

Sustainable Coastal Communities and Ecosystems Program (SUCCESS)

*A Component of the Integrated
Management of
Coastal and Freshwater Systems Program
(IMCAFS)*

Quarterly Report

January 1 – March 31, 2007



**Integrated Management of Coastal and Freshwater Systems
Leader with Associates Cooperative Agreement for
Sustainable Coastal Communities and Ecosystems (SUCCESS)**

**Quarterly Report
January 1 – March 31, 2007**

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A partnership between:

**Coastal Resources Center
University of Rhode Island
and
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in association with:

**University of Hawaii Hilo, Pacific Aquaculture and Coastal Resources Center
Western Indian Ocean Marine Science Association (WIOMSA)
EcoCostas
Universidad Centro América
Conservation International
The Nature Conservancy
World Wildlife Fund
The Sea Grant Network**

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I. INTRODUCTION

On September 30, 2004, the University of Rhode Island (URI) was awarded a Leader with Associates (LWA) Cooperative Agreement in Coastal Management, Fisheries and Aquaculture for a five-year program with core annual funding of \$750,000. This is the Sustainable Coastal Communities and Ecosystems (SUCCESS) Program.

The Coastal Resources Center (CRC) at the URI is the Leader of this Agreement. The Pacific Aquaculture and Coastal Resources Center at the University of Hawaii (PACRC/UHH) is the sub-recipient. The Program's strategic partners are the Sea Grant Association of Universities, through the Rhode Island Sea Grant College Program; the Nature Conservancy (TNC); World Wildlife Fund (WWF); and Conservation International (CI). Regionally, partners include the Western Indian Ocean Marine Science Association (WIOMSA) based in Zanzibar, Tanzania; the Center for Ecosystem Research (CIDEA) at the University of Central America (UCA) based in Nicaragua; and EcoCostas, a nongovernmental organization (NGO) based in Ecuador.

The Program's overarching goal is to help the people of a place improve both their quality of life and their physical environment through good governance. The Program has four major components.

- Achieving Tangible On-the-Ground Results
- Increasing Capacity through Training Linked to On-the-Ground Activities
- Establishing Regional Learning Networks Supported by Effective Knowledge Management
- Applying Science to Management and Good Governance

In each region where the LWA Program operates, these components come together to make a coherent, mutually re-enforcing set of strategies. These strategies ensure that community-based demonstrations of successful natural resources governance are connected to supporting actions and policies at the provincial, national and regional scales. This integrating, cross-sectoral and multi-scaled approach has proven to be adaptable to a wide range of settings.

In addition to these four primary program elements, the Program is working to promote U.S. global leadership in integrated coastal management (ICM) by advocating internationally for sound coastal governance and a stewardship ethic within coastal ecosystems. Further, the SUCCESS Program integrates across a number of cross-cutting themes including but not limited to gender mainstreaming, health and HIV/AIDS, and Volunteers for Prosperity.

1. Biodiversity Conservation and the Sustainable Coastal Communities and Ecosystems (SUCCESS) Program

Coastal ecosystems contain some of the planet's most biologically productive habitat, supporting a disproportional amount of economic output per unit of area, through fisheries and other productive activities.¹ Yet, today these biodiversity-rich ecosystems are under accelerated threat. Integrated coastal management (ICM) takes a long-term view to addressing many of the root causes behind these threats and as such the ICM-based Sustainable Coastal Communities and Ecosystems (SUCCESS) Program contributes to USAID biodiversity conservation goals.

¹ USAID. 2005. Biodiversity Conservation: A Guide for USAID Staff and Partners.

The SUCCESS Program emphasis on ICM takes a different approach to biodiversity conservation compared to most conservation-oriented programs, but aims to achieve similar goals². First, SUCCESS works both within and outside of formally designated marine and coastal conservation areas. While managing protected areas is an important approach to achieve biodiversity conservation, many scientists have pointed out that in and of itself, this is insufficient unless areas outside of as well as surrounding protected areas are also better managed³. Second, SUCCESS emphasizes conservation approaches recommended by the United States Agency for International Development (USAID)¹, including sustainable use, community based and cross-sectoral approaches, linking especially to the fisheries and mariculture sectors. Third, SUCCESS operates under the premise that stakeholders in sustainable use and conservation efforts must see tangible benefits if these programs are to be effective and sustainable beyond the life of the USAID investments⁴. Therefore, livelihood and enterprise development is a feature of all interventions of the SUCCESS Program and also helps address poverty issues⁵—a key feature of communities in most of the places where this Program works. Lastly, SUCCESS incorporates many of the principles identified by USAID for effective biodiversity conservation. The SUCCESS Program: 1) is adaptive and results-oriented, 2) is highly participatory, 3) fosters sustainability, 4) builds in-country capacity, 5) incorporates learning, and 6) complements other conservation initiatives.

Following are specific examples of how the SUCCESS Program contributes to biodiversity conservation in its primary field sites.

1.1 Tanzania

The waters around Fumba village, located within the Menai Bay conservation zone on Zanzibar Island of Tanzania, are rich with a biodiversity of fishes, coral reefs, and mollusks. Here, the SUCCESS Program and its partners—including local bivalve collectors (mostly women)—are addressing the accelerating threat of a depleted bivalve population due to over-harvesting. At the root of the problem is poverty (little income to purchase other food protein); inequality (females have fewer alternative employment options than males); and local market forces (with little market for other income-generating products from Fumba, pressure on this one resource for food and income remains constant).

The fact that women need to venture farther and farther into the ocean to collect sufficient bivalves is testament to the over-harvesting of this resource. Without intervention, the natural environment will be changed, and future generations will lose a valuable food and income source.

² For a discussion of ICM and conservation see: Best, B. 2003. Conservation and Integrated Coastal Management: Looking Beyond Marine Protected Areas. p. 325-342. In: Olsen, S.B. (ed.) Crafting coastal governance in a changing world. Coastal Resources Center, University of Rhode Island. p.376.

³ For discussion of the need to look beyond protected areas to fully achieve marine biodiversity conservation see: Allison, G.A. J. Lubchenco, and M. Carr. 1998. Marine reserves are necessary but not sufficient for marine conservation. *Ecological Applications Supplement* 8(1) S79-S92. and; Jameson, S.J. M.H. Tupper, and J.M. Ridley. 2002. Three screen doors: can marine “protected” areas be effective? *Marine Pollution Bulletin* 44: 1177-1183.

⁴ For a discussion of ICM sustainability factors see: Christie, P., K. Lowry, A.T. White, E.G. Oracion, L. Sievanen, R.S. Pomeroy, R.B. Pollnac, J.M. Patlis, R.V. Eisma. 2005. Key findings from a multidisciplinary examination of integrated coastal management process sustainability. *Ocean & Coastal Management* 48(3-6):468-483. and; Pollnac, R.B., and R.S. Pomeroy. 2005. Factors influencing the sustainability of integrated coastal management projects in the Philippines and Indonesia. *Ocean & Coastal Management* 48(3-6):233-251.

⁵ For a discussion of the links between poverty and biodiversity conservation see: Adams, W.M., R. Aveling, D. Brockington, B. Dickson, J. Elliot, J. Mutton, D. Roe, B. Vira and W. Wolmer. 2004. Biodiversity conservation and the eradication of poverty. *Science*. 306(5699):1146-1149.

The SUCCESS Program is working to change this by introducing a zoning scheme—e.g., designating selected areas as “no-take” zones during certain periods—and by introducing shellfish farming and half-pearl aquaculture as a more eco-friendly alternative source of food protein (oyster) and income (sale of pearls). There is already strong local commitment to implementing the zoning strategy, bivalve farming and half-pearl culture—two interventions, which combined may raise local quality of life and help protect the biodiversity of the Menai Bay/Fumba area.

Zoning programs are also being developed for milkfish and seaweed farming in Bagamoyo and Mkuranga. Zoning for milkfish farming at Mkuranga is aimed at optimum use of salt flat areas without disturbing adjacent and healthy mangrove stands. However, this has been halted for the time being to concentrate on the other zoning schemes. Continuous analysis of downstream effects of the fish farms will help safeguard the environment of the areas. Fish farmers have been asked to return by-catch to the ocean while collecting fingerlings. Threats assessments for all three project areas in Bagamoyo, Mkuranga and Menai Bay were completed and are being used to adjust Program activities. Specifically, we will concentrate less on the pilot farming initiatives and more on policy implications if these farming initiatives were to be scaled up in these areas. The reason would be to ensure that responsible mariculture is practiced, i.e., mariculture that limits any significant environmental or biodiversity impacts. In addition, we will provide training sessions in responsible mariculture. We will specifically target on-going coastal projects (MACEMP, TCMP, RUMAKI, Tanga Coastal Zone, SEMMA) with large amounts of resources devoted to livelihood development initiatives that are also promoting coastal mariculture.

1.2 Nicaragua

A biodiversity threats assessment was conducted to identify environmental, social and economic issues that may affect biodiversity at the SUCCESS Nicaragua Program work sites of Aserradores, Padre Ramos and Puerto Morazan, all of which are either ecological reserves or areas of recognized biological importance.

Padre Ramos and Puerto Morazan are areas with extensive mangrove systems, have great environmental and economic value and are protected areas due to the biodiversity of species in both areas. In Padre Ramos, the mangroves are still largely intact and the extraction of mangroves is not as marked as in Puerto Morazan. Los Aserradores lies near the boundary of the Padre Ramos Reserve and is also an area of extensive mangroves, but lacks the reserve designation. The adoption of best management practices, alternative livelihoods and implementation of management systems, are emphasized in Program work to engage local communities to change behavior and improve their quality of life while effecting positive environmental changes.

The biodiversity threats assessment was conducted in collaboration with Lola Herrera (CRC/URI) using primary sources of information such as stakeholder interviews, studies and observations, as well as secondary sources such as literature. The draft study is in the final stages of review.

1.3 Ecuador

In Ecuador, the SUCCESS Program and local partners are tackling accelerating threats to biodiversity of the Cojimies Estuary. The Estuary, islands within, and adjacent shoreline are nesting grounds for several species of marine turtles. The upper watershed, a designated protected area, comprises significant amounts of primary coastal forests. In spite of this richness, the estuary’s overall health suffers from human-induced conditions: 1) the collapse of lagoon shellfisheries due to overfishing; 2) the exploitation of coastal timber resources from excessive

cutting and the resultant sedimentation that changes the estuary's hydrology, pulsing, and water quality; and 3) conversion of mangroves to shrimp ponds.

Poverty and a lack of governance are at the root of this situation. In a vicious cycle, poverty and a lack of recognized alternative sources for food and income have led to the estuary's decline. That reduction in goods and services from what had been an historically highly productive ecosystem has, in turn, created even greater poverty. Add to this an absence of a governance system—a lack of laws and/or enforcement, of government support or revenues, and long term planning—and the estuary and its biodiversity finds itself at great risk. The SUCCESS Program is working to change this by introducing eco-friendly livelihoods such as a revived culture of the native fish *chame*, home gardening, and beekeeping/honey production. Perhaps even more importantly, the Program and its partners are working with the local communities to create a longer term vision for the future of their place—one that includes conserving the estuary's remaining resources and biodiversity, restoring what is possible to restore, and helping ensure the Cojimies provides food, income and biodiversity for today and tomorrow.

2. Overview and Summary of Accomplishments

This Quarterly Report covers work activities implemented from January 1st to March 31st, 2007. Below is a summary of some of the significant Program achievements to date, as well as during this reporting period. This is followed by sections of the report that list, by SUCCESS Program element, the highlights, activities, and “success” stories from this period as well as priorities for the upcoming quarter. Subsequent sections describe key management issues, challenges and constraints, a summary of highlights from Associate Awards, and overviews of other USAID-supported activities being implemented by the Leader (CRC/URI) and which are relevant to the SUCCESS Program. Contacts with USAID Missions concerning Leader and Associate Program activities are summarized as well. A summary of the Performance Management Plan (PMP) report results for the same period as mentioned above is included in Appendix 1.

2.1 Cumulative Program Accomplishments (October 1, 2004 – March 31, 2007)

- Over US \$311,000 leveraged in support of Program activities
- 450 persons and 201 enterprises benefiting from equitable and sustainable natural resource based enterprises
- Individual capacity built for 566 persons, through implementation of 27 training courses that support better ICM enabling conditions and best practices
- Four US volunteer professionals fielded in support of Program activities, with a time commitment valued at over \$17,000
- Over 1,600 individuals participated in coastal resources and conservation planning meetings—47% were female, achieving a more equitable participation for this traditionally disadvantaged group
- 69% of sustainable enterprise beneficiaries are female, achieving more equitable distribution of benefits for this traditionally disadvantaged group

2.2 Program Highlights Current Reporting Period (January 1 – March 31, 2007)

- 16,487 hectares in areas of biological significance have come under improved management. Of these hectares, 4000 were marine and 12,487 were terrestrial.
- Cockle abundance was monitored in Padre Ramos and Asserradores, Nicaragua, and in Fumba, Tanzania.
- In Tanzania, multi-village by-laws for co-management of seaweed were drafted for the Mlingotini Lagoon

- Over US \$3,500 leveraged for activities in Tanzania, Ecuador, and Nicaragua
- 240 persons (31% women) participated in ICM-related planning meetings in the field sites
- Two training courses were held, attended by 5 persons (60% women)
- Eight publications were finalized, six in Ecuador, one in Tanzania, and one in Nicaragua.

2.3 On-The-Ground Results

2.3.1 Tanzania

Trials of half-pearl (*mabe*) farming techniques continued in the Menai Bay conservation area. After initial pilots of the cage method failed, the floating-line method was successfully deployed in Bweleo for both edible shellfish and half-pearl farming. The redesigning and construction of three pilot milkfish ponds was completed (two in Mkuranga, one in Bagamoyo). Disappointingly, in September and October 2006, seawater flooded both ponds at Mkuranga sweeping away all the fish. There was general laxity on the part of the farmers and accordingly the extension visits were cancelled pending the possibility of their rebuilding the ponds. Meanwhile, two new farmers who seem to be more determined in Kisiju Pwani and in Mkuranga and very near to the old site have joined in. The Bagamoyo pond which was stocked with 4,500 fingerlings managed to harvest their fish in December and successfully marketed this harvest with earnings from the one-hectare pond of approximately US\$2000. Seaweed farming trials in Mlingotini—using the floating-line method—continued producing seaweed with higher growth rates than off-bottom methods and with no report of die-offs. This seaweed farming method is highly promising as it allows farmers to increase production, expand potential growing areas and increase income generation. Pending completion of economic analysis next quarter, the method is ready for widespread dissemination and adoption. Kondo and Pande villages still experience conflicts with fishermen. Accordingly, SUCCESS is working with villagers, village leaders, and Bagamoyo district authorities to implement bylaws that have already been accepted at the village levels and signed by the district commissioner that will empower village leaders to enforce and mete out penalties to those fishermen who disturb the seaweed farms. SUCCESS is also completing zoning maps of the Mlingotini Bay and is working towards putting signboards in each village and buoys in the Bay showing passage ways and seaweed farms.

This reporting period, Fumba, Bweleo and Nyamanzi villages prepared a joint management plan for cockle management—emphasizing no-take zones that have already been identified in each community. Several meetings were conducted in each village to draft village-level ordinances or by-laws. The ordinances have also been reviewed by lawyers to place them in a legally accepted format. Once signed, the by-laws will be launched officially by the Menai Bay Conservation Area (MBCA). Participatory community monitoring of the conservation and fishery recruitment effects of the no-take areas is on-going.

Villagers in Bweleo and Fumba have elected leaders for the village groups that are working on shellcraft jewelry. The Bweleo group is one step ahead, in that they have already established a bank account for their business. In the upcoming quarter, the groups are going to be trained on micro-enterprise development and entrepreneurship.

2.3.2 Nicaragua

SUCCESS Nicaragua continued to promote best management practices with a focus on shrimp farms at AGROPESCA and FINCAMAR. Each farm was assessed on its strengths and weaknesses and the issues needing to be addressed. At the Rosita Farm, several problems were identified. There is no record keeping of production data; pond walls are very low, making it difficult to implement certain good management practices; there is poor feed management,

stocking density was incorrect, and there were low growth rates. In spite of these problems, improvements were made sufficient to prevent the farm from losing money.

CIDEA has been working with the AGROPESCA farm over one complete production cycle and although results were good considering the circumstances, the final economic benefits to the farm are minimal due to the nature of the loans used to finance the production. This group for the first time began using water quality equipment provided by OIKOS, with technical assistance provided by SUCCESS.

Trials have been underway to test whether tilapia could be grown out in shrimp ponds as an alternative or supplement crop for shrimp farmers. Trials went well until mid-March when disease began a rapid onset, leading to die-offs. Rather than risk losing all the fish and because disease was confounding the study, the trials were terminated two weeks early and the tilapia harvested. Even with the disease problems, culture in shrimp ponds may be feasible as long as the farmer would change management practices upon first signs of disease. Reduced densities and feeding might also help prevent problems.

SUCCESS Nicaragua continued to support alternative livelihoods that do not rely so heavily on natural resources. While the pilot with hammock-making did not prove economically viable, bread-making has been a success—providing not only a low-cost supply of bread to the community, but also providing a market for retail sales. The Program also provided technical assistance to alternative tourism development, focusing on an aquatic tourist route through mangrove and bird roosting areas. A nearby international marina has been urging FINCAMAR to develop this as a draw for the entertainment of marina users.

There was ongoing water quality sampling in the cockle fishing areas of Aserradores, El Realejo and Padre Ramos to detect the presence or absence of *E. coli*, and *Salmonella* spp. In Aserradores, 33% of the samples exceeded permissible levels for *E. coli*. Preliminary results pointed out the importance of conducting monitoring in areas where shellfish are farmed or collected. Long-term monitoring helps predict in which areas and season's shellfish collection should be prohibited. This safeguards human health and helps protect bivalve populations since closures also permit shellfish to grow and breed.

