

V(A). Planned Program (Summary)

Program # 9

1. Name of the Planned Program

Aquaculture and Fisheries Development Program

Reporting on this Program

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

| KA Code | Knowledge Area | %1862 Extension | %1890 Extension | %1862 Research | %1890 Research |
|---------|--|-----------------|-----------------|----------------|----------------|
| 102 | Soil, Plant, Water, Nutrient Relationships | 30% | | 30% | |
| 111 | Conservation and Efficient Use of Water | 30% | | 30% | |
| 112 | Watershed Protection and Management | 10% | | 10% | |
| 135 | Aquatic and Terrestrial Wildlife | 30% | | 30% | |
| | Total | 100% | | 100% | |

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

| Year: 2012 | Extension | | Research | |
|--------------------------|-----------|------|----------|------|
| | 1862 | 1890 | 1862 | 1890 |
| Plan | 2.0 | 0.0 | 1.0 | 0.0 |
| Actual Paid Professional | 1.2 | 0.0 | 0.8 | 0.0 |
| Actual Volunteer | 4.0 | 0.0 | 0.0 | 0.0 |

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

| Extension | | Research | |
|---------------------|----------------|----------------|----------------|
| Smith-Lever 3b & 3c | 1890 Extension | Hatch | Evans-Allen |
| 0 | 0 | 0 | 0 |
| 1862 Matching | 1890 Matching | 1862 Matching | 1890 Matching |
| 34176 | 0 | 29951 | 0 |
| 1862 All Other | 1890 All Other | 1862 All Other | 1890 All Other |
| 406000 | 0 | 0 | 0 |

V(D). Planned Program (Activity)

1. Brief description of the Activity

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

1. As a result of program personnel continuing their extension efforts, a CNMI businessman has expanded his infrastructure significantly to increase the overall yield of his farming operation. Such an investment not only will quadruple the individual's yield from 5 tons of tilapia to 20 tons annually, it address USDA-NIFA's goal focused on "food security." This expansion quantitatively illustrates the value of the program to CNMI stakeholders.

2. Due to our continued efforts at finding "the unconventional" client, the Municipality of Rota successfully solicited funding from the U.S. Department of Interior (DOI) to train 5 of their field personnel in the area of Aquaponics (the integration of Aquaculture and Hydroponics). The said individuals recieved certificates of completion from the Oceanic Institute, a research based organization affiliated with Hawaii Pacific University in Honolulu, Hawaii. The goal of such an endeavor is to equip the end user with the skills necessary for a successful industry. Partnering with the Rota Mayor is a clear indication that this industry has the support of policy makers and farmers alike.

3. As part of the Department of Interior's goal of addressing human resource scarcity in the islands and a direct follow up on the outcomes listed from their sponsored Economic Summit in which agriculture was recorded as being one of two key areas of promise when industries were tirelessly considered. Such considerations were made due to our geographic displacement from the contiguous United States, our small population demographic, and historically dependent need for outside commodities. With this as our overarching situation, AFDP collaboratively sought funding from the DOI through means of working with the CNMI Aquaculture Producers Association (CAPA), a non-profit organization comprised of farmers sharing resources to ensure success. This successful partnership has netted the industry not only the much needed financial resources, but also a trained aquaculture workforce totalling 16 (8 on Saipan and 8 on Rota), by means of a rigorous training course at the AFDP wet laboratory, an online course from the University of Hawaii's Aquaculture Training Online Learning (ATOL) program, and hands-on applications at various farms on the islands.

4. Competitive funding was also acquired from Western Sustainable Agriculture Research Education (WSARE) to provide fisheries management training opportunities to fishermen from Rota. The objective behind such is two pronged: Educate potential opponents within industry through educating them that aquaculture and fishing can co-exist; Train potential industry stakeholders in order to steadily migrate them over from fishing to aquaculture as signs of wild overharvesting continue to rise and make their way over to the Pacific. By means of WSARE funding considerations the AFDP was able to train 5 fishermen at the Harbor Branch Research Institute, a division of Florida Atlantic University on fish management, fish health, and the techniques of running a successful aquaculture operations.

