Family Affair” focused on increasing fruit and vegetable consumption to be in line with the 5-9 servings a day Dietary Guidelines for Americans recommendation and increasing physical activity. Activities for the month included a proclamation signing declaring Nutrition Month and the importance of good nutrition and physical activity by the Governor and Lt. Governor, a presentation on the importance of an environment that supports and encourages healthy lifestyles for the local Legislature, presentations at various public schools, an inter-departmental walking competition, and a Nutrition Fair in a high-risk village.

## **B. HIGHLIGHTS**

Program staff continue to be called on as a resource for nutrition education and training. According to evaluations from collaborators, CREES nutrition presentations are consistently shown to increase nutrition and health-related behavior knowledge. Through the nutrition educator’s practical approaches, CREES has reached out to a few thousand people in the CNMI. The Expanded Food and Nutrition Education Program (EFNEP), either thru either enrolling in EFNEP or attending mini-workshops, assisted more than 300 families. Through collaboration with internal and external stakeholders, a more holistic approach to nutrition education has been applied.

The CNMI Chapter of the Society for Human Resource Management (CNMI-SHRM) has requested that NMC-CREES play a key role in raising awareness about the importance of workplace wellness programs, with a particular emphasis on encouraging healthy eating and increasing physical activity. Nutrition educators presented on the topic “Workplace Wellness” at the annual CNMI-SHRM Conference, attended by managers and personnel of various private sector businesses and public sector agencies/departments. A more detailed workshop for the CNMI-SHRM officers on planning workplace wellness programs is now in the works.

### **C. IMPACT**

Participants enrolled in the Food and Nutrition Education Program have learned to make informed decisions regarding food choices, meal planning, food preparation, and resource management. The EFNEP Evaluation/Reporting System shows that 80% of adult participants improved in one or more nutrition practices, such as making healthy food choices and using less salt. Additionally, 70% of adult participants show positive behavior changes in food resource management practices (i.e. plan meals, compares prices, does not run out of food or uses grocery lists. Youth participants have increased their nutrition knowledge by 70% as a result of Nutrition Education Program lessons.

Program staff who have conducted “Where is the Fat and Sugar?” presentations are often approached by people who have seen the presentation and are told that they have reduced and/or eliminated soda and/or canned meat consumption. Community members also report increased fruit and vegetable consumption. This presentation has greatly impacted our clients and continues to be a sort of “signature” presentation.

Collaboration is a key component of Nutrition Education Programs’ success, internally and externally. Evaluation results from stakeholders show that CREES programs are appropriate for their clientele and program needs. The Department of Public Health now refers patients at-risk for poor nutrition and inadequate physical activity to EFNEP; a room is provided at the hospital for monthly presentations on nutrition and physical activity-related topics. Furthermore, the Division of Youth Services is now referring at-risk families to EFNEP for nutrition education classes.

Around 50% of public service agencies/departments and private sector business representatives who have attended presentations and workshops report that they have now included fruits and/or vegetables and water as options during meetings, trainings, and get-togethers.

Nearly 40% of public school system teachers and principals report making positive changes to their behavior with regards to diet and physical activity. Furthermore, public and private school teachers are making efforts to encourage fruit and vegetable consumption and physical activity in the classroom.

### **D. ASSESMENT**

All Family and Consumer Science and Agriculture activities are in line with the FCS Plan of Work. There were some changes that needed to be made to adapt to the changing needs of the community. With the increasing rates of lifestyle diseases, all programs have refocused their efforts to address this urgent need. Because of staff turnover, various activities had to be placed in a different year.

### **E. FUNDING AND FTE**

FTE's: 4.5	PROGRAM COSTS: \$189,264
------------	--------------------------

---

---

**Key Theme - Human Nutrition**

- a. The “Where’s the Fats and Sugars?” helps audiences, particularly parents and children, visualize how much fat and sugar is in foods they commonly eat. The project goal is to teach people to choose healthier foods and moderation in eating by reading the nutrition facts label. The presentations were held in a variety of settings including public school PTA meetings, classrooms, health fairs, parent workshops, job sites, and other community events.
- b. Based on evaluation reports, around 35% of parents have reduced their soda intake and replaced it with diet soda or water. Additionally, these parents have learned to use the nutrition facts to shop for healthier food. Another 40% report increasing fruit and/or vegetable consumption.
- c. Source of Funding: Smith-Lever
- d. Scope of Impact: State Specific

