



**Alternative Livelihood Analysis in Padre Ramos Protected Area.
El Viejo, Nicaragua**



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**Sustainable Coastal Communities and Ecosystems Program (SUCCESS)
2008**



This publication is available electronically on the Coastal Resources Center's website: www.crc.uri.edu. For more information contact: Coastal Resources Center, University of Rhode Island, Narragansett Bay Campus, South Ferry Road, Narragansett, RI 02882, USA. Email: info@crc.uri.edu

Citation: Herrera M.D., E.C. Balladares and M.J. Almanza. 2008. Alternative Livelihood Analysis in Padre Ramos Protected Area. El Viejo, Nicaragua. p.25

Disclaimer: This report was made possible by the generous support of the American people through the United States Agency for International Development (USAID). The contents are the responsibility of the authors and do not necessarily reflect the views of USAID or the United States Government. Cooperative Agreement # EPP-A-00-04-00014-00

Cover Photos:

Left Upper, Don Juan farm's in Padre Ramos

Right Upper, Bread making

Left Bottom, Best management practices for shrimp farmers

Right Bottom, Jewelry-making

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Abstract

This document provides an analysis of livelihood activities undertaken in several communities surrounding the Padre Ramos Nature Reserve in Nicaragua. These activities are part of the United States Agency for International Development (USAID)-funded Sustainable Coastal Communities and Ecosystems (SUCCESS) Program, which is being implemented by the Coastal Resources Center (CRC) at the University of Rhode Island (URI). The goal for these livelihood alternatives has been to both improve the health of the ecosystem and the quality of life of those living in these poor rural communities.

In the Padre Ramos Protected Area, alternative livelihoods have included hammock-making, jewelry-making, bread-making, ecotourism, and ecologically sound small-scale shrimp farming. The process of analyzing these activities included interviewing field staff from the SUCCESS lead partner in Nicaragua—Centro de Investigación de Ecosistemas Acuáticos (CIDEA), at the University of Centromérica—in order to identify the perceived challenges to implementing these livelihoods and the resulting lessons learned. When first established, CIDEA's sole focus was shrimp/mariculture. It is now, however, quickly is emerging as and being recognized in Nicaragua as a center for integrated coastal management (ICM). As such, it plays an important role in building constituencies for and empowering people to embrace ICM. Following are several of the key lessons learned from these alternative livelihood activities—activities that are intentionally designed as part of a larger ICM approach for the Padre Ramos area.

Understanding the capacity, needs and aspirations of the groups that will engage in the livelihood activities is a key to success. Such an understanding is essential to providing sound livelihood advice. Sound advice in turn increases chances the livelihood will succeed. Another way to increase chances of success is to select to work with communities that are business-minded and where there is strong leadership. Once there is a degree of success with the livelihood activities undertaken by an initial group, others will seek to join/start similar activities.

It is routine practice for many communities living in the area of Padre Ramos estuary to earn their income on a day-by-day basis—i.e., they receive income for their labor or for the products, they sell on that same day. Thus, it can be difficult to change thinking and behavior to embrace alternative livelihoods schemes that may require them to work today in activities that may not produce an income until a later date. The ecotourism or hammock-making activities in Padre Ramos Reserve are just such examples—i.e., where returns on an individual or group's investment of time and materials, in the form of income, are realized only in the medium to long-term.

Building trust is an essential pre-condition to getting the community to consider, never mind agree to undertake, alternative livelihood activities. Building such trust requires frequent extension visits to and training with the community. The CIDEA staff of SUCCESS made many such visits to the community to both listen to their needs and at the same time begin the process of both earning their trust and opening their minds to the idea of engaging in alternative livelihoods.

It is critical to note the important role that women play in decisions about livelihoods. It is women who are most often in charge of the children's education and the additional income/profit from these livelihood activities can help in financing educational costs.

Communities may come to the table with preconceived ideas about "projects" such as SUCCESS and ideas for alternative livelihoods that are not linked to ICM framework. CIDEA works diligently to try to make those links where they are reasonable and feasible. It works hard as well to educate the community beneficiaries on the difference between short-term projects and goals and the need for a change in thinking and behavior that leads to longer term and sustained quality of life and ecosystem.

This report acknowledges the challenge that lies in establishing alternative livelihoods in communities with a low level of education and where many of the most necessities are lacking. However, a combination of persistence, practice and knowledge can serve to address this challenge and lead to the community embracing the ICM model as a way to improve their longer term quality of life, including protecting the health of the very ecosystem upon which they depend for food and income.

Resumen

En este trabajo se describen las actividades alternativas de vida implementados en varias comunidades que rodean a la Reserva Natural Padre Ramos en Nicaragua. Estas actividades son parte de la Agencia de Desarrollo Internacional de los Estados Unidos (USAID), que financia el Programa de Ecosistemas y Comunidades Costeras Sostenibles (SUCCESS), el cual ha sido desarrollado por el Centro de Recursos Costeros (CRC) en la Universidad de Rhode Island (URI). La principal meta alrededor de la creación de alternativas o modos de vida ha sido mejorar la salud del ecosistema y la calidad de vida de los habitantes viviendo en comunidades rurales desfavorecidas.