2.3.3 Ecuador

Otherwise successful trials of *chame* and shrimp polyculture have been challenged by a scarcity of *chame* fingerlings. Normally *chame* breed naturally in artificial and natural ponds and wetland areas. Currently all the shrimp ponds in Cojimies have been stocked and local shrimp production has been rebounding. With this rebound has come the use of *barbasco* (toxin from local shrub) to control the mosquito fish which negatively impact shrimp production. *Barbasco* use has, in turn, negatively affected the *chame* fingerling supply. It may be necessary to address the use of *barbasco* or create other sources of *chame* fingerlings, if future work is to continue. The *chame* effort has also resulted in two studies (characterization of *chame* culture and biology; and a feasibility study for a *chame* training center). The document, "Chame culture in the Estuary of the Chone River" also presents an analysis of bio-economic scenarios for low technology *chame* culture and can be found at www.ecocostas.org.

SUCCESS Ecuador has continued testing and promoting alternative livelihoods, including development of family gardens. The economic contribution or potential of such gardens is illustrated by the case of Bolivar citizen Fidel Panezo. He is 50 years old, married, with five children. He developed a garden measuring 1564 m² and has harvested a variety of products for family consumption and sale such as beans (150 pounds, \$20 sold), tomatoes (700 pounds, \$30

sold), peppers (700 pepper, \$20 sold), and 220 watermelons (\$120). The latter amount he used to build his house. The story of Mr. Panezo illustrates how a fairly small plot of land can grow significant amounts of produce for consumption and sale.

SUCCESS is working on another livelihood option in Mompiche, a coastal fishing town rapidly becoming a tourist destination for Ecuadorian and international tourists. Two types of trails with tourism potential have been identified—a terrestrial walking trail and an aquatic trail. SUCCESS is focusing on the latter, which will begin at the Mompiche beaches and end at the entrance of the beach town of Bolivar. The tour will cost between \$40 and \$60 depending on whether fishing or snorkeling is included. On this trail, one could observe resting areas for frigate birds, the Portete Promontory, a rock cliff area with the appearance of natural stairs, mangrove areas, the quaint town of Bolivar and a coconut plantain.

On March 9, a workshop was held in Pedernales to discuss with shrimp farmers the possibilities for a joint initiative with SUCCESS to implement BMPs and to present basic information on experience with BMPs in other countries. Just a few of the most significant problems for the Cojimies shrimp sector are that: 1) financial institutions have closed access to credit for the shrimp sector; 2) exporters pay very low prices to producers; and 3) there is poor postlarval quality.

2.4 Regional Capacity Building

2.4.1 Training

There was limited training this reporting period—one small business skills-oriented course in Nicaragua on “Serving Your Client”. In addition, SUCCESS provided two scholarships to a course delivered by the Organization for Tropical Studies in Costa Rica on watershed management. Most capacity building efforts this period, however, focused on regional certification programs. In East Africa this initiative is targeted at a program for marine protected area professionals while in Latin America it is targeted at a program for coastal professional writ broadly and linked to a master’s degree program in coastal ecosystem governance. More details on both these initiatives is included in section 6.2 of this report.

2.4.2 Regional Networks and Knowledge Management

WIOMSA is considering hosting an effort to build a web forum for mariculture activities in the East Africa region. It would provide for a moderated discussion on mariculture and would be organized around specific topics relevant to the CRC and SUCCESS approach. CRC will assist with this system as it develops and works to integrate the system into CRC initiatives on the mariculture theme.

A large collection of the existing CRC repertoire on mariculture has been gathered and can contribute to both the WIOMSA site and the CRC theme-based site. CRC has developed a section of its website as a knowledge management system (KMS) for delivery of Cross-portfolio Learning Topics (CPLT). This system has been used currently to contain information linking coastal and freshwater resource management. Information supporting the East Africa (EA) mariculture KMS development has been gathered at CRC on three topics of interest to this effort. The three CPLT sections that will be developed at CRC are: General Approaches to Addressing Mariculture as an Element of Integrated Coastal Management Programs, Managing Pond-Based Mariculture Systems in the Coast (Shrimp and Fish), and Managing Open-Water Mariculture Systems in the Coast and Oceans (Seaweed and Mollusks). The structure of these three CPLTs

has been worked through and content from two of the four participating countries in the region has been collated for entry into the KMS at CRC supporting the East Africa mariculture efforts. Web posting will occur only once content is received by all.

A workshop on *Best Management Practices for Coastal Management* was held in Guayaquil on March 28-30 with 25 coastal leaders attending. The purpose was to begin networking among coastal leaders and learning from their successes at developing and implementing various forms of best management practices for coastal activities. The workshop was financed primarily by the AVINA Foundation. However SUCCESS funded the participation of CRC's director, Stephen Olsen and coastal manager Lola Herrera. Eleven case studies were presented that represent successes in coastal management and good practices. Participants also visited three case study sites which highlighted: 1) restoration and clean-up of an estuary by an alliance of the private company VISOLIT and the Municipality of Guayaquil; 2) management of a coastal mangrove system with sustainable crab fishing (*Ucides occidentales*) by the Crab Fishing Association; and 3) a rice irrigation project which is attempting to cultivate rice using organic methods and improved methods of water flow and conservation. The eleven case studies were compiled in a draft publication which will be published in April 2007.

2.5 Science for Management

2.5.1 Tanzania

In Tanzania, the use of Fiji-style no-take areas is being developed in the Menai Bay conservation area as an approach to address declining harvests of cockles. An Institute of Marine Science (IMS) graduate student is assisting with the community development process and is also undertaking thesis research linked to bio-physical monitoring of cockle abundance both inside and outside the designated no-take areas. The student is using a before-after -control impact (BACI) analysis to assess conservation performance of the no-take areas. This is participatory action research linked to the community-based monitoring. A second round of sampling was conducted in late March and initial time series results will be assessed during the next quarter. Another non-SUCCESS funded study is also assessing the environmental quality of the bivalve culture sites.

Environmental quality of the milkfish pond sites is being monitored on an on-going basis. Samples are being collected quarterly in and downstream of the ponds and analyzed for nutrients, organic matter content, oxygen, salinity, temperature and pH. To date, no significant environmental changes in the areas adjacent to the ponds have been detected.

The Swedish International Development Agency (SIDA) is funding (\$6,000) another study to evaluate milkfish fry and fingerling seasonality and abundance in several mainland areas where milkfish farming is viable. This study is also investigating the best gears for collection of fingerlings with least disturbance to the environment and catch composition of milkfish as well as other species caught by these gears. The half-term report of the year-long project has been produced and submitted to WIOMSA for review.

2.5.2 Nicaragua

Two research efforts are underway: 1) assessment of microbiological water quality in the black cockle (*Anadara tuberculosa* and *A. similis*) extraction areas; and 2) application of real time PCR to detect the Hepatitis A virus in cockle tissue samples. Water and tissue samples are coming from areas of heavy cockle extraction—the Aserradores, Padre Ramos and El Realejo Estuaries. These tests are intended to detect pathogens that threaten human health, Hepatitis A, *Salmonella*

spp., *Vibrio parahaemolyticus* and *E. coli*. Preliminary results for water quality are shown in the section entitled Nicaragua, On-the-Ground. Results from the Hepatitis A test will finished in early April and presented in the next report.

II. PROGRESS IN MEETING PLANNED OUTCOMES OF WORKPLAN PROGRAM ELEMENTS

3. Tanzania On-the-Ground Results

3.1 Background

The Program is assisting local communities improve income earnings through mariculture and is promoting improved resource management and conservation through community-based management approaches. In Fumba, Bweleo and Unguja Ukuu in the Menai Bay conservation area in Zanzibar, the Program is assisting women shellfish farmers with improved production techniques and with managing harvests of wild stocks. Trials of half-pearl production are also underway. In Mkuranga district and Changwahela village in Bagamoyo district, milkfish production is being piloted. In Mlingotini, Changwahela, Pande and Kondo villages in Bagamoyo district, new seaweed farming practices are being developed and farming expanded to new beneficiaries and communities. In all the mariculture sites, the Program is supporting the development of zoning schemes and other policies to ensure that sustainable mariculture practices are followed and to show how national and district-level ICM and conservation plans and policies can be linked to and implemented at the village-scale.

3.2 Report Period Accomplishments (January 1 – March 31, 2007)

Activities in Tanzania— in the Menai Bay Conservation Area, Bagamoyo district, and Mkuranga district— are grouped into two categories: 1) promotion of mariculture as a diversified livelihood option, and 2) community-based resources management and zoning initiatives.

3.2.1 Promotion of Sustainable, Low-tech, Mariculture Practices Appropriate in the East Africa Region as Diversified Livelihood Options for Coastal Communities

Piloting sustainable low-cost techniques for milkfish farming in East Africa

In all sites, baseline records and data are collected on a continuous basis to monitor environmental changes. The SUCCESS Tanzania Program is taking action to ensure its activities comply with the integrated coastal management (ICM) and mariculture development guidelines and other government policies aimed at safeguarding the environment. Parallel economic analyses are underway to evaluate the advantages of new versus traditional methods (e.g., off-bottom method versus floating seaweed farms) and provide a comparative assessment of profitability of the mariculture systems being promoted. Cost benefit analyses on seaweed and milkfish farming were begun and are now being reviewed. Both will be completed next quarter.

Conduct regional and national outreach on milkfish farming

After difficulties with the current farmers in Mpafu village of Mkuranga, SUCCESS has shifted extension efforts to another group with existing ponds in Kisiju Pwani village that has repeatedly asked for technical assistance. Beginning this quarter, SUCCESS is assisting the group in pond re-design and construction as the original ponds were improperly built. This is a recurring problem in Tanzania as interested individuals and groups experiment on their own with milkfish farming. Hence, SUCCESS will start to place more emphasis on completing extension bulletin materials and initiate a training of trainer's course in milkfish farming.

The Mpafu ponds were flooded in November 2006 and all crops lost. The ponds in Bagamoyo have not flooded and are better managed. The Bagamoyo farmer stocked only 4,500 fingerlings, (40 percent of the recommended density as Bagamoyo has a reported scarcity of local fingerlings as compared to Mkuranga). Three thousand milkfish were harvested in December 2006 with each weighing between 400 and 500 g each and selling at about 2400/kg, thus generating sales of 2,300,000 Tsh. Despite the reduced level of stocking, the Bagamoyo pilot farm met the projected economic returns as a result of higher-than-expected selling prices. This is this cooperating farmer's fourth harvest, with each harvest having resulted in increasing yields—a very encouraging sign. In Buyuni village, the backyard pond yielded only 17 kg of fish in November 2006 and sold at 1000 Tsh per kg to generate sales of 17,000 Tshs. This situation was mainly due to improper stocking of fingerlings. Restocking for a second cycle under closer supervision is now on-going and to date 575 fingerlings out of the planned 3000 have been stocked. Existing trials, especially the results in Bagamoyo, indicate milkfish farming is a technically feasible and profitable form of aquaculture in Tanzania and ready for more wide-scale dissemination.

The extension manual on milkfish farming was revised in December 2006 during the visit of E. Requentina and the final text will be completed in April 2007. This extension manual will then be printed and serve as an excellent “how to” resource for individuals wishing to venture into this livelihood, and as the basis for the extension course on milkfish farming scheduled for July 2007. There are requests from several donor projects for technical assistance and advice on milkfish farming and these groups will be targeted for the training event later in Year 3. The SUCCESS Program will review several policy issues with the Department of Fisheries before disseminating this technology more widely. The review will be undertaken in two meetings scheduled for April and June 2007. A policy brief outline has been developed for discussion in these meetings.

Tilapia farming

Extension activities in Mfurumwambao are terminated based on the problems experienced there the last quarter. Currently, there are only a few fish remaining in the ponds. In spite of the difficulties and the losses to date, the farmers indicate they expect to continue farming tilapia.

Seaweed farming

The floating-line method of seaweed farming proved successful in Mlingotini and has also been re-introduced to Pande and Kondo villages. Although Kondo started to apply the floating system method of seaweed farming at the end of the 1st quarter, farming has ceased in both Pande and Kondo because fishermen attracted by fish under the seaweed farms repeatedly caused damage. It was noted later that the Pande floating system survived because there was a group of coastal guards with a patrol boat in the proximity of the plot. Because the coastal guards were transferred to Dar es Salaam in December, SUCCESS is now working on village by-laws and zoning of Mlingotini Lagoon to enable village leaders to take action against those fishermen found violating the by-laws. This includes penalties for disturbing the farms. Draft zoning maps have been completed and village meetings will be called to approve the zones. Signboards with the Mlingotini Lagoon maps will be displayed in each village and buoys will mark boat passageways, mooring areas and seaweed farms. Farmers in Pande and Kondo are confident they can re-deploy and make more plots for seaweed farming once by-laws are adopted by the District Council.

Changwahela village was unable to farm seaweed in the past due to strong winds from July through August. However, they have now perfected a system whereby they harvest their seaweed just before the winds are too strong. In the process, they leave behind only the very small seedlings, which can withstand the winds. As a result of this change in approach, the village also no longer needs to purchase new seedlings—a significant cost savings. The floating method also

demonstrates higher growth rates than the off-bottom method and results in fewer die-offs. The use of *dema* traps to capture siganids that forage on floating seaweed farms in Pande has been successful with an average harvest of 40 fish per spring tide period (six days), with each weighing between 200 to 500 grams. During the period of 21 days that three *dema* traps were deployed, the farmers harvested 86 kg of fish equivalent to 172,000 Tsh at a price of 2000 /kg (market price at the time). This innovation has the potential for widespread dissemination once the comparative economic analysis of the two farming methods is completed. The seaweed farming trials in Zanzibar are showing similar results. The farmers in Zanzibar are also complaining of fish predation and SUCCESS is planning to introduce *dema* traps. Farmers are convinced the floating-line method of farming is better than and also a good complement to the off-bottom method. It allows farmers to grow more v *K. Alvarezii* ariety of seaweed, which commands a much higher price than the *E. spinosum* variety. There is high potential throughout the country for expanded seaweed production and higher income generation from this new farming method.

Shellfish farming in Menai Bay

The floating-line system for bivalves deployed in Bweleo in April 2006 proved better than the enclosures method. The number of line plots was increased from five to ten. One plot each has been introduced to Fumba Bondeni and Fumba Chaleni. The floating-lines are being used for culturing *Pinctada* for pearl production. Ninety eight large bivalves were seeded for pearl production and to date the mortality rate is low (only five seeded bivalves have died). Seaweed farming on the floating-lines is also progressing well with no die-offs and high growth rates in Bweleo, similar to the Bagamoyo results. An initial half-pearl harvest is scheduled for May 2007.

Now that half-pearl farming appears to be a viable new enterprise, interest is growing among coastal communities and by some other development projects to promote this activity more widely. However, there are no specific policies in Zanzibar for regulating this or planning expansion in an orderly way. Therefore, we intend to accelerate a policy track on this issue. In addition, if the industry is to expand, an abundant source of spat must be found so that dependence on wild adults for implantation is not necessary and can be restricted.

Developing capacity for entrepreneurship of women groups

Terms of reference (TOR) for a local group to provide extension assistance to the women's groups involved in shellcraft manufacture and bivalve (including half-pearl) farming was completed. The TORs were circulated widely and four individuals applied to design and deliver the training. After discussions with SUCCESS and WIOMSA officials, a lecturer from the University of Dar es Salaam, Dr. Allan Shimba of the Marketing Department of the Faculty of Commerce at the University, was contracted. Meanwhile, two applicants from Department of Cooperatives in the Ministry of Agriculture, Zanzibar have been asked to assist Dr Allan during the training. These two individuals will continue working with the groups after the training is completed to help ensure the knowledge and skills gained in the training are applied to activities on the ground and that these micro-enterprises maximize the chances for success.

3.2.2 Promoting Community-based and District-scale Resource Management and Zoning Policies

Zoning plan for seaweed farming in Mlingotini Bay

The zoning maps that were developed jointly by the seaweed farmers and fishermen have been added to the base maps and arrangements are underway to discuss the maps in village meetings for their approval before the maps are mounted on signboards and buoys put in the Bay to mark

different zones. Meanwhile, SUCCESS is urging Bagamoyo district to launch the bylaw that prohibits fisheries in the seaweed farms.

Establishment of improved harvest practices (no-take zones) for cockles in Menai Bay

After a number of meetings, villagers in Bweleo, Fumba Bondeni, Fumba Chaleni and Nyamanzi identified no-take areas for improved cockle management. The process was participatory and villagers made the decisions about locations to close, rules, penalties and management committees. The Menai Bay Conservation Authority (MBCA) attended the opening orientation for the communities and is fully supportive of this effort. A draft ordinance for the no-take zones has been produced and accepted by the villagers, the MBCA, and the Department of Fisheries and Marine Products. The ordinances, which were reviewed by a lawyer, are being reformatted to include the main laws governing conservation and local government laws. The by-laws will be forwarded to MBCA for final endorsement and inclusion in their management plan once the village by-laws are completed and approved by all three villages. However, there has been a delay in one village concerning approval of the no-take area. The proposed rules call for prohibiting all kinds of fishing—not just cockles. A number of octopus fishers and a few elderly trap fishers are concerned about the impacts this will have on their livelihood. Several alternatives have been proposed and are under discussion, including allowing octopus fishing, or “grand fathering in” rights for old trap fishers but not allowing new entrants. Concerns have also been raised about whether allowing even some fishing may weaken compliance overall.

Five key individuals from each village were identified to lead community monitoring efforts. These and other villagers (145 individuals, 87 female) were trained in how to monitor and conduct analysis of size distribution of the cockles. These individuals then conducted baseline assessments in the designated no-take zones, the collected areas, and control sites far from the villages—where collection is minimal. This quarter, a second round of monitoring was completed. Participatory monitoring will be conducted bi-annually throughout the life-of-Program.

