Development of Artisanal Fishery in Rama Cay community, Atlantic Coast of Nicaragua

Norwegian College of Fishery Science, University of Tromsø-Norway
Master Thesis of International Fisheries Management

By

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Abstract

Development is a term that evokes powerful images. It speaks to the collective aspiration of the people for a life of meaning and dignity. It inspire the hope to achieve what develop countries have achieved and what the poor may one day obtain. This thesis is the first study of Rama indigenous people focussing and its fishing activity in the community of Rama Cay. It examines the fundamental of the incongruities that has kept back the development of the fishing sector in Rama Cay. The problems that have concurred on the appropriate use of the resource such as transportation, processing methods and marketing. This study combines secondary sources with fieldwork notes based on interviews and discussions with members in and out of the community that are involved with the fishery**.** It provides information on type of fishing gears and boats in numbers and percentages. Women participation and how the cooperative system and problems related with processing activities can be improved. It is observe that trade offs at community level can be relatively different in comparison of the national and regional level. This trade offs happen because of pursuing multiples objective that cannot be fulfill at full extent. Therefore, Nicaragua has participated in many fisheries development project that evidently show that fish product from artisanal fishers can be sell to local market and the industrial production for export markets. Co-management is one of the alternatives that Nicaragua itself should develop to the national extent and also regional, so that a small community such as Rama Cay can also be include in the management system.

Key words: Rama Cay, Fisheries Development, Cooperative, Trade offs, and Conflicting goals.

List of Acronyms

UNO	Union Nacional Opositora
URACCAN	University of the Autonomous Region of the Atlantic Coast of Nicaragua
BICU	Bluefields Indian & Caribbean University.
AMC	Christian Medical Action
NUFU	National Council of Norwegian University.
RAAN	North Atlantic Autonomous Region
RAAS	South Atlantic Autonomous Region
CIDCA	Documentary Center and Research of the Atlantic Coast
DIPAL	Integrated Development of the Artisanal Fishery. (Desarrollo Integral de la Pesca Artesanal).
HACCP	Hazard Analysis and Critical Control Point.
APN	Norwegian Popular Help (Ayuda Popular Noruega).
FAO	Fish and Agriculture Organization
FADCANIC	Foundation for Development of the Autonomy for the Atlantic Coast of Nicaragua. (Fundación para la Autonomía y Desarrolo de la Costa Atlantica de Nicaragua).
PROCODEFOR	Conservation and Development of Forestry. (Conservación y Desarrollo Forestal
NGO	Non governmental Organization
CALP	Harvesting Center of Pearl Lagoon. (Centro de Acopio de Laguana de Perlas.
UNDP	United Nations Development Program
UNCDF	United Nations Capital Development Fund
CBRM	Community Base Resource management

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Chapter I: Introduction of the study

The Central American country of Nicaragua has two coastlines. One is facing the Pacific Ocean, the other the Atlantic Ocean or the Caribbean Sea. The Atlantic coast of Nicaragua has a mixture of different ethnic communities who depend mainly on the fishing sector. Thus the fishing activity has always played an important economic role in the coastal Nicaraguan life and it is of course very important for people who depend directly on the fishing. For these people, fishing is the first alternative for survival.

This thesis is about an indigenous people commonly known as the Rama. A large portion of the Rama population is situated on the Island of Rama Cay in Bluefields lagoon just on the coast facing the Caribbean. This Cay is relative small and has around 900 inhabitants. In total, the number of Rama people amounts to approximately 1300.

The Rama community has not only been isolated from Nicaragua, but also from the Caribbean Coast as a whole. During the Revolution war 1979 -1989 when the Sandinista was in power the Rama community was affected, but at the same time the government focused on the development of the community by providing social facilities such as electricity, health, education and development of the fishing sector. The government promoted adult education (Programa Nicaraguense de Educacion de Adultos) and the Rama Cay had participated in this activity. A fishermen cooperative was also formed in the community.

The Sandinista government gave priority to different communities for these activities to take place. During this period, the government also introduced the Autonomy Statute in 1987, established with the objective to protect indigenous communities' rights of the Atlantic Coast in the present and in the future.

In 1989, after the war the new government UNO (Union Nacional Opositora) privatised almost all the public activities. And the Rama as well as other indigenous communities was negatively affected by these changes. Violation of indigenous rights has also occurred. For instance "The dry canal Project 1996", a multi billion project on the Caribbean Coast that will serve as a channel connecting the Atlantic and the Pacific coasts of Nicaragua, in order to carry cargo to United States. This project will affect protected areas (water and land) that belong to the Rama indigenous people according to the Autonomy statute of the Caribbean Coast of Nicaragua. This project will also limit the entrance of the Ramas to their different fishing grounds. This may threaten the survival of the Rama people for whom fisheries is essential to survive.

1.1 Objectives:

General Objective:

The aim of my study is to identify alternative ways of developing the fishery activities in the community of Rama Cay, in an appropriate manner to improve their economic situation for the present and future generations.

Specific Objectives:

The specific objectives are:

- ✓ Describe the nature of fishing in the community of Rama Cay on the Caribbean Coast of Nicaragua.
- ✓ Assess the potential for the development of fish processing, storage and transport facilities for the community (application of the HACCP system).
- ✓ Assess the potential market for their fish products in Bluefields and other areas, by visiting fish processing companies to see in what way they can support the Rama fish cooperative by buying more diverse.
- ✓ Investigate if there was any project before related to fisheries development in the community. If there was, what happened?
- ✓ Identify different commercial species in the area, if data is available.
- ✓ To find out what the Ramas have experienced and learned through previous development projects in the community.

1.2 Research problem

The Ramas harvest oyster, clam, ahi, cackle, shrimp, lobster and turtle. This hunting and gathering of food has always been artisanal, using old fish catching methods. Thus, the fishermen do not employ modern fishing gears and fish processing activities to secure the health of consumers.

Dugout canoes with paddles are mainly used and they lack facilities for transport, storage and processing of their produce for sale at the nearby town of Bluefields, which provides a very good market for fish products. After taking what they need from their catch for consumption, the rest of the catch is dumped, thus, causing a lot of waste.

The availability of appropriate and modern fishing gears and storage facilities, transport and appropriate methods would help improve the living condition of the people and alleviate the poverty of the community by increasing their income.

1.2.1 Disadvantages

- Distance from different zone to processing plants.
- Lack of knowledge of proper fish handling and possible greater difficulties in reaching fishermen with training programs.
- The use of gill nets resulting in poor quality fish.
- The possibility of producing salted, dried and smoked fish has not been investigated.

Analyzing these limitations and disadvantages and suggesting what can be done to overcome these, are my main reasons for writing this thesis.

The following document will investigate some alternative ways of developing the fishing sector in the community of Rama Cay and other adjacent communities. The information was obtained during the period of June to the beginning of August 2001.

The thesis provides information for species of economic importance that are available around the community, oscillation of prices that they can obtain for different species in the different processing plants in Bluefields or nearby. The thesis will describe the capacity and access to fishing boats (number and size of canoes), fishing gears and fish processing capacity in the cooperative system. It also provides information on different fisheries activities (projects) in the community in the present and past.

Some of the information was obtained from non-governmental organizations such as the NUFU program – The Norwegian University Council (relationship between Tromsø-URACCAN – University of the Autonomous Region of the Caribbean Coast of Nicaragua), and the Dutch organization DIPAL - Desarrollo Integral de la Pesca Artesanal. But it is fair to say that the thesis is based mostly on information obtained from members of the Rama Cay community.

I will provide recommendations on different alternatives to obtain other types of fish products such as dry fish, shrimp, salted fish and smoked fish. Some alternative recommendations of processing, storage and transportation of fish and fish products for the fishermen cooperative of the community is also presented in the document.

The thesis will also touch the subject of gender relations and discuss briefly how men or women can work closer without discrimination. In the community both men and women fish for home consumption. The following pages describe materials and methods for data collection that was necessary to conduct this work.

1.3 Material and method of data collection[1].

In order to obtain information the following methodology was used. This study combines secondary sources with fieldwork notes. Important aspects of the research are based on interviews and discussions with community leaders, representatives of the fish cooperative, women organizations in the community, and the owner of a fish processing company in Bluefields.

Drawing on paper and markers was mostly used in seminars held within the community members. Pencils and books were given to the community participants so they could make notes of what was taking place in working group. Television and videos were used to show handling of fish products, the (HACCP seminar in Rama Cay).

The HACCP workshop was conducted to give the people of the community the understanding of why it is necessary to follow instructions of the handling the fish products. This will alleviate some of the pressure that external fish buyers put on the cooperative workers in order to avoid intoxication and maintain food safety. A list of some persons interviewed during the fieldwork is been included at the end of this document.

1.3.1 Data collection.

The community was stratified in four different groups, meaning that it was necessary to have four different questionnaires.

The first week was arranged to have a meeting with community leaders. And to socialize myself with the community members this was essential to gain their confidence and vice-versa.

In the second week first approach with first target group; fishermen. Third week, second target group, fisher-women (group AMIR). Two days of workshop. Fourth week, approaching Fish Cooperative (grupo solidario). Seminar "fish processing, conservation and transportation. Fifth weak, approached a combination of fishermen of the community people, responsible for fish

[1] Note: *Questionnaires was written in English, the resulting information was in Spanish. It was necessary to make a translation from Spanish to English in order to have a concrete understanding of the results obtained from the different questionnaires during the fieldwork. Also some information was recorded in Spanish and then translated to English. This action was done because most of the adults from the community have never have been to a school or they have low level of education so the writing was quite difficult but they do have the ability to express themselves.*

cooperative of the community, community leaders and fisher-women of the community. Sixth week, conducting Seminar "Application of the International HACCP systems, rules and regulation. Teachers/tutors were Karen Joseph, Darlene Downs and Emy Cash[2].

1.3.2 Limitations

Time as a limiting factor made it difficult to focus deeply in the fishing area of Rama Cay. This is because people at community level always find it difficult to express themselves openly to strangers. In addition, no data was found in relation of the fishing sector of Rama Cay. What was available were some very basic official statistic on catch and fish price and these revealed some surprising information on the sociology of the local fisheries as well as on fisheries planing and development aid. Only one paper addressed some aspects pertaining to the conditions of the fishermen based on the socio-economic situation.

1.4 Thesis outline

The thesis is divided in seven different chapters.

Chapter one gives you a brief description of the Rama and the actual problems that they are facing in the fishery. Also it provides the aim of the study (General and specific objectives), material and method used in order to complete the study.

Chapter two presents the general background and recent history of Nicaragua and the Atlantic Coast of Nicaragua in which Rama Cay is situated.

The third chapter is the Theory chapter. This is the key to fisheries development, it describe the theory that Jentoft and Bailey (1990) used to show what will happen when fisheries development projects have several goals and compromises have to be worked out.

Chapter four describe the Ramas, their history, actual location, and cultures, resources and the difficulties that the Ramas are facing in present Nicaragua.

In chapter five I presents the results. This chapter will be the essential part that in the future may be used to guide fisheries development in Rama Cay community.

In chapter six comes the discussion fisheries development in Rama Cay. Viewed from the perspective presented by Bailey and Jentoft (1990).

Chapter seven presents conclusion and recommendations, followed by references and appendix.

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[2] *Karen Joseph, Darlene Downs and Emy Cash conducted the seminar. Three of those are Fishery Engineers and has certificates given by the commission of food and agriculture security base on the application of HACCP system in Nicaragua.*

Chapter II: General background

Recent history and present situation of Nicaragua

Nicaragua is located in Middle America (Central America), bordering both the Caribbean Sea and the North Pacific ocean, between Costa Rica and Honduras. It has an geographic position of 13 00 N, 85 00 W. Representing a total area 129,494 sq. km, 120,254 sq km of land and 9,240 sq. km of water and total land boundaries of 1,231 km (Costa Rica and Honduras), Geografia de Nicaragua (1998). Nicaragua is known commonly as the "Land of rivers and Volcanoes". Natural resources such as gold, silver, copper, tungsten, lead, zinc, timber and fish is common in the Nicaraguan land. Nicaragua is the largest country and contains largest fresh water (lake) in Central America (Lago de Nicaragua). The Nicaraguan population is about 4,918,393 of inhabitants. (Governmental publication - Fact-book, July 2001 est.). Nicaragua is divided in 15 different department (departametos) "two (2) Autonomous regions" known as (Regiones Autonomista) on the Caribbean Coast, Boaco, Carazo, Chinandega, Chontales, Estelí, Granada, Jinotega, Leon, Madrís, Managua, Masaya, Matagalpa, Nueva Segovia, Rio San Juan, Rivas, North Atlantic and South Atlantic. Throughout the centuries Nicaragua has been divided. While the western part of the country belonged to the Crown of Spain, the eastern part and the Miskito kingdoms in the northern part of the Coast, was oriented towards the English. In which the Caribbean Coast of Nicaragua is geographically limited to the north by part of Honduras (Rio Coco), to the South by San Juan River, to the east by the Atlantic Ocean (Caribbean Sea) and to the West by part of Chontales, Jinotega, and Boaco, (Williamson, C.D. 1997:38). The Caribbean Coast is the largest representing 49.9% of the national territory and 15% of the total population, making it the second most populated region of Nicaragua. The Atlantic Coast is known as The Autonomous Region of the Caribbean Coast, and is divided in two different Regions, The south Atlantic autonomous region (RAAS) and the North Atlantic autonomous region (RAAN).
The relationship over the centuries between the Pacific and the Atlantic Coast of Nicaragua has been one of conflict and contradiction. While the Spanish made the western, central parts of the country their main area of influence, the Atlantic coast always had a relation to the Caribbean area. Here on the Atlantic Coast English colonial and commercial interests dominated. The Miskito kings always had an orientation towards the English, and the English supported Protectorates and Reserves up to the final part of the last century. It was then not until the

Sandinista period from 1979 to 1990 that these topics really were discussed again. This resulted in the process for Autonomy and the two autonomous regions mentioned. (Vargas, 1996).

2.0 The Autonomy process

Autonomy has always been as aspiration carefully preserved in the hearts of the Atlantic Coast people throughout its history[3]. The process of Autonomy enriches the national culture. It recognizes and fortified the ethnic identity. It respects the particular aspect of the culture of the communities of the Atlantic Coast. It rescues the history of these communities. It recognizes our people's rights over their communal lands. It rejects any type of deference. These ethnic differences are respected because it is the only way of building, along with them, the National Unity. (Brooks, 1999:83).

The Autonomy Regime constitutes a central reference of the political setting in which the communities' claims have developed. Indeed, the movement and its father growth cannot be analyzed separately from particular social and institutional context. The Autonomy Regime is central to understanding indigenous legal rights over communal land and natural resources.

In September the 2nd 1987, under pressure from a large indigenous guerrilla mobilization in the Caribbean Coast and after the three-year peace negotiation process, the Nicaraguan National Assembly have approved the law No. 28, name the Autonomy Statute of the Atlantic Coast of Nicaragua. This law has come into force since it was published in the gazette No. 238 on October 30 1987. This law represented the culmination of the eight years struggle for the indigenous people and ethnic communities of the area. Through this (autonomy) law, indigenous people and ethic communities acquired special rights, based on the diverse ethnic identities. The status also allows the regions people to establish their own institution of self-government within the framework of the nation-state and under the principle of national unity, CARIBE, by Octavio Rocha (1999:56) (My translation).

The statute created regional governments for nearly one-half of Nicaraguan territory, which preside over approximately 10 percent of the national population. Specifically the Statute proposed a legal political framework for multi-ethnic government based on two regional administrations: the Autonomous Region of the South Atlantic (RAAS) and the Autonomous Region of the North Atlantic (RAAN)

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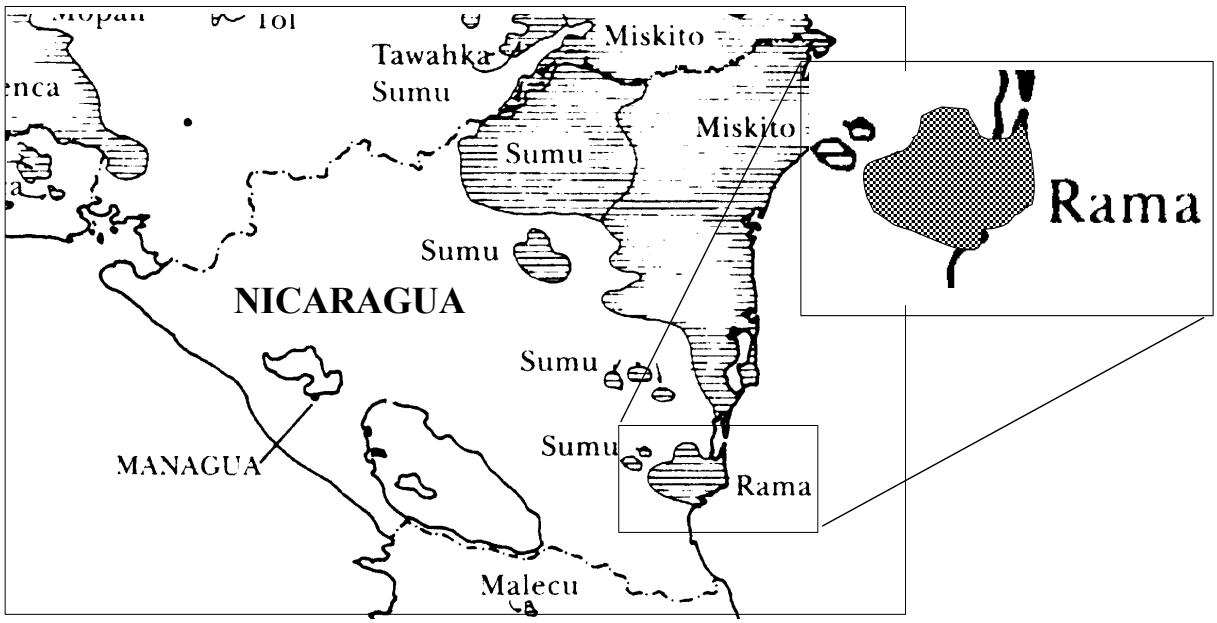
[3] *La Autonomia significa "mas govierno propio para la Costa Atlantica" (Hugo, S. Willson). Translated: Self governing of the people by the people on the Atlantic Coast.*

2.1 The peoples of the Atlantic Coast

Nicaragua reveals itself as a multiethnic community. The continuos suffering caused by the government of Britain and dominant undertaking from North American government has strengthened the unification of the people of the Caribbean coast of Nicaragua in comparison with the rest of the country.

