

2007 Northern Marianas College Combined Research and Extension Annual Report

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I. Report Overview

1. Executive Summary

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 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, youths, 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 the key collaborations and partnerships with government agencies, non-profit organizations and other entities throughout the CNMI and the region. Our interactions with collaboration 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 missions of the Cooperative Research, Extension and Education Service and the Northern Marianas College.

PROGRAMS

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

Agriculture, Research and Extension Programs:

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

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
 - o Family Financial Management
 - o Sewing Program for Families with Limited Resources
- 4H/Youth Development

RESEARCH & EXTENSION INTEGRATION

NMC-CREES integrated 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 of educational backgrounds to cross train thus promoting efficiency and better communication among faculty, scientists, and extension agents. The 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 NMC-CREES 5 year Plan of Work.

Total Actual Amount of professional FTEs/SYs for this State

Year:2007	Extension		Research	
	1862	1890	1862	1890
Plan	18.3	0.0	9.3	0.0
Actual	15.0	0.0	5.0	0.0

II. Merit Review Process

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

- Internal University Panel
- Expert Peer Review
- Other (Program Leaders)

2. Brief Explanation

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.

III. Stakeholder Input

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

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

Brief Explanation

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

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

1. Method to identify individuals and groups

- Use Advisory Committees

Brief Explanation

NMC-CREES has a strong following based on the programs we provide the CNMI community. Being that we represent a diversified community, we make efforts at continuously looking for new stakeholders. Our program staff provide the administration with a list of viable entities based on service delivery. By providing such a list, the administration then forwards these individuals and/or entities with invitations to participate in the program review process.

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

1. Methods for collecting Stakeholder Input

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

Brief Explanation

The Advisory Councils hold quarterly meetings and members discussed 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 provide inputs 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 Clubs Officers and Special Committee members.

3. A statement of how the input was considered

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

Brief Explanation

NMC-CREES understands that in order to provide adequate services to clients, it is necessary to receive their input on which areas most affect them. When stakeholder input is provided we use such information for programmatic focus. This input dictates our department's submission of the AREERA POW.

Brief Explanation of what you learned from your Stakeholders

Because of stakeholder input we were able to put more focus this past year on the following:

- Crop production efficiency strategies
- The development of tissue culture in the Mariana Islands
- Select higher end crops for propagation
- Increase capacity in aquaculture program

IV. Expenditure Summary

1. Total Actual Formula dollars Allocated (prepopulated from C-REEMS)			
Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
845837	0	1176423	0

2. Totaled Actual dollars from Planned Programs Inputs				
	Extension		Research	
	Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
Actual Formula	390914	0	285854	0
Actual Matching	0	0	0	0
Actual All Other	0	0	0	0
Total Actual Expended	390914	0	285854	0

3. Amount of Above Actual Formula Dollars Expended which comes from Carryover funds from previous years				
Carryover	33431	0	154728	0

V. Planned Program Table of Content

S. NO.	PROGRAM NAME
1	Livestock Improvement Program
2	Plant Protection Program (Invasive Species)
3	Crop Improvement Program
4	Soil and Water Quality Program
5	Expanded Food and Nutrition Education Program (EFNEP)
6	CNMI Families, Youth and Communities Enrichment Program
7	Diet, Physical Activity, and Health

Program #1

V(A). Planned Program (Summary)

1. Name of the Planned Program

Livestock Improvement Program

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
111	Conservation and Efficient Use of Water	3%		3%	
301	Reproductive Performance of Animals	5%		5%	
302	Nutrient Utilization in Animals	10%		10%	
303	Genetic Improvement of Animals	10%		10%	
307	Animal Management Systems	20%		20%	
308	Improved Animal Products (Before Harvest)	5%		5%	
311	Animal Diseases	20%		20%	
312	External Parasites and Pests of Animals	5%		5%	
313	Internal Parasites in Animals	5%		5%	
314	Toxic Chemicals, Poisonous Plants, Naturally Occurring Toxins, and Other Hazards Affecting Animals	5%		5%	
315	Animal Welfare/Well-Being and Protection	2%		2%	
722	Zoonotic Diseases and Parasites Affecting Humans	5%		5%	
902	Administration of Projects and Programs	5%		5%	
Total		100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2007	Extension		Research	
	1862	1890	1862	1890
Plan	3.0	0.0	1.5	0.0
Actual	0.8	0.0	0.3	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
106296	0	49253	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

The Livestock Program Leader (LIP) together with extension staff and collaborators performed a great array of activities such as regular farm visitations and consultations, poultry flock health monitoring, hands-on management with piggery, poultry and cattle operations, one-on-one farmer education and supervision regarding disease management, close supervision of island paravets, practical application of selection and culling in livestock production parameters, client education on feeds and feeding, research trials on the ration that will provide better results for ruminants using different forage grass and legumes, adoption of grazing techniques and pasture management using BMP's set by NRCS, promotion and utilization of chicken tractors as innovative farming technique promoting pasture based poultry. Viability of small farms was encouraged through grants availment. Program leader's (PL) completed online courses on sustainable agriculture and National Animal Identification System (NAIS) as well as agro-animal bio-security. Parasite control education and application as well as identification and eradication of poisonous plants were taught and promoted. PL initiated Hatch project on animal disease survey; conducted forum, survey and workshops on sustainable agriculture and alternative livestock enterprise; Implemented and promoted sustainable livestock waste management in collaboration with NRCS EQIP. Activities of FY 2006 were continued and program leader conducted several hands-on, in-farm seminars and workshops that focused on establishing small-scale livestock enterprise (poultry layer/egg production and goat production), promoting sustainable management practices in agriculture (dry litter waste management system), re-sourcing affordable and alternative livestock feeds (imported and local feedstuff), and acquiring external funding for the improvement of the quality and marketability of meat through enhancement of breeding lines and utilization of local feedstuff. The LIP submitted a regional proposal to Western SARE that will utilize available resources as organic and alternative medicine. A Hatch project proposal regarding animal health survey for the CNMI was granted and funded by the USDA-CSREES. A Western SARE producer plus professional proposal grant on Livestock Genetic Improvement was recently re-submitted and waiting for funding approval. Four dry litter demonstration centers have been installed across the region thus far. Two exist in the island of Tinian and two in the Republic of Palau. The technology has evolved through on-farm experimentation and collaboration between farmers and extension professionals. Videos are disseminated to collaborators for further promotion. Power point presentations in environmental forum, conferences and workshops were done on-island and off-island. The program also supported youth and adult entrepreneurship development by applying to FSA Youth Loan. The Program Leader assisted a 4-H youth member to write a proposal about piggery operation coupled with backyard gardening.

2. Brief description of the target audience

The LIP primary audiences were producers (ranchers and farmers), extension personnel from both government and private sectors, and the youth and adults from the islands of CNMI. Producer includes local and non-local, migrants, socially disadvantaged farmer, women and minorities. Most producers are involved in small-scale operations, which are predominantly retired individuals and part-time government employees. Other individuals perform this as a hobby. There were also great involvements of agricultural professionals that serve as audience in the program.

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	200	500	300	500
2007	250	400	250	400

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

Patent Applications Submitted

Year	Target
Plan:	0
2007 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan			
2007	4	1	5

V(F). State Defined Outputs

Output Target

Output #1**Output Measure**

- Number of Research projects on Animal Diseases

Year	Target	Actual
2007	2	1

Output #2**Output Measure**

- Number of Livestock Workshops (Production, Animal Health, etc.)

Year	Target	Actual
2007	6	7

Output #3**Output Measure**

- Number of Research Projects completed on Aquatic Species

Year	Target	Actual
2007	1	1

Output #4**Output Measure**

- Number of farmers engaged in pasture rotation grazing

Year	Target	Actual
2007	5	12

Output #5**Output Measure**

- Numbers of clients implementing best management practices in swine waste management

Year	Target	Actual
2007	2	4

Output #6**Output Measure**

- Numbers of paravets practicing hands-on in the CNMI

Year	Target	Actual
2007	4	4

Output #7**Output Measure**

- Number of new alternative livestock enterprise introduced in the CNMI

Year	Target	Actual
2007	3	2

Output #8**Output Measure**

- Number of Workshops conducted on Sustainable Agriculture

Year	Target	Actual
2007	{No Data Entered}	4

Output #9**Output Measure**

- Number of projects presented in local, regional and national meetings and conferences

Year	Target	Actual
2007	{No Data Entered}	3

Output #10**Output Measure**

- Number of grants submitted for WSARE funding for 2008

Year	Target	Actual
2007	{No Data Entered}	10

V(G). State Defined Outcomes**V. State Defined Outcomes Table of Content**

O No.	OUTCOME NAME
1	Number of New Farmers engaged in Alternative Small Scale Livestock Enterprise
2	Number of farmers use Artificial Insmination porgram
3	Numbers of farmers market thier produce
4	Farmers who adapt the sustainable livestock waste managements
5	Number of farmers learning how to produce new aquatic species

Outcome #1**1. Outcome Measures**

Number of New Farmers engaged in Alternative Small Scale Livestock Enterprise

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	3	4

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Livestock feed cost has been an on-going problem that discourages a lot of producers in engaging themselves to farming. Pasture are poor and under-developed. Weeds overgrowing the grass and there is lack of water source for irrigation. People's behavior are not too receptive to change. Technical knowledge was an issue for most producers.

What has been done

Introduction of innovative farming techniques like chicken tractor and dry litter waste management that increases farm efficiency and are time and money saving. Technical workshops about sustainable practices in collaboration with local and federal organization promoting BMP's.

Results

Four local farmers are now engaged in poultry layer operation in Rota and Saipan. Both operations were supplying local stores and competing with quality against imported eggs. A producer in Rota was collecting 71 dozens of eggs in a day. There was approximately 40% reduction of egg importation in the island of Rota alone. Mortalities are below the standard and expected value, which favors the operation. There are still more local farmers who wanted to venture to poultry operations. Small scale (backyard) goat production is an increasing enterprise in the island of Tinian and Saipan. One farmer used to gather 71 dozens of eggs per day. The demand is high for local fresh eggs and the farmer wanted to meet that demand by increasing numbers of layers in his farm. This is seen with the increase number of clients requesting for health check up for goats.