Development of a zoning plan for the mangrove estuary in Mkuranga to plan orderly and environmentally appropriate milkfish farming expansion

Base maps for Mkuranga, which include marking of the salt pans, have been completed. However, further work on this task will cease in order to concentrate on zoning schemes in Mlingotini Lagoon and Menai Bay. This may require an adjustment in targets under the indicator “improved management”.

3.3 Tasks, Milestones, Dates, Status, Comments

Tasks still pending, completed during, or added as of March 31, 2007

Task and Milestones	Date Due	Status	Comments/Challenges/Constraints
Promotion of Sustainable, Low-Tech, Mariculture Practices Appropriate in the East Africa Region as Diversified Livelihood Options for Coastal Communities			
Piloting sustainable low-cost techniques for milkfish farming in East Africa			
Monitor and analyze harvest results from tilapia, milkfish, bivalves, and seaweed in all sites	Continuous	Ongoing	The floating seaweed and milkfish farming trials demonstrating promising results and are ready for widespread dissemination of the results.

<i>In Mkuranga</i>			
Conduct monthly extension visits to two farmers at two pilot farms	Continuous	Stopped at Mpafu; started at Kisiju	Extension in Mpafu for milkfish and in Mfurumwambao for Tilapia was terminated. Extension on-going in two new ponds sites at Kisiju,
<i>In Bagamoyo</i>			
Conduct monthly extension visits to advise, document and assess farming practices.	Continuous	On going, 1 phase finished; preparing for phase 2.	
<i>Policy</i>			
Conduct study on fry and fingerling abundance and seasonality (leveraged funds from MASMA)	June 2007	Ongoing	The 1 st progress report produced and submitted to WIOMSA
Conduct assessment of fry and fingerling collection methods	November – December 2006	Completed	
Prepare policy brief on milkfish farming	November December 2006	On-going; Meeting scheduled for the 3 rd week of April 2007	Policy brief outline prepared for 3 rd quarter meetings
Produce milkfish and seaweed economic reports	April 2007	On schedule	Information from initial trial results already incorporated into reports and final edits after internal review underway
Conduct regional and national outreach on milkfish farming			
Complete milkfish guide integrating results from the pilot fish ponds	February, 2007	Delayed New date: May 2007	Delayed due to revisions and new figures being added based on peer review comments and final pilot trial results
Tilapia farming			
Terminated			Constant problems of flooding and drying of ponds. Predation by crocodiles, otters and destruction by hippos
Seaweed farming			
<i>In Bagamoyo</i>			
Complete comparative economic analysis of floating an off-bottom seaweed farming methods	January – February 2007	Delay to May 2007	Awaiting comments from SEMMA, adding a section on economic comparisons between <i>Cottonni</i> and <i>spinosum</i> varieties
Assess <i>dema</i> traps being used to capture fish feeding on the floating line system & conduct monitoring	September 2006	Completed	Seaweed farmers highly motivated by the additional income from trap fishery.

<i>In Menai Bay</i>			
Conduct extension visits for seaweed farming to monitor and provide assistance on the floating line system	On going		Seaweed results extremely promising. Predation of the seaweed by herbivorous fish; introducing <i>dema</i> trap fisheries
<i>Shellfish farming in Menai Bay</i>			
Monitor mortality and growth	Ongoing	Ongoing	Mortality rate is low
Move additional pens to deeper water	October 2006	Completed	Pens moved, but farmers now prefer the floating line method which is a better method
Pearl shellfish and floating farms	On going	Ongoing	The first harvest for pearls and shellfish expected May 2007
Monitor nacre production in oysters	Ongoing	Ongoing	Seeded oysters show good growth of nacre. Initial harvest schedules for May 2007
Conduct additional implants of pearl oysters	Ongoing	Stopped at 98 oysters	Farmers organizing themselves in groups to start group farms
<i>Developing capacity for entrepreneurship of women groups</i>			
Develop terms of reference for entrepreneurship training workshop	October 2006	Completed	Trainers identified; training to take place April – June 2007
Produce and market shell handcrafts	Ongoing	Ongoing	Villagers making shell handcrafts; marketing to begin after entrepreneurship training
Conduct extension visits	ongoing	ongoing	
Promoting community-based and district scale resource management and zoning policies			
Zoning plans for seaweed farming in Mlingotini Bay			
Complete existing map with proposed use zones	November 2006	Delayed New date April 2007	Base maps completed; the maps discussed with village leaders, fishers and seaweed farmers in each village to establish zones now being integrated in the base map; community consultation process took longer than expected
Establishment of improved harvest practices (no take zones) for cockles in Menai Bay			
Generate GIS maps with no-take zones plotted	October 2006	Completed	
Draft by laws for three villages	November 2006	Completed	
Submit by-laws and maps to village council for approval	December 2006	Completed	Final submission and approval in process
Development of zoning plan for the mangrove estuary in Mkuranga to plan orderly and environmentally appropriate milkfish farming expansion			
GIS map created	October 2006	Completed	

3.4 Priorities for Next Quarter (April 1- June 30, 2007)

- Complete and launch policy for no-take zones in Menai Bay
- Implement zoning plans and policies for Mlingotini Bay
- Develop policy on siting of fish ponds, fingerling collection and licensing for siting of fish ponds as well as fingerling collection
- Train shell handicrafts groups on entrepreneurship
- Harvest the first half-pearls
- Harvest the first bivalves from the floating line system
- Publish the milkfish manual
- Complete economic feasibility study of seaweed and milkfish farming
- Complete milkfish farming manual
- Plan for mariculture training course scheduled for July 2007

4. Nicaragua On-the-Ground Results

4.1 Background

During this period, efforts to implement best management practices (BMPs) for shrimp culture, which were initiated in September 2006, have continued with extension and follow-up visits to shrimp producers of FINCAMAR and AGROPESCA. Recommended BMPs include the proper use of field equipment, importance of maintaining production records, water quality monitoring, improvement of survival and growth rates, and feed and fertilization management, as these are practices which simultaneously improve production, reduce costs and mitigate potential environmental impacts. Initial success has been significant and is presented below. The findings from this work will be used to analyze the effects of implementation of BMPs. This activity is also supported by the European Union through the nongovernmental organization (NGO) OIKOS.

Members of the women's Cooperative *Altagracia* were assisted in establishing a small bakery. Bread production will help these women who were previous fishers of shrimp post larvae to generate revenues and improve their quality of life since their traditional fishing is now illegal within the Padre Ramos Reserve. Students for Free Enterprise (SIFE) and instructors from the UCA tourism department have been providing information on quality control, hygiene and entrepreneurial vision. Bread-baking has since become a successful livelihood for these women. Since beginning this effort, the women no longer fish post larvae in the protected area.

Work continues with basic preparation for ecotourism with the members of FINCAMAR in Padre Ramos. Also supported by SIFE and the UCA tourism department, initial preparation and studies have been completed. By May 2007, a complete package of tourism services related to the aquatic trail will be developed and ready to offer tourists visiting the nearby yacht marina, "Puesta del Sol". The marina operator is offering to help bring tourists to the Padre Ramos area as a way of offering activities for his marina guests.

Planning has continued for the Masters Program in Integrated Coastal Management in coordination with a diverse range of international and national specialists. The bulk of the Masters degree program structure was completed and work was done in developing the contents of the program. A Working Group was formed with representation by the UCA Coordinator for Masters Degrees, Academic Secretary of the Department of Sciences, Technology and Environment, CIDEA Administration and Nelvia Hernandez (CIDEA). Lola Herrera (CRC/URI) also contributed to the development of the course contents.

4.2 *Report Period Accomplishments (January 1 – March 31, 2007)*

4.2.1 **Promotion of Sustainable, Low-tech, Mariculture Practices Appropriate in the Central American Region as Diversified Livelihood Options for Coastal Communities**

Continue the implementation of best management practices (BMPs) to improve environmental sustainability and operational efficiency

Extension visits were made to the shrimp farms at AGROPESCA and FINCAMAR to assist with implementation of BMPs. Each farm was assessed determine its strengths and weaknesses and thus identify issues to be addressed. Basic historical information and data from the few existing records was compiled. Technical concepts such as biomass sampling and the use and calibration of water quality monitoring equipment were also covered.

Rosita Farm (cooperative shrimp farm): This shrimp farm was rebuilt in 2000 after being destroyed by Hurricane Mitch. It consists of one large pond (6 ha) with rustic drains. CIDEA began providing technical support to the farm in the middle of one production cycle (May through August), beginning in July 2006. Several problems were immediately identified. First, almost no written records existed for production parameters or process (a requirement for certification). Also, the pond walls are very low, particularly on one side, making it difficult to implement certain good management practices. There was poor feed management, stocking density was not correct, and there were low growth rates. The latter problem was particularly obvious as the shrimp averaged only 3 g after three months of culture. Essentially the situation was one of a poorly built and poorly managed pond, as the combined result of too few financial resources and a lack of technical knowledge.

Technical recommendations were formulated with the group and were implemented. The pond was harvested at the end of August and the beginning of September 2006 and since the pond still suffered from erosion problems, draining the pond efficiently was difficult and affected the harvest. The results were a total of 2,324 lb. of shrimp harvested at a production rate of 386lb/ha and a 38% survival rate of PL stocked. In spite of the serious problems due to the water levels and poor management during most of the production cycle, the improvements which were made, even though coming at the end of the harvest cycle, were sufficient to prevent the farm from losing money.

During the second production cycle which followed, CIDEA was able to work with the group on a production strategy. The pond was stocked at the end of September after a few weeks delay due to the scarcity of post larvae, which came from the Padre Ramos vicinity. The stocking density was lowered to 150,000 post larvae and the pond filled with filtered water. Since the pond walls were still too low due to lack of funding to completely repair them, it was difficult to improve primary productivity beyond a certain level. Thus, stocking remained at a low density and wild post larvae were used, since revenues would not justify the cost of hatchery-produced post larvae. The harvest results improved over the first cycle. Survival improved from 37% to 51%. Final growth rates went from 0.43 g/week to 0.81 g/week in the second cycle. The economic returns improved by 20%. Even with a lower stocking density and a lower yield per ha, the shrimp grew faster and survival was improved, thus obtaining a larger size shrimp in less time which brings a higher price per pound, and at the same time, costs were lowered. The pond still suffers from infrastructure problems, but the owner has said repairs may be possible since the group may have

access to a bulldozer for the next cycle. Despite these problems, which do not allow a very high stocking density and which cause other management problems, this experience demonstrated that even in suboptimal conditions, simple BMPs can have significant positive impacts.

AGROPESCA Farm: This cooperative shrimp farm has three ponds, two of 10 ha each and one measuring 3 ha. The farm has a functioning pump and motor. The infrastructure is maintained using private financing, which is paid off in the following harvest. CIDEA has also been working with this farm over one complete production cycle. Although production results were good for the circumstances, the final economic benefits to the farm were minimal because of the nature of the loans used to finance the production. Private financing allowed the farm to experiment with proper techniques and management as opposed to the circumstances under which Granja Rosita was forced to operate. Also, the group for the first time began using water quality equipment provided by OIKOS, with technical assistance provided by SUCCESS. The first cycle of harvests from the two 10 ha ponds resulted in yields of 1050lb/ha and a PL survival rate of 50.5 percent. The next cycles for both farms will begin in April 2007, when high tides can fill the ponds. The intervening time will be used to compile the histories and all information from the farms.

Demonstrate feasibility of growing tilapia in shrimp ponds as an alternative or supplemental crop for shrimp culture

Tilapia were grown out in shrimp ponds to test if this fish could be an alternative or supplement crop for shrimp farmers. The trial was planned to last for nine months—or when the tilapia were expected to reach at least 250 g (11 oz) in weight (the size at which they can be processed for fillets and can bring the highest price). Six ponds were stocked at varying densities and with different feeding regimes. In some ponds, fish were not fed. This allowed for testing how well they did on primary productivity until reaching a certain size, at which time feeding would begin in an effort to test low cost methods that could be adapted by the poorer shrimp farmers. The trials had been going well and the tilapia growth rate had been good, until mid-March 2007 when signs of disease appeared. The unknown disease had rapid onset, and began causing mortalities. Rather than risk loss of all the fish, and because the presence of disease was confounding, the trial was terminated two weeks early and the decision made to harvest the tilapia.

The harvest was conducted from March 19-22, during which several period ponds were emptied of fish that showed severe disease problems. Two ponds were not harvested, as the fish showed signs of disease, yet were not suffering extensive mortalities. The most affected fishes were incinerated as a sanitary precaution. Overall, 67 % of the fish were severely affected and 32.8% were somewhat affected, but will probably recover. In spite of the disease problems, the results were positive over almost all of the planned experimental period. Even with the disease problems, culture in shrimp ponds may be feasible as long as a farmer begins changing management practices as soon as the first signs of disease occur, which in this case was not possible since the conditions were pre-established as part of the trial and could not be changed mid-course without invalidating the experiment. It does appear that fish were stressed in the high density, higher feed ponds, so reducing densities and feeding may prevent future problems. Or, a partial harvest at the first signs of stress might prevent mortalities in the remaining fish.

4.2.2 Technical Support for Alternative Livelihoods

Since the Padre Ramos estuary was declared a protected area, there have been a number of impacts on local communities due to the strict management regimes imposed. For instance, harvest of post larvae shrimp, an activity that was undertaken almost exclusively by women in the area, is no longer allowed. Cockle harvesting - another major income earner especially among women, is totally banned for several months of the year. There are very few alternatives

available to individuals living in the coastal communities surrounding the Padre Ramos Estuary and these communities are considered some of the poorest in the country. The SUCCESS program implemented a strategy to assess and pilot a number of potential alternative livelihoods that would improve the economic welfare of individuals in the communities surrounding the estuary. Providing alternatives is also seen as a strategy to prevent these very poor people from being forced to engage in illegal resource management practices in order to survive.

Production and sale of hammocks to support to the Altagracia women's cooperative

The hammock feasibility study was completed to determine the viability of supporting the women's cooperative *Altagracia*, which had received training in making hammocks as an alternative to collecting wild shrimp post larvae in the Padre Ramos protected area. Results of the study indicate:

- Hammocks made from multifilament yarn are not competitive nor profitable and other materials that could be used (cotton and woven polypropylene) are too costly.
- Potential markets in isolated areas are not sufficiently consolidated or frequented. This, in combination with the low projected margin of profit, indicates that hammock-making is not feasible in these areas.
- The hammocks that seem to be preferred by consumers in these areas are those made from woven hemp line. The margin of profit using this type of materials is minimal (10%) and is only feasible when the volume of production is high.

For these reasons, it was decided that hammock-making would not be continued as part of the SUCCESS Program activities, especially since the women are now having good success making and selling bread. Bread-making offers more regular income with lower investment than the hammocks.

Technical assistance to women's group producing bread

Beginning in January 2007, intensive support activities were initiated for bread-making by a baker from the commercial bakery, "La Viejaza" located in the municipality of El Viejo. SUCCESS provided the materials. Extension visits were made which explained the design and use of accounting systems which were put in place in February 2007 when commercial bread production began. One participant proved to be particularly adept at accounting and has since taken responsibility for this function on behalf of the group. Now that production is regular and good record keeping is underway, the next steps are to expand the market beyond the local area and possibly at a slightly higher price (although at the moment, all bread is being sold locally). Some bread is sold at a wholesale price to one local shop, while the rest is being sold at retail price to consumers who come to the small bakery to make their purchases. While selling a large quantity of bread to the local shop eases the work associated with selling the product, the trade-off is a reduced profit. Also, the group produces bread only three times weekly, alternating with production of corn bread, which has a lower price. Increasing the volume of bread baked each time or increasing the number of days per week the bread-baking occurs would also increase revenues. Work will continue with follow-up for record keeping and at the end of March the UCA tourism school faculty will assist the women's group in the areas of small business communication, language, customer service and production hygiene.

Alternative tourism development in protected coastal areas

A series of meetings has been held with 12 regular participants for development of alternative tourism. Participants are members of the FINCAMAR Association, which includes the Cooperatives Cristo Rey and *Altagracia*, and the collective farm Rosita, among others. Since the

members are extremely poor, there is no way they can invest in even the most minimal infrastructure. Hence, the least costly alternative is an aquatic tourist route through mangrove and bird-roosting areas. This also appears promising because the owner of the nearby international marina has been urging FINCAMAR to develop something for the tourists who visit the marina—as they are in need of entertainment alternatives and the owner is willing to support this initiative. The study, "Evaluation of the species composition and diversity of woody plant species in the Ecological Reserve Padre Ramos" was finalized by students of the National Agrarian University (UNA). The results will be presented to FINCAMAR members in May 2007 after final revision by the students using this as their thesis project. With this information, it will be possible to develop tourist materials on plant identification and provide signage on tourist trails.

Rabbits and iguana rearing

Rabbits: A feasibility study was conducted to determine the feasibility for members of the collective farm *Rosita* to raise rabbits. Rabbits offer a source of protein, income and an alternative to unsustainable hunting practices—practices in which brush and forest fires are set to flush out small game such as rabbits and iguanas. Study results indicated that rearing rabbits to sell as pets or for food is not sufficiently profitable, (profit margins of only 10% or 4%, respectively). And, while producing these animals for sale as breeders was more profitable, there is a limited market. With no market for rabbits, no replication of this activity is planned.

Iguanas: Iguana-rearing has been a low-intensity effort started based on interest and concern of stakeholders in FINCAMAR and the collective farm *Rosita*. Iguanas are considered and cited in CITIES as in danger of extinction. Yet, iguana meat and eggs are popular food items throughout much of Latin America, particularly during holiday times. Iguanas are hunted by starting brush fires in the dry tropical coastal forest, a practice which affects habitat and a wide range of wild life. They have been successfully reared elsewhere and are farmed through an extensive form of ranching. Thus, some support was provided to allow stakeholders to attempt the first breeding in captivity and to rear young before releasing them. The owner of the property where this is being done plans to continue, particularly as it is thought this might interest tourists who pass through the farm. However, SUCCESS no longer provides financial assistance to this activity.