The native population from the Coast constitute a diversification of ethnic peoples (Miskitos, Mayagnas, Ramas, Garifonas, Creole and Mestizos) and communities with pluricultural characteristics. From the last estimates the total population of the Coast was around 398, 000. Of these 44 % was of Mestizos origin, about 18.04% of Miskitos, around 18 % of Creole. Smaller groups of Garifona representing 0.43%, Mayagna (or Sumu) with 2.45% and Rama as a smallest indigenous population of 0.32% make up the rest. In the North Autonomous Atlantic region (RAAN) area, the number of inhabitants is calculated to around 175, 000; with a higher percentage of Miskito – 54.8 % - and Mayagna of 3.7 %. In the South Autonomous Atlantic Region (RAAS) area, the share of Mestizos and Creoles are higher, respectively 52 and 34 percent. The Miskito population is close to a tenth of the total population, (*CIDCA, 1998*). Of these groups the Miskitos, Mayagnas and Ramas belong to the original population of the area, while the others are various mixtures[4] who arrived with the colonization.



This map outlines where the different indigenous peoples have their core areas in Central America. The Miskitos are sharing the north-eastern parts of Nicaragua and eastern parts of

[4] *Mestizo= Indian/Spanish and Creole=Negro/Spanish*

Honduras, the **Ramas** are situated in a defined area close to Bluefields, while the Mayagnas have several locations inland of the Atlantic Coast.

2.2 Resource Zone and potential

2.2.1 The Fishery

According to Nicaraguan fishery statistic data, the total catch in 1999 was 47.2 million pounds, out of this 47% was used for food consumption in the country and 53% used for exportation (Rivera, 1999). Nicaragua like other third world countries is seeking ways to increase foreign exchange earnings. This is necessary to help provide basic social amenities and finance other developmental projects or essential imports and payment of debts. To have the increase of foreign exchange its means that export should increase and for shore domestic supply will decrease. Hence, increasing the domestic supply of fish is only reasonable to serve the nutritional needs of the people.

The importance of export-oriented objective of the fisheries development is understandable but it may have a consequential effect of reducing the biological renewability of the resource and limit the supply of fish available to local consumers.

The Atlantic Coast of Nicaragua has large marine and terrestrial resources. Marine product are exported to the US, European, Asian and Nicaraguan market. Precious and exotic fish resources such as crustaceans (lobster, shrimp and crab) and fishes with high economic value are available in the Coastal zone of the Nicaraguan waters. Terrestrial resources such as timber, sugar cane and gold it is also available in the Atlantic Coast. It is also well known that the land and sea environment of the Coast is vulnerable to economic utilization. It is therefore a matter of utmost importance that the resources are being used and extracted in a careful and sustainable manner.

2.2.1.1 The industrial fishery

The industrial fishery in Nicaragua is based mostly on the capture of Crustaceans of high commercial value, operated by different types of fishing vessels (shrimps, lobster and fish). Since 1990 this activity has experienced a big change. Several processing companies have been established, new investment and granting of licensees for foreign vessels mainly for the exploitation of lobsters and shrimps have been made. The industrial national fleets own old vessels and fishing gears that gives them huge disadvantage to fishing, while the faring vessel most of them from Honduras are equipped with advanced technology that can make the fishing

activity lees difficult. In other words, most the industrial fleets belong to foreign investors and most of the crew consists of foreign workers, (Nicaragua country profile, 2001).

2.2.1.2 The artisanal fishery

Indigenous communities and afro-Caribbean communities situated on coastline of the marine zone in Nicaragua do the artisanal fishing. The artisanal fishing is carried out around creeks, estuaries, river, lake, lagoon and sea by canoe boats. Some are fitted with outboard engines while others with sails and oars. In Nicaragua there are more than 10,000 marine and fresh water artisanal fishermen operating along the coats. Fishermen use a combination of gears such as surface gill nets, cast nets and hand lines. The lack of infrastructure (access, electricity, transportation, ice, fuel etc.) has affected the productivity, quality of the product and access for marketing and therefore the income of fishermen. The artisanal activity should be taken in more consideration as a major part of economic activities on which many communities depend.

2.3.2 Fishing technology

Nicaragua like many other developing countries are limited in technology for the development and improvement of the fisheries sector. Another limiting factor is the weakness of the fisheries management system. The fishery authorities do not have appropriate technology (Boats equipped with high power engine) for monitoring, control and surveillance of the fishery. For example during the closed season for turtle and lobster mainly, local fishermen and also Hondurans pirate fishing boats sneak into the zone, thereby violating the whole purpose of closing the fishing activity. Due to the lack of monitoring and surveillance of the fishery, the enforcement of the rules and regulation becomes a problem. As a result there has been a lot of pressure on the fishery that has been leading to over-fishing.

2.3.2.1 Fish and Seafood

The artisanal fishermen have traditionally utilized the marine resources of the Atlantic Coast mainly for family consumption. From 1958 industrial companies (Casacruz Nicaragua) started processing shrimps (Anuario Pesquero de Nicaragua 1996). After that several foreign companies installed operations on the Coast, mainly to process crustaceans. In 1978 1,300 metric tonnes were harvested, a quantity far above the recommended sustainable level of exploitation, (Nicaragua y el sector Pesquero, 1999). Throughout the Sandinista period catches fell to extremely low levels, all mainly due to the war situation. From 1990 the liberal UNO alliance initiated a process of privatisation and deregulation. The state-owned boats were transferred to

their captains, but financial constraints have made it difficult to improve the quality of the production system. The new government also established a system of licensing fishing rights to foreign companies. There are indications that the use of the resources, as well as an increased activity connected to aquaculture, has again put the marine ecosystem in danger.

In the last years, the seafood industry has become one of the most dynamic productive sectors in the Nicaraguan economy. 80% of the fish catch come from the Caribbean Coast of Nicaragua, which has the largest continental shelf in Central America, (FAO report, Nicaragua and the fishing sector 1998).

The fishing industry has concentrated mostly on shrimps and lobsters, leaving the large populations of commercially desirable scale fish almost untouched. On the Pacific coast (410 km) 339,000 hectares have been identified as suitable for shrimp farming, which is equivalent approximately one-third of the total potential in Central America and Panama, (Nicaragua Central Bank 1998).

The marine shelf in the Caribbean has a 551-sq kms extension. The Caribbean shelf has the richest marine fauna in Central America, is also one of the richest of the whole of the Americas. Lake Nicaragua has an estimated biomass of 500,000 tons, with permission to catch 8,000 tons per year. Nicaragua has approximately 10,308-sq kms of continental waters and 7,365-sq kms of fresh water stemming including the rivers. This abundance of water and adequate climate makes the country the most ideal in the Central American Region for the farming of Tilapia and Carp. Currently there are 5,000 hectares of shrimp farm production, generating more than US 13 million dollars annually.

2.3.3 Level of exploitation of fish resource in Nicaragua (1998 – 1999)

In 1999 the catch volume registered was more than 27 thousand pounds approximately, this value was representing a decrease in comparison of the previous year of 3 %, this was equivalent of 960 thousand pounds in reduction. On the Caribbean Coast the total landing of fish registered was 11,564 pounds, with 5.2 % of increase in relation of the previous year. Shrimp landing decreased by 6% while lobster landing increased by 38 %, fish had a negative result of 2%. A number of fishermen from different communities (the artisanal sector) and the industrial sector on the Atlantic Coast are the responsible of these landing of fish product[5]. *See, Table No. 1.*

[5] *In table one you can appreciate the total landing of fish product, which it's good to say that this information of landing are constructed basically on industrial fish landing. There are lots of unreported landings especially from communities. Fishing inspection is done two to three times*

Table No. 1

Level of exportation of fish resource in Nicaragua.

	Thousand of pounds		
Description	**1998**	**1999**	**Variation %**
Shrimp (sea)	6,072	6,502	7
Shrimp farming	10,526	9,236	-12
Shrimp (river)	2,406	3,336	39
Lobster (tail)	119	205	72
Lobster (meat)	2		
Lobster (live)	9,442	8,380	-11
Fish	7	4	-43
Others	352	303	-14
Total	**28,926**	**27,966**	-3

2.4 Agriculture and Forestry

Forests are one of Nicaragua's richest resources. By 1950, it was calculated that these were 7.1 million hectares, equivalent to 55 % of the national territory. In 1990, the forest area was reduced to 33 %. Up to 80 % of these forests is found in the Atlantic Coast. From the initiation of the peace process in 1988 the deforestation accelerated. If the present phase continues (125-150 thousand hectares annually), Nicaragua will have lost its tropical forests within 20 years. This is partly due to the extracting model; Nicaragua is gradually depending more and more on agro-exportation, which means that forests are being cut down to benefit cultivation of cotton, coffee, sugar canes and cattle. With the change of government in 1990, private and international investments were promoted, and ADFOREST (Servicio Forestal Nacional y la Administración Nacional Forestal) was created. This organization's objective is to give institutional support to the companies on the one hand and to have a governmental body on the other to manage the state owned forests. Although several companies have been supported, the privatization has not advanced as far as in the mining industry and in the fisheries. The activity has also supported some infrastructure build-up. AID and DANIDA have supported road constructions and rehabilitation, even though heavy trucks have put strain to the roads and in some places destroyed them.

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per month. On the other hand the foreign vessels, most of the time they do not land the product in Nicaragua but rather to their country (Honduras).

2.5 Mining

The non-renewable mining resources are important to Nicaragua. The activities in the Atlantic Coast started in the beginning of this century after the discovery of gold near Siuna in northern Nicaragua. In the 1940s and 50s new technologies in the mining business increased and diversified the production. In 1979, the mines were nationalized to the direct benefit of the workers. However, the armed conflict, the blockade and the lack of human resources affected this policy. The Atlantic Coast supports 92 % of the national mining production, producing 150,000 ounces troy of the 163, 000 the country produced in 1998. The mining sector represented 1.6 % of the GDP, and is for the moment the most dynamic as the sales increased from 1997 with 49.3 %. In 1995, the Regional Governments negotiated an agreement with the central Government, stating that 50% of the total incomes of concessions should be distributed to a Fund for Development of the Mining Industry. Of the 2.2 million US $ earned for the period 1994 until 1997 only $500 000 US had been distributed to the regional government. Generally this is the situation for all fees for concessions and licenses – they come too late or never, (Comisión Medio Ambiente y Recursos Naturales in FADCANIC – 1997).

2.6 Mangroves/coastal lagoons

Just inland from the beach along portions of the coast, there are a series of large and small lagoons lined by mangroves, an association of shrubs and trees that are tolerant of saturated soils and salt water. Mangroves swamps provide an essential habitat and shelter for a multitude of fish, shellfish, reptiles and smaller organisms, and it serve as an important nursery for young fish that will later migrate into the lagoon and open sea. The mangroves of Bluefields lagoon, for example, are essential habitat for shrimp and fish that are important for local subsistence and commercial activities. The lagoon and lower river courses of the region also provide important habitat for the endangered West Indian manatee (*Trichechus manatus*). The mangrove swamps of Nicaragua's Atlantic coast are characterized by four principal mangroves species, *Rhizophora mangle* (red mangrove), *Avecinnia germinans* (black mangrove), *Laguncularia racemosa* (white mangrove) and *Conocarpus erectus* (bottom mangrove). Mangrove swamp also line the lower reaches a number of the region's rivering estuaries, although due to the Caribbean small tidal fluctuations, saltwater and thus mangroves do not extend very far upstream.

Chapter III: Fisheries Development Theory

Introduction

Fisheries development policy often involves mutually exclusive goals such as increase in export, supply of fish to domestics markets, fishers income, employment and other opportunities in the fishing sector. The contradictions of fisheries development therefore require some trade-offs between ambitions and competing values (*Bailey and Jentoft 1990).* In fact national fisheries plans rarely specify what these trade offs should be *(Pope 1983).* The following chapter will give a brief description and different definitions of development in general and particular fisheries development that have been proposed in the last century. The main purpose of this chapter is to get a clear vision of what the trade offs in fisheries development are, and how they can be addressed. It will show that these trades-offs should not necessarily be resolved at community level where the fishery is the only source of animal protein and income earning. For this we will focus on the case of the artisanal fishery in the Rama Cay community. A brief description of Hardin's paradigm the "Tragedy of the commons" and why there is a need for co-management in open access fishing areas such as Rama Cay and the rest of the Atlantic Coast of Nicaragua. This chapter will describe the reasons why fisheries development projects often fail in developing countries.

3.1 What is artisanal fishery?

There is no consensus of what "artisanal fishery or small scale fisheries" exactly mean. Two broad approaches could be followed to delineate the small-scale or artisanal fishing sector.
In technological terms, artisanal or small-scale fishing would be composed of all beach-landing fishing units, whether of the traditional variety (e.g. canoes – kayak, crafts or new type of beach-landing plywood boats). Notice that according to the definition, small-scale sector is not a technologically stagnant sector. But it can also comprise traditional craft, which have undergone transformation intended to improve efficiency (e.g. canoes fitted with outboard motors or new type of nets). This definition ensures that the small-scale fishing sector is characterized by relatively low capital intensity.
Artisanal fishery can also be defined as a decentralized and scattered pattern of fishing communities and the use of relatively simple fishing technologies by traditional fishermen. There is an obvious line of continuity between the old and the new techniques and craft and the cost of investment. According to this second definition, small-scale or artisanal fisheries would be

composed of all fishing units whose owners/proprietors are actually and personally involved in fishing operations whether in manual or with direct supervisory or coordination task. A classical definition from (Smith 1979:3) of artisanal fishery stated that: The artisanal fisheries are normally carried out by small-scale fishing units, often consisting of kin groups using small, occasionally powered boats or none at all. This fishing activity is often part time and house hold income must be supplemented by other non-fishing activities…Investment level are relatively low. And part or all of the catch is operator or family consumed.

3.2 Historical Development of a fishery

Bailey and Jentoft model hold true, as they have suggested, when the resource is heavily exploited or fully exploited. However, the result might prove to be different under different resource condition. It has been suggested (Santos 1998, Garcia et al 1999) that a fishery has four development stages. 1) The undeveloped stage 2) The developing 3) The mature stage 4) The senescent stage or the declining stage. The first stage involves low rate of resource exploitations often for extensive period of time. Many reasons could determine how long a fishery would stay in this stage, but prices seem to be the key determinant. Low price of fish will lead to low exploitation, high price increase exploitation at an early stage. With more increase in price and market possibilities, a fishery will move into a developing stage. In this case, expansion will take place in the fishery, fishing effort in term of technology and number of fishers will increase, therefore creating a rapid rise in catches. During the developing stage, fishermen mobility would take place. Fishing effort is increased, resulting in increased total fish landings. At the end of the development stage, a fishery reaches a mature stage, when the total landing is at a plateau. At this stage stock variability is significantly increased. In most cases it is difficult to control effort due to the lack of efficient management. This will lead to the decrease of the spawning potential, which will give declined catches in a senescent stage. Sometime the urge of development is so intense that even when a fishery is in the declining stage, a developing country may still find it politically unacceptable to reduce their fishing effort. And a continued reduction may eventually lead to depletion of stock. Such development is in line with Hardin's theory of the "tragedy of the commons" (Hardin, 1968).

3.2.1 What is development?

Most development analysts would satisfy themselves with studying outcomes. For them development is a series of performance indicators that are applied universally. With the help of

such indicators, international organizations have created "ladders" or "leagues" in which nations are judged according to their ability to improve their conditions. More recently the concept has been further "padded" by the insistence on measuring "human development" and such even more intractable phenomena as "freedom" and "democracy".

Development is also a process; it is a particular way of going about public affairs. It implies the readiness and ability of societies to "problematize" issues; to match and means in creative and productive way (Hydén, 1994). In other words, development becomes meaningful to people when they have a chance to wrestle with means in ways that are relevant to their own point of view. Development, therefore, requires analytical abilities and readiness of society to provide social and political space for the application of logical and empirical consideration to policy and public action (Etziony, 1988).

Development is not only a matter of what we do, but also *how* we do it. Panayotou (1982: 2) defines fisheries development as "the expansion of effective effort through a set of assistance programs for purpose of attaining certain objectives such as increasing the exploitation of under-utilized stocks by expanding effective effort through allocation of additional labor and capital, technology upgrading, and training". In other words, his expression clearly defines that fisheries development has often been expressed in terms of growth. Such production-oriented strategies have been employed in many fisheries development projects worldwide, especially in developing countries.

Fishery development does not necessarily require high or so called advanced technologies (large vessels equipped with "monster" trawlers). People who live in a poor community will not fit in with this change, they will not be able to afford the buying and maintenance of fishing boats and gears. It will also disrupt their way of life.

The most obvious objective of fisheries development is resource conservation and physical yield maximization, the economic objective of profit maximization, and the social political objectives concerned with employment and equity. In practice, however, it is also not possible to maximize all these objectives simultaneously. Even though each of the goals in fisheries development mentioned before are important, they are often mutually exclusive.

Depending on the biological, social and economic circumstances among different nations, some of these goals may be less relevant or urgent. These values, however, compete with each other and are often incompatible in a fisheries development scenario requiring hard choices to be made. Managers commonly have to choose what it is most important for them in order to maximizes their profit or try to balance the different objectives in a way that is acceptable.

Bailey and Jentoft (1990) define development "as a process of changes through which sustainable and equitable improvements are made to the quality of life for all or most of members of a society". According to Snyder (1995) development "is a process, which enables human beings to realize their potentials building up their self-confidence and leading lives in dignity and fulfillment. Development is a process of self-reliant growth, achieved through the participation of people acting in their own interest and under their own control". Fisheries development must be sustainable and for this the fisheries must be regulated in accordance to how much is harvested. The concept of sustainability has been at the core of several international negotiations, for example the Rio-assignment, Agenda 21 and FAO's code of conduct for responsible fisheries. The term of sustainable development is a question of how to conserve scarce resource and has become legitimated as a key concept in the international resource debate. Sustainability in fisheries may be defined as a fish stock harvested in such way so that it is not depleted over time. The fish stock should remain intact period after period. There must be a sufficiently large stock of the renewable resource to generate a flow that can be sustainable as time goes by (Hartwick and Olewiler 1998). But sustainable development must also have a social economic and cultural dimension.

According to these authors, development should be a process of improvement, which should involve society as a whole. In order to understand development in an easy way we can say that, to have development we will need to involve the whole society and not just a portion of it. If development adjusts itself on a specific and reduced subgroup of the community then this will create conflicts and disagreement among the members of the community. In some cases these conflicts can create violence between members that are getting the benefits of the project and others that are not involved. Development does not necessarily refer to the requirement of introducing high technology, but rather increasing people knowledge is for them to better their standard of living. Development does not imply the imposing things that the community does not want or need.