4. Associated Knowledge Areas

KA Code	Knowledge Area
312	External Parasites and Pests of Animals
311	Animal Diseases
302	Nutrient Utilization in Animals
307	Animal Management Systems

Outcome #2**1. Outcome Measures**

Number of farmers use Artificial Insemination program

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	10	5

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Inbreeding is a problem for swine and ruminants. Diseases associated with low immunity due to genetics have been identified. In order to improve production parameters associated with genetics, a need to upgrade the breeding stock is needed.

What has been done

Re-submitted a proposal to WSARE Professional plus Producer grants. Technical discussions with livestock upgrading with selected clients were initiated. Collaboration with University of Hawaii and University of Guam on possible AI project once proposal gets funded. Requested assistance from local agriculture department to allocate funds for livestock genetic upgrading. Identified previous trained staff for AI and included them for the refreshers training course.

Results

It is expected that more than 30 farmers will receive AI technology once grant is received. Received a word from Western SARE Producer plus Professional Grant that it was selected for funding by June 2008. Artificial insemination training and actual insemination will be done thru WSARE funding to the three islands. Ai expert from University of Hawaii have extended their service.

4. Associated Knowledge Areas

KA Code	Knowledge Area
307	Animal Management Systems
301	Reproductive Performance of Animals
303	Genetic Improvement of Animals

Outcome #3

1. Outcome Measures

Numbers of farmers market thier produce

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	10	8

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Due high production inputs, few farmers were able to market their produce. Culturally, produce are used for personal party and gatherings.

What has been done

Introduction of innovative farming techniques that reduced farm production inputs and increases farm efficiency. Promotes pastured based system that supplemented animal nutritions in poultry and cattle operations. The push for organic promotion and utilization of natural resources has been the focus of promotion for the CNMI.

Results

There is increasing involvement of farmers adopting innovative farming techniques such as pastured poultry, pastured beef and pastured pork in small scale. Two poultry raisers were selling their produce in store and local flea markets. Six farmers with pastured beef and pastured pork sell their produce via live weight. And many unrecorded goat raisers do their marketing by themselves.

4. Associated Knowledge Areas

KA Code	Knowledge Area
308	Improved Animal Products (Before Harvest)
302	Nutrient Utilization in Animals
307	Animal Management Systems
315	Animal Welfare/Well-Being and Protection

Outcome #4

1. Outcome Measures

Farmers who adapt the sustainable livestock waste managements

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	5	4

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Island locations are prone to water contaminations. Soil are porous and are easily contaminated that will result to water pollution in both ground and surface waters. The campaign to transfer swine farmers to dry litter system has been a challenged for island farmers. Probably because of limited service of the sole island chippers available to them.

What has been done

There are four demonstration sites two in Tinian, two in Palau and there were two more ranchers applied for EQIP with NRCS. Videos has been disseminated to farmers and advertized in local tv. Articles were written and produced in local newsprints in several occassions promoting water quality and pollution prevention. Information dissemination thru websites have been put through. Local, regional, and national presentations have been done thru poster presentation and powerpoint presentation. There are still two pending applicants from EQIP for the Dry litter system in Saipan office and another one in Guam.

Results

Four local farmers were currently applying and practicing the dry litter system and USDA NRCS is helping us promote the system by including it in the Best management practices (BMP's). Posters, brochures, websites, and videos were disseminated all over the US and pacific islands for the promotion of the dry litter system. It was funded by US Environmental Protection Agency (\$70,000). There are more farmers that are expected to adapt the system once information dissemination will continue and once NRCS fully included it in the BMP's for EQIP.

4. Associated Knowledge Areas

KA Code	Knowledge Area
902	Administration of Projects and Programs
722	Zoonotic Diseases and Parasites Affecting Humans
111	Conservation and Efficient Use of Water
307	Animal Management Systems
315	Animal Welfare/Well-Being and Protection
311	Animal Diseases

Outcome #5

1. Outcome Measures

Number of farmers learning how to produce new aquatic species

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	20	70

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The population of the CNMI, with the Asian guest workers and tourists, are traditionally large consumers of fish. With the decline of the fisheries in the oceans surrounding the CNMI, aquaculture seems attractive, logical, and feasible on the islands. At present the CNMI is highly dependent on imported seafood from other markets. Producing or harvesting more fish locally, may lead to the improvement of the Commonwealth's economy; provide increased employment to local fishermen and farmers; improve the health of its citizenry through increased consumption of seafood; and improve the supply, quality, and freshness of the seafood consumed locally. These are long term issues in the CNMI.

What has been done

On going programs in Tilapia and shrimp production are underway. New varieties of Tilapia have been introduced with characteristics palatable to the local, live, fresh market. To address the lack of Tilapia fry supply, efforts were made to transfer the 'Hapa' and artificial egg incubation technology to improve the availability of Tilapia fry and help increase the number of Tilapia farmers locally. Shrimp production continues to improve with monthly production of live, fresh shrimp for the local market increasing from 1mt to 5mt. With the success in the shrimp for meat sector, more attention will be given to the development of the shrimp broodstock industry with legislation to restrict the importation of live or moribund crustaceans from countries with known disease problems and partnership with the University of Guam Hatchery in the development of Specific Pathogen Free or Resistant shrimp stocks. Furthermore, biosecurity education and demonstration for shrimp farmers will continue.

With shrimp production taking a foothold in the CNMI, the focus has been redirected to protecting shrimp production from the devastating effect of all forms of shrimp pathogens. To this end, an Aquaculture & Fisheries Development (A&FDP) officer was dispatched to the University of Arizona's shrimp pathology short course for training on pathogen detection, intervention, and prevention.

Results

As a result of these activities, training on biosecurity measures and shrimp production strategies were conducted on Saipan, Tinian, and Rota to improve the knowledge and skills of farmers in protecting their crop from shrimp diseases. Additionally, a stakeholder led effort to enact legislation declaring Rota as a Specific Pathogen Free Zone is underway. Furthermore, a collaborative effort between the University of Guam and NMC CREES to write and submit a proposal to fund a Micronesia-wide biosecurity demonstration project to provide shrimp farmers' hands-on training on biosecurity measures is being pursued. As a result of our continued extension outreach efforts, a farmer is now exporting shrimp brood stock and has increased his production capacity from 1 to 5 metric tons. His efforts have sparked further interest and now a farmer from the island of Rota is constructing tanks to cater to the same market.

4. Associated Knowledge Areas

KA Code	Knowledge Area
307	Animal Management Systems
303	Genetic Improvement of Animals
315	Animal Welfare/Well-Being and Protection
313	Internal Parasites in Animals
311	Animal Diseases

308	Improved Animal Products (Before Harvest)
312	External Parasites and Pests of Animals

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Government Regulations
- Competing Public priorities
- Other (Cultural)

Brief Explanation

We are facing economic downturn and farmers have their set of priorities. With the unavailability of affordable feeds in the CNMI, producers are limited to engage in such endeavor. Government regulations that restrict other feed sources plays a significant role in the industry. If the process will favor entrance of good quality feeds from Asian countries, this will reduce the price and farmers can engage in business venture. Cultural behavior is still a part of the local's life, they have treated farming as part of culture and not a primary source of income.

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- Before-After (before and after program)
- During (during program)
- Other (Questionnaire/survey, evaluation)

Evaluation Results

Program must coincide with audience priorities. Cultural background plays a significant part in their decisions and adaptations. A careful before- during and after program must be properly done in order to appreciate outcomes. Direct intervention meaning one-on-one, in-farm seminar and small group discussion are very effective tool compared to workshops (bigger scale). A vivid video is very effective in influencing a change in behavior for island farmers. Government support is lacking and it plays a major role in change.

Key Items of Evaluation

Program #2

V(A). Planned Program (Summary)

1. Name of the Planned Program

Plant Protection Program (Invasive Species)

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
211	Insects, Mites, and Other Arthropods Affecting Plants	40%		40%	
212	Pathogens and Nematodes Affecting Plants	2%		2%	
213	Weeds Affecting Plants	15%		15%	
214	Vertebrates, Mollusks, and Other Pests Affecting Plants	3%		3%	
215	Biological Control of Pests Affecting Plants	30%		30%	
216	Integrated Pest Management Systems	10%		10%	
Total		100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2007	Extension		Research	
	1862	1890	1862	1890
Plan	3.3	0.0	4.3	0.0
Actual	3.3	0.0	0.8	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
84412	0	69289	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

The USDA/APHIS/PPQ CAPS funded project, "Arthropods Survey & Mapping of Agricultural Pest Infestations in the CNMI", was completed in June 2007. Two other CAPS funded projects were initiated: May 2007 (Biological Control of Papaya Mealybug [*Paracoccus marginatus*] in Tinian, CNMI", and July 2007 (Survey and Mapping of New Guinea Sugarcane Weevil and Banana Root Borer Weevil in the CNMI). In June and October 2007, we introduced, from Puerto Rico, three parasitoids for the control of the Papaya Mealybug in Tinian. Much of the activities of the Entomology Unit staff were focused on these three projects during the year. Scheduled trips to the islands of Tinian and Rota were taken to collect data from weevils and other arthropods survey traps and samples of host plants of the papaya mealybug.

In addition to the CAPS projects, we also continued surveillance of the infestations of *Coccinia grandis* (Scarlet gourd). We continued distributing the gourd's leaf mining weevil (*Acythopeus coccinae*) to gourd infested areas in Saipan, Rota and Tinian. In August 2007, we introduced into Saipan another gourd biological control agent, the coccinia clearwing moth (*Melittia oedipus*), from Guam. In September, we introduced the same species into the island of Rota, where the gourd appeared to be spreading.

The Plant Protection staff also continued to visit farms to assess presence of crop pests, crop damage, farmers' needs for assistance, and to continue dialogue with farmers on agriculture and environment issues.