4.2.3 Promoting Community-based and Municipal-scale Resource Management and Zoning Policies

Monitoring of the Estero Real

Monitoring continues with financing from the Nicaraguan Association of Aquaculturists (ANDA). GIS is being used to generate monthly maps of the physical-chemical and microbiological parameters at the 14 sampling stations. An annual report will be issued on the water quality of the Estero Real.

Environmental education and good practices

CIDEA supported ANDA to revise the Code of Good Practices for responsible shrimp culture in Nicaragua. In February 2007, the second draft of the Code was submitted to the government, which incorporated changes. This document is now in the process of public review.

Short events on topics such as planting mangroves were held in communities of El Manzano. An extension event was held in March with shrimp post larvae fishers in Manzano, a community/site which hosts the OIKOS-sponsored mangrove conservation and planting project, which has also been supported by SUCCESS. Themes related to conservation presented over the last year were reviewed and discussed with stakeholders. Good results have been obtained with

the mangrove planting—95% germination using the nursery method, 98% germination with direct planting. This work was conducted with the support of Peace Corps volunteer Nelly Broach.

Alternative forms of management for the cockle fishery in Aserradores and El Realejo

Baseline data for the Aserradores community where cockle management work is being conducted was updated and finalized.

Data on cockle collectors at Aserradores

Number of families in which at least one member collects cockles.	29 families
Total number of individuals in the 29 families	158 people
Average number of people per family	5.4 persons
Total number of females	80
Number of female collecting cockles	32 adult women, 10 girls
Cockle buyers/sellers	3 women
Total number of minor females (0-12 years)	33 women
Number senior citizens females	2 women
Total number of males	78
Number of males that collect cockles	4 adults, 20 boys
Number of males who fish	26
Total number of minor males (0-12 years)	27
Total number of senior citizen males	1

On March 8, 2007 a sampling was made of the cockles in the study areas with the assistance of volunteers. Sampling was conducted in the closed areas with a total of four sample plots measuring 4m² in each closed area (12 in total). The data is currently being processed.

Outreach activities were initiated with the small community of Maderas Negras, located near Aserradores and which has been responsible for most of the cases of intrusion into the closed areas established by the people of Aserradores. Outreach with Maderas Negras residents was intended to socialize the concept of the closed zones and to encourage them to comply with the management regime. The outcome is that the cockle collectors in this area agreed not to fish in the closed areas. They also requested support to establish their own no-take zones. Additionally, CIDEA has been working Ms. Nicolaza de la Concepcion Guerrero, a cockle buyer, to record the number of cockles being taken. Thirty cockles collectors work in this area and extract about 300 dozen cockles for each 15 day period that they work during the month. Other activities related to cockle management include:

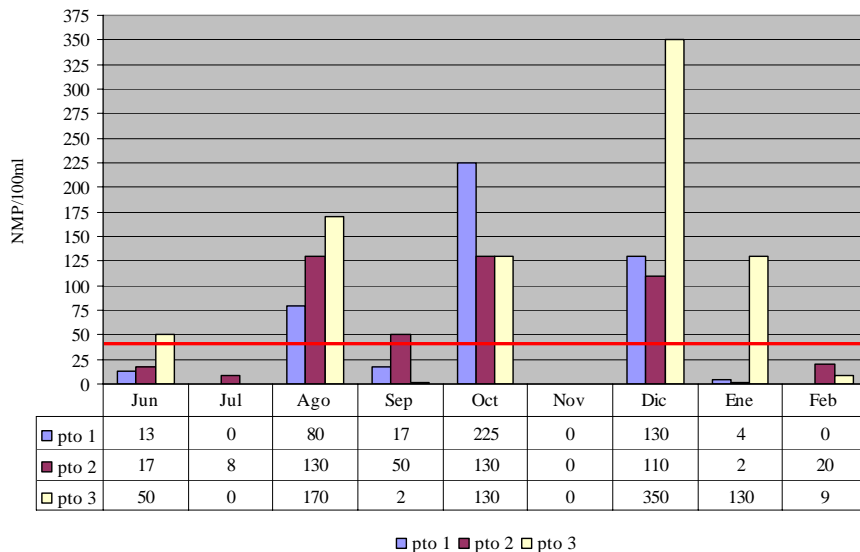
Monitoring cockle growth rates: work to determine the cockle growth rate, a key datum needed for management, has continued in coordination with the community of La Bayona. When the data was analyzed, many values were found that were out of range, so the decision was made to repeat the work, but using individual animals rather than size groups. This data collection and analysis will be conducted during visits for management work, so as not to incur additional costs.

Cockle fisheries data: Data is being collected from three cockle buyers. This process uses the cockle buyers own records, which is the periodic payment of the cockle fishers. This provides information on the total number of cockles harvested for sale in each locale. In the past, each time the payments were made to the fishers, the record was discarded. CIDEA has worked with the buyers to convince them to keep complete records and not to discard them, but rather to provide this information to CIDEA researchers and to ensure the recording of all cockles purchased.

4.2.4 Science for Management: Water quality of shellfish collection areas and microbial analysis of shellfish meats to improve public health and decision-making for cockle fisheries management

Water quality was sampled in the cockle fishing areas of Aserradores, El Realejo and Padre Ramos to detect the presence or absence of *E. coli*, *Salmonella spp.* and *Vibrio parahaemolyticus*. *Salmonella* and *Vibrio* have not been detected in waters to date. Results for the presence of *E. coli* found that for samples taken to date in Padre Ramos, 44 % exceeded the permissible levels for *E. coli* as set by the US Food and Drug Administration for total *E. coli* (44 Most Probable Number-MPN) (Graph 1). Standards for *E. coli* in shellfish collection waters have not yet been established in Nicaragua. Bacterial levels fluctuate even during the dry season, which might be due to the ability of the bacteria to remain in the water for up to 90 days when levels might be expected to be lower. In Aserradores, 33 % of the samples exceeded permissible levels for *E. coli*. High levels were only seen during August, September and December. For determination of Hepatitis A in cockle tissues, analysis of accumulated samples began in March. These samples were taken over the same period of time, but were frozen so that each test kit, which contains materials for a certain number of samples but which has a short shelf life, can be used when the total number of samples required to completely use all kit reagents has been reached.

Graph 1: *E. coli* levels at Padre Ramos



Preliminary results from this work highlight the importance of monitoring in areas where shellfish are farmed or collected. There are times of year and certain areas within each estuary where *E. coli* levels are high enough to be dangerous if shellfish are consumed. Although *Salmonella* and *Vibrio* were not found, it should be remembered that *E. coli* is used as an indicator organism whose presence often suggests the presence of other pathogenic bacteria or viruses, mainly as a result of contamination by sewage, and therefore while *E. coli* is dangerous in and of itself, other pathogens may be also present. A long-term monitoring program can predict the areas in which and the seasons during which collecting the shellfish should be prohibited—as is done in the U.S. This safeguards human health by preventing consumption of contaminated shellfish, and also incidentally acts to help protect bivalve populations since closures also permit shellfish to grow and breed. The preliminary results of the water quality study indicate that while standards and monitoring are important, management measures to prevent contamination of water bodies needs more serious consideration as well.

4.2.5 Outreach

CIDEA adheres to branding requirements of USAID and SUCCESS for all published materials and signage. CIDEA publications, signs and outreach materials are widely distributed and read, and in the case of the signage, are located in high traffic areas within the communities where SUCCESS is active. Examples of recent outreach efforts include an article published in the national newspaper, La Prensa, on the cockle management trials. This resulted in a village located near Corinto on the Pacific coast making a written request for CIDEA to assist with establishing a similar project in their community to help protect their resources. An invitation was also received from the organizing committee of the Cruise of the Sea Fair to publish a similar article in the Fair publication on the Aserradores project. An extension manual “Mangroves, Ecosystem of Life” was published and distributed during this quarter in the Program site communities, government institutions and other natural resources agencies. It is posted on the CIDEA webpage (www.cidea.edu.ni).

4.3 Tasks, Milestones, Dates, Status, Comments

Tasks, Milestones, Dates, Status, Comments

Task	Date Due	Status	Comments/Challenges/Constraints
Promotion of sustainable, low-tech, mariculture practices appropriate in the Central American Region as diversified livelihood options for coastal communities			
Continue the implementation of best management practices (BMPs) to improve environmental sustainability, operational efficiency and to reduce production			
Best/Good Management Practices			
Conduct series of one-day, mini-extension workshops	NA	Ongoing	Extension visits continue to be made every 15 days
Design and implement pilot tilapia trials in shrimp ponds	September 2005	Completed	Ponds were harvested in March 2007; this delay was due to need for an environmental review
Provide technical assistance extension visits to continue implementation of BMPs at Rosita farm and Cristo Rey	On-going through Year 3	On-track	Extension assistance provided over two cycles; visits continue every 15 days; both shrimp ponds have improved production, monitored water quality and realized increased revenues as a result
Provide water quality monitoring equipment and other items to shrimp farmers working to implement BMPs (costs partially supported by OIKOS)	October 2006: equipment purchase August 2007: final report	On-track	Water quality equipment (salinity, pH, dissolved oxygen and HACH kit) purchased for Rosita and Mario Carrillo farms (both in FINCAMAR) and Agropesca farm; monitoring in progress and report due August 2007
Provide technical assistance and extension support to monitor and track key parameters over the culture cycle, including production and environmental data	October 2006-onwards	On-track	Monitoring underway, final report to be submitted August 2007 with technical, economic and environmental data from the farms

Provide support to farms in securing financial support for implementation of other BMPs through meetings with donors, government agencies and financial institutions	On-going during Year 3	On-track	Discussion ongoing with financial agencies and funders including MCC and IDR; no financing obtained to date; efforts will continue;
Policy			
Provide support to Nicaraguan government on outreach for adoption of BMPs once Code of Conduct approved at national level	On-going once Code of Conduct approved by government	On-going	After final round of revisions, Code is now in the public consultation phase
Publication and distribution of the mangrove manual	October 2006	Completed	Publication and distribution of document was completed in March 2007
Demonstrate feasibility of growing tilapia in shrimp ponds as an alternative or supplemental crop for shrimp culture			
Demonstrate culture of tilapia in small shrimp ponds	August 2006 - July 2007	Completed	Ponds were harvested in March
Continue technical assistance to women's group producing bread			
Conduct second phase of small business workshop in coordination with SIFE	November - December 2006	Completed	Work with SIFE completed in March 2007
Conduct extension workshops and follow-up to commercial bread-making	November 2006 - February 2007	On-track	Follow-up continues with emphasis on record keeping and improving revenues
Document the experience	November 2006 - March 2007	On-track	Documentation on-going
Provide assistance in record-keeping	On-going	On-track	Record keeping assistance provided by SIFE;
Continue technical assistance to alternative tourism development in protected areas coastal areas			
Deliver extension support services to/for development of alternative livelihoods	March 2007	On-track	First event held on March 30, 2007
Promoting community-based and municipality-scale resource management and zoning policies			
Monitoring of Estero Real			
Conduct monthly water quality monitoring of Estero Real	On-going	On-track	GIS maps produced containing physical-chemical and microbiological information

Environmental Education and Good Practices	On-going	On-track	CIDEA coordinating with two Peace Corps Volunteers for community and school environmental awareness; support for BMPs on shrimp farms continues with bi-weekly visits
Alternative forms of management for the cockle fishery in Aserradores and El Realejo			
Meet with community to establish Management Committee and agreements on the voluntary measures for management	September 2006	Delayed but on-going	Management Committee established and cooperating with the management regime; agreements to be signed after completion of trials and according to new government protocols
Conduct sampling to determine population density in all study zones	September 2006	On-track	First sampling completed; next step of data analysis underway
Conduct extension visits with community to ensure continuation of management regime in no-take and fishing areas	December 2006 - June 2007	On-track	Extension visits continue and compliance with voluntary no-take zones is good and improving
Work with cockle buyers (consolidators) to develop record-keeping system to estimate harvests	October 2006	On-track and on-going	Cockle buyers providing their records to CIDEA to assess the number of cockles being harvested since March 2007
Visit cockle collectors in Maderas Negras area in Aserradores to disseminate results of study	November 2006	Completed	Two visits in February and March 2007; residents are now cooperating with no-take zones
Meet with community to evaluate results of research including commitment (verbal) to adopt management system	May 2007 and September 2007	On-track	Data from the first six months of implementing no-take areas being analyzed and discussed with communities
Install sign in Aserradores w/ management guidelines	December 2006	Completed	Sign installed in Aserradores
Finalize governance baseline for Aserradores	December 2006-February 2007	On-track; slightly delayed	Study in the final stages of editing; expected publications May 2007
Other activities related to cockle management			
Continue collection of growth rate data for cockles in Padre Ramos	October-December 2006	Re-initiated	Data from first study compromised, due to methodological error; study re-initiated
Science for Management: Water quality of shellfish collection areas and microbial analysis of shellfish meats to improve public health and decision-making for cockle management			
Conduct monthly water quality monitoring	June 2006 - May 2007	On-track	Water quality monitored and tissue samples begun in Aserradores, El Realejo, and Padre Ramos.

Conduct laboratory analysis of water samples	June 2006 - May 2007	On-track	Analysis of accumulated samples begun
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4.4 Priorities for Next Quarter (April 1 – June 30, 2007)

- Work with FINCAMAR to develop a tourist package and present to potential customers
- Assistance to the bread-making group with emphasis on improving records and revenues
- Work with women’s group to expand bread-marketing outside of immediate area
- Conduct exchange visits with commercial bakery
- Sampling the no-take zones in Asseradores and strategies for maintaining compliance
- CIDEA planning and organization for July annual SUCCESS work planning meeting
- Extension to shrimp farmers to implement BMPs as new production cycles begin in April

A SUCCESS Nicaragua Story

“Apoyando a formar una panadería” Supporting the formation of a bakery business

One of the members of the Association FINCAMAR is the women’s cooperative “Altagracia”. Traditionally, the women in this group are shrimp post larvae fishers in the Padre Ramos Estuary. When this area was designated as a protected area under co-management, this activity was outlawed—with the consequence that the women were left without a means of earning a living.

In Padre Ramos, there was no one making bread so all bread was brought from Chinandega to be sold in small local shops at a high price. CIDEA discovered that one woman in Padre Ramos owned a wood-fired oven, but was using it only twice a week to make corn bread to sell to the buses passing on the highway near her home.

Thus, bread making was identified as an activity which could generate revenues for the women, at the same time as producing a local source of bread at lower prices. Once this opportunity presented itself, the SUCCESS Program provided the women with training and extension support—teaching them how to make bread, use the equipment, keep records, conduct simple financial analysis, and ensure quality control.

The four members of the bread-making group decided to name their bakery “Felicita”. They bake bread, including two varieties of sweet bread, three times a week. These women are now selling their bread in the area and are no longer practicing post larvae fishing.

Now that the basics of operating a small bakery have been mastered, CIDEA will continue working with the group to build their skills in bookkeeping, marketing, and improving their bread-making techniques.

5. Ecuador On-the-Ground Results

5.1 Background

SUCCESS provides technical assistance to organized local groups that are testing and implementing alternative livelihood activities, promoting new forms of sustainable production and improving existing livelihoods. Participatory methods are used to engage participants in planning for natural resources use and developing local capacity for integrated coastal management for the Cojimies estuary and surrounding watersheds.

5.2 Report Period Accomplishments (January 1 – March 31, 2007)

5.2.1 Promotion of Diversified Livelihood Options for Coastal Communities in the Cojimies Estuary to Raise Incomes and Promote More Conservation-Oriented Practices

Develop diversified mariculture technologies using indigenous species (chame)

The first *chame* culture trial was completed with the last in a series of partial harvests and the *chame* study completed. The last harvest occurred on December 15, 2006 in a 2.6 ha pond. There are significant outcomes from the development of *chame* culture and associated research. This work was supported by a small grant from USAID/Ecuador. The final partial harvest of *chame* produced 116 pounds of fish (375 fish averaging 340 grams/12 ounces). Of this, 275 fish were consumed by the 21 participating families and the remaining 100 fish were transferred to a three ha pond located in the village of Mache. These fish will remain there for approximately four months until they reach a weight of 700 g (~ 2 pounds), when they will be sold.

The recent scarcity of *chame* fingerlings is one of the issues currently affecting plans to continue to restock ponds with *chame* and shrimp as a successful form of polyculture. Normally *chame* breed naturally in artificial and natural ponds, as well as in wetland areas. Currently all the shrimp ponds in Cojimies have been stocked with shrimp, as recently local shrimp production has been rebounding as farmers learn to manage the previously devastating diseases. A natural toxin obtained from a shrub called barbasco is used to control the mosquito fish which infest shrimp ponds in large numbers and consume significant amounts of shrimp food, thereby negatively affecting shrimp production and economics. It is believed that the upsurge in shrimp farming leading to the use of barbasco in nearly all the ponds in the region, has affected *chame* fingerling supply. This is being investigated. It may be necessary to either address the use of barbasco or create other sources of *chame* fingerlings if future work is to continue.

A positive effect of the *chame* trials has been that it has generated great interest among the *Nuevo Milenio* members and others for continuation. At the beginning of 2007, three members requested a concession for a 2.6 ha pond for polyculture of shrimp and *chame*. In February, they stocked 200,000 shrimp postlarvae, but they have been unable to acquire the 1000 *chame* fingerlings they need for the planned polyculture. Additionally, another group that have a 3 ha pond have saved \$250 to buy fingerlings, but due to the fingerling scarcity, they have not been to make their purchases yet.