Development may mean different things to different people. For the rich it might be industrialization, for the poor social improvements such as better housing or improved nutrition. Development should meet the needs of the society and not external users. There are evidence of development projects that failed because of these reasons. Many development projects are focusing on societies rich on natural resources, in which at the end of the day the benefactors are external investors. Bailey (1988) contends that normally, these projects are capital intensive rather than labor intensive. Usually they use the concept "development" of the target group to get the legal permission to exploit the resource. These exploiters give false hope to poor people that

form part of the society. Hopes like improving their standard of living by increasing employment in the area by facilitating access to health and education. In many cases, lack of project success can be traced to a lack of understanding and respect for social and cultural characteristics of the target population. And those responsible of the project often place too much faith in new technology as a key to development (Bailey et al 1986). These disadvantages have resulted in many communities losing confidence and self-reliance. For many indigenous groups, and the Rama is an example, it led to the loss of their traditional, culture, language and, hence, also, self-esteem. In other communities where the resources are not managed appropriately it resulted in over-exploitation and natural resource degradation. Even though both natural and social scientists reported from diverse regions of the world how certain local populations have maintained viable systems of resource management by successful self-regulating resource harvesting activities. In regard of this, many researchers and managers assume that unregulated resources would suffer the fate, which has come to be known as "the tragedy of the commons" (Hardin, 1968). Worldwide interest in traditional management practices appears to have increased in recent years. Moreover, the Fisheries Department of FAO has been actively involved since 1980 in the question of small-scale fisheries development, territorial use-rights, and community-level management.

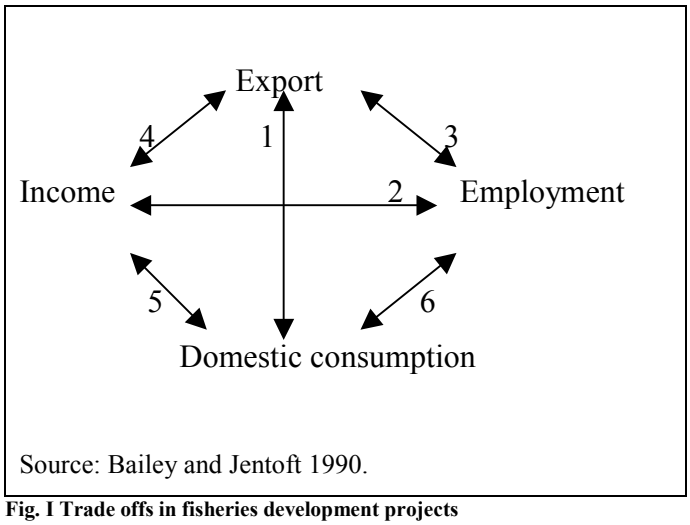
3.3 Trade offs in Fisheries Development.

In developing countries, where there is a struggle to overcome extreme conditions of poverty, fisheries policies often contain four major objectives. It includes provision of food fish for people, increasing fishers income, employment opportunity and increasing export earning, (Hersoug 1992, Maenbe 1996, Bailey et al 1996, Mustafa 1998, Jansen 1997). These authors agree that fisheries development projects most of the time have more than one objective. In theory these objectives sound extremely appropriate and good for people in need but in reality these can become the worst decisions that managers and resource user can make.

Trade offs in fisheries development occur as a result of pursuing multiple objectives that are in contradiction. A trade off is the act of balancing two things that are needed or wanted but which are opposed to each other. It also can be defined as an exchange of one thing for another of more or less equal value, especially to effect a compromise. This may occur, either spontaneously or under a controlled system. It follows a general philosophy that "you cannot eat your cake and have it too". Discussing choice of the overall goal for fisheries resource management, Pope (1983) argue that most real life activities, whether they are running a country or spending pocket

money, have to reconcile a number of partly or wholly conflicting objectives. A major work done on this subject has focused on "third world countries" is the one by Bailey and Jentoft (1990). They assert the notion that most often fisheries policies in developing countries aim at increasing food export, income and employment opportunities.

The following figure summarizes the theory of the trade-offs expressed by Bailey and Jentoft. Based on the model (fig. I) They state that:



Source: Bailey and Jentoft 1990.

Fig. I Trade offs in fisheries development projects

The trade off in fisheries development is complicated, you cannot maximize outcome on each goal but you will need to strike a balance. For this you need to "satisfy" rather than maximize. Most of the time this balance is not the point for investors so then fisheries development projects often fail to create development.

There are direct trade-offs between promoting fishery exports and increasing supply of fish to domestic consumers (axis 1). Exporting fish creates higher income for exporters. Supplying fish to domestic consumers implies less revenue. The mechanism is hinged on price; fish usually fetches higher price in export markets compared to local markets. Once started, increased volume of fish would tend to flow to the export market reducing per capita fish supply at home. Due to the combination of technological and demographic factors, it may be difficult to simultaneously generate employment and increase fishermen's income (axis 2). In this situation normally owners of fish processing companies think that it will be necessary either to generate employment with low income or to have less employees with a reasonable income but that will implicate that they should work more efficiently and harder. On the other hand producers introduce advanced fishing technology in processing companies and on vessels, evidently fish

processing companies would rather use less workers to operate the machinery. The same theory applies to vessels. This would most likely bring a shift from labour intensive to the capital intensive, consequently reducing employment opportunities in the fishery.

The same applies to increase of income and production for either domestic or export market (axis 4 and 5). Fishermen might increase income if they sell all the catch of the day, but then fish consumption for local users will decrease because the fish is taken directly to the fish processing companies. Bailey and Jentoft argued that there are three ways that can be used to increase fishermen's net incomes, namely increasing production or catches, reducing production cost or increasing price of fish. Resource limitation would make it difficult to increase catch. Reduction in production cost cannot be avoided without reducing effort or employment opportunities. In this case increased income may come as a result of higher prices and this would be to the expense of domestic consumers who would have to pay more for the food they put on their dinner table.

Another point in the theory is that effort to promote expanded production for either of these markets may have adverse consequences for employment (axis 3 and 6). Increasing export earnings imply less production for local consumers, because producers get better prices for fish products from external buyers. Bailey and Jentoft suggest that more often excessive increase of a number of fishers in a fishery tend to reduce catch per unit effort. If the trend continues, a situation would inevitably take a different direction like moving a fishery from commercial to subsistence fishing. In this circumstance many fishers would be obligated to look for other alternative employment, and domestic consumption will be affected.

However in a typical fisheries development project one of the main goal is to improve fishers incomes but it also comes with the introduction of new expensive production technologies, and this unfortunately often is capital intensive rather than labour intensive. For this reason aid programs in fisheries development often fails (Bailey, 1988). Poor people cannot afford the investment. A typical fisheries development project results from the combined efforts of scientist, government or private organizational planners and extension agents. Development programs are about changes either in technology, patterns of labour, knowledge and social relations. Interestingly development planners often designed these objectives and changes but community members do not understand what is it they are changing and why are these changes. There are two types of socio-cultural information that is necessary to know before a new technology is introduced. One is the social structural information the second is indigenous technical information such as seasonal variation, rich fishing ground, species composition and

most of all they cultural believe. Another reason why a fishery development often fails is because project designers ignore or reject to learn about indigenous ways of doing things.
It is mentioned that in some fisheries such as tuna fishing, this activity cannot take place by artisanal boats, meaning that industrial fleets should harvest the fish. In this case a capital-intensive strategy may be justified to develop the fishery, but relatively little can be expected of such project in terms of employment generation in local communities.
Advanced vessels equipped with sophisticated technology will not need manpower to haul up the gear; it will only need a few men to operate the machine. Fewer men will be employed. And normally, like in the Nicaraguan case, foreign vessels with foreign workers. In the Nicaraguan situation most of the vessels that are actually in operation in the Nicaraguan coastal waters are Honduran vessels, and 60% of the crew are from Honduras, 40% are Nicaraguan.
If the resources are fully exploited, increasing production for domestic or export market is impossible; you cannot eat the amount of fish if you also want to sell it as well. To export you need an industrial fishery, sometime also foreign investment. Local fishermen (artisanal fishery) will then catch less fish. Access to fishing grounds will be limited for the small-scale fishery, their gears will be damaged and at the same time their effort will increase. Fishermen will need to search for other fishing grounds and they will often need to paddle further than what they normally do. Fish for domestic market and local consumption will decline. Fishermen will rather look for other job alternatives to be able to survive. At the same time it might create competition among user groups of small-scale fishery in the areas.
Finally, effort to promote expanded production for either of these markets may have adverse consequences for employment and large effects in the fishing community. Increasing employment may have the unexpected effect of limiting the amount of fish entering the market. It is normal to hear producers say, if production increase, employment will increase and employers expect that their income will be increased. The increase in production will also increase in income. The truth is that the increase in income is for the plant owners and not really for employees. This owner with time will introduce high technology because production is high, then the employer will need to employ fewer workers with lower wages.
Jentoft and Bailey (1990*)* main objective was to analyze the trade offs that can occur when you have multiple objectives in fisheries development. They provided many reasons to justify why it is not practical to realize multiple development objectives simultaneously, particularly when the resources are scarce.
Fisheries development programs often fail because they are directed mostly toward capital intensive production technologies, giving inadequate attention to resource limitation or social

context within which development takes place. It is obvious that when the failure occurs, international agencies help create a dualistic pattern of development with benefits directed towards a limited number of large-scale fishing enterprises rather than toward small-scale fisheries.

In practice, development effort have failed to satisfy this previous statement (goals in fisheries development projects) and in most of cases it have created a gap between artisanal fishing activities and the industrial fishing sector, giving a disproportional share of the total catch to them latter. From another point of view, the capacity of powerful fishing technology has lead to resource depletion not only in developing countries but also in many of the so call high-industrialized countries. Even though, Bailey and Jentoft (1990) point out, "it is possible to maintain a modern and artisanal sector at the same time and in a same country" provided that they are selling the fish resource to different markets. The modern sector sells in an export market while the artisanal sector sells in the domestic market or for local consumption. Also if they land fish at different seasons of the year and capture different stocks. Artisanal fishers can catch in internal coastal waters while the modern can fish in offshore, so that their operations are complementary and not competitive. They also mention that in Nicaragua for instance they seem to adjust to this situation fairly well. Although this have changed since they wrote their paper. Today, more than ten years after, competition between the industrial and the artisanal fishery in Nicaragua have become more intense.

3.4 Why management?

As already mentioned, Hardin (1968) developed the idea of the "tragedy of the commons" to illustrate that unrestricted freedom to produce children would, in the long run bring ruing to all in form of population explosion. He also pointed out that decline in a natural resource is subject of a similar mechanism. "Freedom in a common brings ruing to all". In other words, with open access and unrestricted harvest, a natural resource such as fish will be depleted.

The fishery has experienced a rapid increase in the world total catch. This expansion began after the Second World War due to the rapid increase of population size and the search of food. Evidently a major slow down of growth in marine fisheries occurred during 1970's at a global level. There is now general consensus that marine fish stocks are fully exploited and in some cases overexploited (Plateau 1989). The problem of over-fishing has now become a worldwide problem. In the 19th century fishery biologists pointed out the consequence of over-exploitation and then later economists explained why common pool resource becomes overexploited.

Therefore it is only one solution to this problem, according to economists, limiting the access to the common pool (fish resource) Hannesson (1996). The open access nature of the artisanal small pelagic fishery in Nicaragua provides a virtually unlimited access to self-employment for people who live in communities along the coast. Along Nicaragua's coastline, fishermen and their families find employment in the artisanal fishery by using mainly canoes, skiff and other small boats. Few of these boats are equipped with low power engines.

Decentralized approaches to natural resource management, of which co-management is one type, have received increasing attention from governments around the world in recent years. This is in response to the failure of centralized management and in the need for improved performance in resource conservation. Thus co-management of natural resources, an approach within development planing, empowerment and capacity building, due to consciousness of the limitation of the natural resources may be an important factor in development of rural communities. It stresses the need for improvement of the performance of natural resources systems and emphasizes institutions and the establishment of property rights. As Jentoft assert, the essence of fisheries management is managing the fishers and not the fishes, which can be address by co-management as it is people-centered and resource-focused.

Locating management at the community level has the tendency, under certain circumstance, to increase efficiency in both the administration and the resource user groups it self. But with regard to equity, this could only be achieved if the community itself is equitable structured. Because management means control, and control involve responsibility of which everyone having the right and equal opportunity, can inshore fisheries involve all the members of the community.

3.5 Co-management

3.5.1 What is co-management?

Co-management has most often been used synonymously with community-based resource management (CBRM), but as Pomeroy (1997) says, there are essential differences on the level of participation of the government. CBRM is people-centered, community-oriented and resource-based, while co-management focused not only on these issues but also on a partnership arrangement between government and the local community and the resource users. Co-management thus also involves the contribution of the government.

As defined by Sen Nielsen, (1996) co-management is seen "as an arrangement where responsibility for resource management is shared between government and user groups and is

considered to be a solution to the growing problems of resource over-exploitation…. A dynamic partnership using the capacity and interest of user-groups complemented by the ability of the fisheries administrators to provide enabling legislation". He continues: "A co-management arrangement is not a static legal structure of right and rules, but a dynamic process of creating a new institutional structure". Addressing co-management as a process rather than as an institution, (Jentoft et al 1998:423-24) defined co-management as "a collaborative and participatory process of regulation and decision making among representatives of user groups, government agencies and research institutions. It implies "autonomy" of users within an overall institutional framework. Jentoft (2000) also points out that the "co" in co-management does not refer to consultative management, but rather a "co-operative" enterprise between partners. According to Jentoft (1989), co-management requires formal leadership and executive staff. Leaders are elected from among membership and, an executive staff has administrative responsibility for ensuring that regulation decisions are implemented. Co- management provides some sense of ownership of the management system, which makes user groups more responsible and willing to obtain long run sustainability of the fish resource. It might also be more cost-efficient in term of administration and enforcement than centralised systems, but administration costs may increase in a co-management system, as the process may be rather time consuming, involving several interest groups.

Hviding and Jul-Larsen (1995) point out that co-management deals with integration and sharing of power and responsibility in regulating access to the resource, even if the situation reflects concerns not necessary compatible whit those of the government. The best alternative to make co-management work is to have the state (government), civil society (community) and market (fishers, sellers) working together as a team. In a western tradition, co-management is a rather loose term referring to the fact that government agencies and fishermen, through their co-operative organization are sharing responsibility for management functions (Jentoft, 1989). There is many definition of what is co-management, but all of them carry you to the same point: the sharing of power and responsibility between the state and user groups. In other words co-management creates more responsible attitudes toward resource use, it promotes learning and rule compliance. It supposes to strengthen, or if it lost, restore social integration among users within and among local communities.

3.5.2 Why co-management?

In summary fisheries development policies often focus on different goals that cannot be achieved at a maximum level at the same time and space. In general, the term of development is

ambiguous. And due to this ambiguity, people at community level often make the same mistakes in agreeing to the various objectives or goals mentioned before in this chapter, used in fisheries development projects proposed to them. At the same, time due to the want of maximizing all goals, proposed development could lead to over-exploitation or stock reduction. On the other hand, as maximization of all the objectives is almost impossible then trade offs must be made. The objectives must be balanced. In most of the cases the affected one is the community in which the supposed development is conducted. These effects can be reduction of fish food supply for local consumers, fish stock reduction, unemployment, etc.

Due to this complicity problems emerge after the project took place, government, investors with other organization agree that previous objectives cannot be accomplished. So new strategies emerge. One of these is the use of co-operative systems including co-management, in order to maintain the resource sustainable and create development at the same time. For which each and every member involved need to work together and share responsibility for development and management as a team. As to fisheries development in Rama Cay, it seems that the solutions will depend on community leaders and members. Co-operation would be the guide for them to be uniting as indigenous community to fight for the best alternative in order to have a prosperous development. Even if the development is at the community level where traditional management is conducted, external management and advisors is also needed. But they must remember that trade offs take place and fisheries development fails if the community fails in working together and if community members become greedy, selfish and impossible to control.

Chapter IV: The Rama of Nicaraguan Atlantic Coast

Introduction

All the indigenous communities in Nicaragua are seeking development. The Rama as other indigenous communities has suffered prosecution by other indigenous groups, reduction of population size during the war, loss of languages, culture and communal land and water. At the same time in addition to economic development, these indigenous peoples are concerned also about the conservation of culture, language and without control of communal land it is difficult to have any development at all.

The following chapter will provide a general background information of the Rama indigenous groups located on the Caribbean Coast of Nicaragua. This chapter will give information about the Rama origin, culture, economic activity, the present situation in terms of development and how they have survived as a separate indigenous group.

4.1 The Rama

At the beginning of 16 century, the Caribbean Coast of Nicaragua was inhabited by three different ethnic linguistic and culturally differentiated groups: The Miskitos, the Sumu (Mayagna) and Ramas. The three ethnic groups belong to the Macro-Chibcha that include a series of languages spoken in Central and South America. In the 17 century the Rama were practically forced to form alliances with the Miskitos. The Miskitos later on compensated the Rama because of their help in a war against the Terrabas from Costa Rica, with a small Island located in Bluefields Bay, today known as the Rama Cay (CARIBE 2000:132-33*).*

The Ramas today are living only on a small coastal area of southern Zelaya. They are what remain of the Chibcha-speaking Amerindian group whose members were previously dispersed throughout southeastern Nicaragua and northeastern Costa Rica.

The Rama language belongs to the Chibcha indigenous language that is spoken in some areas in Costa Rica, Panama, Colombia and Ecuador (Consemius 1938). The Creole English speaking people from Bluefields and Moravian missionary church in 1857 from England, who were preaching in English influenced the Rama. Their ability to learn was quick so in a short time they were speaking Rama-English, instead of the Rama language (Romero V.G. 1996:116 & Brooks R., 1999:70-74).

The Rama population who lives on the south part of Bluefields has less influence and has conserved most of their culture and tradition.

In the eighteen-century the focus of the Voto-Rama population moved away from the Rio San Juan region, new population centers formed to the north, composing of remnants of Rio San Juan Voto-Rama, combined with Voto people who already inhabited the area.
Rama communities subjugated by the British and Miskito were reported in Punta Gorda, Monkey Point Region in 1714, 1742, 1745 and 1788 *(Peralta 1898: 80; Lehman 1929:418; Conzemius 1927: 302; Holm 1978: 364).*
Evidently the Rama population moved constantly in response to hostile activities of the British, Spanish and Miskito intruders. By the nineteen-century the Rama domain had been narrowed to the zone they occupy at present day. The Rama people basically live on the Island of Rama Cay in the southern part of Bluefields Bay and Monkey point. You also can find families living in Bluefields and others dispersed along the rivers such as Torswani, Maiz and Punta Gorda.

4.1.1 Location

Present day Rama culture centers around the Island of Rama Cay, located in southern part of Bluefields Lagoon, fifteen (15) kilometers south of Bluefields. The territory is extended from Rio Escondido to Rio San Juan (San Juan River). The area is small, it has an extension surface of 0.18 km^2 (180.000 m^2), surrounded with water and some small island east and southeast respectively. The Cay is characterized by having an eight-shape figure composed by two hills. According to the Rama's these two hills were separated completely by water in the past and then joined by rock and shells (oyster, clams, and conch) by the inhabitant of the community. The location of the Rama territory can be appreciated on the previous map page No.12. Map of indigenous communities.