As part of our continuing surveillance of invasive species, the Cycad scale (*Aulacaspis yasumatsui*) was first detected in March 2007, in Rota at Muchon area, already infesting and killing numerous native cycad palms, *Cycas micronesica*. We also detected infestations of Erythrina gall wasp (*Quadrastichus erythrinae*) on *Erythrina variegata* in Tinian in August 2007, in the vicinity of the Tinian Airport and along Broadway Road. This species was first detected in Saipan (Kagman) in October 2006.

2. Brief description of the target audience

- Farmers, other crop producers and farm helpers
- Business operators that promote or sell farm products
- Grade schools, high schools and college students interested in further knowledge in agriculture
- Adult Volunteer Leaders (4-H Clubs)

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	300	1000	500	1000
2007	300	1000	500	700

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

Patent Applications Submitted

Year	Target
Plan:	0
2007 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan			
2007	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of Research Projects completed on Invasive Species

Year	Target	Actual
2007	1	1

V(G). State Defined Outcomes**V. State Defined Outcomes Table of Content**

O No.	OUTCOME NAME
1	Number of farmers learning biological control methods against invasive species
2	Number of farmers using biological control against invasive species
3	Number of farmers learning Integrated Pest Management for suppression of invasive species and reduction of damage they cause
4	Number of farmers using Integrated Pest Management to control invasive species
5	Decrease the population of the various invasive species (Cuban Slug; Melon Fly; Sweet potato Weevil; Whiteflies infestation) by certain percentage:
6	Number of farmers learning the identity of invasive species through the use of the invasive species or economic insect reference collection
7	Number of farmers able to identify some of the invasive species causing damage to their farm crops
8	Number of farmers learning best practice management to control or eradicate the Cuban Slug, <i>Veronicella cubensis</i>
9	Number of farmers implementing best practice management to control or eradicate the Cuban Slug, <i>Veronicella cubensi</i>
10	Number of farmers learning methods of early detection of crop pests and diseases on their farms
11	Number of farmers using methods of early detection of crop pests and diseases on their farms

Outcome #1**1. Outcome Measures**

Number of farmers learning biological control methods against invasive species

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	15	15

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

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, the Plant Protection program endeavors to promote programs in safe use of pesticides, biological control, integrated pest management, surveillance and control of invasive species, 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, which include topics such as principles of pest control, integrated pest management, safe use of pesticides, pesticides laws and regulations, etc.

The Plant Protection Program also emphasizes the use of biological control agents, such as parasites, predators and pathogens for control of crop pests. Some of these agents are found locally and can be lab reared, 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 pesticides.

Crop pests can be controlled using number of methods. Pesticides are used commonly because they are generally effective against a target pest. Use of biological control agents, if found to be specific to target pest and effective, is safe and reduces the use of pesticides.

What has been done

The workshops on pesticide safety reinforced the concept of harmony between agriculture and the environment. Farmers, pest control operators and other stakeholders who participated in the workshops have gained greater understanding on the proper and safe use of pesticides. Farmers learn how to use pesticides safely in order to avoid contaminating the environment and to ensure that produce from their farms are pesticide free when harvested. They also learn to prevent accidents when applying pesticides to their crops. 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. From information generated by the cooperative agriculture pest surveys projects, 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 other pest control methods and the combination of these methods can alleviate many of their pest problems. The farm visits keep communications open with farmers. It is an opportunity also for Plant Protection staff to disseminate information generated by researchers locally, in the region and nationwide. The USDA/APHIS/PPQ CAPS program awarded NMC-CREES two new projects during the year. These projects are significant because they provides NMC-CREES with a means to survey and monitor the presence of crop pests in the CNMI and to use biological control agents to control a serious pest of papaya and some ornamental plants. Farmers can be advised of impending pests outbreak should certain pests are consistently captured in the survey traps.

The redistribution of scarlet gourd weevil parasites (*Acythopeus coccinae*) and the introduction of the coccinia clearwing moth (*Melittia oedipus*) will speed up the control of the scarlet gourd. The weevil parasite is firmly established in Saipan Rota and Tinian. However, the clearwing moth, which is considered more effective in controlling the gourd, is still early to see definite sign of establishment.

Results

- a. The Plant Protection section continued to distribute the biological control agent (*Acythopeus coccinae*) of the scarlet gourd (*Coccinia grandis*) throughout the islands of Saipan, and few spot infestations in Tinian and Rota. We also introduced the clearwing moth (*Melittia oedipus*), another biological control agent of the scarlet gourd, from Guam to Saipan (August 2007) and Rota (September 2007).
- b. The weevil parasite of the gourd appears to be exerting some control during the dry season causing the gourd leaves to dry and fall off. However, during the rainy season, new leaves would reappear and the gourd regained its capacity to spread.
- c. With respect to the coccinia clearwing moth, we have not yet seen any definite sign of establishment, although we have released about 2,000 larvae in Saipan and 400 in Rota. In Saipan, we have observed large number of ants evidently eating the pupae inside the scarlet gourd vines at some of the original release sites.

4. Associated Knowledge Areas

KA Code	Knowledge Area
211	Insects, Mites, and Other Arthropods Affecting Plants
216	Integrated Pest Management Systems
213	Weeds Affecting Plants
215	Biological Control of Pests Affecting Plants

Outcome #2

1. Outcome Measures

Number of farmers using biological control against invasive species

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	2	2

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The CNMI has very limited agricultural resources. Most agricultural productions are at subsistence level and any threat to these resources can seriously affect the livelihood of 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, we conduct one-on-one discussions with farmers, we show farmers how to recognize crop damages and associated pests, and we recommend control measures. In addition to farm visits, we encourage the farmers to report to us problems on their farms and then we 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.

What has been done

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.

Results

NMC-CREES collaborates with a number of agencies in the CNMI, Guam, Hawaii, and others in the region and nationwide on agricultural and environmental issues. The CNMI Division of Environmental Quality facilitates the implementation of FIFRA through its Pesticide Regulations in collaborations with NMC. The USDA/APHIS/PPQ provides funding to NMC-CREES to conduct agricultural pests survey and to conduct research on biological control of crop pests. 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.

4. Associated Knowledge Areas

KA Code	Knowledge Area
211	Insects, Mites, and Other Arthropods Affecting Plants
215	Biological Control of Pests Affecting Plants
216	Integrated Pest Management Systems

Outcome #3**1. Outcome Measures**

Number of farmers learning Integrated Pest Management for suppression of invasive species and reduction of damage they cause

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	15	20

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

NMC-CREES feels that in order for us to a proactive approach to creating harmony with the environment, we must take an active role in teaching alternative methods to dealing on farm pests.

What has been done

Reduction of synthetic pesticide use through establishment of demonstration nurseries and on farm trial plots on grower property was conducted in demonstrating the feasibility of further reduction of organophosphates. Growing with sunn hemp has been conducted on our Rota nursery site, where it was reported to be an excellent soil-improving crop. A project to provide an alternative to pests and nematode control is currently on-going. The planting of neem trees on farmland will provide readily available organic solutions to our clients' pest problems.

Results

The results of the on-farm plots had increased participation among other farmers. Submission of WSARE FRG grants targeting invasive species control has been submitted, however none were awarded this fiscal year. The use of sunn hemp on Rota produced high organic matter yields, was able to fix nitrogen, and could reduce the build-up of root-knot nematode populations, and was distributed to five farmers as a beneficial plant to improve their crop production. No results on neem are currently available due to this being at its infancy stage.

4. Associated Knowledge Areas

KA Code	Knowledge Area
211	Insects, Mites, and Other Arthropods Affecting Plants
215	Biological Control of Pests Affecting Plants
212	Pathogens and Nematodes Affecting Plants
216	Integrated Pest Management Systems

Outcome #4

1. Outcome Measures

Number of farmers using Integrated Pest Management to control invasive species

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	2	5

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Our battle with the *Bactrocera cucurbitae* has been around since the early days of the Trust Territory period. At one point the CNMI's efforts saw this pest waning, however being so geographically close to the island of Guam we are left vulnerable for further population explosions. As conditions change, so does our need for further vigilance. We have notice through insect scouting that there has been an increase in the presence of the *Cylas formicarius* which has the potential of devastating our sweet potato industry.

What has been done

Our IPM team has taken a proactive approach at combating the melon fly through the implementation of male annihilation techniques, protein bait applications, and instruction in sanitation to stop the build up in population. The sweet potato weevil suppression efforts consists teaching best management options through the use of pheromone traps and the promotion of sanitation, proper treatment of planting materials before transplanting, and the manual removal of alternate hosts.

Results

Through the aforementioned activities, the IPM team notices increased use of such methods among CNMI farmers. Scouting efforts indicate that there is a gradual decline in the number of reports of damage. Although damages are still found, commercial farmers indicate that numbers are at a manageable level.

4. Associated Knowledge Areas

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

Outcome #5

1. Outcome Measures

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

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	20	25

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The CNMI is a farming community that relies on the Department of Agriculture and Northern Marianas College's technical expertise to deal with impending issues affecting agriculture production. It is an ever-growing occurrence that we must deal with invasive species.

What has been done

During the past year, the plant protection program conducted site visits with technical assistance provided for issues on agricultural and horticultural activities that has already been hampered with pests and diseases. The continued implementation of methods that has been developed to reduce the pest population to the minimum level is on-going on farm sites and permanent sites to monitor for the following pests 1) *Cylas formicarius* (Sweet potato weevil), 2) *Bactrocera cucurbitae* (Melon fly) and 3) Sugarcane weevil *Rhabdoscelus obscurus* (Boisduval), to name a few in the CNMI. Five images of insect pest and disease plants were submitted to Pacific Islands Distance Diagnostics and Recommendation System (PIDDRS) for evaluation. An identification of a particular note was the Center's determination of an invasive Cycad Aulacaspis Scale (CAS). Infestation area is located in Mochong, Rota infesting endemic *Cycas micronesica*, known as Fadang.

Results

Data collection and the release of biological control agents are still on-going. We foresee results being reported in next year's report.