En el área protegida de Padre Ramos se han promovido o asistido modos de vida alternativos que incluyen fabricación de hamacas, fabricación de bisutería marina, creación de panaderías, buenas practicas de manejo de cultivo de camarón para pequeños productores e iniciativas de ecoturismo. El personal del Centro de Investigación de Ecosistemas Acuáticos (CIDEA) en la Universidad de Centroamérica fue entrevistado en este análisis con la finalidad de identificar cuales fueron sus dificultades, retos y lecciones aprendidas en la implementación de modos de vida. En los inicios de CIDEA, su labor estaba centrada en la maricultura, particularmente en el cultivo del camarón. CIDEA actualmente, esta emergiendo como un centro de manejo costera integrado (MCI) en Nicaragua, gracias a la realización de programas como SUCCESS, jugando un importante papel en desarrollar confianza en el futuro entre las comunidades de la costa noroeste del Pacifico y promoviendo las ideas de MCI y el desarrollo sostenible. A continuación, se describen algunas de las lecciones claves aprendidas en el desarrollo de estas actividades o modos de vida alternativos en el área de Padre Ramos, actividades que han diseñadas internacionalmente como parte de un programa de MCI que abarca mayor cobertura geográfica.

Una de las lecciones aprendidas más importantes para CIDEA en este proceso es la necesidad de entender la idiosincrasia local y las aspiraciones de los grupos de beneficiarios. Ese entendimiento es esencial para aconsejar inteligentemente en la implementación de modos de vida alternativos. Otra forma de incrementar las posibilidades de éxito es seleccionar para el trabajo comunidades que tienen una mente abierta a los negocios y con capacidad de liderazgo. Cuando existe un cierto grado de éxito en modos de vida emprendidos por el grupo inicial, otros buscan unirse o comenzar actividades similares.

Las comunidades costeras viviendo en el estuario de Padre Ramos ganan sus ingresos de una forma diaria, recibiendo ganancias por el trabajo o por los productos que se venden en el mismo día. Esta situación dificulta el cambio de mentalidad y comportamiento para abordar modos de vida alternativos que requieren trabajar día a día en actividades que no producen ingresos hasta un tiempo después. Es el caso de la fabricación de hamacas o el ecoturismo actividades en las que la inversión en materiales y tiempo de una persona o un grupo de personas tienen su retorno en forma de ingresos a medio o largo plazo.

Desarrollar confianza entre las comunidades es una pre-condición esencial. Las visitas del personal de campo son cruciales para crear confianza y nuevas esperanzas de mejora entre las comunidades. El personal del CIDEA trabajando en SUCCESS realizó numerosas visitas a la comunidad para escuchar sus necesidades y al mismo tiempo comenzar un proceso en el que ambos ganaron confianza y se convencieron de la necesidad de abordar modos de vida alternativos.

Es muy importante destacar el papel decisivo que las mujeres juegan sobre modos de vida. Las mujeres están a cargo de la educación de sus hijos y cualquier mejora en el nivel de ingresos promueve la mejora en la educación de sus hijos.

Las comunidades en ocasiones, se han acercado a CIDEA con ideas preconcebidas y entusiastas que no siempre están relacionadas con las ideas de MCI. CIDEA trabaja en reforzar esas conexiones donde es razonable y factible. CIDEA trabaja duro también en educar a la comunidad de beneficiarios en la diferencia entre proyectos de corto plazo y metas, y la necesidad de un cambio de mentalidad y comportamiento que conduzca a una sostenibilidad a largo plazo y a la mejora en la calidad de vida de las comunidades y sus ecosistemas.

Finalmente concluir resaltando que la creación de nuevos modos de vida en lugares deprimidos y donde existen grandes necesidades básicas que cubrir es un gran reto que requiere comprender la idiosincrasia del lugar y trabajar con persistencia, práctica y conocimiento. La combinación de éstos atributos puede dirigir a las comunidades a adoptar un modelo MCI como una forma de mejora de la calidad de vida, que incluya proteger la salud de los ecosistemas de los cuales dependen tanto para la producción de alimentos como para generar ingresos.

1. Introduction: SUCCESS goals in the current Nicaraguan economic context

The SUCCESS Program, implemented by the Centro de Investigación de Ecosistemas Acuáticos (CIDEA) at the University of Central America (UCA), is assisting the extremely poor and natural resources dependent communities that surround the Padre Ramos Protected Area in Nicaragua to develop non-extractive alternative livelihoods—e.g., small scale shrimp farming using mariculture best management practices. In the process, it is working to raise the communities' awareness of their environment, build their capacity for sustainable management of that environment, reduce pressures on the natural resources, promote economic independence, and help these communities to access markets in which to sell their products and services.

Nicaragua does not have a National Integrated Coastal Management Program and there is no approved national level coastal policy to guide and regulate management of/in the country's coastal areas. However, in 1983 the Padre Ramos area where SUCCESS works was declared a protected area—in efforts to safeguard the wetlands and mangrove forest and the associated fauna and flora. It is important to note that at the time the protected area was declared, it was far from pristine and for generations had been used by the communities living there mainly for agriculture and fisheries.

In spite of efforts to protect the Padre Ramos area, the degradation and exploitation of its coastal ecosystem has continued—with the communities surrounding the area continuing intensive activities in fisheries, shrimp farming and cutting of mangrove wood. Reducing these activities in order to reduce pressure on the natural resources required developing alternative livelihoods. This is where the SUCCESS Program could help—working with the community to identify other means of generating an income at the same time helping to protect the rich biodiversity of this protected area.

To understand better the economic and social context within which the SUCCESS Program is working, it is important to note that Nicaragua remains the second-poorest nation in the South American continent. Unemployment is officially estimated at 5% of the economically active population; however, an estimated 60% of workers belong to the informal sector. Nicaragua suffers from persistent trade and budget deficits and a high internal debt-service burden. Foreign assistance totaled 26% of the budget in 2006. The country also depends heavily on remittances from Nicaraguans living abroad, which totaled \$655.5 million in 2006.