The *chame* effort has also resulted in two studies (characterization of *chame* culture and biology and a feasibility study for a *chame* training center), which have yielded a large amount of useful background information. For example, twelve individuals outside of *Nuevo Milenion* were identified in the Cojimies area that are conducting *chame* culture and these individuals will be

participating in the upcoming *chame* culture workshop scheduled for June 2007. Traditional methods of growing *chame* have also been characterized. These are either using reservoirs or one of three different types of ponds: natural, semi-natural and artificial. In most cases, natural depressions that collect water are used or simple dikes are built to capture water. There is a natural relationship between wetlands and the presence of *chame*. As wetlands are affected by human activities, *chame* also suffer along with future prospects for *chame* culture. Price data from the major *chame* market, Chone, has been collected from vendors and analyzed. Prices range from a low of \$0.60/lb in February and March to a peak of \$1.00/lb in May. This information is useful for planning production cycles, harvest times and marketing.

The document, “*Chame Culture in the Estuary of the Chone River*” also presents an analysis of bio-economic scenarios for low technology *chame* culture and can be found at www.EcoCostas.org.

Expand beekeeping livelihood to additional women beneficiaries

Beekeeping was started by one of the local leaders, Mr. Santiago Yin, after initial training presented at the first SUCCESS training course in 2005, by capturing wild hives. After some initial success, problems were encountered with the bees abandoning their hives—at the time, thought to be due to an insufficient quantity of flowering plants in the immediate area. Since that time, Mr. Yin has experimented with sites by transferring the hives around the Cojimies area in order to identify the best sites for beekeeping. He now has hives located in five locations with seven of these located in Piedra Fina near the community of Tres Vias. Relocation of the hives is now paying off, as Mr. Yin had a second harvest in February 2007 of 4750 cubic centimeters of good quality honey. He utilized the honey centrifuge that was provided by SUCCESS to efficiently extract the honey. The price of a 750 cc bottle of honey sells for up to \$10 in Pedernales. To date, Mr. Yin has sold 3000 cc of honey for a total of US \$40. The other 1750 cc are being used for family consumption and as gifts for the land owners that have allowed him to locate hives on their land. To help resolve some of the various problems encountered with beekeeping and to assist with an evaluation of whether beekeeping should be continued, Professor Polibio Morillo, a specialist in apiculture with 30 years of experience who lives in Atacames, was invited to visit the sites. He made several recommendations for improvement. Replication of the beekeeping is now taking place. Maria Isabel Bone, Association of Cockle Collectors in Chamanga; Maria Cagua Gracias, Association of Cockle Collectors of the Virgin of Las Lajas of Bolivar; and Roberto Loor, farmer from Nuevo Milenio will participate in an internship in April at the beekeeping operation of Professor Polibio in Atacames. The two women are members of the local leaders group formed by SUCCESS. The Program will provide basic beekeeping equipment to these three new beekeepers.

Document impacts of backyard gardening activities and preparation of medicinal plant gardens

Family gardens and a community garden were begun in Bolivar at the end of 2005 (as the rainy season began) as a trial to test whether gardening could provide food and income for the women of Bolivar. Agriculture is not generally a tradition among the fishing communities and this effort builds capacity to garden and farm as an alternative or supplement to fishing and cockle gathering. One of the greatest challenges for gardening at Bolivar, which is located in a coastal, sandy area, is the water supply as the owner must hand carry water in buckets from a well 500 meter from the gardens. Currently, the gardens in Bolivar produce peanuts, beans, corn, rice, plantains, sweet potatoes, water melon, other melons and passion fruit. The economic contribution or potential of gardens can be illustrated by the case of Fidel Panezo, 50 years old, married, with five children. He lives in Bolivar and has a garden measuring 1564 m². He has harvested a variety of products for family consumption and sale such as beans (150 pounds, \$20

sold), tomatoes (700 pounds, \$30 sold), peppers (700 pepper, \$20 sold), and 220 watermelons (\$120). The latter amount he used to build his house. It can be seen that with a fairly small plot of land, one can grow significant amounts of produce for consumption and sale.

This gardening inspired a similar effort by the partners in *Nuevo Milenio*, which decided to use part of their land (3000 m²) to establish a Demonstration and Experimental Garden and Nursery for Organic Agriculture. Slightly more than half of this plot is being used for the nursery component. The nursery will have the capacity to produce 4000 fruit seedlings, 4000 timber crop seedlings, 1000 ornamental plants and 1000 medicinal plants and herbs. An elevated tank will also be installed to provide water and a small (6 x 12 meters) multiple-use room is being constructed from local materials. The rest of the land will be used for a garden based on ecologically friendly practices such as solids and liquids and intensive permaculture systems. Part of the strategy to preserve local biodiversity and local traditions is the component of the garden that will produce medicinal plants and herbs for local use and sale. Members of the Chamanga Technical high school EcoClub are continuing their gardening efforts and will dedicate part of their school garden to medicinal plants.

Establish low impact eco-tourism enterprises as an income generator and to promote improved conservation ethics among local residents

EcoCostas is collaborating with the Committee for Tourism Development of Mompiche (DCTM), founded in 2004, which is the only group in the community with legal recognition. Mompiche is a coastal, fishing town rapidly becoming a tourist destination for Ecuadorian and international tourists, in part due to its reputation as an unspoiled surfing beach. The President of DCTM and owner of the Dolphin Cabanas is collaborating with EcoCostas on tourism initiatives. This group has about 20 members, mainly owners and operators of hotels and restaurants, and some owners of small boats used for fishing or tourist activities. Among initiatives undertaken by the group is the idea of promoting the preservation of the rustic local style of construction through a zoning initiative and the conservation of existing vegetation and animals in the interest of maintaining the attractiveness of the area.

Tourist trails: EcoCostas has prepared a report, "Preliminary identification of nature trails with potential for the implementation of tours near Mompiche town, Muisne Canton, Esmeraldas Province". This report identifies two types of trails with potential: a terrestrial walking trail and an aquatic trail. The terrestrial trail extends along the Mompiche road. During early morning hours, one can easily observe howler monkeys and various birds including Chestnut Mandibled Toucans (*Ramphastos swainsonii*), Pale Mandibled Aracaria Toucans (*Pteroglossus erythropygiu*), woodpeckers, seabirds and others. Half-way along the road, there is an excellent spot to overlook the coastal valley and beach. A small resting area, possibly serving refreshments, is planned here. The aquatic trail begins at the Mompiche beaches and ends at the entrance of the beach town of Bolivar. One can enter the mangrove areas located inland of Bolivar through a canal. One can then continue by the canal and exit through the town of Portete, which lies between Mompiche and Bolivar, thus returning to the Mompiche beach. The cost of this tour would vary between US \$40 and \$60 depending on whether fishing or snorkeling is included and would last one to three hours. On this aquatic trail, one could also observe resting areas for frigate birds, the Portete Promontory, a rock cliff area with the appearance of natural stairs, mangrove areas, the quaint town of Bolivar and a coconut plantain that is 2 km long. Two other trails are possibilities. The first consists of crossing by boat to Jupiter Island, a barrier island especially desirable for those interested in swimming and bird watching. The second trail would go through Cantil Island, located in front of the town of Daule, and is situated within the estuary where it is possible to observe dolphins during the rising tide.

Tourist surveys and guide training: SUCCESS, in coordination with the CDTP, is conducting the surveys of tourists frequenting the area, asking them about their tourism needs and interests. Survey results will be analyzed during the next trimester and tourist guide training (based on survey results) will begin soon afterwards.

5.2.2 Shrimp Best Management Practices

SUCCESS has been working to better understand and characterize issues associated with shrimp farming that affect the economy and environment of the Cojimies area, where shrimp farming is a major economic activity. Emilio Ochoa and Stephen Olsen have finished developing the governance baseline on the shrimp industry of the Cojimies Estuary. This work will be an important information base for the upcoming ICM workshop to be held in June 2007 with the support of the Mayor of Pedernales. The shrimp farming sector in Cojimies is characterized by having a large number of farmers with relatively small farms, and many of them with a low level of education and technical expertise. Access to information and communication is also limited due to the isolation of the region. These farmers are also very independent and to date have not managed to organized themselves in formal or ad hoc groups. There is no recognized leadership among them. They do recognize that they have management problems, primarily in the area of water quality management, that is associated with high disease levels and possibly environmental problems. This scenario is similar to that found in Nicaragua where extension and outreach for the implementation of BMPs has been successful in mitigating environmental issues, while at the same time improving production and profits on small family and cooperative shrimp ponds.

The SUCCESS Program has started to work more with this stakeholder group which is so important to restoring the ecological integrity of the estuary. On March 9, 2007 a workshop was held in Pedernales by the EcoCostas team, with presentations by the Aquaculture Certification Council (ACC). The purpose was to discuss with the shrimp farmers possibilities for a joint initiative to implement BMPs and to present basic information on experience with BMPs in other countries. Twelve producers attended.

Workshop sessions identified the most significant problems for the Cojimies shrimp sector:

1. Financial institutions have closed access to credit for the shrimp sector;
2. Off-flavor and bad smell of shrimp produced in the Cojimies area (note: this is a result of poor water quality and/or pond management that leads to undesirable blooms of blue-green algae);
3. Exporters pay very low prices to producers;
4. Issues related to land tenure problems for shrimp farms;
5. Sedimentation occurring in the ponds;
6. Quality of formulated food;
7. Indiscriminate use of probiotics;
8. Post larval quality;
9. Waste management (oil/fuel); and
10. Mangrove deforestation.

The shrimp farmers state that the first eight items in the list above directly affect the economics of shrimp farming. Also, they recognize that the last six items (except for number eight) are related to the environment. They believe the first three items need immediate resolution, but that issues four, five and six require more time to address. From their point of view, the legal and financial issues are problems which are difficult for them to address directly, since these in part depend on the government and the market. But it does seem to be clear that they are able to work on addressing some of the other issues and appear to be willing to make an attempt. Dialogue with

the shrimp farmers will continue with the purpose of involving them in initiatives related to SUCCESS Program goals, such as testing some set of BMPs that could assist in resolving some of their management issues (e.g., preventing off-flavor, which could help them obtain better prices) while at the same time producing positive impacts for the environment. The issues are complex. For example, the off-flavor is probably due to three different factors: 1) poor pond management; 2) changes in the estuary and watershed such as reduced freshwater flows over which shrimp farmers have little control; and 3) environmental impacts caused directly by shrimp farming in general, e.g., blocking the lower drainage of the estuary which could be improved if political will existed. Based on experiences with BMP implementation and training in other countries, the Cojimies situation is not particularly unique and if shrimp farmers can rally around a few key issues, making positive changes would be feasible.

5.2.3 Natural Resource Management

Reforestation Strategies Using High Value Crops

As part of the SUCCESS efforts to address key issues that affect the Cojimies estuary, EcoCostas is working with local farmers to reforest previously timbered land using an approach which will provide short-term and long-term benefits through multi-cropping of a rapidly producing crop (passion fruit) integrated with a slower, but longer producing crop (cacao)—both of which provide ground cover and help reforest the area. Results have been rapid. Fourteen members of *Nuevo Milenio* have planted 10 ha of passion fruit and 19 members planted cacao. Sufficient seedlings remain to plant another 11 ha for a total of 30 hectares. It should be noted that other ground crops (e.g. beans, yucca) are being planted along side the passion fruit and cacao to further help reduce erosion and produce immediate food and/or income for the families.

The following example illustrates the benefits of even small-scale planting of passion fruit. Aides Pinargote, Antonio Vargas and Clemente Vargas are members of the same family of small-scale farmers working at *Nuevo Milenio*. They have an area planted with only 1 ha of producing passion fruit. To date, they have harvested three times. They dedicate only a small percentage of their time to this enterprise. Yet, these harvests have produced 750 kg of fruit, which sold for \$150—providing significant additional income for this family. Even though there have not yet been any cacao harvest, data from other areas suggests that even small plots of cacao can also generate significant income for small farm families. In addition, cacao crops serve almost immediately to prevent erosion.

Build skills and capacity of local promoters

One of the local leaders, Walter Peña from *Nuevo Milenio*, who has worked with EcoCostas on the *chame* trials and is now heading the efforts with reforestation and good agricultural practices, was sent to a training course at the Center for Investigation, Development and Training in Permaculture (CIDEP) held at Mallin Ahogado, Patagonia, Argentina. One member of EcoCostas, Guillermo Prado, also attended. Upon return, Walter began implementing the design developed during the training course for a garden/nursery demonstration project at *Nuevo Milenio* that will serve as a demonstration effort for inhabitants of *Nuevo Milenio* and the Mache-Chindul Reserve, generate income and food resources for local families and assist with new reforestation efforts around the area.

Environmental awareness-raising and constituency-building

Awareness raising at the local level continues to be linked with the alternative livelihood efforts (*chame*, honey, gardens, reforestation, ecotourism) and the beginnings of a process of working with the shrimp farmers at Cojimies. The Mayors of Muisne and Pedernales are now supporting

and will convene the ICM workshop that will take place in May and will include local authorities (municipalities and parish committees), local NGOs and CBOs and private business. EcoCostas is also participating in two collaborative projects funded by the EU with the NGOs Ethos, Hegolan, Green Mangrove and the Muisne Muisne Municipality. One of the projects, "Organizational strengthening and improving the quality of life in Muisne Canton, Esmeraldas" concerns solid waste and latrine building in 8 rural parishes of Muisne, including Bolivar, Daule, Salima and Chamanga, communities which are also targeted by SUCCESS. The other project, "Forest management and conservation" has as its objective the management and conservation of 3000 ha of forest, construction of a permanent nursery for forest trees and formation of a team of forest wardens that will monitor the Mache-Chindul Ecological Reserve.

Study to determine effects of pesticides on bivalves in the estuary

A great deal of investigatory and preparatory work went into planning of study to assess the effects of pesticides on the cockle population of the Cojimies Estuary. The goals of this study was to determine if a specific pesticide believed by local stakeholders to be the cause of the cockle scarcity was indeed responsible for harming cockles, as the firm adherence by cockle collectors to this idea was preventing forward moment on cockle management efforts. Some of the information uncovered during this process has indicated that execution of the study might not be needed at this point as it appears that the pesticide in question is no longer being widely used. Additionally, the nature of the pesticide and its use makes it difficult and more costly than previously believed to accurately execute the study. It was therefore decided not to conduct this study and dedicate the funding towards the on-going water quality monitoring work which is proving to be more informative and useful. The issue of cockle management will be taken up again during a June workshop with the cockle collectors.

5.2.4 Outreach

The following reports are now available on the EcoCostas website www.EcoCostas.org:

- Characterization of the watersheds of the Cojimies Estuary
- *Chame* culture in the Cojimies River Estuary
- Agreement for the development of sustainable production systems at Nuevo Milenio
- Medicinal plants used by the inhabitants of La Siberia and the Bolivar Parrish
- Populations of mollusks in the Cojimies River Estuary
- Rapid participatory assessment and SWOT of the tourist corridor Mompiche-Portete-Bolivar

A series of posters used for outreach and to disseminate the information for the aforementioned reports were also made and distributed:

- Edible mollusks of the Cojimies River Estuary
- Watersheds of Eastern Esmeraldas
- *Chame* culture in the Cojimies River Estuary
- Cockle fishing zones near Bolivar Parrish
- Medicinal plants used by the inhabitants of La Siberia and Bolivar Parrish
- Training center, gardens and nursery of Nuevo Milenio

5.3 Tasks, Milestones, Dates, Status, Comments

Tasks still pending, completed during, or added as of March 31, 2007

Task	Date Due	Status	Comments/Challenges/Constraints
Promotion of diversified livelihood options for coastal communities in the Cojimies estuary to raise incomes and promote more conservation oriented practices			
Establish Livelihood Diversification Fund for sustainability of local economic development	November 2005	On track	
Develop diversified mariculture technologies using indigenous species (<i>chame</i>)			
Livelihood diversification pilot projects	Ongoing	Ongoing	Final <i>chame</i> harvest conducted; although wide interest exists in the communities to restock, difficulties are being encountered with an unexpected scarcity of fingerlings. Reasons and solutions for this are being investigated.
Prepare business plans with stakeholders for various livelihood alternatives	On-going	On-going	General business plan and feasibility studies completed.
Continue to monitor and document <i>chame</i> development; evaluate production economics and price variations during the year in wetlands and ponds stocked with <i>chame</i> and shrimp	On going	On track	Monitoring and documentation of <i>chame</i> production continues. Further research is being conducted in areas where <i>chame</i> culture is traditional. Workshop for exchange of information and experiences is being planned for June.
Research and document marketing channels for <i>chame</i>	On going	On track	Currently investigating means of transporting large quantities of <i>chame</i> to regional markets and negotiation with vendors to obtain higher prices
Expand beekeeping livelihood to additional women beneficiaries			
Livelihood diversification pilot projects	Ongoing	Ongoing	Beekeeping continues. A second harvest of honey was obtained.
Prepare business plans with stakeholders for the various livelihood alternatives	Ongoing	On-going	First phases of studies for bees completed; data collection continues
Improve product quality through technical assistance to use centrifuge/filters for processing	On going	On-track	Centrifuge for honey extraction and improved filtration resulting in better honey product.

Document impacts of backyard gardening activities and medicinal plant gardens			
Livelihood diversification pilot projects	Ongoing	Ongoing	Feasibility study is being completed and data being collected from existing family gardens. Initial data shows gardens have significant benefits for providing local foods and revenues;
Prepare business plans with stakeholders for the various livelihood alternatives	Ongoing	On-going	Plans for a permaculture effort at Nuevo Milenio completed and the nursery/garden is being developed to support this plan. A separate reforestation project funded by the EU is also being supported by the nursery.
Establish low impact eco-tourism enterprises as an income generator and to promote improved conservation ethics among local residents			
Prepare business plans with stakeholders for the various livelihood alternatives	December 2005	Delayed	First plan for tourist trails was completed, but actual business plans delayed pending formation of group to begin working on implementation. It became apparent that more training such as for guides and development of materials would need to be done for this to happen.
Map newly formed islands and define their legal status	December 2006	Delayed	Mapping completed. Determination of legal status begun, awaiting government response.
Natural Resource Management			
Reforestation strategies using high value crops			
Livelihood diversification pilot projects	Ongoing	Ongoing	19 ha planted, with 11 remaining to be planted. Specialist in organic methods to provide further training.
Prepare business plans with stakeholders for the various livelihood alternatives	Ongoing	On-going	New work initiated with passion fruit/cacao and preliminary report issued.
Investigate issues of land tenure for <i>Neuvo Milenio</i>	November 2006	Completed	
Build skills and capacity of local promoters			
Conduct ICM workshop to kick-off natural resources initiatives and present alternative management practices	February 2007	Delayed	Workshop now in final planning stages and rescheduled for May. Significant local governmental and NGO support has been garnered for this.