**Key Theme - Human Nutrition**

- a. The Nutrition Education Programs help families with children and food stamp recipients eat a healthier diet on a limited budget. Skills learned in the program help clients build confidence in themselves and their abilities. Lessons are usually taught in groups and occasionally one-on-one settings.
- b. Evaluation results show that at entry into the program, 23% of clients demonstrated acceptable food resource management practices (i.e. plan meals, compare prices, does not run out of food and uses grocery lists) and 6% demonstrated acceptable nutrition practices (make healthy food choices, reads nutrition labels etc.). However, upon program completion, 60% of participant’s demonstrated acceptable practices of food resource management and 50% demonstrated acceptable nutrition practices.
- c. Source of Funding: Smith-Lever, USDA Food Stamp Program
- d. Scope of Impact: State Specific

**Key Theme - Human Nutrition**

- a. NMC-CREES conducted a presentation at the annual CNMI Society for Human Resource Management Conference.
- b. A follow-up survey shows that 40% of the people in attendance have made personal changes to improve their nutrition and physical activity. Around 80% of conference

attendees would like to learn more about workplace wellness. The CNMI-SHRM has set workplace wellness as a priority endeavor for this year.

- c. Source of Funding: Smith-Lever
- d. Scope of Impact: State Specific

#### **4.4. Goal 4: Greater harmony between agriculture and the environment**

##### **OVERVIEW**

Protecting our natural resources and environment is one of NMC-CREES paramount missions. In our efforts to ensure that our agriculture resources and environment are in harmony, we endeavor to promote programs in pesticide use and safety, biological control, integrated pest management, and the use of environmentally safe and friendly pesticides on crops, such as “Neem”.

Much effort is expended in educating farmers, pest control operators and other stakeholders through the presentation of pesticide safety workshops. In collaboration with the CNMI Division of Environmental Quality, and the University of Guam, the NMC-CREES Pesticide Safety and Education Program conducted periodic pesticide workshops for private and commercial pesticide applicators, including farmers, pest control operators and other interested individuals.

Many crop pests, such as aphids, mealybugs, scale insects, whiteflies, lepidopterous larvae, not excluding weeds, etc., have naturally occurring parasites and predators, or biological control agents. Some of these parasites and predators are found locally, while others have to be imported through appropriate regulatory means. The promotion and use of biological agents in the environment can obviate or reduce the application of pesticide.

Crop pests can be controlled using an array of methods. Pesticides are used commonly because they are generally effective against a targeted pest. Use of biological control agents, if found to be specific to a target pest, is safe and avoids the use of pesticides. Other pest control methods are available to prevent pests from becoming a problem and reduce the pest numbers or damage to an acceptable level. The proper combination of these methods, or Integrated Pest Management (IPM), to control a particular pest is one of the programs that NMC-CREES promotes and encourages farmers to implement on their farms.

##### **A. ACTIVITIES:**

In collaboration with the Division of Environmental Quality, the NMC-CREES PSEP conducted a “Termites and Roaches” workshop in Saipan this funding cycle for commercial pesticide applicators. Twenty-nine individuals participated in this training to obtain their commercial pesticide applicators Category 5 (Structural) license

In collaboration with the USDA/APHIS/PPQ Cooperative Agriculture Pest Survey (CAPS), NMC-CREES initiated the “Arthropods Survey & Mapping of Agricultural Pest Infestations in the CNMI” project. Seven different insect traps were deployed at 10 different locations, 6 of which were located within the “Kagman Agriculture Farm Plots”. Traps were checked at least once a month and crop pests captured in the traps were recorded.

In an effort to control the invasive species, *Coccinia grandis* (Scarlet gourd or Ivy gourd), NMC-CREES has been redistributing the gourd beetle parasite, *Acythopeus coccinae*, throughout the island of Saipan. Specimens of beetles from Saipan have also been introduced to gourd-infested areas in Tinian and Rota. These are undertaken in collaboration with the CNMI Department of Lands and Natural Resources.

The Dry Litter demonstration is ongoing for the islands of Tinian and Saipan. Videos are disseminated to collaborators for further promotion. USDA NRCS is currently working for approval of the Dry Litter system as an approved management practices to be offered in EQIP. Visual presentations in different venues such as an environmental forum, various conferences and workshops were done locally and regionally.