Exports have been one of the key engines of economic growth in recent years. Although traditional export products such as coffee, meat, and sugar continue to lead the list, shipments of non-traditional exports such as vegetables, tobacco products, gold, and free trade zone products (textiles and electrical harnesses) increased markedly in recent years. Nicaragua is primarily an agricultural country, but light industry (maquila), tourism, banking, mining, fisheries, and general commerce are expanding.

Nicaragua faces a number of political and infrastructure challenges in achieving sustainable economic growth. Long-term success at attracting investment, creating jobs, and reducing poverty depend on its ability to comply with a new International Monetary

Fund (IMF) program, resolve the thousands of Sandinista-era property confiscation cases, and promote a positive investment climate. In July 2007, the government successfully negotiated a new IMF agreement that requires implementation of free-market policies and includes targets linked to energy, pensions, fiscal discipline, and spending on poverty.

1.1 Place

Nicaragua is a country decentralized administratively and divided into Departments and Municipalities. El Viejo is one of the six municipalities that form the Department of Chinandega and the Padre Ramos Natural Reserve is one of El Viejo's most important natural protected areas (see Figure 1).

The Reserve is an estuary located on the northwest Nicaraguan coast. In the 50's and 60's, the area was used intensively for agriculture (cotton and sugar cane) and livestock purposes—in line with the country's exportation policy and goals of the time.

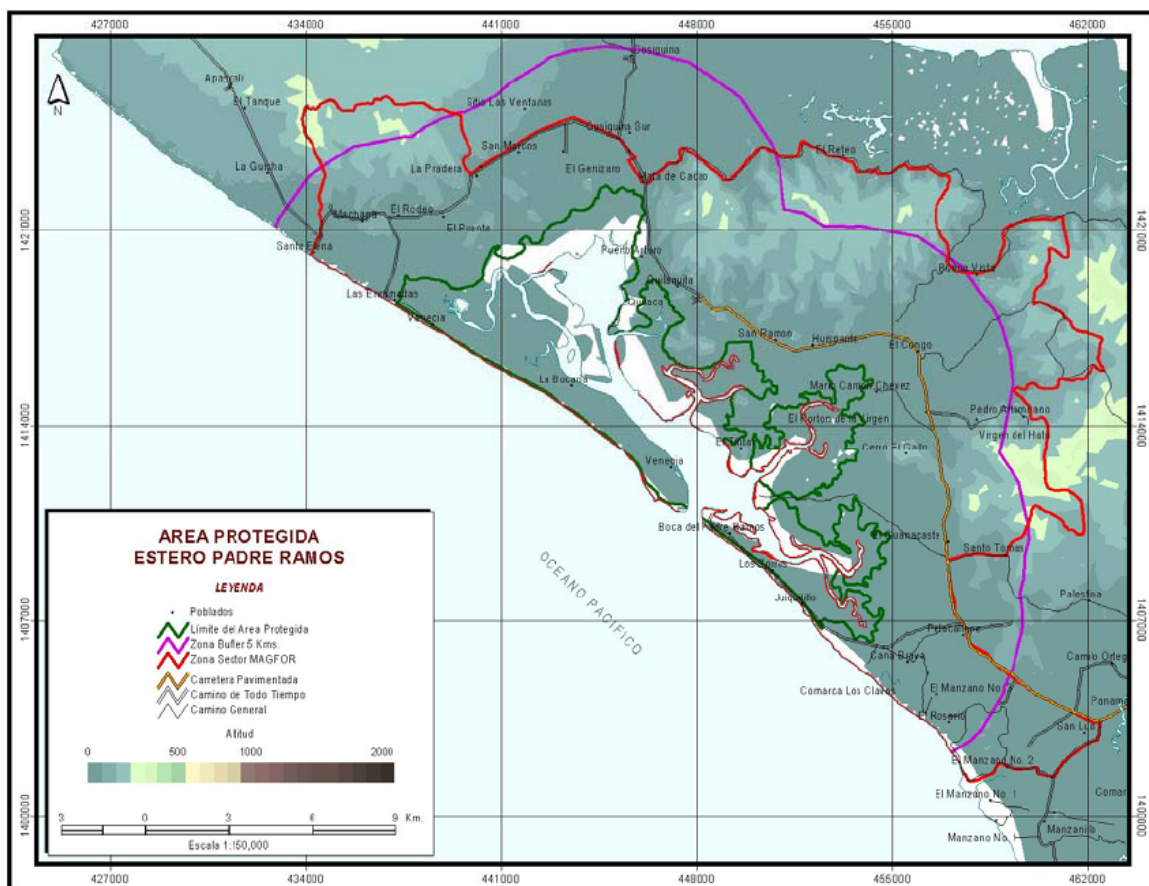


Fig. 1: Natural Reserve Estero Padre Ramos. Análisis y Diagnóstico Socio-Económico de Áreas Protegidas. Jirón J. Aldén, 2005

Like many of the 'Natural Reserves' in Nicaragua, the Padre Ramos Reserve has also been deforested, leaving its fauna and flora extensively damaged. The 1981 Agrarian

Reform transformed how land was to be cultivated. This led to large owners leaving and the lands being given to small farmers and cooperatives.