4.1.2 Ecosystem types of Rama Territory:

The landscape of the Rama territory is comprised of a diverse mosaic of ecosystem types. Along the length of the coast is a beach vegetation community characterized by well-drained sandy soil. The dominant plants species are *Coccolaba uvifera* (sea grape or known as cocco-plum), *Chrysobolanus icaco* (icaco), *Cocos nucifera* (coconut palm), *Croton punctatus*, *Ipomoea pescaprae* (beach morning glory) and grasses of the genera *Sporobulus* and *Paspalum*[6].

[6] *"(Ecosystem discription and species names are from Rizo Zeledon and Bradford Wilson (1993), Ryan (1992) and Nietchmann and Nietchmann (1974)".*

4.2 The Rama population

The Rama represents one of the smallest indigenous groups of Nicaragua comprising 1,338 and representing 0.55% of the Nicaraguan regional population (Consulate of Nicaragua 1999-2000. *Web.www.info@mundoLatino.com)* of those, approximately 900 lives on the Island of Rama Cay, Bluefields lagoon. For the Rama people the main way of transportation is using wooden canoes with paddle, which takes them 3 to 4 (three to four) hours paddling from the Cay to the city of Bluefields, (see **plate № 2**, in Chapter No. 5 page 45 - The Rama wooden canoes). The Rama has inhabited Rama Cay since the end of 18th Century. As mentioned before, the island was a gift from the Miskito indigenous group to the Rama indigenous group. As other communities on the Caribbean Coast of Nicaragua, Rama Cay has suffered devastation. In 1984 the island buildings were reduced to rubble by intensive bombing during the war, and in 1988 it was leveled once more by the hurricane Joan.

Presently in addition to several dozen houses, it also has a clinic, a church, primary school, a basketball field and a building at the main harbor in which the fishermen cooperative is based. The fishermen occupied the first floor of the building to store the fish product. This building was donated to the community by PROCODEFOR in 1999)-a Dutch organization, (see appendix photo № 1, Building donated by PROCODEFOR).

Most of the houses are constructed out wood with zinc roof and some with palm roof. In 1990 a cement sidewalk and a harbor was added in the community. Due to the lack of space to construct more houses, a number of houses are occupied by more than one family, with 15 – 20 people inhabiting one house. Most of the Ramas are sleeping in hammocks or on the floor.

Drinking water on the Island is provided by rain and some wells. Electricity in the community was once existed in the (Sandinista period) but after this period our new government cut these priorities to zero, not giving any maintenance to the energy plant in the community. The Rama still have the hope that one day they will be able to have electricity in the community again.

4.2.1Education:

The community counts two primary schools, one on each side of the island. The two buildings were constructed to have both a primary and a secondary school but it did not function because of economic situation.

The government does not have money to pay teachers to go and teach in the community, as this will implicate transportation, a house to live and food allowances for the teachers. On the other hand, in the community they don't have someone with teaching capacity at a high school level.

The possibility for teenager to have access to a secondary school is thus limited. Parents need to send they children to live in Bluefields to have high school education. Most of the parents are not willing or cannot afford to do so. The kids would also need someone to take care of them.
At the same time the struggle for conservation of culture and language of the Rama will be in vane. Actually the project URACCAN/Tromsø has supported some families in Bluefields and some kids are actually going to secondary school. Three students are going to the University of URACCAN in Bluefields. The people of the community will like their children to go to secondary school in the community. This dream is present in the heart of every Rama family.

4.2.2 Health

The health ministry is present in the community (MINSA): a health center provides the basic needs. In emergency situations the patient has to be transported to Bluefields. The transportation to Bluefields in regard of the health center also has become a problem. The health program in the community does not count on any communication system, much less with transportation. The community has six to seven midwifes. It is common to find people with respiratory problem (flue, cough or asthma), malaria and kids with diarrhea.

4.2.3 Leadership

Although their native language is in decline, the Rama maintains a distinct cultural identity, traditional distinction strategies, and a shared history. The Rama official leadership structures consist of two representatives on the Regional council of Nicaragua's Southern Atlantic Autonomous Region (RAAS). The community also counts with a representative of the region-wide indigenous Council of Elders, and a board of community leaders (president, vice-president, secretary, etc.). In practice leadership often arises on needs basis, according to what a particular situation might call for. For certain matters the community may seek leadership from the Moravian pastor, leader of the fishermen cooperative, or leader of women's organization. The most important community decisions are resolved by consensus at open community meetings in which anyone can participate.

4.2.4 Culture

The Creole-English and Moravian missionary influences have affected the Rama culture over the years. These consequences are reflected on the change of language and way of living of the Ramas. Today only thirty-three persons speak some Rama, out these three are actually living in

Rama Cay. The whole population is speaking the so-call Rama-Creole-English. That is a combination of the Rama language mix with the Creole English spoken in Bluefields. Traditional religion, beliefes, matrimonial ceremonies and cloth - way of dressing, were abolished. But the way of survival has not changed. The fishing and agricultural activities are the same, they have not changed during this period. It is still possible to see how most of people of the community gather at night, sitting under coconut trees to tell stories and listen to the sound of the wind that blows and the water hitting on the rocks. Traditionally they believed that the amount of food for the following day would be according to the amount of stars in the sky. They also believe that this can predict the fish catch for tomorrow. It is a dream that is coming true, as a result of the Tromsø/URACCAN project, to have a cultural house in the community. This cultural house will give the community the opportunity to conserve and present to the world what is left as part of themselves, "the Rama as a Rama".

4.3 The economy

The principal economical activity in the community of Rama Cay is fishing. The second most important activity is the combination of fishing/agriculture. Their economy has been partly monetarized (the buying of rice, oil, sugar and salt mainly). Mutual assistance remains an important part of the Rama economic life activities, such as building homes, digging wells, clearing land and planting crops. The Rama subsistence lifestyle is rooted in their detailed ecological knowledge of the plants, wild animals and rich marine life of coastal Nicaragua. Beyond the city of Bluefields and a few small villages, there is no road network in southern Nicaragua, and thus transport is conducted on water. For fishing as well as other activities that requires transport, they use mainly kayak or dugout canoes. These kayaks are constructed in the community. With their historical skillful navigating and knowledge of the sea conditions, the Rama has long been recognized as the best seamen on the coast.

4.4 The Rama Natural Resources

4.4.1 Agriculture

Many Rama's families that have their primary home on Rama Cay, but they spend a large part of the year at their agriculture plots in the middle to upper reaches of the Kukra, Dukunu and Torsuani rivers. The lower reaches of these rivers are mostly lined by silico (yolillo palms), swamps and are unsuitable for cultivation. Sometime the Rama plant rice and wild cane in the silico swamp of the lower Kukra River.

One of the most important agriculture areas for the Rama is Western Hill (Big Hill), located 5 km to the southwest of Rama Cay on the mainland. To reach the Western Hill area, the Rama paddle or sail to the shore of the lagoon and then paddle for about 45 minute up in a tiny creek. Once a few families planted it, today this planting and harvesting is coordinated by the women association of Rama Cay and supported by [7]PROCODEFOR. In addition to raising crops, the women organization run other activities such as small-scale dairy cattle rising, cutting of wood for boat building, house construction and firewood. Since the year 2000, this cattle rising, planting and harvesting have been reduced to a low level. In the end of 2000 the Rama people who were taking care of their crops and animal on the Western Hill (Big hill) were attacked by a group of unknown and masked people. Women were raped and a man was killed. This incident has now led the Rama to depend most on the fishing sector.

4.4.2 The fishery

Fishing is the Rama' most important activity for acquiring animal protein. Both, fresh water and salt-water fish species are utilized. The Rama fish in streams, river mouths, lagoons and the open sea, especially near by and offshore the Cays. Fishing is a daily subsistence activity for the people of Rama Cay, and at all hours of the day but specially in the morning time, dories (dugout canoes) with sale made off plastic and stick can be seen coming or going between the island and fishing spots. (See **plate No. 1**. Rama fishers coming from fishing ground).

Plate № 1, Rama fishers coming from fishing ground.

[7] *PROCODEFOR is an NGO that once supported the Ramas, providing cattle's and strengthening the Women co-operative in the Cay.*

You can hear the noise of kids yelling and running to help the fishermen to haul in the dories. You can also hear fishermen calling the wife's and yelling how much fish they caught. According to the Rama, the most popular fishing spots are Hone Sound, where Bluefields Lagoon empties into the sea, and the mouth of Kukra River. Men, women and children carry out the fishing alike. Nets (gill net and cast net) harpoon, fish and lobster pots, hook and line fishing method are used, but mainly men use nets and harpoon. In addition to fishing for daily subsistence, fishing is also the primary commercial activity of the Rama. On the Rama Cay this activity is actually coordinated by a fishermen cooperative. As mentioned before the clearest disadvantages that the Rama are facing in commercial activities (fishing, agriculture and forestry) is the lack of reliable transportation and processing, thus making them reliant on middlemen and giving them a low price for their products. Actually a Dutch organization, Desarrollo Integral de la Pesca Artesanal (DIPAL), is currently working with the Rama in order to improve the effectiveness of their fishing cooperative.
The Rama's also do [8]shell fishing. This is another activity that is done mainly by women. The shell fishing gives fisher women the opportunity to obtain money that is used for support of their family (husband children and themselves). They harvest mainly oyster, ahi and clams. Lobsters and crabs are also included.

4.5 The Rama and the Dry Canal project

The Government interest in relation of development has violated the autonomous statute of the Atlantic Coast of Nicaragua by taking into consideration the approval of the Canal Seco in Central America. The dry canal project emerged in early 1994 when a multinational consortium CINN, presented to the Nicaraguan government an ambitious railway construction proposal, from ocean to ocean across its territory. According to expert opinions, international trade by cargo container has grown steadily in recent years and "soon the capacity of the Panama Canal will be too small". This assessment, among other factors, has increased interest in the establishment of a new route in several Latin American countries. The Dry Canal project or Canal Seco project[9] in the Caribbean Coast of Nicaragua is one of the major challenges that the Rama community including the community of Monkey Point is confronting in the 2ths century. A century where you would suppose that indigenous peoples have the right to make autonomous

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[8] *When the Ramas talk about shel fishing, normally they are referring to oyster, ahi and cackle.*
[9] *The dry Canal or the Eco canal project interest comes because of the lost of power of the USA over the Panama and the Panama Canal.*

decisions regarding their communal land that according to the Autonomy Statute these land are unchangeable, untouchable and undivided. The proposed route will cross the Nicaraguan South, connecting the two coasts, the Pacific and the Atlantic, with approximately 500-km of double track railroad to transport the cargo containers of international shipping companies. Eventually the project will affect ancestral communal land and water claimed and possessed by the Rama indigenous people and the Afro Caribbean community from Monkey Point, located in the South Atlantic Autonomous Region. Together they have organized an active political and legal action against the project since 1996 (*Acosta 2000: 66*).
Although the possible project impacts on Monkey Point and Rama territory have not yet been accurately estimated, commentators and NGO's representatives warn that:

"The free trade zone and accompanying development (associated with the Dry canal project) would displace the mixed Rama-Creole community that lives at Monkey Point. Several other Rama communities would likely accompany the Dry Canal, including roads that will connect Bluefields, Monkey Point and Nueva Guinea. These roads would also attract new settlers and would increase the region's deforestation and unsustainable practices" (Mueller 2001; 31)
Gonzalez, M. 2001.

Opinion from a Rama regarding development

"We always hear that development means good things for people in need, they say that this dry canal project will better our condition of living and…. But my question is, do we really want this project to come true? What development really means? So many times they say development of the community but what really happen is that just the external investor get the benefit because… and the community stay worst as what it was before. Years ago there were so many projects that I experienced in my community but they never ask us if we really want this project to come true, they only come and make it be true. We are asking for help in the fishing so my people can keep on fishing they way that we always do, we only receive promises… We are fishermen we are not investors that living in the city… we are people from community and we care about our community and I want to live in our community the way we were living before….. We don't want foreign investors to be owner of our land …this is our land and we want to make our own decisions concerning our water and our land. We need help… we don't need a big change in our environment"(Rufino Omier from Rama Cay[10]). 14/07/01.

[10] *Rufino Omier is one of the oldest members of Rama Cay.*

4.6 Projects in Rama Cay

4.6.1 URACCAN

Actually the URACCAN University is working with a similar system of community coo-management. They teach the people in the community the importance of being an indigenous community that knows how to work as a team. URACCAN with support from SAIH is funding education for students in Bluefields by giving them food and a place to live. URACCAN also teach children (girls) and women how to embroider. This funding is part of the cooperation between the Tromsø/URACCAN program in coordination with SAIH program, and the Norwegian Student Relief Association (SAIH). The project supports the building of a cultural house in the community. This cultural house will serve the community as a museum among other things. It will give the Ramas the opportunity to represent part of their culture for others and at the same time, serve as a center for all sorts of different social activities in Rama Cay. In the future it may also serve as a tourist center.

4.6.1.1 URACCAN and the Rama Cay project

The Rama Cay community development project is a first phase of the research education and assistance titled “Cultural revitalization and Natural Resources of the Atlantic Coast of Nicaragua”. The program is a collaborative effort between the university of URACCAN and the University of Tromsø, Norway, with IREMADES/IPILC, Bluefields as the executive coordinator. The project is financed by NUFU, the Norwegian University Council, and it is now in its second year.

4.6.1.2 The URACCAN project objectives

- ✓ Learn how to work most effectively and sustainable with indigenous communities such as Rama Cay.
- ✓ Develop an approach model that can also be used in other ethnic communities on the Atlantic Coast.
- ✓ Provide support to URACCAN students and faculty members at the Bachelor, Master’s Doctorate level by allowing them to finish their thesis works and subjects related to the Ramas and other indigenous communities
- ✓ Make a lasting positive contribution to economic, social, and cultural life of the Rama Cay people.

4.6.2 PROCODEFOR

The PROCODEFOR project also was another project that has been working in the Rama Cay in the end of 1990's. The objective of this was to form and then strengthen the women cooperative at the same time to support the community members by giving them some cattle and planting crops. This raising of cattle and planting crops were done at the Big Hill. The project was over by the beginning of the year 2000, but a building was constructed. It's a two flooring building. This building was donated to the community. The top floor it is use as a hostel for visitors while they out making fieldwork in the community. The cooperative members to collect the fish from fishermen in the community now use the bottom floor of the building.

4.6.3 Accion Medica Cristiana[11] (AMC)

Another non-governmental organization project actually working with community members of Rama Cay community. The objective is to create unity, self-esteem and educating women and men of how to live in a healthy ambient.

The latest report on the Tromsø/URACCAN project, regarding the situation of the Rama, points out:

"*The following condition on Rama Cay seems fairly good – though the community is impoverished, the presence of the basket ball court, the island baseball league, the church, the management of the school by its fine Rama director and the community building effort of URACCAN and the Rama culture group seems to have created a good energy on the island that we hope to continue…We do believe that the goodwill and the energy of the undergraduate researchers…will possibly provide avenues of interactions and comprehension between the community, which we hope will promote mutual understanding and care".* Diala Lopez et al 2002- 6 Pp.

4.7 Other projects on the Atlantic Coast of Nicaragua

In many ways, Nicaragua is a classic case of fisheries development. The small-scale fishery has been a neglected sector in Nicaragua fisheries, despite its importance for subsistence and employment of a large segment of the coastal population. I the 80's during the Sandinista period, a lot of foreign aid has focused on how to improve the economy and support policies primarily at the industrial fishery which produce lucrative export products, shrimps and lobster, for the most

part aimed at the United States market. The Royal Norwegian Ministry of Development Cooperation (NORAD) and the World Bank were responsible of financing these projects. Projects such as the assistance of fishery development in Nicaragua were initiated in 1986. In 1989 the Norwegian Agency of Development Assistance signed an agreement with the Nicaraguan authorities of funding for the Atlantic Coast artisanal fisheries project. The objective was to provide commodity assistance of various types of equipment for the artisanal sector. Outboard engines and spares parts, gears for fishing (gill nets), shallow water and deep-water long line, ice plants and water supply. Also, equipment and material for aquaculture research and wooden boat construction in Bluefields region were supported. This was not directed at the Rama Cay community, it was directed to other communities such as Pearl Lagoon, Haulover and a small cooperative in Bluefields.

Nicaragua also participated in the substantial five-year, FAO/UNDP/UNCDF (Food and Agriculture Organization, the United Nation Development Program and United Nation Capital Development Fund), have had several missions in the area, studying the necessities for more funding. In the preliminary report, the organization stated that there were possibilities for funding boats, motors, fishing equipment and technical assistance.

In 1983 the Inter American Bank financed the rehabilitation program of the fishing industry in Nicaragua and the Artisan fishermen cooperation for communities around Pearl Lagoon in 1982. In 1984 the Dutch government has provide technical and financial assistance to the establishment of a shipyard at Granada. In 1994 the DIPAL project was introduced also by the Dutch aid (integrated development of the artisanal fishery) until 1997, with the objective to be renewed as second phase DIPAL II in 1998 and finalize in 2001. This DIPAL project was focusing mainly in the community of Pearl Lagoon. The objective was to formulate an Integrated Management plan to have a sustainable development of the artisanal fishery and to reduce post harvest loses.

Ayuda Popular Noruega (APN) has been involved in fisheries in Nicaragua since 1982. The project was to establish a cold storage unit in the community of Pearl Lagoon (CALP) Centro de Acopio de Laguna de Perla and a research center of Haulover. The project was implemented in 1984/85. They confronted a lot of problems, and the results were meagre. The main reason was lack of human resource (professional in the field), administrative control and bad management.

During this period of fisheries development in Nicaragua, the Rama community formed part of the development process, but we have impossible practically no data on they participation. The only base that was possible to obtain was a social-economic census of the community of Rama

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[11] *Acción Médica Cristiana translated in English is Christian Medical Action.*

Cay published in May 1998 by the DIPAL. Most information was obtained from people who had participated in the project now living in the community. According to these informants, the community had a fisherman cooperative functioning during the Sandinista period. The project functioned for some time. When the revolution war was over, the project was also over. The reason of this was that new government took position, the change of money rate system changes from Cordoba to Cordoba Oro (1000 Cordoba had value of one (1) Cordoba). The main reason of this failure was ignorance, the cooperative members felt that the exchange of the profit from Cordoba to Cordoba Oro would not reward all the effort that they have done, they thought that the money was worthless. The problem was that the cooperative members were already used to work with money in terms of thousands and million and with the change of currency took them to hundreds. That in those times having a few hundreds was having nothing. The community members did not understand the change of government much less the change of the money, they though that the money was worthless. The decision of the cooperative members was to make an equal share of the profit and obviously this was the end of the project. Latter on they realice that they did a big mistake.

Summary

In response to the information in this chapter, it is possible to see that social, structural and political systems among the members of the Rama Cay community are limited. And the fight and struggle for survival is still functioning at the same level as before. But in all of these limitations the community has survived until the present day. Even though this survival is mainly because of been united during these last centuries and because of the controllable use of the resources, especially in the fishing sector. That provides them health and wellbeing.

