

A SURVEY OF NICARAGUA'S FISHERIES

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WORKING PAPER

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We welcome your input to this working paper on Nicaragua's Fisheries. Please recognize that this paper is merely a draft report. Nonetheless, we hope it will help fisheries workers and solidarity groups to participate in such foreign aid in any ways that they can.

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PREFACE

This Survey of Nicaragua's Fisheries is meant to be a draft data base. Life in Central America is subject to rapid change, especially in Nicaragua. Reports and sources are often conflicting or inadequate. So, data in this survey may differ from as it might occur today. This is especially true of economics. Inflation and exchange rates have gone haywire since this survey was compiled. Also, the structure of INPESCA has changed from the diagram in Appendix B--considerably. Nonetheless, we include such modified material in order to reflect the circumstances at the time of our survey or its data. We use the word "fisherman" advisedly, since it is a fact that those who fish in Nicaragua are men (exceptions noted in the text). This is not to slight a sex, especially in Alaska, where so many of the top commercial fishing people are women. Please feel free to contact us and use this survey however you might (note the address quantity on the copyright page).

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INTRODUCTION

In 1985, a group of Alaskans organized the Nicaragua Fisheries Project. Their purpose was to send material aid to fishing people in Nicaragua. They surveyed resources in Alaska and needs in Nicaragua, from which they assembled this report of Nicaragua's fisheries. The project soon grew into an international network.

Briefly, Nicaragua has two major fishing fleets--small scale and industrial. They work on the Atlantic and Pacific Coasts, in rivers, and in lakes. The Nicaraguan Fisheries Institute (INPESCA) is the government agency that administers both sectors, as well as co-ordinates an aquaculture and boat-building program. The industrial fishing fleet is under public ownership, the small scale fisheries are privately owned. Despite the Contra-war and economic difficulties, Nicaragua has the potential for a strong fishing industry. Several international agencies are helping Nicaragua to develop their seafood industry at this time (See Appendix I--International Agencies Assisting Fisheries in Nicaragua). Nonetheless, the primary problem faced by Nicaragua's fishing community is a lack of basic equipment and gear.

The following survey is a description of Nicaragua's fisheries situation, as best as we could piece it together in the winter of 1986. Although our team was the guest of the Nicaraguan government, we solicited a divergent range of opinions--from Sandinistas to Miskito insurgents. There were logistical and bureaucratic problems of getting around Nicaragua, as one would expect of a country in the midst of a war. So, there are some subjects and regions that are better documented than others. (For a description of how our project was organized, please see Appendix A--The Nicaragua Fisheries Project.)

THE NICARAGUAN FISHERIES INSTITUTE

After the revolutionary Victory of 1979, responsibility for fisheries in Nicaragua was given to IRENA--the Department of Natural Resources. In July 1980, fisheries were then divided between IRENA and the newly created INPESCA.

The new Nicaraguan government had taken over the corporate holdings of the Somoza's, after the Dictatorship had fled, in order to manage them for the benefit of the Nicaraguan people as a whole. These confiscated enterprises included cattle pastures, factories, utilities, as well as seafood processing plants and their vessels. The Instituto Nicaraguense de Pesca (INPESCA--the Nicaraguan Fisheries Institute) was created, at this time, to manage the suddenly acquired seafood industry. Responsibility for non-industrial fisheries operations (co-ops, research, and management) had been placed under the Instituto Nicaraguense de Recursos Naturales y del Ambiente (IRENA--the Nicaraguan Institute of Natural Resources and the Environment). The fisheries were underutilized, but Nicaragua had also inherited three basic deficiencies:

- 1). A lack of fisheries equipment and gear,
- 2). Little foreign credit to purchase it with, and
- 3). A small domestic market for fish.

Since most fisheries gear is manufactured outside of Nicaragua, foreign exchange was necessary with which to purchase it. Since shellfish were the only Nicaraguan seafood resource with an export market structure, development of this industrial-export sector became a priority--as the base from which to capitalize the rest of Nicaragua's fisheries. Over the following two years, the new government began to recognize the unique potential of Nicaragua's aquatic foods.