4. Associated Knowledge Areas

KA Code	Knowledge Area
212	Pathogens and Nematodes Affecting Plants
216	Integrated Pest Management Systems
211	Insects, Mites, and Other Arthropods Affecting Plants
214	Vertebrates, Mollusks, and Other Pests Affecting Plants
215	Biological Control of Pests Affecting Plants

Outcome #6

1. Outcome Measures

Number of farmers learning the identity of invasive species through the use of the invasive species or economic insect reference collection

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	10	30

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

NMC-CREES believes that by learning the skills in insect and pathology detection is a basic tool for farmers to make economically viable decisions in crop production. The active role of our IPM team has been to teach insect characteristics as a first detection method. Farmers generally apply pesticides without definitive identification of target pest.

What has been done

The workshops on pesticide safety reinforce the concept of harmony between agriculture and the environment. Farmers, pest control operators and other stakeholders who participated in the workshops have gained greater understanding on the proper and safe use of pesticides. Farmers learn how to use pesticides safely in order to avoid contaminating the environment and to ensure that produce from their farms are pesticide free when harvested. They also learn to prevent accidents when applying pesticides to their crops. 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. From information generated by the cooperative agriculture pest surveys projects, 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 other pest control methods and the combination of these methods can alleviate many of their pest problems. The farm visits keep communications open with farmers. It is an opportunity also for Plant Protection staff to disseminate information generated by researchers locally, in the region and nationwide. 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.

Results

This past year, 30 individuals came to our Pesticide Safety Education Program's certification workshop. Although these individual depend on the use of commercial pesticides, they were introduced to alternative organic and botanical applications. A session was conducted on the use and benefits of Integrated Pest Management.

4. Associated Knowledge Areas

KA Code	Knowledge Area
215	Biological Control of Pests Affecting Plants
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants
216	Integrated Pest Management Systems
214	Vertebrates, Mollusks, and Other Pests Affecting Plants
213	Weeds Affecting Plants

Outcome #7

1. Outcome Measures

Number of farmers able to identify some of the invasive species causing damage to their farm crops

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	2	5

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The invasive species scarlet gourd, *Coccinia grandis*, was first detected in island of Saipan in early 1994, with small area infestation. By 1997, the gourd had spread throughout most of Saipan. This weed impacts all concerns as it enshrouds vegetations and any object where this weed grows, and it is very difficult to control mechanically and chemically. In the farm areas, it enshrouds fruit trees and shrubs. It penetrated the limestone forests and covers native, as well as exotic vegetation. Using herbicide is impractical because adjacent vegetation would be impacted. Many farmers and the lay public are well familiar with the gourd and its impact on all vegetation.

What has been done

The government attempted to eradicate the initial infestation using herbicide and mechanical means, but to no avail. In 2002, two species of biological control agents, *Acythopeus coccinae* and *A. burkhardtorum* (Coleoptera: Curculionidae). However, only *A. coccinae* became established, which has been exerting some control, particularly during the dry season. In August 2007, another biological control agent, *Melittia oedipus* (Lepidoptera: Sessidae), coccinia clearwing moth, was introduced into Saipan, and into Rota in September. While *A. coccinae* feeds on the gourd leaves, *M. oedipus* feeds inside the vine of the gourd.

Results

There are already signs of control by *A. coccinae* as indicated by the gourds leaves drying and falling off the vines. However, control by *M. oedipus* is not yet evident. *A. coccinae* is well established and is found practically everywhere the gourd is found. NMC-CREES entomology staff continue to rear *M. oedipus* in the laboratory and periodically release adult moths at areas that are heavily infested with the gourd.

4. Associated Knowledge Areas

KA Code	Knowledge Area
213	Weeds Affecting Plants
215	Biological Control of Pests Affecting Plants

Outcome #8**1. Outcome Measures**

Number of farmers learning best practice management to control or eradicate the Cuban Slug, *Veronicella cubensis*

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	10	15

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

The Cuban slug, *Veronicella cubensis* (Pfeiffer, 1840) is believed to have been introduced in 1994 from Guam to the island of Rota in the US Commonwealth of the Northern Mariana Islands, and has become a serious pest of local crops, impacting the island's agricultural and nascent ecotourism industries.

As a result of pest surveys conducted by R. Hollingsworth (ARS) and D.G. Robinson (APHIS PPQ) in 2004 and 2005 (supported by the FAS Scientific Cooperation Research Program), the spread of this serious pest is currently being documented in detail. Already well established in Guam and the Hawaiian Island chain, the Cuban slug has already invaded American Samoa, and has now been detected on some of the principal islands in the Federated States of Micronesia, and threatens other island groups in the American Pacific. It is also frequently intercepted on agricultural and horticultural commodities being imported from the Hawaiian Islands to the US mainland, especially California. Should the slug be introduced to the mainland, the southern tier of states, in particular California and the Gulf Coast states would be threatened.

In all life stages, the Cuban slug is macrophytophagous causing significant feeding damage to plants. It reportedly feeds on a variety of ornamental and agricultural commodities including hibiscus, orchids, sour sop, melon, pumpkin, pepper, eggplant, cabbage, cassava, taro, Polynesian arrowroot, sweet potato, yam, papaya, banana, star fruit, breadfruit, mango, noni, citrus, and coffee. Slugs can hitchhike on unwashed plants, produce, and containers used in agricultural trade. Current control measures for terrestrial mollusk pests employ the use of either liquid; granular, or pelletized bait formulations most of which contain the active ingredient metaldehyde. There are numerous different commercial formulations with varying concentrations of the active ingredients, making product selection a difficult process. There is currently limited information available on the efficacy of a few of these products against Cuban slug.

What has been done

A collaborative research between the USDA APHIS PPQ Eastern Region and NMC CREES, Rota with P.I.: Matthew Ciomperlik, PPQ CPHST PDDML, Edinburg, TX., David Robinson, USDA APHIS PPQ NIS, Philadelphia, PA. And Tim Stevens, USDA APHIS PPQ Eastern Region, Wilmington, NC was conducted on Rota on Developing control methods for Cuban Slug (*Veronicella cubensis*).

One of the principal factors in molluscicide efficacy in the field is the formulations ability to withstand breakdown of the pellet or granule due to rainfall. Our field tests were conducted during the 'rainy season' in Rota, which normally occurs from July through November (<http://www.cnmi-guide.com/info/main.html>). The list of molluscicide formulations was tested in the laboratory and field were: 1.) Metarex 2.) Durham granules 3.) Slug fest 4.) orcal Snail & Slug Bait 5.) Mesurool Pro 6.) Mesurool 75 W 7.) Sluggo.

Results of the laboratory bio-assays will provide useful information for either including or excluding specific formulations in the field trials. Those formulations that show little or no efficacy from the bio-assay trials will be excluded.

Apply the equivalent of the full label rate of the molluscicide into the field screen cages, and place either 15 to 30 Cuban slugs into each cage. Mortality will be recorded and dead snails will be removed from the cage every 24 hours. Each molluscicide treatment will be replicated four times. The number of available individuals, cages, space, etc may prove to be limiting factors in conducting this study; therefore replications may need to occur over time.

A workshop was conducted on Saipan and Rota to our extension agents and quarantine staff of the Department of Lands and Natural Resources on the proper identification, taxonomy and the result of the survey of Slug and Snail Pests on Subsistence and Garden Crops in the Islands of the American Pacific: Guam, and the Northern Mariana Islands; the Federated States of Micronesia; and American Samoa, with special reference to Samoa.

Results

Developing control methods for Cuban Slug (*Veronicella cubensis*) test results showed the most important information from the 48 hours tests showed that Bug-Getta, Metarex, Deadline MP, Durham Granules, Slug Fest, Orcal Bait, Sluggo-Fe to see which molluscicides really did the best job. Any of those that gave high mortality rates, greater than 80% mortality in the Field trials, especially at the 48 hour time interval, would be the best to suggest to use in our recommendations to land owners. This is a preliminary report going out to our extension agents that should be able to be incorporated into an extension document.

4. Associated Knowledge Areas

KA Code	Knowledge Area
214	Vertebrates, Mollusks, and Other Pests Affecting Plants

Outcome #9

1. Outcome Measures

Number of farmers implementing best practice management to control or eradicate the Cuban Slug, *Veronicella cubensi*

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	5	7

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The cuban slug has become a major agricultural pest on the island of Rota. Efforts must be made to avoid the spread of this invasive species from making its way over to the other islands of the Marianas.

What has been done

Currently, collaboration is being made with USDA APHIS to identify chemical methods of suppressing its damage on agricultural lands. USDA APHIS sent a group of mallacologists to evaluate the extent of the population on the island.

Results

USDA APHIS through its collaboration with NMC-CREES has identified that there are no current biological methods to suppress the widespread outbreak of the cuban slug. Such news has brought about major efforts at using chemical baits as a suppressant. A proposal was submitted to attempt several alternatives to suppress the population. The mentioned proposal has been awarded and work is underway to begin such efforts.

4. Associated Knowledge Areas

KA Code	Knowledge Area
216	Integrated Pest Management Systems
215	Biological Control of Pests Affecting Plants
214	Vertebrates, Mollusks, and Other Pests Affecting Plants

Outcome #10

1. Outcome Measures

Number of farmers learning methods of early detection of crop pests and diseases on their farms

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	10	12

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The CNMI is susceptible to many crop pests due to its climate being a haven for widespread population growth. NMC-CREES feels that farmers need to be equipped with the tools necessary to avoid population explosions. As such, NMC-CREES proposes to arm farmers with the ability to detect potential pests, hosts contributing to their population and identifying beneficial insects to combat these whenever possible.

What has been done

The NMC-CREES Plant protection program has trained and certified twenty one first detectors from Department of Lands and Natural Resources (DLNR) and NMC-CREES staff in the CNMI to be responders and teach the farmers to increase their capacity in diagnosing various arrays of problems that affect their farms.

Results

Participating farmers have witnessed dramatic increases in their production after learning methods on how to detect their pest problems in their farms. Such efforts include the set up of traps to identify which insect pests are prevalent. These farmers call our offices to report any new insects that they are unable to identify on hand. The participating farmers are now familiar with the life cycle of insects and which areas cause the most damage. Such abilities increase their capacity to make best management decisions.