The Padre Ramos Reserve is characterized by a Sabana Tropical Climate, which consists of a dry and wet season. The common vegetation is Subtropical Dry Forest, and the rain is seasonal between May and October, with average rainfall of 2020 mm annually. The rainfall in the Reserve has a torrential character provoked by the geography. Average temperatures vary based on the location due to the existence of microclimates. According to Alden 2006, the temperature in the Reserve ranges between 24°C and 32°C annually.

Within the estuary, the banks of its ramifications and channels are covered by mangrove forests, with the most abundant species being *Rizophora mangle*, *R. racemosa* and *Avicenia spp.* These mangrove forests offer protection to numerous species such as cockles, larvae shrimp and fishes, all of which play an essential role in the local economy. The mangroves in Padre Ramos are also a stop for migratory birds and other bird species and a reproductive area for numerous marine and estuarine species.

Identified in the Padre Ramos estuary are: 156 species of birds (48 migratory), 21 mammals, 20 amphibious and reptiles and 45 aquatic species (among them, 7 crustaceous, 3 mollusks and 35 fishes). Some of these species are threatened or are listed in CITES—e.g., reptiles like *Crocodylus acutus* or *Ctenosarura similes* and *I. Iguana* and which are used by locals as a source of protein. The challenge lies in educating locals how to still use but avoid overexploitation of this fauna and these animals.

There is limited knowledge about and studies of the area of/around the Padre Ramos Reserve, however what is known is that it is a sandy ecosystem that includes reefs. It is believed this ecosystem is seriously affected by anthropogenic activities (dynamite fishing, pollution, sedimentation).

1.2. People

The several rural communities that surround the area of the Padre Ramos estuary are extremely poor, have little access to markets and other opportunities, and depend on fishing, cockle gathering and related activities for their food and income. Meanwhile its natural resources are seriously threatened, in spite of the area being under a purported co-management scheme.

Most of the population is concentrated in the coastal communities of Jiquillo, Venecia, Los Zorros or Padre Ramos where artisanal fisheries is the main economic activity. The communities gather shellfish, lobsters and shrimp larvae. However, overexploited fish and bivalve stocks, removal of mangroves by shrimp farms, mangrove wood cutting and increased pressures by immigrants from elsewhere (e.g., fishermen from El Salvador and Honduras fish illegally in the estuary and its marine areas) have combined with rapid local population growth to make income generation and food security increasingly tenuous in the area. In addition, some coastal communities are engaged in tourist activities, but in a haphazard fashion and without sufficient regulations. That said, tourism activities and retirement settlements are growing rapidly along the Nicaraguan coast—creating possible opportunities for the smaller communities, but also some pressures.

Other communities (Mata de Cacao, El Congo, Cosiguinia or Santo Tomas) are scattered around the buffer and border areas of the Reserve and work primarily in farming, livestock and aquaculture (shrimp farming).

Both coastal or buffer area communities live in rudimentary housing built using mangrove wood and with plastics or zinc for roofs—making the structures particularly vulnerable to natural disasters such as storms or hurricanes. The majority of houses also lack sanitary systems, electricity or potable water.

Social conditions are also poor. There are too few teachers in the region and because many school age children must work to support their parents—sometimes providing the income for the entire family—they are not able to attend school. A high percentage of women are poor, with a large number of single women ill-treated, lacking in resources, and singularly responsible for child care. Men also have educational and cultural challenges which manifest in alcoholism and family abandonment.

2. Tourism Development at Community Level in Padre Ramos Protected Area

The Association Finca Mar is a group dedicated to fostering alternative tourism in the Padre Ramos Protected Area. They are located in the Chinandega Department within El Viejo Municipality, along the coast of the Padre Ramos Estuary. This area covers 245 hectares, of which 40 ha are dedicated to shrimp culture. The membership of Finca Mar consists of various cooperatives, small and medium-scale agriculturists, cattle farmers, shrimp farmers, craftsmen, restaurants and boatmen—all brought together with the vision

of starting alternative tourism. The groups that make up Finca Mar are organized in various forms—cooperatives, associations, collectives—representing 67 organizations.

One of the most well-preserved mangrove forests in Nicaragua is situated in the Padre Ramos Estuary. The coastal area around the Reserve is beautiful and as such spurred the interest by the communities to develop some ecotourism livelihoods. Finca Mar had already promoting their ideas for ecotourism in this area when CIDEA offered its support. One idea that is now being implemented is the design of both a terrestrial and an aquatic routes through the estuary that allows the tourists to get out at various points along the way to experience the small income-generating enterprises (e.g., shrimp farm or livestock farm). In addition to support from CIDEA and SUCCESS, Finca Mar has been working with national institutions seeking support from such sources as the Millennium Account, the Nicaraguan Tourism Institute (INTUR) and from European Programs operating in Nicaragua.

Faculty and students from UCA's department of tourism assisted in conducting a feasibility and viability assessment of ecotourism development in the area and identifying the necessary resources, sites and personnel. Training in entrepreneurial vision was also provided to members of Finca Mar as preparation for their tourism endeavor. Meanwhile, tourist trails were defined and developed, and interpretative materials and sign posting created (see Fig. 2 y 3). Local tour guides were trained and began to practice how to serve as a guide along an aquatic trail within the Padre Ramos area—some of this training involved a specialist from the AVINA Foundation. The area proposed for the aquatic trail is rich in bird life and nesting areas, mangroves, and dry tropical forests. In addition, the trail has interesting activities to examine such as shrimp farming and cattle ranching.