During Somoza's dictatorship, very little government funding had gone to fisheries research or development (1). What research had been done between 1970-71 had been performed through biology departments at the universities. After the 1979 Victory, the Nicaraguan government immediately ordered an assessment of ocean resources by IRENA. This report showed an incredible wealth of fish species (2). It seems that the Revolution and Contra-war had had a beneficial side-effect on underwater ecology. The commercial seafood harvest that had not been stopped by the destruction of equipment, had been halted by the threat of attack. No one had been fishing for several years. Nicaragua now had abundant fish stocks and perhaps the most commercially valuable seafood resources in Central America. Fisheries exports have risen from 3% of Nicaragua's total export revenues before the Revolution to 7% by 1982--of importance only after cotton, coffee, sugar, bananas, and beef. In terms of Nicaragua's development, seafood harvest has the advantage not only of fertile fishing grounds, but also that it is a labor intensive industry with a favorable international market (3). Seafood is also valuable as a source of high quality protein for in-country consumption.

By 1982, in recognition of Nicaragua's fishery potential; fish co-ops, research, and management were transferred from IRENA into the new cabinet level ministry to which the government raised INPESCA (see Appendix B--Structure Chart of INPESCA). Thus, from a nucleus of a half dozen shellfish processing plants, INPESCA's responsibilities grew like a hatchery fed salmon, rising from a skeleton agency for the administration of a handful of rusty shrimp boats to a full fledged ministry that is now responsible for all of Nicaragua's fishery programs (4).

Since there had been no fisheries department under the Somoza Dictatorship, there was no organized system of fisheries biologists, administrators, or technicians with which to build INPESCA--other than university biologists and other associated workers. Help came from Mexico, Peru, and Cuba, which are among the major fishing nations in Latin America. Cuba, for example, had developed its under-exploited fisheries into one of high export value, as Nicaragua hoped to do. So, Cuba offered to provide help in the form of crash courses in fisheries science. Sergio Martinez and Julio Sanchez are the chiefs of the Research and Small Scale Fisheries Divisions, respectively. Both were university instructors of general biology recruited by INPESCA, who went to Cuba for an accelerated program in fisheries biology and then joined INPESCA's staff. Daniel Narvaez had fought for the Popular Insurrection and been an accountant. After the Victory, he heard that the new Fisheries Institute was being formed, volunteered, attended an accelerated course in fisheries administration and finance in Cuba, and is now the Regional Representative for the northwestern State of Chinandega. However, such innovative arrangements must confront even more basic problems.

In 1979 and 1984, IRENA and then INPESCA began the first survey of small scale fisheries in Nicaragua--to learn about lifestyles and needs. They found that most fishermen have not completed primary school and have only a basic understanding of modern advances in fishing technology. And the fishing skills of INPESCA's organized fishing co-ops haven't always lived up to INPESCA's hopes. In 1983, on INPESCA's urging, *Norsk Folkehjelp* (Norwegian People's Aid) contributed two 31-foot draggers, fully equipped with the best technology, to the fishing co-op at Asseradores. Within just a few weeks both vessels were broken down and unable to be repaired--for lack of parts and expertise (5). Likewise, eight Volvo-Penta outboard engines were given to the co-op at Asseradores, but are not now in use for ocean fishing because of difficulties with the kerosine/gasoline mixture. INPESCA's program of fisheries education is an extension of the basic campaign to teach everyone in the country to read and write (6). INPESCA would eventually like to establish a development team and a training center for fishing people (7).

A major difficulty for the fishing industry is that crucial funds are tied up in the Contra-War; in the purchase of more expensive, non-U.S. materials since the Reagan Administration's 1985 embargo; and in the more basic services of agriculture, education, housing, and health (see Appendix C--A Short History of Nicaragua). INPESCA has had to be creative with their

limited funds and supplies. The researchers rely on fishermen to help them with transportation in their boats, on other agencies to loan them automobiles, and on foreign aid to provide gear for small scale fishermen. While faced with such limitations, INPESCA is actively trying to introduce new seafood products and popularize their use at home and abroad. They have begun two chains of retail shops in which to sell fresh fish and cooked fish--the Pescafresca and Pescafrito shops, as well as publishing seafood cookbooks (see Appendix D--INPESCA Activities). Besides more traditional forms of fishing and fish processing, INPESCA is also interested in alternative methods such as Japanese surimi (fish meal), Scandinavian artemia (algae protein), and aquaculture. Although the Reagan Administration's embargo on trade with Nicaragua has posed logistical problems for Nicaragua's external marketing (the U.S. previously purchased almost all of Nicaragua's shellfish), the basic problem still is how to catch the fish...