## **B. HIGHLIGHTS:**

The Cooperative Agriculture Pest Survey is a new program for NMC-CREES. This program is significant because it provides NMC-CREES with a means to survey and monitor the presence of crop pests in the CNMI. Farmers can be advised of impending pests outbreak should certain pests be consistently captured in the survey traps.

The redistribution of scarlet gourd beetle parasites ensures that these parasites are present and establishing control of the gourd. There are many areas in Saipan where the gourd is apparently dying out as a result of the beetle parasites’ activities. These parasites are also firmly established in Tinian and Rota, although significant effect on the gourd is not yet evident.

## **C. IMPACTS:**

Farmers are getting information on the kinds of pests on their crops and pests distribution from data generated by the cooperative agriculture pest surveys. From farm visits, farmers learn to recognize crop pests and their damage to the crops. They also learn various control measures and the importance of biological control agents. Although farmers continue to apply pesticides, they also learn that there are alternative pest control methods and the combination of these methods can alleviate many of their existing pest problems.

Farmers, pest control companies and other stakeholders who participated in our pest focus workshops have gained greater understanding on the proper and safe use of pesticides. This would significantly reduce the amount of pesticides in the environment and would significantly reduce the number of accidental contamination of non-target plants and animals.

As a result of the efforts made on Tinian in regards to recycling, a strong partnership has been set up between NMC-CREES and the local NRCS Office, Public works, DEQ/EPA and the Tinian Leadership. This year, students have begun taking an active role in the public outreach campaign and are working on the radio ads and public information bulletins, which will be disseminated upon completion.

As a result of these efforts, three recycling centers have opened up on the outer islands within 2006. Prior to these efforts, recycling was only being practiced on the largely populated island of Saipan. It is important to note that in the beginning of 2006 there were no recycling efforts on Tinian and Rota. Recently, one recycling center reported being able to collect and market 53 tons of aluminum and other metals as a result of recycling efforts made on the island. These numbers represent tons of waste that would have normally gone straight into the Tinian and Rota landfills. Furthermore, many people are now actively seeking out cans throughout the islands and aluminum cans that used to litter beaches, parks, etc. are now being collected and recycled. In essence, it's difficult to find aluminum cans on roadsides and beaches. All in all, people in the community are showing great enthusiasm in regards to recycling and are looking forward to being able to recycle commodities such as paper, plastic and others.

As a result of the collaboration between EPA, the CSREES Water Quality Team and NMC-CREES in regards to promoting the Dry Litter Waste Management System for Hogs, other colleges and universities in the region have initiated efforts to build similar demonstrations to further investigate and promote the system in their respective areas. Palau Community College and the University of Guam (which built two different dry litter systems) have both renovated piggeries at their respective facilities to demonstrate the Dry Litter System. This type of activity has caught the attention of a growing number of researchers, extension personnel and farmers, and will certainly serve to encourage farmer adoption of the program. The second demonstration Piggery contract (paid for mainly with EPA funds) has finally been completed and construction should begin soon. This piggery will be used for video documentation for the completion of the second half of the piggery video series.

**D. ASSESSMENT:**

For a number of years, there has not been monitoring of crop pests and farm visitations for immediate assessment of crop damages and existence of crop pest. Farmers generally apply pesticides without definitive identification of target pest. Continued survey, monitoring, and periodic farm visitations will provide the opportunity for farmers to gain immediate knowledge of crop pests and appropriate control measures to implement.

The dry litter system is designed for small-scale operation with difficulty in water source. The presence of wood chipper and dry litter in any location should be considered. Continued collaboration with different agencies is needed to further observe impact.

**E. FUNDING AND FTE:**

FTE's: 7	PROGRAM COSTS: \$ 273,066
----------	---------------------------



## **Key Theme - Agriculture Waste Management**

- a. Since the arrival of the Spanish here in the Marianas, the people of the CNMI have raised hogs to be eaten during family gatherings, fiestas or just simply for family consumption. Thus, raising hogs is an important cultural tradition for local people. This results in a large number of small piggeries throughout the CNMI, at any given time. Unfortunately, hog farmers almost exclusively use the conventional spray out system of waste management which requires copious amounts of water and adds to the probability of leaching of excess nutrients past the soil and beyond to the drinking water aquifers or into the nearest stream.