Fig. 2: Entrance to Finca Mar



Fig. 3: Finca Mar Terrestrial tour

Since CIDEA's expertise lies mainly in aquaculture, it turned to other departments within the university—e.g., Tourism, Economics or Engineering to help promote alternative tourism in the area. Finca Mar continues and will continue after the SUCCESS Program ends to work with the community and tourism specialists to develop marketing strategies, including development and pricing of tourist packages; to make contacts with embassies and nongovernmental organizations to encourage tourism among their personnel; to

establish links on popular tourism web pages, and to develop strategies that Finca Mar can implement once SUCCESS Program (2004-2009) has ended.

While ecotourism in this area can be an opportunity for both economic growth and environmental conservation, it is necessary to consider that most communities in the area of the Reserve lack infrastructure and are unable to confront this challenge. Most of the people living here also lack education, a sense of empowerment, and a vision of how to improve their own situation. These factors combined present a challenge to making a success of ecotourism at any significant scale.

Meanwhile, tourism and retirement settlements are rapidly growing on the Nicaraguan coast and thus creating potential opportunities but also challenges for the smaller communities. New roads constructions and other infrastructure, some of it funded by the Millennium Development Account, will allow open access to places that have typically been difficult to reach. Opportunistic foreign investors are rapidly buying real estate and land while national laws regarding property and land ownership remain vague. This situation often forces the relocation of poor coastal communities, or creates “pockets” of rich individuals inside of an otherwise poor community.

All this considered, ecotourism still is a step ahead of traditional tourism in that it raises awareness of the value of natural resources for today and future generations. Nevertheless, communities in the Padre Ramos area are not completely ready for ecotourism as their day-to-day realities of poverty and need forces them into having short-term vision, one that addresses meeting their most basic and daily needs. The model they have in their head for tourism is too often a Western model of short-term investments with a quick turn-around and hefty profit—an inappropriate and unfeasible model for these small, rural, poverty-stricken communities. Rather, ecotourism in coastal places like Nicaragua’s Padre Ramos Reserve needs first to focus on raising community awareness of the benefits that can come from protecting the natural resources and designing an appropriately scaled and sustainable model of ecotourism in keeping with the place and the capacity of the people of that place to manage the enterprise.

3. New Livelihoods as an Alternative to Unsustainable Fisheries

CIDEA has worked with three groups comprised largely of women who are members of the Finca Mar association) to identify and create opportunities for small businesses linked to ecotourism—i.e., bread-making, hammock manufacture and jewelry-making. CIDEA also provided training in entrepreneurship and development of business plans and conducted feasibility studies. More information on each of these three alternative income activities follows.

3.1 Hammocks

In the Padre Ramos buffer area, a group of women in the Cooperative Altagracia (a subgroup of Finca Mar) showed interest in developing a small business making hammocks. They received training in small business development in general and in hammock-making techniques and were provided with the materials to make their first hammocks.

What the women learned was that hammock-making generates only sporadic income as compared to earnings from their more traditional livelihood activities—e.g. collecting post-larvae. Also, in hammock-making they had to invest money upfront for the raw materials, then contribute their time and effort to making, marketing, and selling the finished product before they ever received any income. This is in sharp contrast to what they are familiar with, i.e., gathering, selling, and receiving monies on a daily basis. Another fact that it was also difficult to find raw materials that were inexpensive enough that the women could actually earn a profit on the sale of the finished product. A feasibility study confirmed this price/profit dilemma and the hammock-making initiative. These factors coupled with a lack of organization on the part of the group lead to the hammock-making being discontinued.

3.2 Bread Making

Members of Cooperative Altagracia that had been in the hammock-making group received training in how to make the bread, improve their production techniques, and market their product. CIDEA also provide materials to cover an existing outdoor bread oven (see Fig. 4 and 5). The results of feasibility study were positive, indicating that the bread making would provide a steadier stream of income for the group on a daily basis. In all cases, the focus was to move women from making their living from natural resource extraction activities (illegal collection of shrimp post-larvae) to an alternative livelihood.

While this bread baking livelihood activity has been a partial success, the women's dependence on illegal resource harvest practices continues. A possible explanation is the rising price of the flour—the key ingredient in bread. The group has also suffered from internal organizational problems. This, added to the fact that some members of the group have migrated as labor workers to other countries, has caused the number of women involved in bread making to decrease.

Today, the Cooperative Altagracia continues harvesting shrimp post-larvae, and the bakery functions only on a part-time basis. The recommendation if the activity is to continue with any degree of success is to help the group strengthen its organizational skills, learn to make better use of their equipment, and open the group to other women interested in working in bread making as a supplemental if not alternative income generation activity.



Fig. 4: Bakery in Padre Ramos Protected Area



Fig. 5: Making Bread in the Realejo (close to Padre Ramos Protected Area)

Bakeries can offer a good alternative livelihood activity for communities like those in the Padre Ramos buffer area as bread is a basic component of the diet and there is always demand for the product—in spite of price increases. In the best of cases, it will also result in some reduction in the level of harvesting of the marine and other natural resources. That said, in the case of many poor rural areas the very source of fuel for the baking ovens is wood and in the specific case of the Padre Ramos area, that wood is likely cut from the mangrove forest within the Reserve.