Obviously Nicaragua have wasted a lot of opportunities regarding fisheries development in the nation. One of the possible main reasons can be the change of governmental power during the 1980's. In the beginning of the 1990's most of public institutions were privatized by our government and the interest of developing our nation became an individual task. He who had the money and power was the leader. The focus was still on the fishery but now as a solution to gaining foreign exchange only and social benefits were forgotten or not part of the agenda. On the other hand many NGOs shifted their objectives and drive to other areas in which the development was more appreciated. This chapter has given a picture of the present situation, thus offering also a background for the next chapter that is related specially with the present condition of the fishery sector in Rama Cay community.

Chapter V: The Rama and the local fisheries.

Introduction

This chapter will show most of information obtained mainly from the fishing sector of the Rama indigenous community gathered during the period of June to August 2001. The chapter gives information on approximate number of fishing gears, canoes and most commercial species around the area. The chapter will give the reader details about the weakness, strength and difficulties of the Ramas as an indigenous community. Also it provides a brief description of different development activities that is taking place in the community. It gives information on the fishermen's cooperative system that exists in the community. And of how women can be more involved in the fishery. The chapter will cover the fishing sector and how the Rama have survived until present day. Hopefully it will give clear understanding of why there is a need of fisheries development in the Rama Cay indigenous community and in what way this development may benefit them.

5.1 Resource attributes

5.1.1 Fishing boats

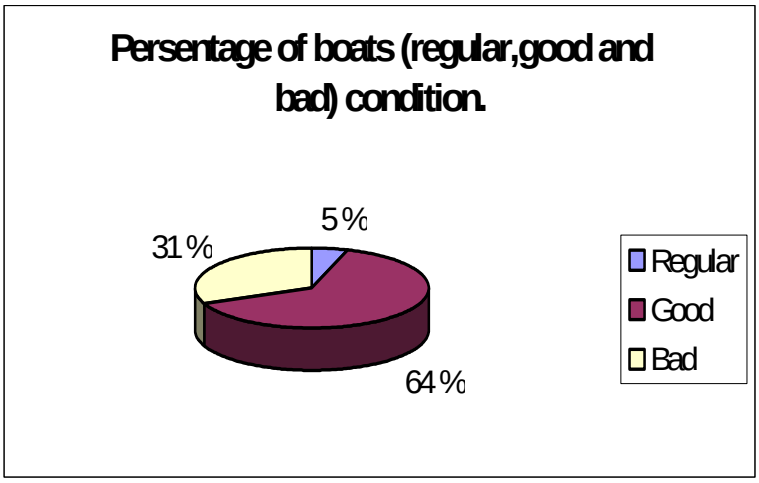
As table in (**Appendix III, table № 1**, shows the type, size and number of fishing boats), for this information seventy-three fishermen's were interviewed[12]. It is clear that the most common boat used in the Rama Cay community for transportation is the wooden canoe or the dug-out canoe, with a plastic or cloth sails and paddles, (Appreciation of **plate № 1** in the previous chapter-page 37 and **plate № 2** in the following page). Most of the canoes have the capacity to carry two persons; only some can carry more people. The people of the community construct these canoes in the community, the canoes have a length between (5-9) five and nine yards long and fifty to eighty centimeters wide.

Sixty three percent of these canoes in the community are in good condition, five- percent regular and thirty-one percent in bad condition. Out these seventy-three canoes only two to three of these are equipped with an out board engine to make the transportation easier. (See also **fig**. **№ 2. Pie plot**, percentage of fishing boats). In the following plate, the kayak that Rama fishers use for they daily transportation and fishing activity is seen.

[12] *The table was too large, reason of this it was decided to add it in appendix*.

Plate № 2 - Kayak used by Rama Cay members.

Fig. Pie chart. Pesentage of boat.



5.1.2 Fishing gears

The Ramas use gill net, long line and throwing net or – the atarraya to obtain the catch. As table number two (**Appendix IV, Table № 2** shows - Type and number of fishing gears), seventy-three fishermen were interviewed, the objective was to know about the number, type and condition of fishing gear used. In total there are 321 gears, gill net, cast nets, long line and lobster traps. The community possesses 60 cast nets. There are approximately 133 gill nets. There are 15 long lines in total, in regular condition.

The population of the Rama community also catches lobster for sale only. Within the community I was able to find 113 lobster traps owned by only four families. Almost all of the traps are in good condition. It should be mentioned that every fishermen/women and kid posses a hand line. Gears are made and repaired in the community and the material is bought in the city of Bluefields. Each gear owner is responsible for repairing his/her own gear but in practice the house wife/fisher-women do this activity[13].

5.2 The fishing activity

The fishing activities of the Rama population take place in rivers around the area (the community), lagoon near and away from the community and out in the sea. This activity is done in the nighttime. The fishermen leave their nets for two to three hours. Some actually set the net around 9:00 to 10:00 pm, then return to check the catch the following morning. This is one of the main reasons that cause a lot of spoiled fish that needs to be dumped. Due to the fact that the fish have been dead for a long period under the water. In addition the high concentration of protein accelerate the decomposition of the fish resource. This is one of the main problems in addition of not giving appropriate maintenance that causes low prices from external buyers. The people of the community should seriously address this problem. The catching of shrimps is a two-person job. One person steers the canoe, while the other person stands in the bow and repeatedly throws a *cast net* which sink to the bottom and entrap the shrimp. Shellfish (oyster, clam and ahi) is one of the principal and traditional meals of the Rama people and the whole population of the Caribbean Coast of Nicaragua. It also represents a good sale for the Ramas at the market in Bluefields to the people from the Pacific. Women and kids from Rama Cay do the marketing of this product from corner outlets of Bluefields market and offer it to people who walk by. It is possible to obtain more than one hundred Cordoba from each trip[14]. Women are more skillful in marketing shellfish products. After asking why is they assume that women are more skilful? The answer from fishermen is that they feel ashamed to do it, others say that it is because women are more patient and responsible than men are.

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[13] *It is good to say that all member of the Cay were represented in the different seminars. So information concerning boats and gears are not based on only 73 fishermen but on the whole community*

[14] *Most important species find in Bluefields lagoon is mentioned with local name in* ***appendix V*** *table No. 3.*

5.2.1 Shell-fishing

Gathering shellfish is also another important subsistence and commercial activity for the Rama community. According to the Rama fishing community this activity is profitable. Shrimps (*Penaeus spp*) are gathered during the dry season (March to May), and they are an important commercial item in Bluefields. Shrimps are gathered from shallow waters in various locations in Bluefields Lagoon. Gathering oyster (*Crassostrea rhizophora*) is another essential sustenance activity for the Rama. The large oyster shell mounds on Rama Cay provide evidence of this. In the middle parts of the island, the ground itself seems to be made of oyster shells and indeed, over the years oyster shells have been used repeatedly as fill for the low marshy area between the two halves of Rama Cay. The southern part of the Bluefields Lagoon is shallow and it contains a large number of productive oyster beds. According to the Rama, the location of the oyster bed has shifted over the years, due to hurricanes and other environmental factors.

Oysters are gathered along the western shore of Deer Cay, Filis Cay, Wairu Cay and Coco Cay. Oysters are generally regarded as a reliable food source even when other protein sources are unavailable. Two other shellfish gathered by the Rama are Ahi or surf clam (*Donax spp*) and cockles (a small clam—*Polymesoda solida*). Cockles are gathered by digging in the mud and it is found in many places along the Bluefields Lagoon during the whole year, such as Mission, Skwallup and Walker Cays. Ahi is found on the sandy beach of Hone Sound and Monkey Point. It is gathered by digging in the sand usually in the month of September. Oyster, cockle and ahi are most commonly eaten in soup by the Ramas.

Up the rivers, especially in Kukra River, the Ramas catch large freshwater shrimp (*Macrobrachium spp*). The fresh water shrimps resembles a lobster, it is large (30 cm or more) with long claws and meaty tails. In addition the Ramas also fish lobster, by submerging a wooden trap with bait inside. Lobster from the sea is not a major traditional food source for the Rama but it is a species that has a lucrative commercial market. The Ramas catch lobster (Panulirus argus ssp) known commonly as spiny lobster, which is used only for sale in Bluefields.

In the following page shows a table of different species consumed in the area of the Rama Cay community. (**Table No. 2**).

5.3 Marketing

For a long time marketing artisanal fish product on the Caribbean Coast has been an overall problem discussed mainly by inhabitants of different communities and now by inhabitants of

Rama Cay. Export is planned to be the main way of marketing the products. The experience related to marketing of fish from the Cay indicates one way, fish should be sold at local level. Actually there is a cooperative system functioning in the community of Rama Cay. This cooperative gives the Rama population the opportunity to obtain some money from the fishing activity. After the fish is caught, most of the product is sold to the cooperative leaders. The cooperative leaders are also members of the community. These are responsible for buying the product from the fishermen; they also have the responsibility to wash, clean, ice and storage the fish in small containers and transport it to Bluefields, where the selling takes place.
When the fishermen arrive with the fish to the harbor, the cooperative collaborate with the women cooperative to do the washing, cleaning weighting and storing. The washing and cleaning is done in the Bay, where the contamination is really high. (**See plate No. 3**. Page 50 Women and kids washing fish product in the Bay).

Table. No 2 most important species consumed d by the Rama

Family	Genus	Species	Local name
Fish			
CARCHAHINIDAE	Carcharhinus	Carcharhinus acronotus	Tiburon/Shark
MEGALOPIDAE	Tarpon	Tarpon atlanticus	Sabalo real/Tarpon
ARIIDAE	Cathorops	Bagre marinus	Bagre/cat fish Tunqui/Sea cat fish
MUGILIDAE	Mugil	Mugil cephalus	Lisa/mullet
CENTROPOMIDAE	Centropomus	Centropomus ensiferus	Robalo/ Snook
SERRANIDAE	Epinephelus	Epinephelus itajara	Meru/June fish
CARANGINIDAE	Caranx	Caranx hippos	Jurel/Jack
LUTJANIDAE	Lutjanus	Lutjanus aposus	Pargo/Snapper
SCIAENIDAE	Cynoscion	Cynoscion acoupa	Curbina/ Weakfish
SCOMBRIDAE	Scomberomonus	Scombrinomonus brasilien	Macarela/Mackerel
CLUPEIDAE	Opistonema	Opistonema oglinum	Saridna/Atl.Herring
ENGRAULIDAE	Anchoa	Anchoa spinifer	Sardina- Sprot/Anchovy
LOBOTIDAE	Lobotes	Lobotes surinamensis	Mojarra/Sand fish
Crustaceans			
PENAEIDAE	Penaeus	Penaeus notialis	Chacalin/Seabob
PORTUNIDAE	Callinectes	Callinectes sapidus	Jaiba/ Crab
PALAEMONIDAE	Macrobrachium	Macrobrachium carcinus	Camaron de rio
Bivalve			
CORBICULIDAE	Polymesoda	Polymesoda aequilatera	Almeja/Carckle
OSTREIDAE	Crassostrea	Crassostrea rhizophorae	Ostion/Oyster

5.3.1 Prices

The fish is sold at for different prices in and out of the community and this price will depend on the species type and sizes. For example in the community prices will oscillate between 1 to 6 Cordoba's per pound of fish, between 15 to 30 Cordoba's for shrimp.

In Pesca Fresca fish processing company they also confirm that the price of fish resource price will depend on the type and size[15]. Pesca Fresca offers prices between 3 to 8 Cordoba's per pound of fish, 20 to 87 Cordoba's per pound of shrimp and 145 Cordoba's for lobster.

Presented below is a table (**Table No. 3)** comparing shrimp and fish prices bought from fishermen at Rama Cay and sell out the community to the Processing companies in Cordoba[16]. The shrimps are classified in number per pound. It depending on how many shrimp is composing a pound. The numbers of shrimps give the classification of price of the shrimp[17].

Table No. 3 Price of species in and out the community of Rama Cay

	Price-in Rama Cay	Price-in Fish processing company
Shrimp	15 – 30	20 – 87
Top commercial species - fish		
Shook	6.00	8.00
Sheep head	1.00	8.00
Snapper	3.00	8.00
Cat fish	1.00	3.00
Lobster	-	145
Other species is available but these are most abundant species in the area. Money exchange rate is 13.5 Cordoba for a Dollar		

[15] *Pesca Fresca is a fish processing company situated in Bluefields. Hare members of Rama Cay sell they product.*

[16] *The money exchange from Cordobas to Dollars is: 13,5 Cordobas per Dollar.*

Plate № 3, Rama Women and kids washing and cleaning the fish in the Bay.

The storage is done in unclean baskets, deep ice container and in bowls that are used for other activities, (**see plate № 5**, page 54, appreciation of fish containers used by the Rama). This is another problem that limit the selling of fish product from the Ramas to the different fish processing companies in Bluefields or other communities. It is correct to say that this is one of the main reasons of low prices offered from the different processing companies to the fish cooperative of the Rama community.

During the period of data collection June-August it was possible to construct a table that can give us information about how much money the Ramas fish cooperative was able to obtain from the fishing activity per month. Combining the fish bought with price it was able to find out what was the possible profit of the fish cooperative per month. After taking out other expense, such as buying fuel, and their salary. The actual values are in Cordoba. One Dollar equals to 13.50 Cordoba. (**Table No. 4**–Total profit…in Rama Cay June/August 20001).

Table N. 4 Total profit per month of the fishing cooperative. (June 12-August 17) 2001

Month	Beginning of the month	End of the month	Profit
June	**2,227.05**	**6,782.00**	**4,554.95**
July	**6,782.00**	**11,645.05**	**4,863.05**
August	**11,645.05**	**19,000.00**	**7,354.95**
Total	**-**	**-**	**16,772.95**

[17] *Informant (Andres martinez-President of fish cooperative in Rama Cay and Darline Downs-Responsible of HACCP application in Pesca Fresca processing company).*

5.3. 2 Principal buyers of fish products

The principal buyers for the Rama Cay fish production are Pesca Fresca fish processing company, Consejo de Iglesias Evangelicas Pro Alianza Dominacional (CEPAD), and small buyers in the market and some people in Bluefields[18]. These processing companies sometimes provide ice to the cooperative in Rama Cay. The Fish Company distribute the fish to local consumers, hotel and restaurants in the cities of Bluefields and Managua, but most of the fish is destined for the US market. The selling of the fish to the different processing plants is conducted by the cooperative. The cooperative buy the fish products from fishermen of the community then take it to these processing companies in Bluefields. According to people of the community and cooperative members in Rama Cay, the benefit of buying and selling of fish resource go directly to the members of the community. The reason is that community members get the opportunity sell some of the product caught, and each one do not have to go to Bluefields to sell the product. Fresh and iced fish is intended as the main product for domestic distribution and local consumption.

In addition of not having any appropriate conditions for processing and transportation, the community members also have other difficulties. The fish processing companies put conditions to fishermen who wants to get their products sold. In relation to these conditions the cooperative members also formulate conditions to fishermen of the community. These can for instance be that they buy fish above two pounds only, fresh fish products and also only the top commercial species of fish. Those can be snook, snapper and sheep-head, lobster and shrimps in the best conditions with respect to smell and texture. The product should have enough ice and Sodium Bisulfate. It will be rejected if they do not fulfill these requirements. These different types of fish are for local consumers, important buyers in the city of Bluefields or in the Pacific. Lobster and large shrimp is for export, the US market mainly. Fishermen also catch other fish of commercial value that are consumed in the community or sold to the local market of Bluefields without passing through a processing company.

5.4 The fishing cooperative in Rama Cay

The DIPAL project is an Integrated Development project of the artisanal fishery mainly in Pearl Lagoon area, financed by the Dutch government. Actually this project is playing a major role in fishery development in Rama Cay and in the life of the community members.

[18] *CEPAD, is an evangelistic NGO, co-operation system (house construction), sometimes they buy fish from the co-operative of Rama Cay.*

Meynel (1984), writes that small scale fishermen, who are a marginal and exploited group, are impeded by existing economic and social power structures and suggests that fishermen's cooperatives are the ideal organizational form to overcome these obstacles despite their limited success rate in development projects. The fish cooperative system functioning in the community of Rama Cay was actually organized by the DIPAL program. But it is the [19]cooperative that is organizing the transportation of the fish from the Cay to Bluefields by using a skiff with engine 48 HP. It takes approximately one hour from the Cay to Bluefields. This skiff, motor and 30 nets, was given as a support activity by DIPAL.

Plate № 4. House skiff with outboard engine donated by PROCODEFOR & DIPAL projects to the Rama Cay community

Andres Martinez (president of the fish cooperative in Rama Ca) says.

"*To be a member of the fish cooperative in Rama Cay, first of all you need to be a Rama fisherman, and then to pay 1000 Cordoba ($ 74.5) as a member entrance fee. The person in charge of the economic affairs of the cooperative has the responsibility to deliver this money to the responsible of economic leaders of DIPAL. Actually six members of the community that are also fishermen compose the cooperative. They are responsible for the administration, accounting, transportation, processing, storing and maintenance".*

[19] *The members of the co-operative are using the bottom flour of the building to do the processing activities. (Weight, cleaning and storage).*

Danilo Rosales (Sub-director of DIPAL) confirm that:

"The cooperative system started in the year 2000 and it was initiated by DIPAL project[20]. These actual members had to pay 500 Cordoba in place of 1000 Cordobas to DIPAL. DIPAL opened a bank account which is administrated by DIPAL by a using the concept of a revolving fund. DIPAL has the responsibility to inform the community of all the movements and transactions that are taking place with the saving account. Since there are six fishermen in the cooperative, the cooperative had 3,000 Cordoba to initiate the project. In addition to giving support, and organizing workshops related with the fishery, DIPAL also added 100% to the initial capital. Thus in all, the cooperative had 6,000 in the Bank as starting capital. This is used to buy fuel for transportation, ice to preserve fish product, and maintenance of the outboard engine and fishing gears given by DIPAL".

According to the informant *Danilo Rosalez,* the main objective of the project, was to change the selfish behavior to group strategies of conflicted communities. Another reason was to create solidarity, to teach the community that they can survive if they work as a team, an approach co-management. This is why that the cooperative of Rama Cay named in Spanish as Grupo solidario (Solidarity group). The aim were to teach them how to work as a team in terms of self administration, perform maintenance of the fish containers, weight, skiff, engine, gears, materials that is needed, radio and solar panel, without needing the presence of a member of the DIPAL project in the community. Also DIPAL gave an administrative checkup by the end of the month to see how the fishing activity is functioning in terms of economic and biological issues.
Training and education of fishermen (by giving seminars) were also offered. The subjects of accounting and how to improve the condition of processing the product, fishing methods and projects formulation, are being taught. DIPAL also created a saving system with low interest for the cooperative. A total of 15% of the net gain and 13% of lost of value of materials such as the skiff, engine and gears went to DIPAL. The reason of the application of this interest rate, was to create funds so other fishing communities like Rama Cay could also have the opportunity to get the benefit and form membership with the DIPAL project.