In past years, NMC-CREES agents have set up piggery demonstrations to promote the Dry Litter Waste Management system for Hogs to include rainwater catchments. This system reduces the use of water and leaching of nutrients to almost zero. Simultaneously, carbon materials that would normally be burned or thrown into a landfill can now be utilized for the dry waste management system. Furthermore, hog waste is automatically combined with carbon materials (the chips-usually wood or coconut husk) to be periodically collected and composted. This valuable compost is important in increasing soil fertility and decreasing the overall cost of agricultural crop production as commercial fertilizers are hard to come by and costly.

- b. In our long-term efforts to promote hog waste management systems, agents collaborated with the Environmental Protection Agency and the CSREES Region 9 Water Quality Team to produce the first half of a two part series on the DLWMS for hogs. This year, the second half of the video is forthcoming.

A presentation/training was requested by the Soil and Water Conservation District of Saipan regarding the Dry Litter Waste Management System. The training was delivered in collaboration with Natural Resources Conservation Service and was documented by the local cable company and aired on the evening news a few nights later. As a result of the collaborative efforts and relationships built between the NMC-CREES team and the local NRCS office, NRCS agents are now actively advertising the Dry Litter System for Managing Hog Waste as a potential system to be cost-shared under the NRCS-EQIP program. Case in point, the mentioned training highlighted the potential benefits of the Dry Litter System with the second portion of the training (conducted by NRCS representatives) suggesting to the general public that the Dry Litter System was in fact cost-shareable via the EQIP program. As a result of this team presentation being aired on public television, at least 8 inquiries were made within this same week to the NRCS office in regards to potential applicants who wished to sign up for cost-sharing a Dry Litter System for piggeries under the EQIP program. At least two applicants have submitted and supposedly been approved under the NRCS program and the systems for these farms are currently being designed and approved by NRCS engineers.

- c. Source of Federal Funding: Smith Lever, EPA, USDA-CSREES Water Quality Program
- d. Scope of Impact: Regional

### **Key Theme - Recycling**

- a. NMC-CREES along with the Resource Conservation and Development Council of the Marianas (RC&D) teamed up and has identified recycling as a means of redirecting some of the waste away from CNMI landfills. USDA Rural Development provided a grant to implement an Aluminum Recycling Program on the island of Tinian. This project has contributed to a positive cash flow for the island and has begun to change the way community members view their waste. In time, people in the community will learn that not all waste is trash.

This has been the first attempt at recycling of any kind on the island and will hopefully evolve into a regional effort to ensure that all islands are recycling as much as possible.

- b. The Tinian Recycling program is in full swing as many community members, students and colleagues have come together to prepare the recycling bins, set them out for recycling and promote the idea of recycling through road-side waving of posters and signs and other outreach efforts. The high school environmental club provided the recycling logos and information. Students will often get on the microphone at these events and frequently encourage people to recycle in an effort to keep the island clean and beautiful.
- c. Source of Federal Funding: Smith Lever, USDA Rural Development, USDA-NRCS Resource Conservation and Development Office
- d. Scope of Impact: State Specific

### **Key Theme- Agricultural Waste Management**

- a. With the increasing number of demonstration sites as well as farmers adopting the system, it has proven that the system is working. The establishment of the dry litter system helps improve water quality and further promotes soil fertility. The said activity creates wanted benefits for the environment.
- b. The second video focusing on the complete system is currently being produced. The anticipated completion is scheduled for mid-2007. More conversions from typical piggery spray-out systems to dry litter is expected in the coming years with increased collaboration from DEQ, DLNR and NMC
- c. Source of Funding: Smith-Lever, EPA, CSREES
- d. Scope of Impact; Regional

### **Key Theme – Biological Control**

- a. The Plant Protection section has been distributing biological control agents (*Acythopeus coccinae*) of the scarlet gourd (*Coccinia grandis*) throughout the island of Saipan, Tinian and Rota. The biological control agent of *Chromolaena odorata*, *Cecidocharis connexa*,

was reintroduced into Saipan from Guam in June 2006. The biological control program will be expanded to develop an insectary to rear additional biological control agent for other various crop pests.