4. Associated Knowledge Areas

KA Code	Knowledge Area
215	Biological Control of Pests Affecting Plants
214	Vertebrates, Mollusks, and Other Pests Affecting Plants
212	Pathogens and Nematodes Affecting Plants
216	Integrated Pest Management Systems
211	Insects, Mites, and Other Arthropods Affecting Plants

Outcome #11

1. Outcome Measures

Number of farmers using methods of early detection of crop pests and diseases on their farms

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	2	2

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Although are program continues to promote lessons targetting early detection, one must way which of these are being carried out to maximize our efforts. With Pesticide Safety Education Program workshops being offered, farmers are now equipped with the latest management strategies to help prevent disease and insect outbreak.

What has been done

Extension agents were given the opportunity for professional development through guided instruction from the University of Colorado and the Colorado State Department of Agriculture. Such professional development training emphasizes the need for increased understanding of potential outbreaks. Complimenting this training, staff have provided one on one visitations along the Marianas chain and have increased their efforts to create better understanding among PSEP certification seekers.

Results

2 participating farmers are now using insect traps along the perimeter of their farm plots. Of the two farmers one is using neem as a demonstration on botanical pesticides. This individual was awarded a Farmer Rancher Grant to develop and test different formulations of the botanical pesticide. Through his demonstration, we have noticed greater demand for this use by other PSEP attendees. We foresee that the number of indirect contacts is greater than what we have ever anticipated.

4. Associated Knowledge Areas

KA Code	Knowledge Area
212	Pathogens and Nematodes Affecting Plants
215	Biological Control of Pests Affecting Plants
211	Insects, Mites, and Other Arthropods Affecting Plants
216	Integrated Pest Management Systems

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

Our division was challenged with replacing some FTE's targeting this program area. On the island of Rota for example, we lost one tropical horticulturist with some of his time obligated to dealing with impending invasive species. Such a loss in faculty has resulted in increased workload for some of the IPM team members. The loss in staff and the failure to replace is due to competing public priorities.

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- Time series (multiple points before and after program)

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

Program #3

V(A). Planned Program (Summary)

1. Name of the Planned Program

Crop Improvement Program

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
202	Plant Genetic Resources	10%		10%	
204	Plant Product Quality and Utility (Preharvest)	40%		40%	
205	Plant Management Systems	50%		50%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2007	Extension		Research	
	1862	1890	1862	1890
Plan	1.5	0.0	1.8	0.0
Actual	1.0	0.0	2.5	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
14612	0	167312	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

The NMC-CREES Crop Improvement and Production team conducted several hands-on, in-farm seminars and workshops that focused on plant propagation and nursery management, soil analysis and nutrients, organic and inorganic fertilizers, composting, irrigation, promoting sustainable management practices in agriculture, variety trials and acquiring funding for the improvement of important staple crops, fruits and vegetables. Also, collaborative projects with USDA/ARS, Hawaii and Florida is underway for germplasm importation of fruit trees and regional institutions Secretariat of the Pacific Community (SPC), Fiji for the introduction of root crops and banana varieties produced through tissue culture. New research facility and projects in plant tissue culture is currently being implemented to provide pathogen-free planting material to the farming community in major staple crops.

The Crop Improvement Program received two hatch proposals on the introduction and field evaluations of banana, sweet potato and taro varieties through tissue culture. The proposals will be of good basal reference in venturing to a bigger project for the better development of the agriculture industry in the CNMI.

Demonstration plots on farm sites in the form of vegetable variety trials was performed in the three islands of the CNMI. A workshop on Soil, Nutrient, Pest, Irrigation/Fertigation Management was conducted on Rota and was attended by 35 stakeholders and has gain a great deal of knowledge and understanding about the quality of soil that enables it to supply the proper kind and amount of the elements needed for plant growth when other factors and soil characteristics are favorable.

2. Brief description of the target audience

- Government /Agency Collaborators
- All farm crop producers and farm helpers in the CNMI
- Business operators that promote or sell farm products
- Grade school, High School and College students
- Adult Volunteer Leaders (4-H Clubs)

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	100	500	100	500
2007	125	550	150	600

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

Patent Applications Submitted

Year	Target
Plan:	0
2007 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan			
2007	1	2	3

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of research projects completed on Crop Improvement Issues

Year	Target	Actual
2007	1	1

V(G). State Defined Outcomes**V. State Defined Outcomes Table of Content**

O No.	OUTCOME NAME
1	Number of households that begin to grow food in their own garden
2	Number of farmers that learn to use Organic agriculture production systems on farm
3	Number of farmers using Sustainable Agriculture techniques (best management practices) such as cover cropping, mulching, rotational grazing, no-till farming, composting, etc...

Outcome #1

1. Outcome Measures

Number of households that begin to grow food in their own garden

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	10	40

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The NMC-CREES Crop Improvement and Production Program has continued in conducting on-farm demonstration trials on the islands of Saipan, Rota, and Tinian with cooperating farmers. There was a remarkable increase in the number of cooperating farmers who has participated in this program. In hopes of improving vegetable crop production in the CNMI, we have increased numerous varieties for trials. The varieties chosen such as; head cabbage, cauliflower, broccoli, red bulb onion, tomatoes, sweet corn and cucurbits were tested pest and disease resistance as well as yield result. Rota farmers find vegetable production very difficult after the ban of more effective chemicals used to be readily available in the market. Today, many farmers totally abandon the production of leafy vegetables in favor of root crops such as taro and sweet potato. However, taro and sweet potato have their own special problems with nematode infestation. A collaborative project with a farmer and professionals from the University of Guam which aims to provide readily available alternative organic pest and nematode control in vegetable production with the use of Neem tree is on-going in Rota through WSARE farmer rancher grant. The first phase of the project has proven and convinced the farmer that organic pest control using neem extract from leaves at certain formulation can be successful on head cabbage and Chinese cabbage.

What has been done

The inter-island team collaboration contributed to the success of these programs through the continuous workshops, extension visits, and one-on-one sessions with the farmers. The new demonstration plot and farm is set up at the As Perdido Agriculture Experiment Station. The demonstration plot has over fifty new varieties of taro, sweet potato and banana produced through tissue culture.

Plant Health Extension serviced almost 150 farmers for 2007 in all the three islands. Client visitation and consultation are being done in regular basis that covers disease diagnosis, soil and nutrient management, soil analysis, disease prevention and treatment, composting and other related fields.

Results

The farmers learned various management practices and technique to increase their production. Extension agents increased their efforts in convincing farmers how to reduce labor costs, fuel for tillers and preparation time by using a prototype plow for planting vegetables in a larger area. This has resulted in an increase of the number of farmers interested to participate in this program. The farmers estimated revenue have increased by 40%, which apparently resulted from reduced pest damage and using a prototype plow. Promoting low-toxicity pesticides like Bacterial thurengiensis and Neem also reduces the risk of pesticide contamination and pest resistance to pesticides.

With the improvements in Plant Health services, it is estimated that crop production and efficiency have improved well.

Increasing number of farmers wanted to learn and venture grafting of fruit trees and nursery plant propagation of economically important and other staple crops. Farmers became aware of the potentials and strengths of grafting and tissue culture techniques. Number of farmers wanted to adopt sustainable agriculture practices to improve the soil, composting and nutrient management.

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems

204	Plant Product Quality and Utility (Preharvest)
202	Plant Genetic Resources

Outcome #2**1. Outcome Measures**

Number of farmers that learn to use Organic agriculture production systems on farm

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	2	35

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

The Commonwealth of the Northern Mariana Islands has had very minimal exposure to organic farming. The Crop Improvement Program stressed greater understanding of organic agriculture production systems to CNMI residents in this fiscal year.

What has been done

Demonstration plots on-farm sites in the form of vegetable variety trials were performed throughout the three populated islands of the CNMI. A workshop on Soil, Nutrient, Pest, Irrigation/Fertigation Management was conducted on the island of Rota in regards to this theme. This sponsored workshop was attended by 35 stakeholders showing strong promise of greater acceptance. This workshop was intended to entice local participants to use age old farming practices proven to have great success. Issues discussed include fertigation use, nutrient management, composting, and the use of soil analysis for making decisions on farms.

Results

Although we have had numerous attendance at workshops, we do not have a quantitative numbers at the present. Farmers are currently using some of the techniques learned, however none have been organically certified.

4. Associated Knowledge Areas

KA Code	Knowledge Area
202	Plant Genetic Resources
205	Plant Management Systems
204	Plant Product Quality and Utility (Preharvest)

Outcome #3**1. Outcome Measures**

Number of farmers using Sustainable Agriculture techniques (best management practices) such as cover cropping, mulching, rotational grazing, no-till farming, composting, etc...

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	2	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

NMC-CREES' primary goal is to promote a sustainable agriculture industry through scientific research. This project will use methods of conservation in order to establish a model farm for any CNMI farmer to have access to. This demonstration facility will serve as a hub for agriculture producers as well as for the general public to view and mimic in their farming and gardening endeavors.

What has been done

A Conservation Innovative Grant (CIG) entitled: `Modeling Resource Conservation Techniques through Innovative Farm Practices was approved and implemented in 2005 covering the period of 2006-2007. The project is intended to enhance agricultural profitability on the islands and to develop the As Per Dido Agriculture Experiment Station in a manner fitting modern agricultural trends and efficiency in production considered the benefits of both traditional and modern agricultural techniques with emphasis in the maximization of soil and water resources. 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 currently in progress. By using the no-till method, high labor input that comes with traditional farming methods is hoped to be saved. By implementing both farming methods, the general public will be given the opportunity to compare and contrast.

Results

Data collection is currently ongoing at the station. We foresee reporting such in the 2008 reporting period.

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

We did not experience any external factors that would hinder the progress of our projects for this fiscal year.

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- Time series (multiple points before and after program)

Evaluation Results

NMC-CREES continues to address key themes listed in Goal 1 by carrying out plans listed in our current 5 year Plan of Work.