[20] *The DIPAL project period of working in Bluefields has expired. The project is no more functioning in the Atlantic Coast*

5.5 Processing

Regarding information about processing, cooperative members respond that most of the information about conservation of fish is learned from seminars given by professionals of DIPAL and self experiences. But there are a lot of physical limitations. They do not own an ice processor and the ice is bought in Bluefields when it is available.

Fishing material such as fishing line, hooks, weight etc, is also bought in Bluefields. After the fish is received by the fisheries cooperative the fish have to be treated before it can be stored and then sold. First the product is being washed, cleaned and dissected by using the help of women and children**.** Then weighing and storaging is done by the cooperative that is administrated by men that are members of the cooperative. This process is done in an inappropriate manner; no food security control is conducted.

Plate № 5, Rama cooperative member conducting processing activity.

5.5.1 Salting, smoking and drying of fish and shrimp[21].

Salting, smoking and drying fish is common. This activity is done for local consumption and sometime for sale in Bluefields town. This sale will take place if some one outside the community has ordered any of these products to a member of the community. The salting, smoking and drying are conducted in a robust way. They normally smoke the so-called "non commercial species", most of the time catfish or tarpon. The Ramas normally salt, smoke and dry fish when catches are high. When catches are high most of the fish is wasted and a small

[21] *Some recommendations to obtain other fish product is mentioned in Appendix No. 1 and 2.*

portion is taken at home for consumption. What cannot be consumed for that day is directed to the other alternative that can be salting, smoking drying or dumped. This will happen because of the lack of electricity and mainly because of the necessity of a shore market to sell the fish product.

5.5.2 Smoking

This is a woman activity. Every housewife in Rama Cay use wood for cooking. It means that they keep the fire hearth always with fire and a lot of smoke. In every house you can see that they have a rope or wire tie across the fire heart. On this wire there are fish hung on it for smoking. In case of the Tarpon fish, it is wrapped in banana leaves and then set on the edge of the fire hearth. This is done during the whole year.

5.5.3 Salting

Salting of fish is another activity conducted by women. Smoke is also very important for the salting of fish; the difference is that they add a lot of salt on the fish after the bone is taken out. After a period of one day it is hanged outside, then put back inside at night. This process will keep on until the fish is cured. They have their own way of knowing when is the right time. This activity is carried out during the whole year.

5.5.4 Drying

This is also a female activity. In this case, fish drying is done in the dry season when the temperature is very high. After cleaning and small bones have been removed, they add a little bit of salt and then they put it on the housetop or on a piece of zinc to be dried by the sun.
With respect to shrimps, it is being scolded before the drying takes place. After scolding the shrimps, it is left to drain out the water. Then the shrimp is put out in the sun on a plastic or zinc piece for several days until it dries completely. After the shrimps are dry, the shell is removed. The product provides a good market in the city of Bluefields and in the Pacific area of Nicaragua. Some people will order dried shrimp to send it out of the country (black market), mainly to the US market. The shrimp to be used is the Sea-bob, commonly caught in the Bluefields lagoon. This drying of shrimp is done during the shrimp season when the weather is hot e.g. February to April.

5.6 Fisher women in Rama community

In Rama Cay, women are also demanding representation and equal treatment principally in the fishing sector. Actually there is a women's cooperative functioning in the community known as the AMIR group. The objective is to make women more active in and outside the community. In order to obtain this result, forty women were interviewed, these forty women dedicate themselves as housewives, but in addition to this they also fish. Sometimes they go fishing with their husband and at other times by themselves or in company with other family members. They dedicate themselves mostly to the collection of oyster, clam, ahi and cockle (shell fishing) in order to support they family. This will take place commonly when their husbands travel to Bluefields or to the zone known as Big Hill to do some agricultural activity.

Women in the community will like to have the opportunity to form part of the fishing cooperative. They are willing to work for fishermen of the cooperative and be a member. Women are willing to be responsible of taking care of the fish in practical issues such as cleaning and storage of the resource, especially in season when catches are high. Men in the community are positive in relation to share some responsibilities with women in order to strengthen the cooperative.

These are the direct words of fishing women regarding the fishing activity.

"Fishing is one of our main activities and the only opportunity to gain money for our selves, we just cannot depend of what our husbands give to us… The fishing give us opportunity to buy something for our personal use … and to support our husband in their own personal use also…. It is an opportunity that all of us have because we can fish all the year around. In addition to keep the household and being a fisher women, we also help our husband in repairing the damaged nets, and construct nets (cast net) for sale for fishermen in Bluefields and other communities[22]".

There are institutional facilities available actually in the community such as the NUFU program Tromsø/URACCAN, AMIR, AMC, but none of these are focusing on women in the fishing sector.

[22] *This was a result of a combination of women opinions during seminar period.*

5.7 The HACCP seminar

In order to conclude this thesis it was also necessary to give the community some information that is necessary for them in order to generate fisheries development. It was important to let them know that to have fisheries development it will take time and a lot of work. It is also important to let them know that this is not an immediate action and that it implies responsibility and self-control, and also that it works with rules, regulations and measurements from the moment of capturing the product until it sold to the final consumer. The HACCP seminar was implemented in the community in order to give a clear understanding of why it is necessary to follow rules and regulations[23]. To let them know why it is necessary to take step by step to reach the end of the journey. It was also important to let them know that training is the key. The HACCP system is the system used to identify risk and to apply preventive measurement of controlling the risk before disasters happen. The HACCP system is applied to secure the health of consumers. It provides guidelines that a fishermen and owners of fish companies should follow to have a safe product that will increase the demand and better prices from external buyers.

5.7.1 Conservation and processing

Most of the losses of fish due to spoilage normally go unnoticed by resources managers, but at community level these losses mean sweat and sleepless nights. Nevertheless, there are continuing losses on the fishing grounds, in the landings, the storage and in the marketing. It is possible to improve this particular situation. There are steps that fishermen need to know. These steps are necessary from the moment that fishermen go fishing until these product reach local consumers and external buyers. There is the HACCP regulation that each government is introducing. Communities such as Rama Cay should also know and put it in practice. Normally at community level common handling malpractice are parts of the daily activity.

5.7.2 Handling malpractice

While staying at Rama Cay, it was able to see that the fishermen/women kept the fish in the bottom of the boat for a long period, exposing it to sun, dirty water and some times they step on them. After the fish was cleaned and washed, the fish was packed improperly in the ice. It was common to see problems such as:

- ✓ Fish was crushed by too much ice and other fish piled on them;
- ✓ Fish bruised by throwing fish carelessly in the icebox;
- ✓ Failure to properly pack crushed ice around the fish;
- ✓ Mixing fresh and well-iced fish with un-iced and un-fresh fish.
- ✓ No verification if fish was cleaned appropriately before storing.
- ✓ Throwing and putting the fish on the sidewalk; exposed to flies.
- ✓ Carelessly washed, often with dirty water or in the Bay.

5.7.3 Processing problems:

Most of the fish actually caught by Rama fishers are in great demand by local consumers (Bluefields). Better processing method leading to and fresh product may easily satisfy the consumer preferences and will increase the revenue to the fishermen by obtaining increased prices for fish form external market, as well as stimulating them to catch more in many cases, that latter on this may cause other problems. Local consumers have strong preferences for fresh fish and meat. They will buy processed fish from fish processing companies only as a last alternative.

Summary

The community is using only canoes for they daily activities. They use cast nets and gill nets mostly, to obtain they product for their consumption and in some occasion for marketing. This activity is done in the nighttime. They gather shrimps, fish, lobsters and other shellfish. Due to the problem of not having a direct market to sell their product, sometime it is sell to Pesca Fresca or CEPAD, some other times to local market in Bluefields. If they don't get they product sell to any of these buyers, the product is dumped. The prices obtained from the product will depend on size, type and condition of the production. There is not a formal cooperative system functioning in the community[24]. Women are also willing to participate in the fishing activity of which men are also thinking positive about it. This cooperative was supported by the DIPAL project not established by the government, no legal process is involve reason is that is no a formal system.

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[23] *The HACCP seminar was an addition project, which was not proposed in my research objective. For this to be much understandable for the community members I used videos tape and the help of other professionals in the field.*

[24] *To be a formal co-operative the community members need to work with legal system. It is not a formal co-operative at the moment, because they are working without governmental authorisation, they do not have legal documentation to support them.*

Chapter VI: Analytical discussion

Introduction

This thesis is one of the first publications trying to present a formal description of the Rama and the fishing sector. This chapter analyses the lessons that can be learned from fisheries development in Rama Cay. A central issue is multiple and conflicting goals and the need for analyzing choices between different development paths as defined by Bailey and Jentoft (1990). The contradictory problems imply trade-offs of conflicting values of which hard choices need to be made. At the community level these trade offs might be less problematic than at the regional and national levels.

Historically most of fisheries development programs and projects have never adjusted to the real conditions and necessities that concern of the fishing families. Even when programs are operating at village level, the people participating are normally involved as inexpensive labour. It is true that there is a lot of fisheries development projects formulations and planning aiming at the rural poor but most of the time it exist only on paper. In some cases, projects over time shift to other areas. This shift can sometimes be related to problems faced in the first community. At end of the day development agencies find out that it is impossible to reach the goals stated. In other cases, fishermen loose interest or do not follows rules or respond to the inducement that are introduced.

6.1 Participation and Control

In indigenous communities suffering from discrimination, poverty often forms part of their life. The constant fight for survival and conservation of their natural resources is conducted by rules of which each and everyone are responsible to follow. This means that you must pay back if you do something that will affect the other members of the community. In the case of the Ramas, people always participate in building their community and managing their resources. Trade offs must be made because of their wish to maximize each goal in fisheries development project at the same time. These trade offs are made more difficult because of the influences of others (external users), in this case the pressure from buyers demanding more products. If the community members work united and care for the future generation and the rational use of the resource, then they should be better able to control and to balance the use and management of their resources. Resource managers and community members need to work together to make

development and management more effective inside and outside the community. This can be the result of keeping the circle of unification alive. The Rama Cay resource user group is relatively small, therefore a resource manager should find it relatively easy to manage. The management effort should not be targeted on the resource only, but more on the people who are using the resource. Managers should help so that community members will keep on the same track as the one that they have learned: To be united and caring for one another as well of the resource that is part of their daily livelihood.

6.2 Situation of the Rama fishery

The resource actually is in open access use, every community member has access to the resource. Thus the resource is at the outset equitably distributed among community members. But at the same time of been qualified as open access, it is formally owned by the Rama indigenous group. The Rama indigenous land and water known as the indigenous "communal land and natural resources" dictated in the Autonomy Statute, law №. 28 in 1987. In other words the Rama Indigenous community leaders and members have the right to decide what and when different activities should take place in regard to their resources. Even though this law has been violated by the government and their famous "Dry Canal project" in Nicaragua. The Rama does not exercise these rights at full extent, due to limited human resources in the community.
In Rama Cay as in other fishing areas of the Atlantic Coast of Nicaragua, there is an absence of data, monitoring, control and surveillance. Fisheries inspectors have the opportunity to note and inspect the landing one or two times per month but this is done only for the industrialized fishery. These problems permit the mist landings and uncertainties among resource managers in regard to obtaining data of total fish catches in the area. It is reasonable to say that most of the data that exist are based on approximations of total fish landings. The reason is that data are only derived from the industrial sector, the artisanal sector is excluded. In the case of the Rama Cay fishery no data was found which makes it difficult for anyone to assess the fishery in order to have development.

6.3 Why Rama Cay

Rama Cay was chosen in this context because it is a small community that needs development. It is a community, that has a limited number of inhabitants with no income facilities outside the fishery and therefore they are totally depend of the fishery as the principal resource. In this case, fishery development is needed for them to have improvement. The Rama Cay was also chosen as

a “first case” of the problem connected with fisheries development, in particular the fact that hard choices must be made between conflicting goals. It wasn’t their choice to live isolated from the rest of the Nicaraguan population but it was their choice to stay and build their community and their choice to develop what is needed to improve their standard of living. It is also their choice to fight and defend what by right belongs to them as an indigenous community. They choose to defend the right of the rational uses of their natural resources. For this they are willing to follow rules in order to obtain the best results for the present and future generations. Now that some foreign development agencies are focusing on the Rama Cay community, the fishery seems to be one of the principal resources that need to be developed in the area. On the other hand, in the Rama community people live in sharing relationships and in relative harmony. Indigenous communities are often more skillful working in cooperation, because of their shared identity. They also have survived under difficulties and under hard life dilemmas. In addition to this they have shared beliefs and aspirations. Perhaps for others, who do not belong to the community, this may sound as a selfish dilemma. But on the other hand it keeps them united and alive as a unique indigenous group on the Caribbean side of Nicaragua.

In a fishing context, resource sustainability is important. It is possible to imagine a rapid increase of harvests from use of new technology, without bringing much development in the community, because it may be destructive and therefore not sustainable over time. The fact is that most of international and national investors rather focus on industrial fishery in Nicaragua that might give fast returns on what they invest. In most cases, this has led to an over exploitation or depletion of the natural resource and impoverishment of the people affected. In the Nicaraguan context, most development efforts are focused on the industrial fishery. Particularly our government has neglected the artisanal fishery. Large investments, which give priority to fish for export, and some regulation with limited management, have been introduced in the Nicaraguan industrial fishery. Some regulation such as license systems and closed seasons. For example if a fisherman get a license to operate in the industrial fishery, it means that he has right to use ten (10) vessels under one license and no specification of which species he have right to catch. The artisanal fishery is actually not developed, and information of this activity is limited. As a result this limited the Ramas as well as other communities to have access to basic resources, fishery technology such boats and fishing gears and access to processing and marketing. Fish processing companies prefer to buy fish caught by the industrial fleets. One reason is that the industrial fleets catch more lobsters which gives fast return, another is that they prefer to buy bigger fish for filleting. An exception is the DIPAL project in Pearl Lagoon and Haulover area, a project of which fishermen are pleased and grateful. The DIPAL project has promoted co-management,

and it was teaching communities to work together, to protect and defend their resources. The DIPAL project has been expanding since 1994 on the Atlantic Coast been working at a low level with Rama Cay community members. Unfortunately DIPAL has now pulled out of the area leaving behind a hollow, which needs to be filled by someone else. This can also be one of the main reasons why communities have lost interest and confidence in project designers and foreign aids. Donors were raising hopes that later disappeared, together with the project.

6.4 Approaches in Fisheries development

Michael Todaro (2000) writes that development is a process by which people gain greater control of their own destinies. Community development happens when a process takes place within a local community, usually, but not always, understood as the geographical area where people carry out their day to day activities. This should also be a main goal in fisheries development and management projects in Rama Cay.

Christenson and Robinson's (1980) identified three basic themes or approaches to community development. The first is community self- help. This process works toward slow and sustainable change, and sees the role of the outsiders as facilitators and educators. The second approach is technical assistance where the change agent is seen as an advisor or consultant who works with community leaders and administrators. The third approach is the conflict approach where the change agent is seen as an organizer and the goal is a fundamental shift in community power and control of resources. When we introduce development projects into the Rama Cay community they may create competition, and grudge among community members and outsiders. This might be if the benefits of the project are limited to a few members of the community only. On the other hand government or community leaders might not be willing to give up some power and control over possible profitable resources. This can be one of the conflicting values of which communities in search of development need to confront and make the best decision for the sake and security of the community members and to keep the resources sustainable over time. On the other hand, in many cases when community leadership agree to give up and share power and decision making, most of the time the opinion of the community members or leaders is not taken into consideration by external change agents. Thus the community loses power over the resource and government or investors become the controllers.

6.4.1 Why development is needed in Rama Cay

The search for fish as food and economic growth has become one of the fundamental topics world-wide. Especially in third world countries, in which the resource is available but the possibility, ability and facilities to develop the use of this resource to obtain benefits are limited or unknown.

The availability and access of capital for investment in transportation, capture, processing, storage and marketing of fish products of the small-scale fishery of the people who live on the Atlantic Coast of Nicaragua is very limited. Especially in some communities like the Rama Cay, where fishing is the principal activity and, in some cases, the only reliable source of existence, these limitations are a main reason that is concurring the development. After analyzing the scarcity and in some case absence of facilities, some questions should be addressed. Does this situation occur because of the ignorance of people who live in the community or is it because of the way government influences foreign donors and investors so that development is not occurring in the area? Or does it occur because it will be easier to convince a group of people that normally they do not have any interest in conserving the resource but only to have uncontrollable use of it? There are so many unanswered questions, which will lead to confusing answers. Maybe also because development may mean different things to different people. Thus people will give very different answers to these questions?

For one group of people, development means highly industrialized mechanisms and expensive and luxurious technology. For others development is just to have a reasonable income to cover their basic needs.

In the context of a small scale fishing community such as Rama Cay, development might mean improvement of social organization that can involve cooperative management of the local resource or collective efforts to improving infrastructures such as roads and the wharf. It is fair to say that development is not defined exclusively in money terms, even though improving income, would be part of the picture. Should development be capital intensive rather than labor intensive? We must remember that what is good technologically may not be good socially and culturally. On the other hand, measuring economic gain in aggregate form would not be enough; it is obvious that we would like to know something about how this added income is distributed, the extent to which income is distributed equitably. Equity in Rama Cay is the key word and if development is not equitable it will be resisted.

6.5 Hardin's paradigm "The tragedy of the commons"

The problem of over-exploitation and the need for trade offs will occur in the future in the Rama Cay community. A stable property right would be needed. Or the actual (autonomy statute) should be strengthen. Our new government will need to fight and preserve the autonomous statue of the Atlantic Coast of Nicaragua. These are technical solutions that would require changes. According to Garret Hardin's (1968) and Scot Gordon (1954), the term "common property" is synonymous to "open access". This essentially means a question of fairness and justice. Hardin pointed out that it is not mathematically possible to maximize for two. This lead back to Jentoft and Bailey theory "Trade offs in fisheries development". The difference is that Hardin used the term "population" and "goods" (resource) to make the comparison. He stated that it is impossible to maximize population size and goods at the same time because of resource scarcity. Obviously because the population need to use natural resources in order to survive, if these resources (goods) are used by the population without any concern of the carrying capacity they will be reduced. (Hardin 1968: 198-205), developed the "tragedy of the common" by picturing a pasture that is open to everyone. He used the expression that, it is to be expected that each herds-man will try to keep as many cattle as possible on the commons….As a rational being each herds-man seeks to maximize his gain…Each man is locked into a system that compels him to increase his herd without limit – in a world that is limited. Ruin is the destination toward each men rush, each pursuing his own best interest in a society that believes in the freedom of the commons. "And that freedom in a commons will bring ruing to all". The social dimensions of fairness and social justice are the part of what every reasonable person who is seeking for true community development would look for. If the benefits of the changes are captured by a limited set of actors, then we should not say that it is development of the community. It is just to say that it will rather be *failure of development*, even if overall aggregate income increased. Hardin's paradigm is used actually to teach a lesson to resource users, that individualism, selfish behavior brings ruing to all.