- b. In a number of areas where the parasites of scarlet gourd has been distributed, there is evidence that parasites are exerting substantial control. However, the gourd rebounds very fast during the rainy season. The biological control agent *Chromolaena odorata*, which was introduced in June 2006, unfortunately did not become established.
- c. Source of Funding: Smith-Lever
- d. Scope of Impact: State specific

### **Key Theme – Integrated Pest Management**

- a. The NMC CREES Crop Improvement and Plant Protection Program conducted on-farm demonstration trials on the islands of Rota, Saipan and Tinian with cooperating farmers. There were fourteen commercial and subsistence farmers who collaborated in these trials in hopes of improving crop production in the CNMI. The crop tested includes various varieties of sweet corn.
- b. The IPM extension agents convinced farmers that IPM techniques of monitoring populations, establishing thresholds, rotating pesticides, and alternative controls are better than traditional methods of applying pesticides on regular intervals. The farmers were encouraged to monitor pest populations of the adult and juvenile corn borers, and to distinguish species. The use of low-risk pesticides like BT (*Bacterial thurengiensis*) formulation and mineral oil to repel corn earworm through direct application to cornhusk tip right after pollination was promoted as well as the safe use of rodenticides in bait feeding stations not accessible to wild life, livestock and people. The value of IPM and how to improve crop production by the farmers have increased dramatically. They learned various management options and techniques to increase crop production.
- c. Source of Funding: Smith-Lever, ADAP
- d. Scope of Impact: State specific

### **Key Theme – Pesticide Application**

- a. The CNMI PSEP conducted the Commercial Pesticides Safety Program on “Termites and Roaches” on the island of Saipan in late 2005, in collaboration with the CNMI Division of Environmental Quality (DEQ).
- b. 29 individuals attended the workshop. Workshop topics included: concepts of basic pest management, pesticide safety measures, pesticides in the environment, pesticide exposure, principles of pest control, transportation, loading and handling of pesticides. Of the 29 who attended, 15 were able to pass the exam and became certified pesticide applicators.

c. Source of Funding: Smith-Lever, EPA

d. Scope of Impact: State specific

#### **4.5. Goal 5: Enhanced economic opportunity and quality of life for Americans**

##### **OVERVIEW**

The economy in the Commonwealth of the Northern Mariana Islands (CNMI) continues to decline as a result of foreign investors closing down their businesses and leaving the CNMI. The size of the CNMI government has been reduced by over 500 personnel since 2005, a reduction of about 10.5 percent according to data released by the Administration and reported by Saipan Tribune on February 20, 2007. The number of recipients for public assistance available to US citizen in the CNMI has tremendously increased as well. One in particular, is the Nutrition Assistance Program also referred to as the Food Stamp Program.

The goal of the Community Resource Development Program (CRD) is to empower the CNMI's citizens in order to improve the overall quality of life and creatively seek economic opportunities. Research-based information, education, workshops, training and series of life skills lessons are taught in a non-traditional setting where participants are strongly encouraged to apply the knowledge and skills learned.

The following are CRD established Programs.

- Family Financial Management
- Youth Money Management
- Sewing Programs for Families with Limited Resources
- 4-H/Youth Developments
- Legal Aspects Facing the Older Adults in the CNMI

##### **A. ACTIVITIES**

Numerous mini-workshops, series of life skills lessons, after school activities for youth and CRD program presentations were conducted at both private and public schools throughout the CNMI. Workshops and presentations were also conducted at community social halls, centers for senior citizens, home visitations, village youth centers, private day care centers, the CNMI military support group and to a number of non-profit organizations. At these events, CRD programs distributed many educational handouts which they developed specifically for easy reading.

The program also helped CNMI youth become potential entrepreneurs through a partnership effort with the Farm Service Agency's Youth Loan Program. By being FSA's point of contact and mediator with potentially interested CNMI youth, more youth entrepreneurs are on the rise.

Complimenting such efforts, the program is currently assisting 4-H youth members in writing business proposals on agriculture topics.

## **B. HIGHLIGHTS**

The Youth Loan (Pilot) Program was launched in 2005. In 2006, the USDA, Farm Service Agency (FSA) Office on Guam approved three Youth Loan applications. The three approved Youth Loan recipients are active 4-H Club members. Applications were approved based on proposals that they submitted detailing the kinds of projects that they plan to manage.

Family Financial Management workshops were conducted on Saipan, Tinian and Rota. This fiscal year saw increased enrollment coming from more public entity referrals. In 2006, increased demand for services came from the Office of the Board of Parole, Public Health, Juvenile Detention facility, Center for Living Independently and from the Public School Systems.

Recently, NMC-CREES participated in the Western SARE Regional Workshop in Guam, Three local farmers and 2 extension agents joined the rest of the pacific region in sharing their expertise on sustainable management practices in agriculture.