The hiring of new research staff has increased our capacity this past fiscal year. We are currently working on two hatch projects and various competitive grants to improve program functionality. Although we are currently still acquiring data on the aforementioned projects, this increased capacity has brought about positive improvements. A new plant pathology lab fit with tissue culture capability is now functional. Another notable improvement is the current fertigation and chemigation capability at our As Perdido Experiment Station. Introduction of new affordable and efficient technology will likely support and continue the momentum of aggressiveness of farmers. Finding ways to lower cost of production is necessary for successful operation in the CNMI.

Key Items of Evaluation

Program #4

V(A). Planned Program (Summary)

1. Name of the Planned Program

Soil and Water Quality Program

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
102	Soil, Plant, Water, Nutrient Relationships	20%		20%	
111	Conservation and Efficient Use of Water	50%		50%	
403	Waste Disposal, Recycling, and Reuse	30%		30%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2007	Extension		Research	
	1862	1890	1862	1890
Plan	1.0	0.0	0.8	0.0
Actual	1.0	0.0	0.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
23337	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Demonstration/research project will be introduced as learning tools. To maximize the exposure of the demonstrations themselves, an educational video series will be produced whenever possible. Efforts will be made to either receive free or purchase airtime on the local cable TV station to maximize viewer exposure to the educational video series. Furthermore, a goal of this program will be to supply video rental stores with these educational videos for increased viewer numbers. Still photography will also be used to document research and demonstration projects for use in publications (brochures and fact sheets) and presentations to be produced and dissemination through informational seminars and lectures. Farmer-type gatherings such as association meetings, soil and water conservation district meetings and forums will be targeted. Students from the grade school, high school and college will also be involved in activities and presentations when ever possible.

2. Brief description of the target audience

- Government /Agency Collaborators
- All farm crop producers and farm helpers in the CNMI
- Business operators that promote or sell farm products
- Grade school, High School and College students
- Adult Volunteer Leaders (4-H Clubs)

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	100	500	100	500
2007	124	200	75	525

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

Patent Applications Submitted

Year	Target
Plan:	0
2007 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan			
2007	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of research projects completed on Soil and Water Quality Issues

Year	Target	Actual
2007	0	0

V(G). State Defined Outcomes**V. State Defined Outcomes Table of Content**

O No.	OUTCOME NAME
1	Number of households recycling aluminum cans or other recyclable commodities such as paper and plastic
2	Number of households learning to safely use Rain-catchments systems
3	Number of farmers using Dry Litter Waste Management Systems for Hogs
4	Number of farmers or members of the community learning to compost animal wastes, yard scraps, etc...
5	Number of farmers using Sustainable Agriculture techniques (best management practices) such as cover cropping, mulching, rotational grazing, no-till farming, composting, etc...

Outcome #1**1. Outcome Measures**

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

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	15	20

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Solid waste management on small Pacific Islands remains as a challenge to Municipalities due to the intrinsic costs associated with such activity, limited land availability, and a limited capacity to recycle and reuse items of value that have been discarded into the solid waste system. Many islands continue to use open refuse dumps that are in a continuous state of burning and leaching, posing a significant threat of contamination of soil, air, and water resources on the islands. Inevitably, contamination of these vital resources will have a detrimental effect on the local environment and the health and safety of local residents. Program activities have been related to outreach, education and capacity building to facilitate community recycling and reuse of materials, diverting them away from landfills and dumps.

What has been done

Recycling education and outreach efforts continued at all major public events on the island of Tinian including the Tinian Fiesta, Tinian hot pepper festival and others. At these events, and other events such as family parties, students from the High School environmental club or Northern Marianas College Service Learning group organizes the bin distribution at these events and performs the task of announcing to the guests regarding recycling efforts and how to recycle. Furthermore, the HS environmental club has recorded two of 5 radio advertisements that will soon be played on the radio throughout the CNMI.

Results

Thousands of pounds of Aluminum and other recyclables are now being diverted from the Dump on Tinian. Many households now recycle aluminum cans and other materials. Currently, a minimum of 20 households are actively separating aluminum cans and other materials to be recycled.

4. Associated Knowledge Areas

KA Code	Knowledge Area
111	Conservation and Efficient Use of Water

Outcome #2**1. Outcome Measures**

Number of households learning to safely use Rain-catchments systems

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	2	2

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

The CNMI gets an annual rainfall of 42 inches per year representing a huge resource that exists and underutilized in the area. Furthermore, water quality and quantity issues plague the islands as water reservoirs are limited in size and very vulnerable to contamination.

What has been done

Rain-catchments outreach efforts continued this year through efforts to inform the public about the use of rain catchments for animal shelters such as piggeries and such. Furthermore, the Water Quality team has prepared and distributed rain catchment safety materials as events such as the NMC-CREES open house, Department of Environmental Quality Expo, and at other venues.

Results

No results are currently available regarding the number of households that are currently using rain catchments.

4. Associated Knowledge Areas

KA Code	Knowledge Area
111	Conservation and Efficient Use of Water
403	Waste Disposal, Recycling, and Reuse

Outcome #3**1. Outcome Measures**

Number of farmers using Dry Litter Waste Management Systems for Hogs

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	2	5

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Water resources on the islands are limited in quantity and are at a great risk of becoming contaminated by animal waste run-off coming from piggeries. Leptosporosis, which can exist in pig waste and can be distributed via piggery runoff, poses a threat to human health as has been observed in Samoa.

What has been done

As an alternative to the conventional spray out system for swine waste management, the dry litter waste management system for hogs has been promoted to protect surface and groundwater resources from contamination and provide farmers with a useful fertilizer, compost, for crop production. In 2007 the Palau piggery demonstration was completed and is prepared for utilization and documentation for inclusion into the piggery bliss video, which will soon be disseminated across the region. Agents also participated in the design of a dry piggery that has been constructed in Guam. Furthermore, agents participated in the design and promotion of the dry system which has resulted in two farmers who have applied for assistance under the NRCS EQIP program to facilitate the construction of dry piggery waste management systems on their farms.

Results

As it stands, now there are 5 farmers utilizing the Dry Litter waste management system for hogs. With two more currently in the design stage.

4. Associated Knowledge Areas

KA Code	Knowledge Area
403	Waste Disposal, Recycling, and Reuse
102	Soil, Plant, Water, Nutrient Relationships

Outcome #4

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	15	12

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Due to the heavy rainfall received here in the islands during rainy season or storm events, erosion is a major issue as soils are swept into the ocean during periods of heavy rainfall. This activity has the potential to suffocate corals at the receiving end of watersheds and reduce agriculture production on lands where run-off is most heavy.

What has been done

Composting demonstrations continued this year with the utilization of waste materials from the dry litter piggery demonstration and tree litter generated from the fruit tree repository. The compost demos are visited by farmers, gardeners and students at any time, but certainly during the NMC-CREES Open house, field days and other events.

Results

There are at least 12 households and farms that have begun to compost yard scraps and/or animal waste materials instead of the traditional method of removal, dumping or burning.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
403	Waste Disposal, Recycling, and Reuse

Outcome #5

1. Outcome Measures

Number of farmers using Sustainable Agriculture techniques (best management practices) such as cover cropping, mulching, rotational grazing, no-till farming, composting, etc...

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	2	25

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Soil structure improvement and increase soil fertility can greatly improve agriculture production and protect soil and water resources through the use of sustainable agriculture practices.

What has been done

Conservation practices such as pasture management, composting, animal waste management, mulching and other techniques have been promoted at various events and through one on one consultation with farmers.

Results

A minimum of 15 farmers, ranchers, and gardeners have begun to use sustainable agriculture practices as a result of outreach and demonstration efforts.

4. Associated Knowledge Areas

KA Code	Knowledge Area
111	Conservation and Efficient Use of Water
102	Soil, Plant, Water, Nutrient Relationships
403	Waste Disposal, Recycling, and Reuse

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

There were no external factors that affected the outcomes this reporting period.

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- Before-After (before and after program)
- During (during program)

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

Program #5

V(A). Planned Program (Summary)

1. Name of the Planned Program

Expanded Food and Nutrition Education Program (EFNEP)

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
703	Nutrition Education and Behavior	45%		45%	
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	10%		10%	
724	Healthy Lifestyle	45%		45%	
Total		100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2007	Extension		Research	
	1862	1890	1862	1890
Plan	8.0	0.0	0.0	0.0
Actual	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}

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

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

V(D). Planned Program (Activity)

1. Brief description of the Activity

All EFNEP Activities were funded by Smith Lever 3D and have a separate reporting.

2. Brief description of the target audience

All EFNEP Activities were funded by Smith Lever 3D and have a separate reporting.

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
2007	0	0	0	0

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

Patent Applications Submitted

Year	Target
Plan:	0
2007 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan			
2007	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Output Target: Number of presentations and classes to be held.

Year	Target	Actual
2007	20	0

V(G). State Defined Outcomes**V. State Defined Outcomes Table of Content**

O No.	OUTCOME NAME
1	Increase physical activity among families who enroll in EFNEP (at least 30 minutes of moderate intensity activity most days of the week);
2	Increased quality of diets, including the increased consumption of locally grown produce;
3	Increased food security among economically challenged households
4	Increase participation in our program, as well as other programs offered by our internal and external linkages.

Outcome #1**1. Outcome Measures**

Increase physical activity among families who enroll in EFNEP (at least 30 minutes of moderate intensity activity most days of the week);

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	80	0

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

All EFNEP Activities were funded by Smith Lever 3D and have a separate reporting.

What has been done

All EFNEP Activities were funded by Smith Lever 3D and have a separate reporting.

Results

All EFNEP Activities were funded by Smith Lever 3D and have a separate reporting.

4. Associated Knowledge Areas

KA Code	Knowledge Area
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins
703	Nutrition Education and Behavior
724	Healthy Lifestyle

Outcome #2**1. Outcome Measures**

Increased quality of diets, including the increased consumption of locally grown produce;

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	80	0

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

All EFNEP Activities were funded by Smith Lever 3D and have a separate reporting.

What has been done

All EFNEP Activities were funded by Smith Lever 3D and have a separate reporting.

Results

All EFNEP Activities were funded by Smith Lever 3D and have a separate reporting.