6.6 Common questions arrive in fisheries development projects

In the Rama Cay community, each and every one of the houses have at least one dugout canoe and one net. If they are lucky with the catch, it can provide a meal, sometimes also some income. The question in fisheries development comes when the community decides how much and if they are willing to change their ways of operating to have development? Are these changes

reasonable? The fact is that people will adapt to changes if they find that they are reasonable and if the sharing power of is the way to have better results in managing the resource.
Sharing power and knowledge to make the best decision is an alternative that the Rama's should take into consideration. These sharing should be e.g. with the DIPAL project and the Tromsø/URACCAN program or others that are willing to help in improving the condition of living of the Rama people in the Rama Cay community. If the community and these other intermediate groups work together as a team using co-management as a guide to build unity development and positive changes may result.
Unfortunately development planners design these changes and in many cases, at the end of the day, they really don't even understand what these changes are about. Perhaps this is because they feel that the changes they make are isolated to technical areas. Even though the situation is different from project to projects. And now present day resource managers and foreign aids around the world are focusing more on the appropriate use and resource conservation especially in indigenous communities.
Bailey and Jentoft (1990) define development as "a process of change through which sustainable and equitable improvements are made to the quality of life for all or most of members of a society".
In most fisheries development project, the benefits are just for a small portion of the population, in some cases one or two member of the actual population in which the development will take place. Perhaps in most of the cases the benefactors are external investors or someone that do not have any knowledge of the area. Most of the time, this happen because of the money issue. "Money makes the mail run". That leads later to the concrete question in focus in fisheries development, "development for whom?" Who will get the benefits? Who will be affected? Who will or will not be involved? In the Rama Cay context, the development is for the Ramas and the Rama community; the benefit will go to the Ramas. But of course the Ramas will not be the only benefactors because it also involves others such as other communities near by, external buyers, resource managers (data of fish landing) and the government it self. Even though community members should understand that any decision concerning the fishery, the benefit is for all the members of the community. For example if it is to strengthen the fish cooperative system that is actually functioning in the community. Then they will need to understand that not all of the community members can be part of the cooperative. Because each member have a specific responsibility at the same time it will create difficulties in the money sharing process makeing it difficult to control. But the benefit that they will obtain is that all community members will have

the opportunity to sell they fish product in the community. And the need to go paddling to Bluefields to get some of the product sell will not be needed anymore.

6.7 Trade offs in Rama

Bailey and Jentoft (1990) outlined a list of valid goals related to fisheries in developing countries. These goals are linked with one and another. They are often mutually exclusive. Due to the combination of technological, demographic and ecological factors, it is not always possible to simultaneously generate expanded employment opportunities and to increase fishermen income because of the scarcity of the resource. One has the same situation related to efforts to increase production for either domestic supply or export market. Export provides hard currency, which is important for technology renewal, but at the same time it takes away fish from domestic and local market. According to Bailey and Jentoft (1990), efforts to promote expanded production for either of these markets may have adverse consequences for employment and for the resource as well.

There is worldwide Christian proverb saying that: “You cannot serve God if you are serving the devil. You will always be faithful to one and unfaithful to the other”.

Making tradeoff is the act of balancing between conflicting goals. Developing countries tend to struggle to overcome extreme poverty, and fisheries policies often contain the objectives of provision of food for people, Increasing fishers income, employment opportunities for the poor and increasing export earning which is good for the nation as whole, Hersoug (1992), Maenbe (1995), Bailey et al (1996), Mustafa (1997), Jansen (1998). They all argued that these objectives are laudable, and due to resource limitation, they are difficult if not impossible to realize at the same time. And that all of these objectives cannot be fulfilled concurrently to their full extent, especially when results are supposed to be realized within a short period. However, poor countries cannot afford to wait long until the result of development initiation are beginning to show results.

As in the case of the Rama Cay, fish is the most important source and the only affordable source of animal protein. But this resource also gives them the opportunity to buy other goods that is necessary for their daily living. This is the way that this community has survived for ages and the resource as well the communal decision is what matters more than individual decisions. The most productive development projects are collaborative. A healthy dose of recipient control is necessary for lasting successful development. The same is true regarding the use of local knowledge. The Rama people have their beliefs and norms of self-control, which helps them in making trade offs. The resource is under the control of the community members; every decision

made in relation to the resource involves the community as a whole. Community leaders and community members make the evaluation and then a decision on what can best benefit them and making sure that the resource is sustainable over time. However, they have experienced that the resources have been declining over the years, so they are all concerned about over-exploitation. According to the Rama fishers, some years ago they did not need to paddle so much to get to the fishing ground. The fishing took place at the main harbor or areas around the Cay edge. In the actual situation, fishermen need to go farther out to fish and in some occasions paddling out to sea. The reason for this decline is unknown but there are many factors that can have a link to the decline. It can be a result of environmental factors, deforestation and soil erosion (the advance of the agriculture frontier), increase of contamination and over fishing by the industrialized fleets. At the same time maximization of the use of the resource is not the objective, the objective is to alleviate poverty by using the resource in an appropriate manner conducted and lead under rules and regulation of which each and every member of the community should comply. They know the consequences if the resources become over exploited, and that over exploitation happens because of selfishness and recklessness. When you want all, you will get nothing. In short, indigenous knowledge is essential in development and management decisions. Equal importance should be given to the local knowledge that is vital for the successful development to eradicate poverty. The problems of over exploitation generally are attributed to the lack of clear property rights lack of local information and consequent individual efforts to maximize benefits even at the expense of resource sustainability and a long-term societal good (Gordon 1954; Christy and Scott 1965). And this is the essence of Hardin's "Tragedy of the Commons" (1968). Where the term "common property" was synonymous to "open access". Co-management seems the best alternative for the Rama people as well for the rest of the Nicaragua fishery. Nicaraguan law guaranties the Ramas ownership of natural resources, but the enforcement of these laws has been proven ineffective.

This issue is coming to be concern of the Nicaraguan Ministry of Fishery since the 1990's and seems to be developing these last years. Before these years the issue of management and co-management was unknown. In Rama Cay co-management has been functioning "unconsciously" within the community members, by the leadership, the community board of elders – "[25]Cosejo de anciano".

In some developed countries the trade-offs are not that urgent. Take Norway for example: Norway is known as one of the principal countries of fish production export (catch and farming),

[25] *The Consejo de Anciano is reffering to the elders or the community leaders*.

but the population still has a reasonable good supply of fish food and 95% of fish is exported. In developing countries, however, these goals are contradictory. The increased export of fish is decreasing the domestic supply for fish. But coming back to the case of the Rama community, this is not necessary because this is the way they practice the fishing activity and have survived from generation to generation. After the catch they use what is necessary for the day, the rest will go for sale for local consumption in the city of Bluefields. Often when they make a good catch part of it will be left to rot due to insufficient ice and demand or in most cases, processing and transporting facilities. Their fishing is not oriented to export. Their goal is to find a way of getting the product that they decide to sell safely to Bluefields market.

To increase employment and fishermen's income, in Norway these goals are not contradictory. It seems that in Norway actually the problem is scarcity of fishermen. At the same time the Norwegian population often has reasonable and good opportunities for employment outside the fishing sector. In developing countries, however, an increase in technology power of certain fishing units may result in reducing employment opportunities in the fisheries. This will happen in communities that are heavily dependent on opportunities to be employed within the fisheries, and then this situation may be really problematic. But in case of communities where the dependency of employment is not the point, then this will not be contradictory. Taking in consideration the Rama Cay community, these fishermen are self-employed, they do not depend on anyone to do the fishing, and the only thing they depend on are the fish buyers. They work for themselves; they decide what and how much should go for sale in or out of the community.

Increasing employment in the community of Rama Cay fisheries is hard. You go fishing from the moment you can handle a canoe and paddle. The amount obtained from the sale of fish will be the income of an individual fisher. Increasing both, employment in the community and fish for export is the other issue. But this seems not to be complicated for the Rama people because, as mentioned before increasing employment is not the issue of this community (Rama Cay). Everyone goes fishing for self-consumption and for sale if possible. On the other hand the main problem of the community is to increase income by supplying fish for domestic market rather than export.

Rama Cay as part of Nicaragua that is essentially a developing country with access to the sea, rivers and lagoon, has traditionally followed a pattern in which fishermen in the community used simple techniques for the catching, processing (curing, drying and smoking) and the marketing of fish. They are able to supply low-cost protein to local consumers and could also export cheep-

processed fish to regional market with a similar level of living and purchasing power. Rama Cay members must be able to realize both goals, fish for food and cash income. Therefore, as Lawson (1984), pointed out "it is possible to maintain a modern and artisanal sector simultaneously", provided that they sell to different markets. The modern sector sells in an export market while the artisanal sector sells in the domestic market. But only as far as there is no resource scarcity. In the case of the Rama Cay surrounded area, no study about the health of the resource has yet been done. Hopefully government and resource managers can take this into consideration for the development of the area, not only for the Rama but also for the outskirts. Providing fish for domestic markets can be an option for the Rama. This would improve the quality of their life and the wealth of the community.

What will happen with the fishery after the different problems that are now keeping back the members of the Rama Cay are solved? What will then be the best solution for them?

Of course there is a possibility that the resource can be over-exploited if the development is not conducted with caution. The use of more effective fishing gears and more boats with outboard engines will increase the catch in quality and quantity but at the same time it will increase effort over time. That can lead to stock reduction, which in the future may result in depletion. Fishermen might need to go fishing farther out to sea or in other fishing areas that might also create other type of conflict between other communities. For this development to function right, it will be necessary to assess the fish stocks of the area. By this way, over-exploitation can be avoided and at the same time, conflicts that can occur between communities that depend on the fishery to survive can be prevented. This would require Rama Cay to cooperate closely with other communities in the area.

Summary

To have true development the community needs to develop more than the fishing sector. It will also be necessary to introduce and develop other sectors such as agriculture by planting crops or if it is possible forestry and other activities that will also involve women. The women cooperative system that is functioning already in the Rama community is willing to work and join their power as one cooperative in order to develop the community. No women, no men cooperative separately, just one unified cooperative with various but similar functions. It will strengthen not only the cooperative system but also the community, by avoiding conflicts among

community members. And for this to function, the same cooperative should not be only a harvesting center but also a processing center. In the sense of selling salt, smoking, drying and other food product that can be obtained from the fish resource. In which the University with the URACCAN/Tromsø program can be the guide and supporters of the cooperative. At the same time the students of the University can give their knowledge, practices of conservation, processing and marketing. The fishing activity may only be the principal base to support the Ramas in their daily activity. In which the cooperative system can be the guide that can strengthen the organizational capacity of fishermen that is vital to strategies of participatory development. (Jentoft 1986, Berkes , Bailey 1988, McCay 1998) and others have explored the potentials of cooperatives in developing countries. Cooperative systems are often regarded as the ideal organizational model for fisheries development provided that they operate according to the participatory decision-making principles. However, there are many well-documented cases where indigenous organizations (not formal cooperatives) have effectively managed common property resource. But the fact remains that strengthening the organizational capacity of fishermen and other community members is vital to strategies of participatory development.

Once organized, local fishermen including women should be better able to enforce restrictions in their own fishing grounds through the application of social pressure rather than depending on more costly and less effective methods of government agencies. Local control over resource management and allocation decisions may provide fishing cooperative in Rama Cay a more and responsible attitude, which will hold a solid membership. Thus investing in the cooperative is important if one should overcome the dilemmas and hard choice in fisheries development that are pointed out by Bailey and Jentoft (1990). The cooperative systems in Rama Cay are only seen, as a non formal cooperative where organized activity are solidarity groups. The point is that there is some type of common undertaking, necessary to improve the situation. Such as legal process, in which they can have right to process and market they product.

Chapter VII: Conclusion and Recommendations

Fisheries development is often difficult and it can prove to be complex, involving society as well as government, the fishing or non fishing community, investors, fishers, scientists, socialists, environmentalists, economists, biologists, and so on. Most of all the knowledge of members of the local community in which the fishing development will take place is important. Fisheries development needs to take into consideration the real needs of the community and not what donors think is needed. In many ways, Nicaragua is classic case of fisheries development. Small-scale fisheries have been a neglected sector in Nicaraguan fisheries despite its importance for subsistence and employment of a large segment of the coastal population. Nicaragua authorities supported by donors agencies such as NORAD, the and the World Bank, has focused its support policies primarily at the industrial fishery, which produce lucrative export products, shrimps and lobsters for the most part aimed the US market. Therefore the fishing industry has a dual patter. Next the most sophisticated vessels and processing technology fully in line to HACCP quality standards, there are producers that employ the most rudimentary technology such as dugout canoes driven by sails and oars, and sun drying of fish and shrimps under the most unsanitary conditions. Extreme poverty is present. This should not be a surprise that at the lowest level of the socio- economic spectrum is the indigenous communities of which Rama Cay is a typical example.

The tendency of having multiple objectives in fisheries development and management policy is a problem that is calling attention of many policy makers all over the world.

Fisheries management is the integrated process of information gathering analysis, planning, decision-making, and allocation of resources, formulation and enforcement of fisheries regulations. Fishery management authority can control the present and future behavior of interested parties in the fisheries, in order to ensure the continued productivity of the living resources. But also this control would depend on community members to work under co-operative system with government and resource managers. In Rama Cay the fishery are based on unwritten regulations or customary laws that prevent individuals from maximizing their private gains at the expense of the community interest. The community has ways of dealing with selfish users.

Fisheries development projects need to be broadened to incorporate more than harvesting, processing and marketing of fish. They must also include “integrated” project, which have

broader impact at the community and regional level. At the same time it is important to remember that trade offs in fisheries development are different at community level in comparison of local and national level.
Bailey and Jentoft, identified four common fisheries development objectives found in most policies of developing countries. These are to increase fish for domestic consumption and for exportation, to increase income, create employment. They found that these objectives are incompatible and trade offs are inevitable. From my point of view policy makers in developing countries need to be more realistic and focus more on the social context of the people and try to limit these objectives. On the other hand most developing countries depend on the fishing resource, in which these objectives are reasonable but the "maximization" is impossible.

Fishery development projects should not use males as the main responsible for the development to come true. Most of projects have tended to focus on men as fishermen, ignoring the important role that woman and children can play in the fish processing and marketing. The general assumption has been that what benefits fishermen will eventually benefit women as household members. This assumption has proved to be superficial (Chapman, 1987). Fisheries development in Rama Cay might be one of the best alternatives to have development in the community. On the other hand development of the community would not depend only on the fishery as the only resource that can be used, it will also need to develop other sectors such as agriculture and forestry. But first of all the problem facing development would need to be solved. Poorly represented user groups, low level of education, lack of empowerment, processing, transporting and marketing activities, all hinder a more equal participation in the decision making process and managing. Fisheries development and resource management needs to be seen as a complementary aspect of a single process rather than as separate activities. Fisheries development will occur if resources are managed properly. Effective resource management is a necessary condition for the viability of fisheries communities and viable communities are also important contribution to the preservation of healthy fish stocks. Thus before one can hope to rebuild fish stocks, one must start to rebuild communities; neither one can succeed without the other. In the last decade, much attention has focused around development that is using co-management as process to effective fisheries management worldwide.

Based on the finding, there is no doubt that significant trade offs between export and domestic fish supply will exists in Rama Cay community. This compounds the problem of food security and employment opportunities in the post harvest aspect. Certainly the increase in export,

employment in harvesting sector and income are in the line with the fishermen policy. Another repercussion lies in the fact that fishing effort might increase as community members use the idea of increasing income. They would most likely to switch to more sophisticated fishing method that or to other method that gives lower production cost.
With regard to domestic fish consumption by the members of the community, there is no doubt that the strong demand for fish for local market (Rama Cay) would continue.
It must also be remembered that every decision comes from hard choices that are being taken concerning the resource, where the choices should be made on the criteria of each one of the representatives. In the future these decision or choices will have an impact either beneficial or not, every member involve will live and feel the consequences of it. It is clear, planed and good to point out that ***every development needs management.***

7.2 Recommendations

According to the theories and facts presented in this thesis, I will finally make the following proposals in order to strengthen and support the positive development already commenced with the DIPAL support project. This can be seen as an overall strategy not only to support the Ramas, but as wells any of the indigenous peoples at the Coast living from marine and fresh water resources.

7.2.1 A co-management plan

First and foremost there is a need to establish a plan or program to strengthen the overall management of the fisheries at Rama Cays. As stated throughout the text this should be developed in close co-operation with the fishermen and women themselves. The following elements are essential:

- ✓ Continue the strengthening of the co-operatives and (solidarity groups)
- ✓ Strengthen the contacts to the regional and central of fisheries authorities.
- ✓ Strengthen the relationships to essential buyers like the fishing enterprises and intermediaries

As the institutional base for this type of development is rather weak at the Atlantic Coast there is also a need to develop a contact with an agency that could support the overall plan. This can be an outside agency, but a far better strategy would be to seek for cooperation between a local institution, which might be one of the universities in Bluefields, e.g. the URACCAN or BICU *and* an outside NGO. It is crucial to find the necessary funding to afford the basic elements in

establishing this overall plan. The income level and difficult situation for the Ramas should very well qualify for this type of support. Therefor the state should establish mechanism for cooperation and coordination among agencies involved in development, planning and managing. In order to obtain better results.

Additionally to this plan there are the following needs:

7.2.2 Stocks and resources assessment

As stated in the text the resources and exploitation levels available are not well known. The work already carried out by DIPAL should be evaluated and continued, specifically in relation to a possible infrastructure improvement of the Ramas capturing capacities.

7.2.3 Enhancing the market channels and potentials

There is a need to work further on aspects related to possible market channels for products from the Ramas' fisheries; potential additional buyers and their criteria to move in and operate.

7.2.4 Improve quality lines and the more basic introduction of HACCP principles

There is clearly a need to improve the local knowledge as to the production of fish and shellfish, the understanding of the fact that one is producing foods for a market, and the possibilities of having products discarded, or contrary accepted at higher prices. In relation to this there is a need to carefully assess the needs for further and better equipment both in the area of reception and processing of the products, as well as to the sea-going activities in relation to gears.

7.2.5 Clarify the relationship between the Ramas' fishing activity and other economic and cultural activities

All of the community's activity is integrated. There is a great need to make an overall assessment of this, to what extent the workforce is directed to the most beneficial economic activity, or whether other activities not seen today could be relevant. Also the challenges in relation to the cultural activities now seen on the Cays, as well as the interrelationship between for instance school, museums, artisanal production – and fisheries is important to assess.

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APPENDIX

APPENDIX I

Some alternative for the elaboration to obtain other fish food products.

I. Dried-Salted fish.

The dried-Salt fish is an alternative to preserve fish. You only need to use salt. It consists in eliminating the water from the fish meat and replaces it with the salt. With this process, the salt reduces the decomposition process of the fish.

Factors that can effect the acceleration of observing the salt in the fish.