3.3 Jewelry Making

The coastal communities of Padre Ramos and Jiquilillo lie within the Padre Ramos Protected Area and have approximately 800 inhabitants whose main economic activity is fisheries or fisheries-related. CIDEA identified a group of women already involved in a jewelry-making funded by *Save the Children* and offered them additional support to improve their efforts. While *Save the Children* had provided them with training in jewelry-making and equipment needed in their craft, CIDEA provided additional training including training in how to improve the quality of their product, and to market and sell it. Unfortunately, CIDEA support for this group was suspended when it became clear that if/when the group's leader was not present, the group was unable to function on its own.

4. Introduction Best Management Practices (BMPs) for Sustainable mariculture to small-scale farms

The coastlines of Nicaragua and Central America provide tremendous potential for sustainable mariculture activities that can raise the incomes of and food security for coastal community households.

In Nicaragua such an economically important activity is small-scale shrimp culture. This small-holder activity can grow into cooperatives—of women's groups and artisanal fishers—who culture shrimp. However, for small-scale producers the profitability of this important activity has been dropping dramatically due to dramatic increases in the cost of inputs (e.g. fuel and feed), to lower farm gate prices resulting from consolidation of the regional industry, and to continued farm management issues such as diseases. In the 1980's, when shrimp farming boomed in Nicaragua, small-scale farmers produced nearly 90% of the shrimp while today they account for only 5% (Saborio, 2007).

Since the mid-1980's, shrimp aquaculture has grown to be one of the most important sources of income in the Gulf region of Nicaragua. By 2002, approximately 9,000 hectares from estuarine areas were used for shrimp aquaculture—with approximately 4,000 hectares operated by large producers and about 5,000 hectares operated by 130 shrimp cooperatives. On average, there are 13 associates in each cooperative with a total involvement of approximately 1,200 families.

SUCCESS efforts in sustainable mariculture in Nicaragua have focused on encouraging the use of best management practices for shrimp culture—practices that cover a wide range of issues from environmental quality to operational efficiency. This focus was largely driven by the fact that CIDEA-UCA has a long history of working with the shrimp sector in Nicaragua and leading regional efforts to implement shrimp farming best management practices (BMPs) with the goal of reducing risks of all types (i.e. environmental, economic) and increasing production efficiency to improve the competitiveness of the small-scale farms in particular. Implementation of BMPs is more important to the small-scale producers than ever, given the recent national adoption of a Code of Practice by the National Association of Aquaculture (ANDA) and the approval of the Code of Practice by the Nicaraguan Government, increased stringency of US Food and Drug Administration regulations for shrimp imports and certification efforts at the processing plant level. Unless small-scale producers can conform to new, more rigorous standards, the remaining producers are likely to go out of business. CIDEA-UCA has continued to work with small-scale farmers to improve their management and improve their competitiveness on a national and international scale. CIDEA also continues to support the national industry by providing technical support to ANDA and the government. CIDEA is uniquely qualified to do this given their accredited laboratories, extension program and personnel who have been accredited by the Accreditation Committee of the Aquaculture Certification Council to certify shrimp farms.

CIDEA has been working to develop the capacity and infrastructure to support development of alternative livelihoods. Contributions to the profitability and

competitiveness of the small-scale shrimp sector were made through training and implementation of best management practices (e.g. lowering water exchange rates) and contributions to development of a National Code of Conduct, which was adopted by the industry (see Fig. 6 and 7). The Code of Conduct is now adopted as a national policy.

Finca Mar and Agropesca are large associations of cooperatives, collectives, family farms and small businesses in the Padre Ramos estuary area where shrimp culture is a major economic activity. The implementation of BMPs at Finca Mar and Agropesca is based on good management practices developed and promoted by various international organizations including the World Bank, the Network of Aquaculture Centers in the Asia-Pacific/NACA, WWF and the Food and Agriculture Organization (FAO). These BMPs address a wide range of issues associated with the sustainability of shrimp farming.

The goal of these good management practices is to prevent, mitigate or compensate for negative environmental impacts caused by shrimp farms or hatcheries so that operations are developed in a manner that is environmentally and socially responsible. Sustainable shrimp culture can thereby continue to make a significant contribution to food security, economic development and help improve the quality of life for small-scale shrimp producers and their communities.



Fig. 6: CIDEA Technical visit in shrimp farm



Fig. 7: Sampling in shrimp ponds

CIDEA has been working with two large associations of small-scale farmers that have shown commitment to implement the BMPs despite their financial limitations. Efforts have focused on building technical capacity for improved methods in shrimp culture. Best management practices are intended to lower environmental, economic and production risks of all types. Many BMPs may resolve several types of problems simultaneously. For example, precise adjustments of feeding rates and lowering protein content of feeds help reduce water effluent quality, improve water and soil within ponds (thereby, perhaps lowering risk of disease, and reduce feed costs). A key part of implementing BMPs is the requirement that the farmer be capable of routinely monitoring a variety of biological and physiochemical parameters to obtain the information needed to prevent problems and accurately make management decisions such as when and how much to pump water, feed, fertilizer and treat diseases.

As mentioned previously, one important consideration is the economic limitations of the small-scale shrimp farmers—economics which constrain small farmers' abilities to implement and fully adopt these practices. For example, adjusting feeding rates costs little to implement and relies mainly on the technical capacity of the farmer. However,

some other BMPs that benefit the environment (e.g., constructing settling basins to reduce sediments in pond effluents entering the ecosystem) have high costs with little if any financial benefit for the farmer. CIDEA works with the farmers to seek additional funding that would enable them to implement the costlier BMPs to further improve production and reduce environmental risks.