4. Associated Knowledge Areas

KA Code	Knowledge Area
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins
724	Healthy Lifestyle
703	Nutrition Education and Behavior

Outcome #3

1. Outcome Measures

Increased food security among economically challenged households

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	80	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

All EFNEP Activities were funded by Smith Lever 3D and have a separate reporting.

What has been done

All EFNEP Activities were funded by Smith Lever 3D and have a separate reporting.

Results

All EFNEP Activities were funded by Smith Lever 3D and have a separate reporting.

4. Associated Knowledge Areas

KA Code	Knowledge Area
724	Healthy Lifestyle
703	Nutrition Education and Behavior
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

Outcome #4

1. Outcome Measures

Increase participation in our program, as well as other programs offered by our internal and external linkages.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	80	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

All EFNEP Activities were funded by Smith Lever 3D and have a separate reporting.

What has been done

All EFNEP Activities were funded by Smith Lever 3D and have a separate reporting.

Results

All EFNEP Activities were funded by Smith Lever 3D and have a separate reporting.

4. Associated Knowledge Areas

KA Code	Knowledge Area
724	Healthy Lifestyle
703	Nutrition Education and Behavior
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

All EFNEP Activities were funded by Smith Lever 3D and have a separate reporting.

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- Before-After (before and after program)
- Other (process evaluation)

Evaluation Results

All EFNEP Activities were funded by Smith Lever 3D and have a separate reporting.

Key Items of Evaluation

All EFNEP Activities were funded by Smith Lever 3D and have a separate reporting.

Program #6

V(A). Planned Program (Summary)

1. Name of the Planned Program

CNMI Families, Youth and Communities Enrichment Program

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
801	Individual and Family Resource Management	40%		0%	
802	Human Development and Family Well-Being	10%		0%	
806	Youth Development	50%		0%	
	Total	100%		0%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2007	Extension		Research	
	1862	1890	1862	1890
Plan	10.0	0.0	0.0	0.0
Actual	4.0	0.0	0.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
122622	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

This past fiscal year brought about positive results. A proposal was formed and submitted to Farm Service Agency to provide training opportunities to Rota residents. As a result of such collaboration the program was awarded \$3,000.00 to conduct such. This micro-grant was used to conduct a 4 day workshop on Marketing and Value Added of underutilized crops. 36 individuals participated in this event and found such topics to be useful in future endeavors. Participants were composed of staff, small scale farmers and other interested individuals from the business community.

The CRD program also targetted activities that cover SAFE home canning and food preservation. The CRD Program conducted 4 Mini hands-on-mini workshops entitled Making Mango Jam. These workshops took place during our local mango season but limited its number of participants to 18 due to limited space availability.

The Sewing Classes for Beginners are now offered on the islands of Saipan, Tinian and Rota. 362 individuals enrolled. The Program required students to successfully complete 12 sewing projects in order to graduate and be issued a Certificate of Successful Completion. 204 students completed 6 to 9 of their sewing required projects and were not issued certificates. 95% of them will return sometime in 2008 to complete the requirements and are determined to obtain a Certificate. 158 successfully completed the 12 requirements and walked away with a Certificate of Successful Completion but also with their very own sewing machines. The sewing machines were purchased from money earned through fund raising. The sewing machine will enable the students to continue applying the many skills and valuable knowledge that they have learned through their participation in the program. Some students claimed to have saved over \$300.00 on back-to-school clothing and further claimed that their children's outfits are more durable, unique and look more expensive compared to those purchased from department stores.

In 2007, the 4-H Youth Development Program reached 2,500 youth through several activities, mini projects/workshops, summer camps and after school programs. Topics and activities included leadership skills, self-esteem, goal setting/time management, team building, physical activities, arts and crafts, stenciling, nutrition, life skills and character building (citizenship, respect, responsibility, respect, caring trustworthiness, and values).

The 4-H program conducted its first after school program in the community youth center. Participating youths were between ages 8 and 14. Based on the evaluation/survey from the after school program, 100% of the participants enjoyed the activities (self-esteem, team building, character building, physical activities and life skills). 85% said they are want to return next school year, 15% were advancing to the junior high level. Some of the participants' parents were very appreciative of the after school program and mentioned that they want their kids involved in more structured programs such as these in their community.

2. Brief description of the target audience

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

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	200	1000	1000	3000
2007	700	3000	2500	3500

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

Patent Applications Submitted

Year	Target
Plan:	0
2007 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan			
2007	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

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

Year	Target	Actual
2007	175	272

Output #2

Output Measure

- Number of 4-H Clubs established in the CNMI

Year	Target	Actual
2007	3	4

V(G). State Defined Outcomes**V. State Defined Outcomes Table of Content**

O No.	OUTCOME NAME
1	Number of participants completed workshop and training on home canning and food preservations.
2	Number of participants applying knowledge gained. (Home canning and food preservation)
3	Number of youths and adults successfully completing the Sewing for Beginners on the islands of Saipan, Tinian and Rota.
4	Number of youth and adults applying knowledge gained and sewing for their families.
5	Number of youths and adults completing workshops on Youth and Adult Money Management.
6	Number of youths and adults applying knowledge gained.
7	Number of Adult Volunteers Recruited.
8	Number of Youth Participating in the 4H/Youth Development Program

Outcome #1**1. Outcome Measures**

Number of participants completed workshop and training on home canning and food preservations.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	100	115

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Participants who completed the Value Added and SAFE Food Preservation Workshops/Hands-on-Demo were glad that they made time to attend these workshops. They further claimed that over flooding of vegetables and fruits, especially mango are now put into use and some profited by selling pickle vegetable and mango jam at the Street Markets and Farmers Market. A good 80% of the participants appreciated the many hands-on-demo on food preservation and claimed to passed what they have learned to close friends and relatives.

What has been done

The CRD program targetted activities that cover SAFE home canning and food preservation. The CRD Program conducted 4 Mini hands-on-mini workshops entitled Making Mango Jam. These workshops took place during our local mango season but limited its number of participants to 18 due to limited space availability. Locally grown fruits and vegetables that would have flooded the local retail stores are now processed for family consumption and sometimes sold to supplement the family income.

Results

Flooding of locally grown fruits and vegetables in retail stores and farmers markets has decreased. The weekly Thursday Night Street Markets continue to promote cooked fiesta/local food, arts and crafts, fresh locally grown fruits and vegetables. There is an increase display of value-added products. Such as processed jams, jellies, preserves, pickles, preserved vegetables and hot chili sauces.

4. Associated Knowledge Areas

KA Code	Knowledge Area
801	Individual and Family Resource Management
806	Youth Development

Outcome #2**1. Outcome Measures**

Number of participants applying knowledge gained. (Home canning and food preservation)

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	50	115

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Each year CNMI farms continue to produce fruits and vegetables that often go to waste because of viability issues. The program sees a need to respond to the overflooding of commercially viable agricultural commodities on the islands. As such, we ventured into providing the public with a venue to learn techniques at improving the shelf live of such commodities.

What has been done

115 or all of our participants claimed to be applying the knowledge that they gained. 10 of our participants who have been selling their processed hot pepper sauce/paste, sweet potatoes chips and jams claimed that they benefited and gained new knowledge from the Marketing and Value-Added workshops that they attended. They claimed to have applied they knowledge gained (values-added)to their products but yet, could not increased their prices due to CNMI bad economy. 40% of our participants have agreed and decided to improve the designed on their product and to also include the nutritional content and value. A good number of our participants who were strictly processing for family consumption are now more confident to market their processed items at the Street Markets to supplement their family income.

Results

There is evidence of a decreased flooding of locally grown fruits and vegetables in retail stores and farmers markets. The weekly Thursday Night Street Markets continue to promote fiesta or local food, arts and crafts, fresh locally grown fruits and vegetables. NMC-CREES is venturing into establishing a Community Kitchen and the Northern Marianas Housing Authority recognized the need and offered to allow NMC-CREES to utilize one of their vacant units on Saipan.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development
801	Individual and Family Resource Management

Outcome #3

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	150	184

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

CNMI residents continue to see a decline in the job opportunities being offered locally. This is due to the cost of living showing a continuous rise while wages remaining at a stand still. As such the CRD program sees a need to decrease dependence on store bought garments by teaching the trait of sewing to homemakers throughout the CNMI.

What has been done

A total of 184 student were taught basic sewing skills through community courses sponsored by the CRD program throughout the three most populated islands of the Commonwealth.

Results

Of the 184 students that graduated from the Sewing Class Program. 158 were adults and also took the initiative to own their very own sewing machines. Owning a sewing machine will enable the students to continue applying the skills and valuable knowledge that they have learned. Students sewed their children back-to-school cloths and claimed to have saved an average of \$300.00. Some students have come to use such knowledge for economic gain by performing minor adjustments such as replacing zippers and charge 75 cents to a 1.00 per service.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development
801	Individual and Family Resource Management

Outcome #4

1. Outcome Measures

Number of youth and adults applying knowledge gained and sewing for their families.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	75	184

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Our stakeholders continue to see a rise in the cost of living on the islands. As such the program sees a need to increase vocational capacity in order to assist its clientel.

What has been done

The program held community courses targeting beggining sewers throughout the three populated islands of the CNMI.

Results

158 adult students graduated and own their very own sewing machines. They continue to apply the skills and knowledge learned. 26 youth completed the Summer Youth Sewing Program and received a Certificate of Successful Completion. These youths are able to replace buttons, do simple hemming and embroidery. Adults notice big savings for clothing on their family budget and the majority of students have expressed an interest in taking Advanced Sewing Classes.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development
801	Individual and Family Resource Management
802	Human Development and Family Well-Being

Outcome #5**1. Outcome Measures**

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

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	100	305

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

CNMI residents continue to experience a hike in every aspect of their surroundings. As such, the program intend to confront such a dilemma through the instruction of family financial management.