- ✓ *Purity of the salt*
- ✓ *Thickness of the fillet*
- ✓ *Freshness of the fish*
- ✓ *Level of fat in the fish*
- ✓ *Temperature of the fish*
- ✓ *Hygiene and cleanliness during the handling of the fish*

The best species recommended to use is the white flesh fish. And those are abundant in the Nicaraguan Coastal waters.

These species can be

- ✓ *Droma – Palometa*
- ✓ *Shark – Tiburon*
- ✓ *Snapper – Pargo*
- ✓ *Weakfish – Corbina*
- ✓ *Tilapia - Tilapia*

You can also use other species such as snook, jack, sardine, mullet, etc. that are also available in the area.

Equipment needed.

- ✓ *Knife to filet the fish.*
- ✓ *Table to work on*
- ✓ *Plastic box to put the fish in*
- ✓ *Scale to weigh the fish*
- ✓ *Ice box to put the salted fish*

- ✓ *A place for drying the fish*
- ✓ *Plastic bags*

Input

- ✓ *Dried salt*
- ✓ *Vinegar*
- ✓ *Ice*
- ✓ *Whole and fresh fish*

Salting and processing

After the fish is caught, it is wash, clean and head off, then filleted. These fillets are salted with enough salt, put in a box that had salt also. It needs to be collocated and ordered in different layers: salt – fish – salt – fish.

Drying

After salting, comes the drying. The process of salting is over after there are no more salted water coming out of the fish fillets. Immediately the drying can begging by putting the fish fillet in the open air, in a clean, adequately and dry place. Depending on the ambient humidity, will be the period that it takes for drying. It should be in a place that is protected from birds, terrestrial animals and rain.

Packing

After drying then comes packing. This is pack in plastic bags to increase the time in useful, at the same time it protect it from contamination's.

Storage and distribution

It should be store in a clean, ventilated and dry place. It should not have any contact with the ground or other products, then they are ready to be distributed to the market.

APPENDIX II

II. Smoked fish

Smoking is another alternative of preserving the fish, this is because of some effect of the smoke component (fenole), produced from the semi-combustion from the wood (ashes) and others obtained from the process combination such as salting, cooking and drying.

Species recommended

- ✓ *It is much better to use pelagic species with high level of fat such as:*
- ✓ *Tuna*
- ✓ *Bonito*
- ✓ *Swordfish, etc.*

Ingredients for marinating

- ✓ *Black pepper*
- ✓ *Orange juice*
- ✓ *Salt*
- ✓ *Oregano*
- ✓ *Ice*

Process

After the fish is caught, it is clean, wash and head offs. After this process the fish is filleted, then washing again and left to drain for 20 to 25 minutes. After draining, it needs to be marinated for 8 to 12 hours with temperature water below 10 degrees. After this process the fish fillets is taking out to drain for 30 minutes.

Smoking

Before introducing the fish to the smoking area, first it got to be heated. To produce smoke, corns stuck and leaves, coconut stuck and orange skin can be use. Constant smoke is needed.

Stage of smoking

Actually there are three phases.

- ✓ *First, temperature of 70° C for one hour*
- ✓ *Second, temperature of 80° C for one and a half hour*
- ✓ *Third, temperature of 100° C for one to two hours*

After smoking this put to be cooled with ambient temperature for 90 minutes approximately, then packing ready to be distributed.

APPENDIX III

Table N0. 1

Type, number ans size of boat used by fishermen in Rama Cay

Number	Type of boat	Length (yard)	Wide/depth (cm)	Years/month (in use)	State	Engine
1	Kayak	5.0	50.0	3.0	Good	No
2	Kayak	5.5	52.0	10.0	Bad	No
3	Kayak	6.0	60.0	4.0	Good	No
4	Kayak	6.0	60.0	9.0	Bad	No
5	Kayak	6.0	60.0	5.0	Bad	No
6	Kayak	6.0	60.0	1.0	Good	No
7	Kayak	6.0	59.0	9.0	Bad	No
8	Kayak	6.0	59.0	8.0	Bad	No
9	Kayak	6.0	57.0	3.0	Good	No
10	Kayak	6.5	66.0	2.0	Good	No
11	Kayak	6.5	66.0	2.5	Good	Yes
12	Kayak	6.5	66.0	3.0	Good	No
13	Kayak	6.5	66.0	2.0	Good	No
14	Kayak	6.5	66.0	2.5	Good	No
15	Kayak	6.5	68.0	4.0	Good	No
16	Kayak	6.5	68.0	4.0	Good	No
17	Kayak	6.5	68.0	6.0	Bad	No
18	Kayak	6.5	68.0	6.0	Bad	No
19	Kayak	6.5	69.0	3.5	Good	No
20	Kayak	6.5	69.0	3.5	Good	No
21	Kayak	6.5	69.0	8.0	Bad	No
22	Kayak	6.5	67.0	3.0	Good	No
23	Kayak	6.5	67.0	2.5	Good	No
24	Kayak	6.5	67.0	3.5	Good	No
25	Kayak	6.5	66.0	5.0	Regular	No
26	Kayak	6.6	68.0	4.0	Regular	No
27	Kayak	7.0	68.0	6.0	Bad	No
28	Kayak	7.0	68.0	3.0	Good	No
29	Kayak	7.0	77.0	6.0	Bad	No
30	Kayak	7.0	77.0	10.0	Bad	No
31	Kayak	7.0	77.0	2.0	Good	No
32	Kayak	7.0	76.0	10.0	Bad	No
33	Kayak	7.0	76.0	2.0	Good	No
34	Kayak	7.0	76.0	5.0	Bad	No
35	Kayak	7.0	76.0	3.0	Good	No
36	Kayak	7.0	76.0	5.0	Bad	No
37	Kayak	7.0	76.0	6.0	Bad	No
38	Kayak	7.0	78.0	4.0	Good	No
39	Kayak	7.0	78.0	2.0	Good	No
40	Kayak	7.0	78.0	2.5	Good	No
41	Kayak	7.0	78.0	2.0	Good	No
42	Kayak	7.0	78.0	6.0	Bad	No
43	Kayak	7.0	78.0	7.0	Bad	No
44	Kayak	7.5	80.0	5.0	Bad	No
45	Kayak	7.5	80.5	6.0	Bad	No
46	Kayak	7.5	80.5	3.5	Regular	No
47	Kayak	7.5	80.5	4.0	Good	No
48	Kayak	7.5	82.0	2.0	Good	Yes

APPENDIX III

Continuation

Type, number and size of boats used by fishermen's in Rama Cay

Number	Tipe of boat	Length(yard)	widw/depth (cm)	Year/month in use	State	Engine
49	Kayak	7.5	79.0	2.0	Good	No
50	Kayak	7.5	79.0	3.0	Good	No
51	Kayak	7.5	78.0	4.0	Good	No
52	Kayak	7.5	78.0	7.0	Bad	No
53	Kayak	7.5	78.0	6.0	Bad	No
54	Kayak	7.5	79	2.5	Good	No
55	Kayak	7.5	79	3.0	Good	No
56	Kayak	8.0	79	8.0	Bad	No
57	Kayak	8.0	82.0	8.0	Bad	No
58	Kayak	8.0	83.0	0.5	Good	No
59	Kayak	8.0	83.0	3.0	Good	No
60	Kayak	8.0	83.0	2.5	Good	No
61	Kayak	8.0	83.0	4.0	Good	No
62	Kayak	8.0	82.0	3.0	Good	No
63	Kayak	8.0	82.0	3.0	Good	No
64	Kayak	8.0	82.0	2.0	Good	No
65	Kayak	8.0	84.0	5.0	Regular	No
66	Kayak	8.0	84.0	2.0	Good	No
67	Kayak	8.0	84.0	0.5	Good	No
68	Kayak	8.5	83.0	0.5	Good	No
69	Kayak	9.0	85.0	3.0	Good	No
70	Skiff	9.0	105.0	2.0	Good	Yes
71	Kayak	9.0	85.0	3.5	Good	No
72	Kayak	9.0	85.0	2.0	Good	No
73	Kayak	9.0	85.0	1.0	Good	No

APPENDIX IV

Table N0. 2

Type and number of fishing gears use by fishermen's in Rama Cay

Number	Number of gears owned by a person	Tipe of Fishing gear	State
1	2	cast net + Hand line	Good
2	1	cast net + Hand line	Good
3	2	cast net + Hand line	Good
4	2	cast net + Hand line	Good
5	1	cast net + Hand line	Good
6	2	cast net + Hand line	Good
7	2	cast net + Hand line	Good
8	1	cast net + Hand line	Good
9	1	cast net + Hand line	Good
10	3	cast net + Hand line	Good
11	1	cast net + Hand line	Good
12	2	cast net + Hand line	Good
13	2	cast net + Hand line	Good
14	2	cast net + Hand line	Good
15	2	cast net + Hand line	good
16	1	cast net + Hand line	good
17	3	cast net + Hand line	good
18	3	cast net + Hand line	good
19	2	cast net + Hand line	Good
20	1	cast net + Hand line	good
21	2	cast net + Hand line	good
22	2	cast net + Hand line	Bad
23	2	cast net + Hand line	good
24	2	cast net + Hand line	Good
25	2	cast net + Hand line	good
26	2	cast net + Hand line	good
27	2	cast net + Hand line	Bad
28		cast net + Hand line	good
29	1	cast net + Hand line	Good
30	1	cast net + Hand line	Good
31	2	cast net + Hand line	Good
32	4	cast net + Hand line	good
33	3	cast net + Hand line	good
34	1	cast net + Hand line	good
35	5	Gill net + Hand line	Good
36	5	Gill net + Hand line	Good
37	5	Gill net + Hand line	Good
38	11	Gill net + Hand line	Good
39	12	Gill net + Hand line	regular
40	6	Gill net + Hand line	regular
41	10	Gill net + Hand line	Bad
42	2	Gill net + Hand line	Good
43	8	Gill net + Hand line	regular
44	6	Gill net + Hand line	regular
45	5	Gill net + Hand line	Good
46	3	Gill net + hand line	Good
47	2	Gill net +Hand line	Good

APPENDIX IV

Continuation

Type and number of fishing gears used by fishermen's in Rama Cay

Number	Number of gears owned by a person	Type of fishing gear	State
48	6	Gill net + Hand line	Good
49	2	Gill net + Hand line	regular
50	2	Gill net	Good/regular
51	2	Gill net	good/regular
52	5	Gill net	good
53	3	Gill net	good
54	6	Gill net	good
55	6	Gill net	regular
56	5	Gill net	good
57	3	Gill net	good
58	5	Gill net	regular
59	4	Gill net	Good
60	2	Gill net	Good
61	2	Gill net	Good/regular
62	2	Long line	Good
63	3	Long line	Good
64	2	Long line	Good
65	2	Long line	Good
66	2	Long line	Good
67	1	Long line	Good
68	3	Long line	good
69	35	trap	Good
70	21	trap	Good
71	30	trap	good
72	27	trap	good

APPENDIX VI

Benny Secundino
Medino Hodgson
Cenlin Hodgson
Larry Secundino
Ninos Secundino
Benencio Francis
Rostran Hodgson
Baclio Omier
Antonio Alvarez
Nestor Alvarez
Winston Alvarez
Paciero Alvarez
Juanito Daniels
Eufemia Martinez
Sebastian McCrea
Adelaida Martinez
Augusto Daniels
Carlos Thomas
Adan McCrey
Anastacio Martinez
Andrea martinez
Orly McCrey
Neldo daniels
Gardel Daniels
Lorenzo Martinez
Rufino Omier
Brismo Prais
Silvestre daniels
Augencio Salomon
Valbino McCrey
Allan Omier
Delvin Martinez
Roger Nickins
Roger Romero
Avelardo McCrey
Camilo McCrey
Javin Hodgson
Noel Hodgson
Juan Hodgson
Rosalino Martinez
Mariano Omier
Lorenzo McCrey
Roberto Omier
Danilo Rosalez
Darline Downs

And more……..

APPENDIX V

Species most catch in the area and use for sale and consumption.

Family	*Genero*	*Species*	*Local name*	*Common name (spanish/english*
		Fish		
CARCHARHINIDAE	Carcharhinus	Carcharhinus acronotus	Tiburon-Shark	Tiburon amarillo-blacknose shark
		Carcharhinus leucas	Tiburon-Shark	Tiburon sarda-Bull shark
		Carcharhinus limbatus	Tiburon-Shark	Tiburon macuira-Blacktip shark
		Carcharhinus obscurus	Tiburon-Shark	Tiburon arenero-Dusky shark
SPHYRNIDAE	Sphyrna	Sphyrna tiburo	Tiburon marilla,Pez martillo-Hammerhead shark	Cormuda de corona-Bonnehead
MEGALOPIDAE	Tarpon	Tarpon atlanticus	Sabalo real-Tarpon	Tarpón-Tarpon
ARIIDAE	Bagre	Bagre marinus	Bagre-Catfish	Bagre cocumo-Gafftopsail sea catfish
	Cathorops	Cathorops spixii	Tunqui	Bagre cuinche-Madamango sea catfish
MUGILIDAE	Mugil	Mugil cephalus	Lisa-Mullet	Lisa pardete-Stripes mullet
		Mugil curema	Lisa-Mullet	Lisa criolla-White mullet
		Mugil lisa	Lisa-Mullet	Lebranche-Lebranche mullet
CENTROPOMIDAE	Centropomus	Centropomus ensiferus	Robalo-Kalwá	Robalo maqueque-Swordspine snook
		Centropomus parallelus	Robalo-River snook,Old man snook.	Robalo cuchumite-Fat snook
		Centropomus pectinatus	Robalo-Big bone	Robalo constantino-Tarpon snook
		Centropomus undecimalis	Robalo-Snook	Robalo blanco-Common snook
SERRANIDAE	Epinephelus	Epinephelus itajara	Meru-June fish	Mero guasa-Jewfish
CARANGINIDAE	Caranx	Caranx hippos	Jurel-Jack	Jurel comun-Crevalle Jack
LUTJANIDAE	Lutjanus	Lutjanus apodus	Pargo-Snapper	Pargo amarillo-Schoolmaster
		Lutjanus jocu	Pargo-Snapper	Pargo jocu-Dog snapper
SCIAENIDAE	Cynoscion	Cynoscion acoupa	Bilapaw/Curvina-Coppermout	Corvinata amarilla-Acoupa weakfish
		Cynoscion leiarchus	Curvina	Curvina blanca- Smooth weakfish
		Cynoscion similis	Curvina	corvinata tonquicha-Tonkin weakfish
		Cynoscion virescens	Curvina salmón-Salmon Salmons hogfish	Corvinata cambucú-Green weakfish
		Micropogonias furnieri	Roncador-Drummer	Corvinón rallado-Whitemouth croaker
		Diapterus auratus	Sea stone bass	Mojarra guicha-Irish mojarra
		Euguerres brasilianus	Palometa-Stone bass	Mojarra de Brasil-Brazilian mojarra
		Euguerres plumieri	Palometa-Stone bass	Mojarra rallad-Striped mojarra
SCOMBRIDAE	Scomberomonus	Scomberomonus brasiliensis	Macarela, Sierra-Mackerel	Sierra-Serra spanish mackerel

Continuation: Sepecies catch in the area used for sale and consupmtion.

Family	*Genero*	*Species*	*Local name*	*Common name (spanish/english*
ELOPIDAE	Elops	Elops saurus	Bony fish	Malacho-Ladyfish
CLUPEIDAE	Opistonema	Opistonema oglinum	Sardina-Sprot	Machuelo hebra atlantico-Atlantic thread herring
ENGRAULIDAE	Anchoa	Anchoa spinifer	Sardina-Sprot	Anchoa de charco-Spicule anchovy
	Anchovia	Anchovia clupeoides	Sardina-Sprot	Anchoa bocona-Zabaleta anchovy
		Anchovia surinamensis	Sardina-Sprot	Anchoa de rio-Suriname anchovy
	Anchoviela	anchoviella perfasciata	Sardina-Sprot	Anchovieta cubana-Poey's anchovy
CARANGIDAE	Chloroscombus	Chloroscombrus chrysurus	Sardina-Sprot	Casabe-Atlantic bumper
		Oligoplites palometa	Zapatera-Leathercoat, Jack	Zapatero palometa-Maracaibo leatherjack
		Oligoplites saurus	Zapatera-Leathercoat, Jack	Zapatera sietecueros-Atlantic leatherjack
		Selene vomer	Pampas jack, Silver jack lookdown	Jorobado de penacho-Atlantic look dowm
SCIAENIDAE	Menticirrhus	Menticirrhus littoralis	Ronco-Zulá drummer	Lambe verrugato-Gulf kingcroaker
SPARIDAE	Archosargus	Archosargus probatocephalus	Sheephead	Sargochopa-sheephead
EPHIPPIDAE	Chaetodipterus	Chaetodipterus faber	Pez angel-Potcover	Paguara-Atlantic spadefish
LOBOTIDAE	Lobotes	Lobotes surinamensis	Dahá-Mojarra del mar-Sand fish,Sun fish,Blackfish.	Mojarra peña,Dormilona-Atlantic tripletail
ELEOTRIDAE	Aleotris	Aleotris pisonis	Guabina	-------
BELONIDAE	Strongylora	Strongylora marina	Pez aguja-Long guard	Agujón verde-Atlantic needlefish
POLYNEMIDAE	Polydactylus	Polydactylus oligodon	Goat fish	Barbudo sietebarbas-Littlescale threadfin
		Polydactylus virginicus	Goat fish	barbudo de charco-Barbu
SCIAENIDAE	Bairdiela	Bairdiella rhonchus	Pis-pis	Corvineta ruyo-Ground croaker.
		Crustaceans		
PENAEIDAE	Penaeus	Penaeus notialis	Shrimp	Camaron rosado sureño-Southern pink shrimp
		Penaeus schmitti	Chacalin-White shrimp	Camaron blanco sureño-Souththern white shrimp
		Penaeus subtilis	Shrimp	Camaron café sureño-Southern broun shrimp
	Xiphopenaeus	Xiphopenaeus kroyeri	Siete barbas-Seabob Hardhead	Camaron siete barbas-Atlantic seabob
PORTUNIDAE	Callinectes	Callinectes bocourti	Crab	Jaiba roma-blunttooth swimcrab
		Callinectes sapidus	Crab	cangrejo azul-Blue crab
PALAEMONIDAE	Macrobrachium	Macrobrachium carcinus	Camaron de rio-River shrimp	Camaron pintado-painted river prawn
		Bivalves		
CORBICULIDAE	Polymesoda	Polymesoda aequilatera	Almeja-Carkle	Guacuco de marjal-equilatera marsh clam
		Polymesoda arctata	Almeja-Carkle	Guacuro de marjal esbelto-Slender marsh clam
OSTREIDAE	Crassostrea	Crassostrea rhizophorae	Ostión-Oyster	Ostion de mangle-Mangrove cupped oyster