CIDEA continues to support the Nicaraguan government in dissemination of the Code of Practice and associated BMPs to shrimp farmers throughout Nicaragua. CIDEA has also been working to develop an accessible publication on mangroves and their management—an issue of importance to shrimp farmers whose farms are located near mangroves, and other users such as fishers, fire-wood gatherers and those beginning ecotourism efforts.

Two shrimp farms working with CIDEA in the Padre Ramos protected area has adopted BMPs as far as possible given their financial limitations. Practices such as routine record-keeping, improved use of feeds and fertilizers, and the ability to calculate proper stocking densities have yielded multiple benefits—improved revenues, reduced threats to natural resources, and the lowered risks. Farmers are on a stable and sustainable footing, but they will continue to receive limited technical support to ensure that adoption of these practices continues.

Taking all of the previous information into consideration and regardless of CIDEA's efforts to assist small-scale shrimp producers, a growing number of issues have made it clear that shrimp farming at the artisanal scale has significant difficulties. Small shrimp farmers have difficulty accessing loans, often face high interest rates, and have limited financial management capacity, high input costs, and excessive fees for bringing shrimp to the sole processing facility that sets the local price for shrimp. These factors, combined with falling prices for shrimp on world markets, have made the cooperative shrimp farms unprofitable. Therefore, farms are being sold to the foreign-owned, large-scale operators or are being abandoned. CIDEA has concluded that a diversified mariculture industry for small pond holders that is less dependent on shrimp farming is necessary.

5. Enterprise Innovation Extension Attributes

To recap what has been mentioned in the previous sections of this report, the following livelihoods were introduced in the Padre Ramos Protected area: hammock-making, jewelry-making, bread-making, best management practices for small shrimp farmers and ecotourism. In each case, field staff from CIDEA who assisted communities with these activities were interviewed for their opinion on the following extensions attributes:

Complexity: the degree of difficulty and new skills needed to carry out the enterprise

Compatibility: the ability to integrate the enterprise into the existing livelihood mix

Advantage: the potential household benefits to be obtained from the enterprise

Trialability: the ease of experimenting with the enterprise with minimal risk

Observability: the degree to which and speed at which benefits will be derived

For each enterprise promoted/assisted by the SUCCESS Program, CIDEA staff ranked it on a scale of 1-5 (1 being poor/low and 5 being excellent/high) on the following extension dimensions in Table 1:

New Enterprise Type	Complexity	Compatibility	Advantage	Trialability	Observability
Hammocks	4	3	1	2	2
Jewelry	4	4	3	4	4
Bakery	3	4	3	4	4
Best Management Practices (shrimp farmers)	1	4	4	4	3
Ecotourism	4	4	4	4	3

Table 1: CIDEA rank opinion field staff in every livelihood promoted

Hammock-making as a livelihood activity was highly complex—requiring individuals to learn a totally new skill as although hammocks are commonly used in the area, they are produced and sold elsewhere. Also, hammock-making is a repetitive and boring activity that is somewhat difficult to assimilate for people accustomed to working outdoors in fisheries, agriculture or livestock. Also, as mentioned earlier, the women group realized they would have a time lag between investing their material, time, and labor in producing a product that would only be sold and would only generate income at a later point in time. Further, sales were not guaranteed and the women had to compete with many other vendors also selling hammocks. Again, high materials costs, the lag time in receiving income from sales, the heavy competition for sales, and internal difficulties amongst the group contributed to ending this activity.

Jewelry-making was another relatively new but already underway activity for communities in the area of the Estero Padre Ramos Reserve. CIDEA’s contribution to the enterprise was to help the women improve their production techniques to achieve a higher

quality final product. A challenge for this group was being sufficiently self-disciplined to keep pace with the orders that were coming in. This stems from a cultural orientation to/preference for work that is less repetitive and less steady.

Jewelry can be a profitable activity as there is a proven market. While the cost of the materials can be low, it is essential to educate the women in using only those materials that do not endanger the resources. For example, the women involved in this jewelry-making enterprise sometimes use shells from animals that may be endangered species. This simply emphasizes the need to provide the women with more education on the species they should and should not use for their products. Knowledge about species that can be used for making jewelry. Jewelry-making as an income generating activity has a high degree of trialability—i.e. easy to test with minimal risk involved.

Bread Making is less complex than either jewelry- or hammock-making and there existed greater capacity for this activity. The challenges instead were driven by a low level of education of the women involved in the activity and their lack of business knowledge/experience and organizational skills within the group. The group fractured into two smaller groups as a result of internal disagreements amongst members. This alone was not the deciding factor in the downfall of this activity. There was also a “disconnect” between the trainers and the group members, a situation which further hampered the group learning as much as they potentially could have. Lastly, just as in the groups making hammocks or jewelry, the women involved in bread making were not accustomed to working on a daily basis and with the additional requirements of filling out a timesheet or maintaining certain work hours.

Bread making as a group can be compatible with other income generating enterprises that do produce income on a daily basis. Before the women in Padre Ramos started their bakery, they were dedicated at least half of the day to collecting shrimp larvae—an illegal activity that also threatens the natural resources base. These two activities—larvae collecting and bread making—were incompatible with each other, however. Other problems included the high cost of the flour, and the women’s cutting of mangroves for wood to use in the baking ovens—an activity counter to good ICM practices and sustainability for the protected area. The group also lacked an entrepreneurial spirit and good business vision and skills.