Ensure attendance for one member of local promoters group at Permaculture course	May 2007	Completed	
Black cockle management	On-going	On track	No further work is being done on this issue until after the ICM workshop when local support for management initiatives can be consolidated.
Environmental awareness-raising and constituency-building			
Provide continued support to EcoClubs	Through September 2007	On-track	
Disseminate and diffuse materials produced during year	On going	On-track	Maps, posters, other outreach materials produced and distributed. See list in report.
Begin development of an ICM network for coast of Ecuador	July 2006	Delayed Now on-track	Workshop on BMPs for ICM was held in March and document, "Connecting leaders for social change from the Ecuador Coast" is in preparation and will be published in April 1007.
Study to determine the effects of pesticides on the bivalves in the estuary			
No activities scheduled for this reporting period		Cancelled	Due to expert advice, and higher than expected cost, this work is no longer a priority and has been cancelled.
Water quality monitoring for Cojimies Estuary			
Conduct water sampling in Cojimies Estuary	November 2006 and February 2007	Ongoing and on-track	Second set of water quality samples to be taken in April, coinciding with the dry period. Preliminary results from first sampling drafted and submitted.

5.4 Priorities for Next Quarter (April 1 – June 30, 2007)

- Continue to monitor and document *chame* development including: production economics, variations in price during the year, various culture methods such as stocking in wetlands and polyculture with shrimp.
- Research and document marketing channels for *chame*, including export opportunities.
- Conduct an extension event with *chame* producers from around Ecuador for an exchange of lessons and experiences.
- Support Yin and three others in internship at beekeeping facility and visit other honey projects to strengthen Yin and others' technical capacity in honey production and processing.
- Award small grants to women and others who successfully complete beekeeping training to establish hives.
- Identify local honey buyers in large cities near Pedernales and Esmeraldas.
- Improve honey packaging and develop labeling.
- Finalize the collection and analysis of gardening results.

- Prepare gardens in at least two communities with the medicinal plants.
- Complete defining legal status of these islands to determine if communities can use islands for tourism.
- Conduct tourist interviews to determine interests and needs.
- Conduct tourist guide training.
- Continue developing passion fruit and cacao cultivation areas and monitor results.
- Support two visits by agriculture specialist to teach and monitor use of organic cultivation methods and soil conservation practices.

6. Regional Capacity Building

6.1 Development of a capacity-building strategy and implementation of courses prioritizing needs of on-the-ground field site participants

All training this in this reporting period was targeted at participants from SUCCESS on-the-ground field sites and supporting institutions. The only site where training occurred this reporting period was in Nicaragua where four females and one male received small business-related training on “Attention to the Client”

6.2 Certification

6.2.1 Latin America

In Nicaragua, the CIDEA team in coordination with the UCA School of Sciences, Technology and Environment has been working to develop a Masters Degree program in Coastal Management. Draft curriculum for the program was submitted last quarter to the Dean of the Department of Sciences, Technology, and Environment (FCYTA) for review and discussion with the UCA administrative authorities. As of this reporting period, however, there is no further movement on this. While this curriculum could be part of a broader master’s degree, core elements of it would also serve as modules within a series that would lead to a certificate/certification program for non-matriculating individuals. Further discussion (and possibly decisions) on this idea of certification, and whether Latin America is ready and interested in such a program, will be discussed at the EcoCostas Network meeting in April 2007.

6.2.2 East Africa

Forward progress continued in this quarter in development of a certification program for Marine Protected Area (MPA) professionals. At a February 2007 workshop, WIOMSA and CRC (Lesley Squillante and Glenn Ricci represented CRC), with funding from SUCCESS and from the Swedish International Development Agency (SIDA) ,brought together 27 individuals from throughout the region and internationally who had reviewed and provided input to background documents which CRC and WIOMSA had drafted and circulated regarding the initiative. Further discussion at this workshop determined that rather than tie the program exclusively to the job title of marine protected area managers, the program should be opened up those who are marine protected area professionals, i.e., other job positions functioning at a professional level within MPAs (e.g., enforcement officers working in an MPA, etc.). At that workshop, the European Union-funded *Regional Coastal Management Program*, which has a significant percentage of its budget targeted at marine protected area management, was potentially interesting in providing financial support to this effort/Program. Preliminary discussions with The Nature Conservancy (TNC) also revealed that organization’s potential interest in providing programmatic and financial support. A meeting of representatives of WIOMSA, CRC, TNC and potentially WWF is

slated for July 5/6, 2007 for further discussions on these matters of potential partnership in and support of this initiative.

Although no representative from the IUCN's World Commission on Protected Areas was at the workshop, they did provide input to the circulated drafts and have been in further conversation with Julius Francis of WIOMSA and have tentatively expressed their interest in and potential support of this initiative. Next month, Dr. Francis will also present this initiative at the conference in Washington D.C. on marine protected areas and will solicit additional input and observations and statements of support.

A terms of reference was developed for a consultant from the region to detail out a breadth of aspects of the program, from curricula to standards, to the management structure that builds from the strawman initially developed by WIOMSA and CRC and input from representatives at the February workshop. This consultant should be hired in the next quarter. The goal is to have a fully crafted program by early 2008.

6.3 Tasks, Milestones, Dates, Status, Comments

Tasks still pending, completed during, or added as of March 31, 2007

Task	Date Due	Status	Comments/Challenges/Constraints
Training Courses			
Conduct module as part of Organization for Tropical Studies (OTS) course on watershed management	February 2007	Completed	Olsen cancelled making a presentation as his allotted presentation time was reduced in final agenda to one-hour vs. originally planned half-day. However, SUCCESS did provide two scholarships open to SUCCESS or other project partners.
Certification			
<i>East Africa</i>			
Contact potential partners to socialize certification concept	October 2006-February 2007	Completed	Drafts of concept and curriculum for MPA Manager certification circulated in region; verbal discussions on same indicate serious interest
Develop February 2007 meeting agenda and planning for	January 2007	Completed	Workshop was conducted
Develop an implementation plan prior to meeting for certification	December 2007	Completed	
Implement meeting with partners and participants from Mozambique Kenya, Tanzania and South Africa, Madagascar, Seychelles	February 2007	Completed	

Start initial implementation activities	March 2007	On Target and on-going	
Finalize concept paper for certification with the East Africa strategy included	June 2007	On Going	Hiring consultant to detail out all aspects of program; target date for completion is September 2007
Latin America			
Assemble and organize curriculum materials for both certification courses and the ICM Masters degree to be offered by the University of Central America.	October 2006	On-going	Draft curriculum awaiting approval from Dean of Dept of Sciences, Technology and Environment
Continue working with members of CRC/EcoCostas regional network to assess interest in the certification program and strengthening of related university curricula	On-going		EccNet meeting slated for April 2007 at which time this will be discussed
Finalize certification concept paper including the full description of standards and requirements	March 2007	On going New target date September 2007	See last item under East Africa section above.
Dissemination of Extension Materials			
With partners, develop overarching communications and dissemination strategy for SUCCESS materials	February 2007	Delayed	First draft next quarter
Identify list serves and other distribution lists to which SUCCESS can announce availability of these documents	December 2006 then on-going	On Target, on-going	First such vehicles made public in December 2006 through IMCAFS, SUCCESS websites and <i>Basins and Coasts</i> Newsletter
Post selected training materials on CRC theme-based knowledge management web system	December 2006 then on-going	Delayed	Pending appropriate development of KM system; selected sessions/modules may, however, now be posted on SUCCESS website
Distribute at Summer Institute and other SUCCESS and non-SUCCESS partner training courses	March 2007 then on-going	On Target	Being shared/disseminated as appropriate at field-based and CRC/UHH based training courses

6.4 Priorities for Next Quarter (April 1 – June 30, 2007)

- Continue discussions with TNC and WWF regarding support to the certification program
- Identify potential non-USAID funding sources and draft at least one proposal seeking funding for the certification program

7. Regional Networks and Knowledge Management

7.1 Background

The CRC SUCCESS Program is partnering with Western Indian Ocean Marine Science Association (WIOMSA) to assemble a Knowledge Management System (KMS) that will serve the WIOMSA network of countries. This organization is dedicated to promoting the educational, scientific and technological development of all aspects of marine sciences throughout the region of Western Indian Ocean (Somalia, Kenya, Tanzania, Mozambique, South Africa, Comoros, Madagascar, Seychelles, Mauritius, Reunion(France)) There is a geographical overlap in the region with the SUCCESS field sites in Tanzania and this overlap allows significant room for cross-portfolio development of an information system and KMS. WIOMSA has agreed recently to coordinate the formation of a regional Mariculture network and SUCCESS will provide KMS development in support of this activity.

The SUCCESS program worked to establish the EcoCostas-CRC Network of coastal management practitioners in Latin America. Members of this network participate in two field programs supported by SUCCESS in Ecuador and Nicaragua.

7.2 Report Period Accomplishments

7.2.1 Development of a Web-based Knowledge Management System Latin America

The AVINA Foundation renewed funding this quarter to support and implement a regional KMS focusing on governance baselining in Latin America. Development of this system has been passed to EcoCostas, a SUCCESS partner organization, in Ecuador. Information collected for the SUCCESS field sites in Ecuador and Nicaragua, along with other regional sites, will be input to this KMS.

7.2.2 Development of a Web-based Knowledge Management System, East Africa

WIOMSA has decided to host an effort to build a web forum for mariculture activities in the East Africa region. It would provide for a moderated discussion on mariculture and would be organized around specific topics relevant to the CRC and SUCCESS approach. CRC will assist with this system as it develops and work to integrate the system into CRC initiatives on the mariculture theme. In addition to the moderated forum, a web-accessible database containing publications of interest as well as regional practitioners and projects will be designed. This effort has been moved to Q3, FY07.

A large collection of the existing CRC repertoire on mariculture efforts has been gathered and can contribute to both the WIOMSA site and the CRC theme-based site. CRC has developed a section of its website as a KMS for delivery of Cross-portfolio Learning Topics (CPLTs). This system has been used currently to contain information linking coastal and freshwater resource management. Information supporting the East Africa (EA) mariculture KMS development has been gathered at CRC on three topics of interest to this effort. The three CPLT sections that will be developed at CRC are:

- General Approaches to Addressing Mariculture as an Element of Integrated Coastal Management Programs,
- Managing Pond-Based Mariculture Systems in the Coast (Shrimp and Fish),
- Managing Open-Water Mariculture Systems in the Coast and Oceans (Seaweed and Mollusks).

- The structure of these three CPLTs has been worked through and content has been collated for entry into the KMS at CRC supporting the EA mariculture efforts.

7.2.4 KM Support to other SUCCESS Activities

The SUCCESS Monitoring and Evaluation System (M & E) has been completed and is now implemented for the reporting of monitoring and evaluation data from all the SUCCESS Program field sites. Field partners can now securely login to the M & E system from their sites and enter data into forms for indicators spanning the complete range of intermediate results (IRs) in the Program's performance monitoring plan (PMP). Information within the system is backed up with evidence files submitted remotely by the field sites to provide an auditable collection of information. Reports from the system can now be generated as needed for any location, person submitting data, or reporting period.

7.2.5 Disseminating the SUCCESS Experience

SUCCESS has partnered with the Global Water for Sustainability Program (GLOWS) to produce and distribute a periodic newsletter containing articles of interest to the broader realm of the Integrated Management of Coastal and Freshwater Systems (IMCAFS). As the 'umbrella' program encompassing both SUCCESS and GLOWS, IMCAFS is hosting the newsletter on a new website at <http://www.imcafs.org/> that contains descriptive information on the Program and pointers to the GLOWS website, a new SUCCESS website and the IMCAFS Program newsletter Basins and Coasts. The first edition of Basins and Coasts was launched on 8 December, 2006, with the theme of Environmental Flows.

Construction of the second edition of the Basins and Coasts newsletter has begun on the theme of Environmental Security. While the inaugural issue featured largely GLOWS and SUCCESS experience and cases, this issue will include articles by/about others/other projects and non-IMCAFS initiatives focused on the theme of Environmental Security. This second issue of Basins and Coasts will be published online during the next quarter. The IMCAFS website contains information on the IMCAFS Program's project sites, training initiatives and contact information.

7.3 Tasks, Milestones, Dates, Status, Comments

Tasks still pending, completed during, or added as of March 31, 2007

Task	Date Due	Status	Comments/Challenges/Constraints
Development of a web-based knowledge management system in LA			
Develop web-based KMS	April-September 2006	Transferred	This task has been taken over by the EcoCostas Foundation in Ecuador.
Preparation and development of a web-based knowledge management system in EA			
Prepare templates for assembling data and analysis of mariculture initiatives in the region	September 2006	Delayed to second half of 2007	This task is being coordinated with the WIOMSA director and is rescheduled for a June/July 2007 start
Produce theme-based KM section on Mariculture for CRC website	May 2007	On Target	Development of the content for this cross portfolio learning topic is underway
KM support to other SUCCESS activities			
Complete PMP web-based database system	December 2005	Completed	r

Disseminating the SUCCESS experience			
SUCCESS and IMCAFS websites	November 2006	Completed	Minor maintenance occurred in this quarter
IMCAFS electronic newsletter	May 2007	Second issue in progress	Development of newsletter content is ongoing

7.4 Priorities for Next Quarter (April 1 to Jun 30, 2007)

Build additional reporting capabilities into Monitoring and Evaluation online reporting system
Collaborate with WIOMSA on development of online systems to track mariculture activities in the Western Indian Ocean region.

- Complete content evaluation and load information on mariculture cross-portfolio learning topics into the theme-based KMS at CRC
- Launch a second issue of the IMCAFS Basins and Coasts newsletter
- Continue refinement and updating of SUCCESS and IMCAFS websites
- Assist SUCCESS staff in building their skills in making documents 508 compliant

8. Science for Management

8.1 Background

SUCCESS science for management includes two sub-components: 1) cross-project learning and, 2) site-level science for management. This work is linked closely to the knowledge management activities and the monitoring and evaluation components.

The SUCCESS Program builds on the WSSD position that good ecosystem governance includes environmental, social and economic development components. We believe that while technical and institutional capacity is necessary for achieving the goals of ICM, they are insufficient unless individuals and communities are also economically empowered. SUCCESS sees its livelihood projects as an important element of ICM programs because quantitative and anecdotal evidence shows that early actions that demonstrate tangible benefits are crucial to sustained success. Thus, a primary premise of SUCCESS is that tangible benefits to quality of life through a livelihoods approach is a necessary (but not sufficient) condition to sustained success of ICM programs. Unfortunately, there is also a growing body of anecdotal evidence that suggests many of the livelihood activities are not having the intended impacts on increasing household income in coastal communities, or reducing pressure on coastal and marine resources. Additionally, there have been very few rigorous assessments to date on livelihood activities in relation of marine conservation and resource management issues. For this reason, SUCCESS selected this topic as the main theme for a cross portfolio global learning agenda. Since all three field sites (and the associate award site in Thailand) have significant livelihood components, they provide living laboratories for this learning agenda, and the local partners involved in their implementation are a clientele for the learning outputs.

After much background preparation and planning, the learning agenda on livelihoods was launched in earnest in Year 3. There are two main outcomes expected from the field-level learning agenda:

- A well documented assessment of the impacts of project livelihood strategies on coastal households, and ICM initiatives, and;

- An improved understanding of the factors that lead to successful and not successful livelihood components of ICM initiatives.

The learning agenda intends to take these findings to achieve another set of outcomes:

- A set of recommended strategies are formulated that improve the probability of achieving successful livelihood activities as part of marine conservation and resource management initiatives.
- Improved capacity built among our local partners for integrating successful livelihood strategies into on-going ICM initiatives.
- Information, including a training module, is made available to donors and practitioners on how to design and implement better livelihood strategies.

A second component of the SUCCESS learning agenda is to conduct biodiversity threats assessments for each of the SUCCESS field sites. Working with partners in the field, the assessments will identify existing and anticipated direct and indirect threats to biodiversity in each site and current biodiversity conservation efforts that are addressing these threats. This information will be used to recommend conservation goals and targets related to the priority threats, suggest investments/activities to fill gaps, and address the priority threats, and if necessary, recommend adaptations to the current SUCCESS goals and activities in each site.

A third SUCCESS learning component is to revisit the governance baselines for Ecuador and Nicaragua. Although the baselines were completed for all sites in Year 2, they fall short of serving as models. For the purpose of creating model baselines that could be used to showcase the method, the decision was made to revise the Ecuador baseline and one of the Nicaragua baselines (Estero Real). The Estero Real baseline is revised already and the Cojimies baseline will be finalized this year.

8.2 Report Period Accomplishments (January 1 – March 31, 2007)

8.2.1 Cross-Cutting

A research concept paper for the microenterprise learning agenda was drafted during the second half of 2006. This paper provided a basis for developing qualitative and quantitative case studies of the current microenterprise and micro credit initiatives that are managed through the SUCCESS program as well as the SUCCESS Tanzania and PEACE projects in Tanzania and the SUCCESS Thailand project. The microenterprises and beneficiaries in Thailand and Tanzania are studied in Year 3. In Nicaragua and Ecuador, where the microenterprises are less well developed, similar studies will be undertaken in Year 4. During quarter one of this year, a qualitative case study was conducted around the microenterprises in Tanzania, including interviews with beneficiaries and the micro credit institution, FINCA. The bulk of the field work was undertaken during the current reporting period including additional qualitative interviews and a quantitative survey, which was administered among beneficiaries in Thailand and Tanzania. Several hundred project and non-project beneficiaries were surveyed in each country along with dozens of key informants.