The following are other noteworthy activities performed during this reporting period:

- Presentations at various outlets (Natural Resource Management Class, Association of Pacific Island Legislators, etc)
- Professional development for staff to be in tuned with industry advancements (Marine Finfish Hatchery Methodology, Fish Culture, etc.)
- Sponsored Internships (National Institute of Health, Caribbean and Pacific Consortium, Department of Interior, etc.)
- Client Visitations (Follow up recommendations, Appointments, General inquiries, etc.)
- Workshops Conducted (Aquaculture Workforce Development Project, Aquaponics Production on Rota, Marine Finfish Species Selection, Aquaculture for Beginners- Students from College of Micronesia)

2. Brief description of the target audience

Youth and Adult
 Aquaculture Producers
 Government Agencies
 Non Governmental Organizations
 Business Community
 Retirees looking at new investment

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

| 2012 | Direct Contacts Adults | Indirect Contacts Adults | Direct Contacts Youth | Indirect Contacts Youth |
|---------------|------------------------|--------------------------|-----------------------|-------------------------|
| Actual | 750 | 2000 | 259 | 600 |

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

Patent Applications Submitted

Year: 2012
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

| 2012 | Extension | Research | Total |
|---------------|-----------|----------|-------|
| Actual | 0 | 0 | 0 |

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of aquaculture workshops

Year Actual

2012 4

Output #2

Output Measure

- Number of aquaculture research project

| Year | Actual |
|-------------|---------------|
| 2012 | 0 |

Output #3

Output Measure

- number of short course/training

| Year | Actual |
|-------------|---------------|
| 2012 | 3 |

Output #4

Output Measure

- Number of aquaculture demonstration project

| Year | Actual |
|-------------|---------------|
| 2012 | 4 |

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

| O. No. | OUTCOME NAME |
|--------|---|
| 1 | Number of farmers familiar with Recirculating Aquaculture Systems |
| 2 | Number of farmers learning how to use locally available ingredients in the on-island production of feed |
| 3 | Number of youths familiar with aquaculture and aquaponics |
| 4 | Number of individuals that will venture into aquaculture |

Outcome #1

1. Outcome Measures

Number of farmers familiar with Recirculating Aquaculture Systems

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

| Year | Actual |
|------|--------|
| 2012 | 150 |

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

As the CNMI is primarily made up of soils that percolate at a quick rate, the Recirculating Aquaculture System (RAS) is the most feasible option for our industry.

What has been done

Training courses, workshops, online course training offered by our partners were some of the steps taken at increasing knowledge of RAS.

Results

As a result of our ongoing efforts a Saipan farmer is now capable of producing 40 tons of tilapia annually.

4. Associated Knowledge Areas

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

Outcome #2

1. Outcome Measures

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

Not Reporting on this Outcome Measure

Outcome #3

1. Outcome Measures

Number of youths familiar with aquaculture and aquaponics

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

| Year | Actual |
|-------------|---------------|
| 2012 | 259 |

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The sustainability of an industry is largely dependent on the workforce skilled in the subject area. By investing in such an age population, we anticipate greater understanding of environmental stewardship and how science drives industry.

What has been done

The AFDP has erected small scale demonstrations models that are mobile and can be easily erected at fairs, exhibitions, etc. In addition to carrying miniature prototypes, program personnel allow access into their wet laboratory to showcase the different systems available and how the science has evolved from its humble beginnings.

Results

The news of our program growth has spread to outlying nations in the Pacific, that we provided 9 students from the College of Micronesia with a hands on workshop entitled "Aquaculture for Beginners." This growth has also lead to the request for a similar workshop from the Caribbean and Pacific Consortium slated for the Summer of 2013.

4. Associated Knowledge Areas

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

Outcome #4

1. Outcome Measures

Number of individuals that will venture into aquaculture

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

| Year | Actual |
|------|--------|
| 2012 | 4 |

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

In our previous AREERA submission we had 17 actual farmers focused on different crops such as shrimp grow out, tilapia production, and aquaponics. Economic studies indicate that aquaculture is a very promising industry to invest in considering our strengths and weaknesses as an island economy. Efforts remain on bringing this number higher annually as this industry is becoming evidently sustainable.

What has been done

AFDP continues the promotion of the different systems available to stakeholders by means of extension visitations, public media outlets, demonstration projects, and the continuous professional development of program personnel.

Results

As a result of dynamic program implementation efforts 4 more farmers have demonstrated their commitment to such an industry by investing their financial resources at aquaculture related businesses.

4. Associated Knowledge Areas

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

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

The key area not reported on this submission is in the area of "feed creation with locally available products." We continue to put in key infrastructure investments at this time. Work is underway, however the impact of such efforts are not quantitatively ready as such infrastructure is key in ensuring the success of this endeavor. Program personnel anticipate reporting on this section on future reporting submissions as phases of our infrastructure become reality.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

It is obvious that Land Grant division is at its intermediate stage requiring the program's management and USDA-NIFA to continue supporting current efforts being made and invest in the overall growth of the program. The need for such can be justified based on the impacts created and the lives positively changed as a result of client participation.

Key Items of Evaluation

Please refer to the aforementioned section indicating continued collaboration.