A piggery project by a 10-year old student from Tinian was approved by the Farm Service Agency (FSA) Youth Loan Program. This new product offering teaches youth entrepreneurship skills while encouraging the life long skill of responsibility.

Three local farmers on the island of Rota engaged in Poultry Layer operations. 800 chickens of Rhode Island and Leghorn breeds from the Asagi hatchery in Hawaii are now in the laying stage and providing “home grown” eggs for the island of Rota. The said farmers were taught through a series of workshops and on-farm seminars on topics that include brooding, nutrition, feeding, housing designs, lighting and husbandry management techniques

## **C. IMPACT**

In 2006, the Family Financial Management and Youth Money Management programs increased their number of participants through additional workshops. Due to drastic increase in the number of recipients for Nutrition Assistance Program and LIHEAP Prior to 2006, majority of our workshop participants were referrals from agencies providing public assistances. However, in 2006, referrals from the Office of Parole, Public Health, Juvenile Detention Facility and the Center for Living Independently outnumbered our regular workshop referral participants.

The hiring of three Sewing Instructors for the CRD-Sewing Programs has enabled significant increase in student enrollment. The CRD-Sewing Program on the island of Tinian continues to have a long waiting list of adult students waiting to take the Sewing Class for Beginners course.

In 2006, the youth loan was made available for youth who are members of non-profit organizations. The availability of the FSA Youth Loan enabled NMC-CREES to significantly increase in the number of youth participants, while arousing parent interest and involvement.

The Legal Aspects Facing Older Adults in the CNMI program assisted the Centers for the Man Am'ko (the elderly) in identifying and referring local lawyers, judges and social workers to educate them in matters pertaining to Man Am'ko Rights as well as obtaining Power of Attorneys, Wills, Living Wills and other such legal documents.

Three local farmers are now selling their fresh eggs in Rota at \$3.25 per case. It is expected that this will make additional income. One of the farmers is now ordering an additional 2,000 day-old chicks from Hawaii.

#### **D. ASSESSMENT**

All Family and Consumer Science programs and activities are in line with the approved Northern Marianas College-Cooperative Research, Extension and Education Services Five Year Plan of Work.

Monitoring the market will help if there's a need for additional layers for Rota. It is viewed that three farmers are enough to saturate the market for Rota. Alternative feeding and innovative technology is needed to cope with the expected expenses.

#### **E. FUNDING AND FTE**

FTE's: 8.5	PROGRAM COSTS: \$279,630
------------	--------------------------

---

#### **Key Theme – Money Management**

- a. The Family Financial Management and Youth Money Management workshops were conducted on Saipan, Tinian and Rota. Prior to 2006, majority of participants for Money Management workshops for both adults and youths were mostly referrals from agencies providing public assistances. In 2006, the Office of Parole and the Division of Juvenile Detention Facility required some of their clients to attend workshops on money management. Youth Money Management workshops conducted in the Detention Facility and are open to not just for juvenile detainees but to staff and parents of detainees. The Money Management workshops covers the following lessons; from how to develop a family budget, balancing your check book, how to budget your food stamp coupons, how to conserve water and power or cutting down on utility cost, tips on smart shopping etc.
- b. 18 adults attended the Family Financial Management workshops. 40% of the participants now regularly develop a short-term or bi-weekly budget. Evaluation results show that 100% of the participants realized that a budget would enable them to have absolute control of their finances. 100% of NAP recipients are committed to budget their food stamps to last them for one month. 70% of the participants claimed that a prepared shopping list not

only saves them time but prevents unnecessary spending. Evaluation results show that 100% of the participants are committed to develop a shopping list before going shopping. 90% of youth participants now own a piggy bank.

- c. Source of Funding: Smith-Lever
- d. Scope of Impact: State Specific

#### **Key Theme –Family Resource Management**

- a. The Sewing Class for Beginners on Tinian has extended its class hours in order to accommodate those students who are employed full-time in the private and public sectors. Classes run from 7:00 p.m. to 10:00 p.m. during the weekdays and half days during the weekends.

Students are required to complete 12 sewing projects and are encouraged to fundraise for the purchase of a sewing machine for home use. Such a promotion is done so that the student continues applying the knowledge and skills that they have learned.