During this reporting period, a draft biodiversity threats assessment was completed for Nicaragua. Preparations for the Ecuadorian assessment, which will be conducted in April and May 2007, were also undertaken. The Nicaragua assessment is based on a literature review of existing articles and reports as well as interviews conducted with NRM staff, SUCCESS managers, and resource user groups in the Nicaraguan field sites. The goal was to gather information on threats

to biodiversity and their causes, and identifying the threats of greatest priority. The results will be used to gauge if/how the field-based activities might need to be revised in order to better address these priority threats. The assessment also helped identify key players and projects in biodiversity conservation that are active in the study areas. The Tanzanian assessment, which was drafted in the previous quarter, was vetted with field partners during this reporting period, as part of a mid-project evaluation of the impacts and progress towards addressing the priority threats.

8.2.2 Site-Specific

Ecuador

In the Cojimies estuary of Ecuador, cockle gatherers complain that pesticides used by shrimp farmers have resulted in die-offs and low abundance of cockles. Alternative hypotheses have been that El Nino is changing substrate conditions, and/or that the decline is due to over-harvesting. To rule out pesticides as the culprit and convince harvesters to take more responsibility for declining harvests, discussions are underway with scientists concerning applied research to answer this question. The pesticide in question (Lambda cyhalotrin) could be a possible cause of mortality of adults in the substrate and/or of larvae residing temporarily in the water column. Since this pesticide is no longer used in the shrimp ponds of the Cojimies estuary we decided not to fund a research study as it was considered too costly and highly unlikely to show any impact from the substance. However, EcoCostas also initiated an estuary-wide water quality monitoring effort to establish a baseline. This work is being funded by the PMRC, representing leveraged resources of \$30,500 for the Ecuador SUCCESS Program. A water quality probe was donated by an U.S. company and a scientist from ESPOL is leading the effort. The first field work to identify and locate sampling stations took place in November.

Nicaragua

In Nicaragua, the black cockle is a species with great economic and ecological value, but also one that is threatened by fishing and habitat loss. Unfortunately, there is little scientific information for MARENA to use in formulating management regimes or for purposes of guaranteeing that this widely consumed shellfish is safe for consumption. Currently CIDEA is working on two aspects of cockle management: 1) cockle fisheries management; 2) researching the microbiological aspects of food safety for cockles; and 3) researching growth rates to determine optimal minimum harvest size. The latter involves working with commercial collection centers where fishers sell their cockles and where these are consolidated for local and national sale. Data on the number and size of cockles is collected in coordination with other institutions and stakeholders, thus helping to raise awareness about fisheries issues.

Tanzania

In Tanzania, the use of Fiji-style no-take areas is being developed in the Menai Bay conservation area as an approach to address declining harvests of cockles. An Institute of Marine Science (IMS) graduate student is assisting with the community development process and is also undertaking thesis research linked to bio-physical monitoring of cockle abundance both inside and outside the no-take areas designated. The student is using a before-after -control impact (BACI) analysis to assess conservation performance of the no-take areas. This is participatory action research linked to the community-based monitoring. A second round of sampling was conducted in late March and initial time series results will be assessed during the next quarter. Furthermore, a separate study that is not funded by SUCCESS is also assessing the environmental quality of the bivalve culture sites.

Environmental quality of the milkfish pond sites is being monitored on an on-going basis. Samples are being collected quarterly in the ponds and downstream of the ponds and analyzed for nutrients, organic matter content, oxygen, salinity, temperature and pH. To date, no significant environmental changes in the areas adjacent to the ponds have been detected. A separate study funded by SIDA (\$6,000) is evaluating milkfish fry and fingerling seasonality and abundance in several mainland areas where milkfish farming is viable. This study is also investigating the best gears for collection of fingerlings with least disturbance to the environment and catch composition of milkfish as well as other species caught by these gears. The half term report of the 1 year long project has been produced and submitted to WIOMSA for review.

8.3 *Tasks, Milestones, Dates, Status, Comments*

Tasks still pending, completed during, or added as of March 31, 2007

Task and Milestones	Date Due	Status	Comments/Challenges/Constraints
Tanzania and Nicaragua biodiversity threats assessment	November 2006	Completed	
Ecuador biodiversity threats assessment	November 2006	Ongoing New completion date: April 2007	Delayed due to rescheduling of international travel
Tanzania microenterprise case study completed	December 2006	Ongoing	Will be merged with the quantitative data for one report on for Tanzania.
Tanzania quantitative survey of microenterprise beneficiaries	March 2007	Completed	
Thailand quantitative survey of microenterprise beneficiaries	March 2007	Completed	

8.4 *Priorities for Next Quarter (April 1 – June 30, 2007)*

- Draft reports on microenterprise studies in Tanzania and Thailand
- Complete Ecuador threats assessment
- Complete Ecuador and Nicaragua governance baseline

9. Global Leadership

9.1 *Conferences and Committees*

As leader of the Land Ocean Interface in the Coastal Zone (LOICZ) committee on coastal governance, Olsen garnered support for the three-year effort to design governance baselines in different world regions beginning with Latin America in 2007. This will be funded by LOICZ and the Inter American Institute (IAI) for Climate Change Research. The International Human Dimensions program expressing strong interest in being another support of governance dimensions of coastal change. Olsen also agreed to facilitate a one day symposium in Vancouver on the governance dimensions of change in the Arctic in late May. This will be a feature of the annual LOICZ Scientific Steering Committee meeting.

9.2 *Publications*

The Fisheries Opportunity Assessment report was finalized and disseminated in this quarter. The United States Agency for International Development (USAID) commissioned CRC to take the

lead in developing this report to identify and recommend opportunities for the Agency to contribute to Improving Management of Fisheries to Enhance Conservation, Ecosystem Health and Productivity. The report provides information on why small-scale fisheries are important and on the relationship of small-scale fisheries to biodiversity conservation. It also describes issues affecting the sustainability of fisheries and its associated threats to biodiversity. It includes a review of past and current activities of both USAID and others in order to identify strategic opportunities for which USAID may hold a competitive advantage. The final component of the assessment report offers specific recommendations for action at global, regional, and national levels.

10. Cross-Cutting Elements

10.1 Gender Mainstreaming

Gender mainstreaming is a priority cross-cutting theme within SUCCESS as well as within CRC's overall program portfolio. For example, in on-the-ground activities in Tanzania, the Program is working with women to pilot bivalve grow-outs and half-pearl farming in Fumba. In Bagamoyo, more than half of the seaweed farmers are women. In both Ecuador and Nicaragua, women comprise the majority of the cockle harvesters in the Program sites and, therefore, women make up a large share of key stakeholder groups and targeted program beneficiaries. The SUCCESS Program expects to see improved gender equity through livelihood development as the Program's microenterprise activities focus on—although are not limited to—women and vulnerable groups. Equity is an important principle and enabling condition of integrated coastal management (ICM). Therefore, the expectation is that this support for livelihoods for women and vulnerable groups will not only build their income and their sense of empowerment, but will also improve their overall awareness of ICM and increase their willingness and interest in participating more fully in other aspects of the Program's ICM planning and implementation activities. The microenterprise learning agenda explores to what extent this expectation is being met. In this reporting period, women comprised 33% of those individuals participating in coastal resources and conservation planning initiatives, 60% of those individuals who were trained and 75% of persons benefiting from natural resources based enterprises. Over the life of the project, 41% of the individuals trained, 47% of the individuals participating in coastal resources and conservation planning initiatives, and 69% of persons benefiting from natural resources based enterprises have been women.

10.2 Health and HIV/AIDS

Health and HIV/AIDS are emerging issues within the CRC portfolio. As part of the SUCCESS learning agenda, the question of seaweed farming as an alternative livelihood activity has been examined in a preliminary report of the Tanzania livelihood assessment conducted this quarter. In a comparison of two forms of seaweed farming, the report concludes that the higher value "*cottonni*" variety of seaweed is likely a better alternative for HIV/AIDS affected households compared to the "*spinosum*" variety as it requires less labor for the same level of earnings. Less labor intensive livelihoods has been recommended as a coping strategy for HIV/AIDS affected households. The *cottonni* variety of seaweed is promoted in the National Seaweed Development Strategy, but this strategy is experiencing problems due to greater complexities of growing this variety of seaweed. Trials of alternative technologies for *cottonni* seaweed conducted by SUCCESS have demonstrated new farming methods that resolve earlier problems with *cottonni* farming. Diffusion and adoption of this new technology will make *cottonni* farming a more realistic alternative for HIV/AIDS affected households.

In Nicaragua, illnesses such as hepatitis as diarrhea are common in coastal communities. SUCCESS has been investigating whether the consumption of cockles from estuaries may be a contributing factor to these health problems. Preliminary results of a study to assess water quality in cockle growing areas for *E. coli* contamination have documented levels well above US standards for safe harvest and consumption of shellfish. This information will help in setting the stage for further discussions concerning management of shellfish beds to ensure safe and sanitary harvests.

Priorities for Next Quarter (April 1 – June 30, 2007)

- Assess gender impacts as part of the overall analysis of the microenterprise study in Tanzania.

11. Volunteers

11.1 Background

The Coastal Resources Center has a long history of using volunteers in its international work. To date, the SUCCESS Program has assigned Volunteers for Prosperity (VfP) to Tanzania and Ecuador. Field Program sites have also been successful in recruiting other volunteers who do not necessarily qualify under the VfP program, but who add great value in helping SUCCESS reach its goals.

11.2 Report Period Accomplishments (January 1 – March 31, 2007)

A volunteer has been on assignment in Thailand since January 2007. Katie Wolff is volunteering with the SUCCESS Thailand project on assessing the water quality in Klong Naka, Thailand. Her assignment will be complete in May 2007.

Four volunteers have been identified for assignments in Nicaragua and Ecuador. In June 2007 one volunteer, from the University Vermont, will be on assignment in Nicaragua as a natural resources management, fisheries and aquaculture development specialist. He will be assisting (CIDEA-UCA) in developing a framework for an effective and financially sustainable coastal extension program. In July and August 2007, a volunteer from Grays Harbor College in Washington, will be involved in water quality sampling in the Cojimies Estuary, specifically with shrimp farmers. Two volunteers will be on assignment in Nicaragua as Ornithologists in November 2007. Their assignment is to train local tour guides and to write a field guide for distribution to local tour guides.

The Volunteer for Prosperity Global Giving Project has yielded \$300.00 in on-line donations for volunteers on assignment in Tanzania. Currently advertising for a volunteer to assist in Small Business Specialist with experience in costume jewelry trade is underway. Once a volunteer is hired the funds received will be used towards the costs of their assignment.

11.3 Tasks, Milestones, Dates, Status, Comments

Tasks still pending, completed during, or added as of March 31, 2007

Task	Date Due	Status	Comments/Challenges/Constraints
Recruit and screen volunteers	July 2007	On-going	Recruit volunteer for Tanzania
Orient and assign volunteers	June and July 2007	On-going	Nicaragua and Ecuador
Evaluate and make recommendations for volunteer program	September 2007	On-going	
Identify detailed volunteer job description for posting on the CRC web site.	July 2007	On-going	Continue to receive new volunteer assignments for posting
To decide on continuation with the Volunteer for Prosperity Giving Portal	July 2007	On-going	Participation has been at no-charge. If this changes we will re-evaluate participation.
Update CRC web site with new volunteer assignments	July 2007	On-going	

11.4 Priorities for Next Quarter (April 1 – June 30, 2007)

- Advertise for volunteers for Tanzania
- Orient and dispatch volunteers to Ecuador and Nicaragua.
- Evaluate membership with on-line Giving Portal
- Interview returned volunteers and post stories on web site and to Volunteers for Prosperity

12. Monitoring, Evaluation and Reporting

12.1 Background

The SUCCESS monitoring and evaluation (M&E) activity includes two components: 1) Performance Management and 2) Learning. The background to and accomplishments of the second component are described in the science for management section of this report. The SUCCESS Performance Management Plan (PMP) was approved in January 2006. A summary of the SUCCESS Program PMP indicators and results for January-March 2007 is attached in Appendix 1. It includes fifteen indicators collected quarterly that feed into the indicators and strategic objectives of the USAID/EGAT NRM team. In the first year an a half of the SUCCESS Program, the field teams sent their PMP data via email to the PMP coordinator at CRC. However, in the end of year two, a web-based database system was launched that allows field site personnel to directly input their PMP data. Partners were introduced to and trained in the system during the SUCCESS Annual Partners meeting in July 2006. All partners are now using the web-based data input system and we are in the process of improving the report-writing feature and revising the indicator names and definitions based on a recent revision of the PMP.

Under the learning component, activities are underway to promote applied research and adaptive management. The three major elements, described in the science for management section, are:

- The SUCCESS learning agenda (including IMCAFS learning)
- Governance baselining
- Biodiversity threats assessments (new element in third quarter)

12.2 Report Period Accomplishments (January 1 – March 31, 2007)

The SUCCESS PMP was revised in January 2007 to more fully correspond with USAID’s indicators. This has included revising the names and definitions of four indicators. The new indicator names are:

- Indicator 1. Number of hectares in areas of biological significance under improved management
- Indicator 2. Number of hectares in areas of biological significance showing improved biophysical conditions for selected parameter(s)
- Indicator 3. Number of policies, laws, agreements, or regulations promoting sustainable natural resource management and conservation implemented
- Indicator 6. Number of people with increased economic benefits derived from sustainable natural resource management and conservation.

As part of revising the indicator names and definitions, the program also undertook a review of the targets. While the targets for indicator three and six remained the same, the targets (including the baseline) for hectares under improved management were changed. This included changing the reporting to define the hectares as marine or terrestrial. The new indicator definitions are presented in Appendix 1.

During the second quarter of FY 07, initial preparations were made for a mid-term evaluation of the SUCCESS program. This included using the Tanzania biodiversity threats assessment to analyze current program activities together with the field program staff. In the third quarter, a full review of all program components, including the on-the-ground results will be conducted and a plan will be established to guide the programs activities during years four and five.

12.3 Tasks, Milestones, Dates, Status, Comments

Tasks still pending, completed during, or added as of March 31, 2007

Task	Date Due	Status	Comments/Challenges/Constraints
PMP indicators and targets revised	April 15, 2007	Completed	
Web-based monitoring system developed	June 2006	Completed/ Ongoing	System established, but reporting formats options being expanded.
Mid-term program evaluation and review of program activities	June 2006	Ongoing	Workshop on program elements 2-4 will be in April. The on-the-ground results will be in May.

12.4 Priorities for Next Quarter (April 1 – June 30, 2007)

- Conduct mid-term program review
- Revise web-based PMP data entry and reporting system

III. MANAGEMENT ISSUES

A major management issue for the Center is the need to make 508 compliant all documents and publications that are to be loaded onto a website and that are funded by Federal monies. The costs to contract someone to do this or even to train in-house staff to learn how to do it as they produce new documents has been a strain on SUCCESS staff time and budget. However, all SUCCESS staff at CRC have been trained and are now producing documents to be 508 compliant. A larger challenge is in attempting to get our local partners trained and able to comply with these standards for locally produced documents. This is an undue burden for a project the size of SUCCESS and which works with so many local partners based in the field sites.

Designing the masthead, developing the first two issues, and otherwise managing the process of the new IMCAFS newsletter *Basins and Coasts* has largely fallen to CRC. A short deadline to get these first two issues out the door has thus strained the workload of the SUCCESS CRC team. However, now that the boilerplate design is finalized, and now that the GLOWS program takes over responsibility for the next one or two issues, management from this end should become easier. This said, Florida University International (FIU) was to hire a counterpart to Bob Bowen at CRC so that Bob and this counterpart could switch off on the responsibility of laying out the issues and loading on the web, etc. To date this has not happened, and it will make a difference if CRC once again has sole responsibility for laying out the upcoming issues and loading them on the website.

Field activities have now been on-going for approximately two years and we have been able to clearly identify many of the challenges our local counterparts are having in implementing various technical components of their programs. Our ability to field short term technical assistance to support local partners has been fairly limited to date, primarily provided by the Program Directors. However, we have started to build in more additional assistance for various tasks and draw on a larger pool of expertise available at CRC. We are limited to some extent by budget constraints as well. We are discussing with our partners ways to focus work down on fewer activities, ensure they are more carefully linked to threats identified in the areas, and are activities where collectively, we can provide the degree of financial and technical support necessary to achieve tangible outcomes.

IV. UPCOMING CHALLENGES, CONSTRAINTS, AND OPPORTUNITIES

Having reached the half-way point in the SUCCESS Life of Program, it becomes ever more critical to periodically assess where the Program is in terms of adjusting activities, setting the best targets, and reaching those targets before Program conclusion. In preparation for the annual SUCCESS meeting in early July, CRC conducted a retreat on the regional and global activities in March. This exercise was designed to assess progress to date, degree we are achieving our intended Life-of-Project Goals, and map out our broad strategy for the next half time frame of the program. We are also planning a one and a half day retreat in April in order to assess Program direction and make mid-Program adjustments in thinking and programmatic focus so as not only to realize its targets but to position itself for a potential extension to the existing LWA. Realizing that USAID may put a cap on Global Cooperative Agreements to limit these to an annual funding ceiling of \$750,000, it is important to strategize as well on best approaches to securing leveraged funding.