Best Management Practices in Shrimp Aquaculture is an area in which CIDEA has great expertise, hence activities related to working with local, small scale shrimp farmers to implement BMPs was not complex to implement. Support from both the SUCCESS Program and other projects/funds helped to finance the purchase of technical equipment and to train the farmers in the processes and techniques for measuring and controlling the water quality and in turn the quality of the harvested shrimp. One challenge, however, was that shrimp farmers have not been able to systematically collect data and establish control measures in their ponds. While small scale shrimp farming is compatible as a supplement to many other livelihood activities such as ecotourism, this is not always the case. For, example maintaining a livestock raising activity in close proximity to the shrimp farming would be an incompatible mix.

Shrimp farms have been operating in the region for several decades in the region, but not without risk from natural hazards and other changes in the natural environment—sometimes leading to economic losses. In contrast to the past, today small scale shrimp farmers have more knowledge about BMPs and have the equipment that can help them improve the quality of the final product. However, they often lack the funds to make the investments they need to make in order to increase their production and yield. Further, the benefits the small scale farmer reaps are small compared to the large scale farmer.. Large farms reduce their risk by making large investments in technology and putting vast numbers of hectares into production. CIDEA supports the Nicaragua Government’s code of management practices for shrimp farmers that currently is binding for the whole sector in spite of the difficulty that many small farmers have in implementing these practices due to the investment costs involved.

Ecotourism. The challenge in ecotourism is to achieve a balance among investment, knowledge and organization. This activity required partnership with other institutions within the University of Central America and other Universities and with private organizations. CIDEA worked with faculty from UCA’s tourism department to design terrestrial and aquatic trails and identify different species of birds and animals along the routes. A challenge was in training those interested in starting up ecotourism activities in the principles of and tools for providing a public service like ecotourism, and this training needed to be conducted at a slow enough pace to be absorbed by the group. It is an activity compatible with other livelihoods for several reasons. First, because it has seasonal characteristics—i.e., it is not necessarily a full-time, year-round activity. Also, it is relatively easy to integrate on-going farm activities into ecotourism activities.

While ecotourism activities take considerable time and money to launch, the benefits can be many. As with some of the alternative livelihoods already mentioned, e.g., jewelry and hammock-making, there is a lag time between the point of investing time and money to make the product or establish the service and the point at which the individual or group generates income. This requires a mutual understanding and cooperation amongst a wide range of stakeholders who agree to this model and can tolerate its implications of “having to wait for the income to flow.”

Ecotourism requires not only that the place be physically beautiful and ecologically of interest to tourists, but it also requires those conducting the ecotourism to capable of providing quality service and to maintain high quality infrastructure. Implementing an ecotourism-based livelihood is not easy and carries a certain amount of risk. Some types of ecotourism have more trialability than others—for instance, aquatic routes can be more successful than terrestrial in the protected area because much of the infrastructure needed to deliver the ecotourism services are already part of the individual/group’s existing livelihoods. For example, those who are fishers already have the boats that will be needed to take tourists along the aquatic route.

6. Overarching Lessons and Conclusions

The strategy behind promoting livelihood alternatives is not only to generate income for these extremely poor communities, but empower them to advance their overall quality of life and to promote social justice. In tandem, the goal is also to improve the health of the very ecosystem health upon which these communities rely for food and income. Only when the livelihood activities focus on first addressing these basic needs of the community for food, income, quality of life, is there opportunity to turn the focus to integrated coastal management.

The livelihood strategies undertaken in the Padre Ramos Protected Area focused on training and field extension and providing small subsidies or grants to carry out the livelihood activities. The success of these livelihoods, however, has been mixed.

The SUCCESS Program provided CIDEA with its first experience working in alternative livelihoods in impoverished communities. As a result of this and other factors, CIDEA has grown from being an aquaculture-focused Center to one that is increasingly recognized as a Center of Excellence in ICM center—skilled in building constituencies and empowering people belonging to various stakeholder groups to improve their quality life at the same time they are promoting ICM.

CIDEA learned many important lessons through its work with SUCCESS. One is the importance of understanding the capacity, needs and aspirations of the groups that will be engaged in the livelihood activities. Other lessons include:

- Working with larger groups may be controversial and unproductive
- Changes of having successful livelihood activities are increased when the groups/communities are business minded and have good leadership
- For groups/communities accustomed to early income on a daily basis, it is difficult for them to adjust to “waiting” weeks or months before they see money coming in
- It is easier to “build onto” existing livelihoods than creating entirely new ones
- Frequent extension visits and training play a catalytic role in helping establish and sustain livelihoods
- Allowing sufficient time to hear and understand stakeholder needs and wants and to build their trust is essential to success
- Women should be involved in the process from the start as they play a central role in the education of their family and often channel monies/profit from the livelihoods into education for their children, including girl children

- Diversification can improve household security and reduce fishing pressure but it is difficult to predict the long-term trends in the composition of livelihood options that households maintain. A reason for this is that people have a tendency to change their livelihoods over time as opportunities arise or as they adapt to environmental and economic shocks and trends
- It can sometimes present a challenge in making links between livelihoods and ICM as groups come with preconceived ideas about what they want and these do not always relate directly to ICM
- Selecting the “right” beneficiaries is essential and can be difficult, as groups/communities often maintain a “project mentality” that works against sustainability and project buy-in
- It is critical to avoid too narrowly defining the livelihood outcomes and successes (e.g. measuring just incomes) as other important outcomes such as empowerment, buy-in for ICM, etc. are also essential.

All these lessons learned by CIDEA implementing alternative livelihoods will be useful after SUCCESS Program finish in September 2009 and will continue supporting CIDEA to promote ICM practices in Nicaragua.

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