- b. The Rota Sewing Program graduated 26 youth during the Summer of 2006 and 30 adults also completed the required 12 projects. Only 7 students were successful in raising enough money to purchase their own sewing machine. Tinian graduated 37 students and 14 of them were able to purchase a sewing machine. Saipan graduated 25 students and 5 were able to purchase their sewing machines. 80% of the students who successfully completed the Sewing Class for Beginners signed up for the Advanced Sewing Class. 99% say they are determined to purchase their own sewing machine.
- c. Source of Funding: Smith-Lever
- d. Scope of Impact: State Specific

#### **Key Theme – 4-H/Youth Development**

- a. The FSA youth loan was launched in 2005. The approved projects range from providing custom printing, shish kabob sales, and running a piggery operation.

In summer 2006, the CNMI 4-H program conducted several activities for the CNMI youth. Activities included instruction in arts and crafts, tree planting, proper nutrition, etc. Other sponsored events included “youth career day”, peer counseling, camp outs, youth sewing and embroidery, hiking, a fishing derby, talent competition (traditional dances, modern/contemporary, eco (educational) camp. Mini-workshops focused on topics such as, basic computer skills, self-esteem, goal setting, citizenship, and teambuilding.

- b. All of the youth applications for the FSA youth loan submitted were approved. They have established a joint checking account with their advisors (extension agents).

In 2006, the CNMI 4-H/Youth Development program reached over 3000 youths. About 600 youth participated in one or two activities mentioned above. At present there are 400 active youth participants with 35 committed adult volunteers. The CNMI now has 4 chartered 4-H Clubs with the number of members continuously increasing. Presently, there are only 3 extension agents serving the entire CNMI youth population.

- c. Source of Funding: Smith-Lever

- d. Scope of Impact: State Specific

### **Key Theme - Legal Aspect Facing Older Adults in the CNMI**

- a. The Legal Aspects Facing Older Adults in the CNMI assisted the Centers for the Man Am'ko in identifying and referring local lawyers, judges and social workers to educate them in matters pertaining to Man Am'ko Rights as well as the importance of the Power of Attorney, Wills, Living Wills and Medical Rights of Patients.

- b. Source of Funding: Smith-Lever

- c. Scope of Impact: State Specific

## **B. STAKEHOLDER INPUT PROCESS**

NMC-CREES has established Advisory Councils on the islands of Rota, Tinian and Saipan. The Advisory council members include stakeholders within agriculture, homemakers, youth, community leaders and consumer components.

The Advisory Councils hold quarterly meetings and members discuss the many concerns that were brought up to their attention from farmers, homemakers and community leaders. NMC-CREES held periodic meetings with stakeholders and solicited advice on community needs and priorities. Also, for better ways to effectively serve the community in general, periodic meetings attended by NMC-CREES staff include: the monthly Tinian Soil and Water Conservation District, Saipan and Northern Islands Soil and Water Conservation, Luta (Rota) Soil and Water Conservation District, the CNMI Interagency Watershed Committee, the Head Start Health Advisory Council; the Rota Agricultural Advisory Council, Parent-Teacher Association and other school-based organizations and the Women's Affairs Group.

Other less regularly held meetings attended, which solicits input from stakeholders on research and extension needs, include the General Farmers' Meetings, the Farmers' Association Meetings, the Sabalu Market Association, the Saipan Agriculture Fair Association quarterly meeting and the 4-H Club Officers and Special Committee members.



### **C. PROGRAM REVIEW PROCESS**

NMC-CREES continues to hold formal Merit/Peer reviews of each federally funded research and extension project proposal, prior to submission. All professional level staff members from NMC-CREES are encouraged to participate in Merit or Peer reviews. Stakeholders are also encouraged to participate in the reviews.

The review process is carried out in three steps: First, a draft of the proposal is e-mailed to all of the NMC-CREES staff and other participants for review, suggestions and comments, well before the peer review meeting. Second, the draft of the proposal is revised, based on the comments and suggestions received. Lastly, the revised proposal is submitted to the Director for final review before submittal.

During the review we assess:

- 1) The priority or importance of the proposed project
- 2) The review of literature
- 3) The completeness of the proposal
- 4) The relevance of the proposal
- 5) The quality and scientific value of the proposed research activities and
- 6) The opportunities for external agencies supports and collaborations.

The proposals are revised to incorporate the suggestions given and agreed upon during the merit/peer review meeting. The Director assures that the recommendations for changes are addressed. The proposal is then submitted to the President of the Northern Marianas College for concurrence then it is submitted to the appropriate funding agency.