With the certification program for marine protected area (MPA) professionals there is an opportunity to speak to the growing statements globally for an increase in the number and the effectiveness of MPAs. There is also the opportunity to link with at least one and possibly more SUCCESS strategic partners and others. For example, in this current quarter, SIDA provided leveraged funding to this initiative in the Western Indian Ocean region while the European Union-funded Regional (Western Indian Ocean region) Coastal Resources Management Project (RECOMAP) and The Nature Conservancy both expressed interest in providing potential programmatic and financial support to the effort as well. The challenge is to move from “statements of support” to real financial support from these other interested parties.

This reporting quarter the SUCCESS Program benefited significantly by having several graduate students from the IGERT (Integrative Graduate Education and Research Traineeship) program participate in Tanzania based activities. These are students who have been hand-selected from the great number of applicants to this program for their intelligence, analytical skills, and motivation. Hence, there has already been a “screening” of these students and any program that involves them (as did SUCCESS) benefits from a low cost/high return source of subject matter expertise. The opportunity to continue the use of IGERT program students in the SUCCESS activities is there for the seizing and CRC should continue to do so.

Discussions at the annual IMCAFS meeting and the Directors meetings between GLOWS, SUCCESS and their respective USAID CTOs have led to a greater desire for collaboration between the two programs. The first effort on developing a common learning agenda during the previous year was not very successful. However, with the Basins and Coasts e-newsletter where we produce outreach articles on topics of common interest, we seem to have found a useful way to collaborate. For field sites, we have not been successful at identifying areas or places where we could work collaboratively within the SUCCESS and GLOWS family of sites. However, our interactions have led to substantial collaboration in Tanzania on watershed management and freshwater flows to estuaries for the Wami river basin. These activities are funded by the USAID/Tanzania mission as well as through the Washington-based GDA partnership of USAID and Coca-Cola Inc.

V. ASSOCIATE AWARDS

Thailand

Six training workshops were conducted in February in community based disaster management with the Kamphuan villages, TAO, Thai Department of Disaster Prevention and Mitigation, National Disaster Warning Center, and the Suksamran District Government. The training workshops build on a series of earlier capacity building workshops all designed to provide the understanding and skills needed to develop locally owned solutions for disaster preparedness and implement a system of community-based disaster management.

The workshops concluded with successful drills on February 24, 2007, simultaneously evacuating over 900 people in three villages (Villages 1, 2 and 7) to safe areas in less than 20 minutes. After the drills, a discussion was held with each village volunteer group, DDPM, and representatives of police and military to provide feedback. The Governor moderated each of these sessions which were animated, open, and inclusive. Lessons learned and recommended disaster management plan modifications were discussed.

From January to March 2007, a volunteer from the United States Environmental Protection Agency (Katie Wolff) assisted local government authorities and scientists on water quality monitoring for watershed management. Information was collected through ground surveys that will help to guide future sustainable development of aquaculture in the rich Klan Naka estuary. The final report will be presented to the governor's office and DoF offices both in Ranong and in Bangkok. A workshop, with participants from the Provincial Fisheries Office, Kaolak National Park, Kasetsart University Marine Lab, and the Ranong Coastal Aquaculture Station, was delivered on January 25-26, 2007 on water quality monitoring for watershed management.

Reconnaissance missions to Sri Lanka and Banda Aceh were completed in November 2006 and February 2007 respectively, as steps in the implementation of the regional exchange program on best practices. Mr. William Murray was hired in January to coordinate the regional exchange initiative. The last scoping mission to the Maldives will take place April 9-13.

On February 5-7, 2007, a sustainable tourism workshop was conducted at the Kamphuan Community Learning Center. The event was part of the project's ongoing efforts to improve community governance of natural resources through promotion of sustainable eco-tourism while enhancing the diversification of livelihood options in tsunami-affected areas. The School of Travel Industry Management of the University of Hawaii facilitated the workshop. Participants shared experiences and exchanged information and opinions on the present status and future of tourism development, including tourism vision and strategies for Suk Samran sub-District. The workshop also outlined national and provincial strategic plans to coincide with the district and local level plans.

In addition to the above, a number of other notable activities were completed.

- Production of two "Kamphuan in Action" newsletters (January and March 2007) in English and Thai language. The newsletter is distributed to the TAO and to the villages through the project's village volunteer facilitators.
- Bi-annual meeting with each of the five villages for input and project progress reporting were held from January 23-27. These meetings included consultations to plan activities for the newly-constructed Kamphuan Community Learning Center

- RTG meeting held at RDMA office (February 2007)
- On March 13th 2007 Dr. Kevin Fitzsimmons from the University of Arizona conducted a workshop at the KCLC on the feasibility of raising red algae seaweed (*Gracilaria sp.*)
- A group of 14 women have begun a Muslim headress business after completing a month of training in December. The group purchased two sewing machines with village microfinance loans and purchased another with their own funds.
- A group of 10 people prepared the land and planted yellow ginger with SCL technical and loan support
- On March 28-29, 2007 village 1 (Talay Nok) welcomed a group of 30 community members and government officials from Krabi and Ranong Province to teach them about their experience in CBDM. The study tour was supported by Raks Thai (CARE International) and was led by community members who have been actively involved in the SCL program of capacity building in CBDM
- On March 22-23, 2007 a training of trainers workshop was conducted at AIT in preparation for Coastal Institute Asia. There were 23 participants from organizations such as IOTWS, ADPC, AIT, CORIN, and the National Park, Wildlife and Plant Conservation Department.
- Preparation of outreach materials on CBDM and waste management was initiated in March

A request for no-cost extension of selected program elements was submitted to RDM/A Regional Environment Office on March 28, 2007 for approval.

VI. CONTACTS WITH USAID MISSIONS

Tanzania

In February, Brian Crawford, SUCCESS Director briefed the mission on the ongoing livelihoods learning survey including survey results on income of households and revenues generated from enterprises supported and on the economic analysis of seaweed and milkfish report which was nearing completion at the time and showing positive results and opportunities for these practices. Also in February, Lesley Squillante and Glenn Ricci visited the Kenya mission and briefed them on two elements of the SUCCESS Program which might interest them, namely the certification program for MPA professionals and the upcoming Milkfish mariculture training to be held in Tanzania and for which a number of Kenyans will attend. Lesley Squillante also visited the Tanzania mission to introduce them to the certification initiative and to provide Juniper Neill, the newly incoming environment and natural resources management officer, with a brief overview of some of the highlights of the SUCCESS Program.

Nicaragua

On March 13th Agnes Saborio, Director CIDEA-UCA, Maria Jose Almanza, coordinator of the project in Nicaragua and Dr. Maria Haws, Assistant Director of the SUCCESS Program visited with Mr. Steven Fondriest (AID-Nicaragua), Director of the USAID Mission Office of Agriculture Development Office. The objective was to brief him on Year 3 SUCCESS activities and budget for Nicaragua, and on efforts to collaborate with other partners. They also discussed the delivery of extension brochures, manual, and calendar being produced with Program funds. The group proposed a field visit to the SUCCESS sites in April or May.

Ecuador

On January 16, 2007 Emilio Ochoa, Rafael Elao and Stephen Olsen visited the USAID/Ecuador mission in Quito. They met with Tom Rhodes (Director of Economic Development, Growth and Environment), Rosio Cedeno (Environment programs), and Doug Mason who manages the environmental portfolio. Richard Volk, the SUCCESS Program CTO visited the Guayaquil office of EcoCostas and was provided a project briefing by the EcoCostas staff.

Thailand

SUCCESS Thailand Chief of Party (COP) made periodic visits to the Thailand regional development agency in Thailand/RDMA-Thailand to provide routine updates. Also, in February the COP and national partners met with RDMA officials for a semi-annual coordination and planning meeting.

APPENDIX 1. SUCCESS PERFORMANCE MANAGEMENT REPORT

This Performance Management (PMP) Report shows the progress that the SUCCESS program has made towards its targets for FY 05, FY 06, and quarter one and two of FY 07. The report is based on the Performance Monitoring Plan, which was approved in December 2005. The report will begin by explaining the SUCCESS Project logic, followed by outlining how data was collected and analyzed. Thereafter is an overview of the results for SUCCESS as a whole and the detailed results report per indicator and country.

The SUCCESS Project Logic

The SUCCESS program's goal *is to help the people of a place improve their quality of life (health, income education) and their physical environment through good governance*. This is a long-term objective (a third order outcome) that the project will contribute to over the life of the project. To achieve this goal, the program has established four Program Elements. The first Program Element, "On the ground results", have three underlying Intermediate Results (IRs):

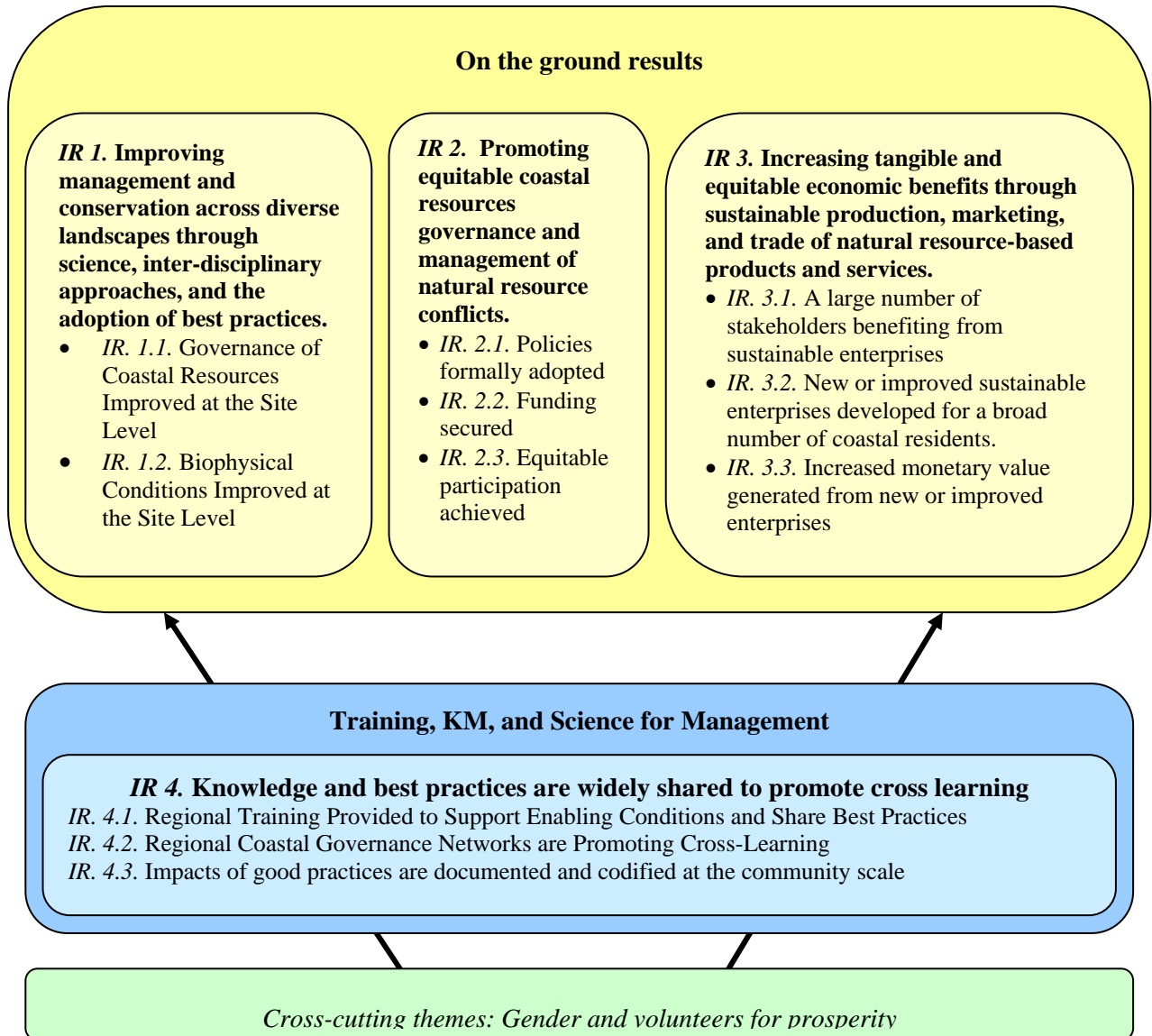
- IR 1.* Improving management and conservation across diverse landscapes through science, inter-disciplinary approaches, and the adoption of best practices.
- IR 2.* Promoting equitable coastal resources governance and management of natural resource conflicts.
- IR 3.* Increasing tangible and equitable economic benefits through sustainable production, marketing, and trade of natural resource-based products and services.

The other three elements together form the fourth "cross-cutting" IR of "knowledge and best practices are widely shared to promote cross learning". There are several sub-intermediate results under each IR (Figure 1).

For each Sub-IR, there are one or two indicators. These are presented in the results framework below. The results framework shows the targets for the SUCCESS project as a whole (when applicable), the frequency of monitoring and what data sources/evidence will be used to gauge if the targets have been met. More specific information on the targets and results for each country is presented in more detail below.

The SUCCESS Program Results Framework

Goal: Sustainable coastal communities and ecosystems: helping people of a place improve their quality of life (health, income education) and their physical environment through good governance



Overview of the Results for the SUCCESS Program to Date

This table gives an overview of the “rolled-up” results for SUCCESS in Year One, Two, and Three (until 03/31/07). Comments on the results and targets are found under the description of each indicator.

indicator	FY 05 Targets	FY 05 Results	FY 06 Targets	FY 06 Results	FY 07 Targets	FY 07 Results Quarter 1	FY 07 Results Quarter 2	FY 07 Total	Cumulative results
1. Number of biologically significant hectares	no target	0	no target	123,107	40,880	0	16,487	16,487	139,594
<i>Marine hectares</i>	no target	0	no target	111,668	28,801	0	4,000	4,000	115,668
<i>Terrestrial hectares</i>	no target	0	no target	11,439	12,079	0	12,487	12,487	23,926
2. Number of hectares in areas of biological significance showing improved biophysical conditions	no target	Not measured until 2007							
3. Number of policies, laws, agreements, or regulations promoting sustainable natural resource management and conservation implemented	0	0	0	1	4	0	0	0	1
4. Leveraged funding and financing	no target	177,073	no target	121,778	no target	9,509	3,554	13063	311,914
5. Number of persons participating in coastal resources and conservation planning initiatives	123	123	620	1,164	755	147	240	387	1,674
6. Number of people with increased economic benefits derived from sustainable natural resource management and conservation.	118	124	241	180	255	36	4	286	450

indicator	FY 05 Targets	FY 05 Results	FY 06 Targets	FY 06 Results	FY 07 Targets	FY 07 Results Quarter 1	FY 07 Results Quarter 2	FY 07 Total	Cumulative results
7. Number of new or improved enterprises developed	46	47	72	146	60	25	1	26	201
8. Monetary value generated from sustainable natural resources or conservation initiatives (USD or equivalent)	no target	Not measured until 2007							
9. Number of people trained (gender disaggregated)	75	93	150	468	100	0	5	5	566
10. Number of training courses implemented	3	5	10	20	3	2	2	2	26
11. Number of active participants in web-based regional networks (gender disaggregated)	0	20	17	1	8	0		0	21
12. Publications documenting impacts of best practices	no target	3	no target	8	no target	1	8	9	20
13. Number of American volunteers	2	2	2	2	2	0	0	0	4
14. Volunteer person days	24	24	24	46	24	0	0	0	55
15. Value of volunteer time (\$)	12636	12,636	12,952	6,603	13,276	0	0	0	17,039

indicator	FY 05 Targets	FY 05 Results	FY 06 Targets	FY 06 Results	FY 07 Targets	FY 07 Results Quarter 1	FY 07 Results Quarter 2	FY 07 Total	Cumulative results
16. % females participating in coastal resources and conservation planning initiatives	74%	74%	78%	60%	42%	35%	31%	33%	47%
17. % females with increased economic benefits derived from sustainable natural resource management and conservation.	75%	75%	51%	71%	47%	28%	75%	33%	69%
18. % females trained	40%	30%	40%	37%	30%	0%	60%	60%	41%
19. Number of female participants in web-based regional networks	50%	40%	50%	38%	38%	38%	38%	38%	38%
% female American volunteers	50%	0%	50%	50%	50%	0%	0%	0%	25%

Overview of the Results for the Current Reporting Period

This table gives an overview of the results for the current reporting period (January 1st – March 31st, 2007). Comments on the results and targets are found under the description of each indicator.

indicator	FY 07 Results Quarter 2	FY 07 Total (Quarter 1 and 2)	Cumulative results (FY 05-FY 07)
1. Number of biologically significant hectares	16,487	16,487	139,594
<i>Marine hectares</i>	4,000	4,000	115,668
<i>Terrestrial hectares</i>	12,487	12,487	23,926
2. Number of hectares in areas of biological significance showing improved biophysical conditions for selected parameter(s)			
3. Number of policies, laws, agreements, or regulations promoting sustainable natural resource management and conservation implemented	0	0	1
4. Leveraged funding and financing	3,554	13,063	311,914
5. Number of persons participating in coastal resources and conservation planning initiatives	240	387	1,674
6. Number of people with increased economic benefits derived from sustainable natural resource management and conservation.	4	286	450
7. Number of new or improved enterprises developed	1	26	201
8. Monetary value generated from sustainable natural resources or conservation initiatives (USD or equivalent)			
9. Number of people trained (gender disaggregated)	5	5	566
10. Number of training courses implemented	2	2	26
11. Number of active participants in web-based regional networks (gender disaggregated)	0	0	21
12. Publications documenting impacts of best practices	8	9	20
13. Number of American volunteers	0	0	4
14. Volunteer person days	0	0	55
15. Value of volunteer time (\$)	0	0	17,039
16. % females participating in coastal resources and conservation planning initiatives	31%	33%	47%
17. % females with increased economic benefits derived from sustainable natural resource management and conservation.	75%	33%	69%
18. % females trained	60%	60%	41%
19. No of female part in web-based regional networks	38%	38%	38%
% female American volunteers	0%	0%	25%