What has been done

Participants have been taught how to develop a weekly, bi-weekly and a monthly budget. They are taught to distinguish the different between an income and expense as well as a need and a want. Food Stamp (NAP)recipients learned how to shop wisely and budget their NAP coupons to last until their next issuance. They are taught how to balance their checking account and the importance of savings. One Youth Money Management Workshop activity is for the participants to make and maintain a piggy bank. Participants made piggy banks from cans and plastic containers. Some even built a small wooden birdhouses as their piggy banks. Participants are asked to report the amount saved and report the opening and closing date of their deposits. 305 participants attended the Youth and Adult Money Management and gained new knowledge in the process. Youth attended the workshops as part of their after school or weekend activities. Majority of our Adults attended the Family Financial Management workshops because they were referred by agencies such as; Division of Youth Services, Probation and Parole Office and from the Food and Nutrition Program.

Results

Majority of our participants now go shopping with a written shopping list. Food Stamp (NAP)recipients learned how to shop wisely and budget their NAP coupons to last until their next issuance. Majority of our participants took the 'Pay Yourself First' concept seriously. This is simply depositing money into your savings account and treating it as a Fixed Loan Payment Obligation. 85% of our participants claimed to have established an allotment for less than \$5.00 to their savings account and a good number of them refused to accept an ATM card. Out of the 26 youths, 7 reported to have saved over \$200.00 within a one year period. Average savings reported for the rest was \$78.00. We have a waiting list of Youth who would like to attend the Youth Money Management workshop.

4. Associated Knowledge Areas

KA Code	Knowledge Area
801	Individual and Family Resource Management
806	Youth Development

Outcome #6**1. Outcome Measures**

Number of youths and adults applying knowledge gained.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	50	305

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

305 Money Management Workshops participants claimed to have gained new knowledge and continue to apply the knowledge learned. 80% have a written list of items needed when they go shopping. Not everyone of them stick to their shopping list but still claimed to spent less. 90% do their shopping during weekends when groceries are on discount. 60% actually established a joint savings account and allot not more than \$5.00 into their savings account on a bi-weekly bases.

What has been done

Majority of our participants took the 'Pay Yourself First' concept seriously. This is simply depositing money into your savings account and treating it as a Fixed Loan Payment Obligation. 10 of the Youths used the money from their piggy banks and bought gifts for their siblings and parents. 3 youth reported to have collected over \$60.00 and had their parents build a bigger piggy bank. They redeposited their collections and decided to wait for another year then they will decided what to use their money for. Note: Piggy banks are available in many department stores but we feel that if they build their own or have their parents involved then they will value it more.

Results

100% of our participants claimed that they are spending less since they started applying the simple lessons that they learned from our Money Management Workshop. The 60% who actually opened a savings account for the first time claimed that not accepting the ATM card was a smart decision.

4. Associated Knowledge Areas

KA Code	Knowledge Area
801	Individual and Family Resource Management
806	Youth Development
802	Human Development and Family Well-Being

Outcome #7

1. Outcome Measures

Number of Adult Volunteers Recruited.

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	5	27

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

90% of the adult volunteers agreed to be on an on-call status. Adult volunteers conducted a number of Arts and Home Crafts workshops. They supervised and prepared healthy snack for our youth participants and always the last to leave the activities.

What has been done

A Certificate of Appreciation for their valuable Time and Contribution is presented to new and adult volunteers after every workshops that they participated. These certificates are not just signed by our Program Director but by the Program Dean and College President.

Results

Recruiting volunteers for one-time event never seem to be a problem. CRD Program and 4-H/Youth Development Program required long term volunteers to obtain a Police Clearance especially if they will be dealing with Youths.

4. Associated Knowledge Areas

KA Code	Knowledge Area
801	Individual and Family Resource Management
806	Youth Development

Outcome #8

1. Outcome Measures

Number of Youth Participating in the 4H/Youth Development Program

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	2500	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Several mini projects/workshops,and summer camps. The 4-H program conducted it's first after school program in the community.

Results

100% of the participants enjoyed the activities and the mini workshops topics, 85% said they would return the following year. 95% said they enjoyed the physical activities, especially the team building games. The after school program participants' parents mentioned that they liked the program because it was more structured.

4. Associated Knowledge Areas

KA Code	Knowledge Area
801	Individual and Family Resource Management
802	Human Development and Family Well-Being
806	Youth Development

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

The only external factor that hindered implementation of some of our approved activities was bad weather such as Super Typhoon. The other contributing factors were as a result of unscheduled power/water outages, which leaved us with no other alternative but to cancel or reschedule workshops or on-going activities.

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- After Only (post program)
- Before-After (before and after program)
- Other (ES 237)

Evaluation Results

The CNMI Families, Youth and Communities Enrichment Program mainly use the "Before-After (before and after program) for its Evaluation/Measurement tool.

Majority of our participants were referral from public agencies such as;DYS, NAP, Probation and non-profit social services. Also, 90% are within the low-income bracket and a good number of them never get a chance to graduate from high school. They usually walk into our programs not knowing what to expect. This behavior alone is a positive indicator because when they will leave the training, workshops, classes, hands-on-demos, they always noted that they learned new skills and gained valuable knowledge as well.

Key Items of Evaluation

Telephone survey is very effective and this approach also enable us to get more information than what we really needed.

The three most populated islands of Saipan, Tinian and Rota are small and it is not surprising if you bumped into the same person three to five times within one week. Another very effective approach is to just walked up to a clients and start an informal conversation and then gradually asked questions relating to those in our standard survey questions. We usually wait six months before we try to touch base with clients on a one-to-one bases. CNMI Cultural events, Annual Agricultural Fair, Thursday Night Street Markets and even during the weekend Sabalu (Saturday) Farmers Market are excellent in meeting clients for they usually bring the entire family to enjoy free entertainments.

Program #7

V(A). Planned Program (Summary)

1. Name of the Planned Program

Diet, Physical Activity, and Health

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
703	Nutrition Education and Behavior	50%		0%	
724	Healthy Lifestyle	50%		0%	
	Total	100%		0%	

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2007	Extension		Research	
	1862	1890	1862	1890
Plan	1.5	0.0	1.0	0.0
Actual	2.5	0.0	0.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
39635	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

The Diet, Physical Activity, and Health Program (DPAH) personnel have been actively raising awareness about how non-communicable disease in the CNMI negatively affect the individual, the community, the economy, and place undue strains on the CNMI's medical services. Furthermore, DPAH has sought to educate the public on how improving diet, specifically increasing fruit and vegetable consumption, and physical activity contribute to preventing the incidence of NCDs in the CNMI. Presentations on the aforementioned topic areas have been made to various government agency and private sector representatives, non-profit groups, congressmen, senators, educators, parents, and elementary school, junior high school, high school, and college students. At community events, informational exhibits with food demonstrations have also been an effective way to raise awareness and encourage people to improve the nutritional quality of their diets.

In 2006 to 2007, DPAH in partnership with the Department of Public Health-Diabetes Prevention and Control Program (DPCP) met several times to discuss the preliminary structure and plans for the first meeting of the proposed CNMI Non-Communicable Disease Control Task Force. In August 2007, DPAH and DPCP hosted the first CNMI Non-Communicable Disease Control Task Force meeting. Over 20 people from various government, non-government, and non-profit agencies/organizations attended the event. The group decided that the name "Health Promotion Council" (HPC) would better describe the workings that we planned to undertake. The HPC brainstormed various ways to address a broad spectrum of NCD-related issues, primarily through prevention efforts such as promoting healthier eating, physical activity, workplace wellness, and policies and laws that build and environment and culture that are conducive to healthy living. The HPC also discussed the necessity of having a document/plan to guide the group's efforts. In mid-2008, the HPC will write the CNMI Health Promotion Council's 5 Year Strategic Plan.

2. Brief description of the target audience

The target audience includes the general public, elementary to high school students, and their parents. Particular emphasis will be paid on areas of the islands that have a majority of its' residence at or below the poverty level. Taking into consideration social-economic status, educational attainment, and lifestyle (diet, physical activity, tobacco) the majority of the general population can be considered "at risk".

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	75	1000	100	1000
2007	1200	2000	350	300

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

Patent Applications Submitted

Year	Target
Plan:	0
2007 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan			
2007	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Diet, Physical Activity, and Health

Year	Target	Actual
2007	3	3

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	Development of Physical Activity Social Marketing Campaign (PASMIC)

Outcome #1**1. Outcome Measures**

Development of Physical Activity Social Marketing Campaign (PASMC)

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	1	0

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

According to the WHO, per capita the Northern Mariana Islands has the third highest rate of Type II Diabetes in the world. According to the CNMI Department of Public Health, 8.8 million is spent annually on hemodialysis. Diabetes and uncontrolled blood pressure take up the majority of health care spending, whereas other lifestyle-related conditions such as stroke and heart disease are also rampant in the CNMI.

What has been done

Plans have been made to write a 5 Year Strategic Plan that will guide the various aspects of the HPC. Personnel from the World Health Organization and the Secretariat of the Pacific Community will facilitate the writing process. Members have already started brainstorming ideas that they would like to be considered for inclusion in the document.

Results

Sixty (60%) of those who attended the Health Promotion Council meetings stated that they are now aware of the burden that NCDs has on the Northern Mariana Islands. Ninety (90%) of HPC members stated that they will be directly involved with the writing of the plan. Of that 90%, 70% will work directly towards the plans implementation. At least five additional agencies/organizations have stated that they would also like to join the HPC.

4. Associated Knowledge Areas

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

V(H). Planned Program (External Factors)**External factors which affected outcomes**

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Competing Public priorities
- Competing Programmatic Challenges
- Other (Stakeholder's input differs from original plan)

Brief Explanation

Currently, no baseline data exists on adult physical activity in the CNMI. DPAH had discussed with its stakeholders, plans to use the International Physical Activity Questionnaire to collect baseline data on adult physical activity in the CNMI. Stakeholders informed us that the Department of Public Health (DPH) had planned to conduct a similar survey using the World Health Organization's "STEPwise approach to Surveillance" (STEPS). It was determined that a better approach would be for the DPH to share the data results with DPAH in order to provide the baseline data around which the Physical Activity Social Marketing Campaign could be designed and evaluated.

In summation, this goal has not yet been reached.

V(l). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- Before-After (before and after program)
- Other (process evaluation)

Evaluation Results

Key Items of Evaluation