INPESCA's harvesting arm is divided into two parts:

- 1). The **artisanal** fisheries (8) are made up of privately owned co-ops, collectives, and individuals fishing in Nicaragua's oceans, lakes, and rivers. They catch all types of seafood from small boats.
- 2). The **industrial** fleet is composed of large vessels, which are run from nationalized processing plants. They catch lobster, shrimp, and some of the larger finfish.

Industrial and artisanal fisheries, on both the Atlantic and Pacific Coasts, are all maintained by the sort of infrastructure that runs any state fish & game department in the U.S.A.--planning & statistics, administration & personnel, research & development. However, some special agencies exist, too--agencies peculiar to a nationalized industrial fishery and centralized economic planning. While decisions on day to day operation are left to the local "enterprise," (9) detailed coordination with international commodity markets and local public markets require different structures--something like combining the Alaska Department of Fish & Game with Icicle Seafoods. INPESCA has begun to experiment with its infrastructure, recently sub-dividing itself into both regional and institutional areas of responsibility (see Appendix B--Structure Chart of INPESCA).

As a new agency, INPESCA has the flexibility to experiment with new forms of administration. This administrative freshness has both good and bad sides. Unlike many "old" government agencies, INPESCA is not encumbered with pro-Somoza administrators, who might retard development out of previous loyalties or desire for personal gain (10). However, since INPESCA workers are all involved in creating a new ministry in a very specialized field, they often lack the experience that comes from a long tradition of fisheries administration (11). "We've been solving one problem after another since the Revolution," Sergio Martinez reported about his Research Division. Fermin Vargas, a fisheries technician, began as a fish inspector with INPESCA three years ago and has seen a gradual increase of technical capabilities of both fishermen and INPESCA. He added that INPESCA's approach "is a trade off between old and new technology, between tradition and innovation."

ARTISANAL FISHERIES

Artisanal fisheries are conducted on the Atlantic and Pacific Coasts, on the rivers, and in the lakes. Over 80% of Nicaragua's fishing takes place on the Pacific Coast (Conover). The fishing is primarily for finfish, which are very underutilized. The first survey of Nicaragua's finfisheries in 1985 showed a total catch of about 324 tons, out of an estimated maximum sustained yield of 20,000 tons per year. (12). The most commonly caught Pacific Ocean fish are:

- 1). **Pargo**, a rockfish, is the most popular; it is taken by hook & line jigging.
- 2). **Curvina**, a sea trout, is taken by both nets and jigging.
- 3). **Macarela**, a mackerel, is caught primarily by nets.
- 4). **Brunt**, another rockfish, is taken by both nets and jigging; it is the major incidental catch of the shrimp trawlers.
- 5). **Tiburón**, four types of shark--hammerheads, blackfins, and two types of **Cason** (dogfish)--are taken by nets and jigging.

(See Appendix E--Common/Latin Fish Names)

There is a basic pattern to artisanal fisheries on the Pacific Ocean. They are pursued mostly with nets, but also to a lesser extent by jigging and longlining. The Pacific pattern is similar to artisanal fishing in the fresh-water lakes and rivers, as well as on the Atlantic Coast, both of which generally have more varied techniques (see "The Lakes & Rivers & Atlantic Coast" and "The Corn Islands," below).

Two or three fishermen, working from a 20 foot dug-out canoe, tend their nets twice a day. They place two sets off-shore. One is two miles out in 30 feet of water, the second set is six miles out in 120 feet of water. The water is warmer at the in-shore set and catches mackerel, curvina, and pargo. The off-shore set catches shark. Since they are fished mostly as tangle nets, the fishermen adapt almost any size net to their fishery. The nets are not species specific. When you haul the net in, it could contain anything from a two pound mackerel to a 20 foot hammerhead shark. Since most of the fish caught are very edible, this non-selectivity of the nets is not a major problem for anyone but INPESCA, which is trying to establish regular supplies of selected species for their chain-store markets and restaurants (See Appendix D--INPESCA Activities). Traditional hours of fishing are also a problem for INPESCA. Nets are left out in the sea and are checked only once or twice a day. If fish hit the nets right after the first set, they aren't very good for sale when the nets are checked 12 hours later. The problems of local fishing patterns and limited fuel is magnified by the lack of ice and transportation to assure fresh delivery to market.

Every water based village takes part in some sort of commercial fishery, but different patterns emerge on the two coasts and in the interior. Take an example on the Pacific Coast. Asseradores has a two industry economy. Surrounding this fishing village are cotton fields and co-ops. The local fishermen have traditionally been salt-water farmers--both raising crops and catching fish. Asseradores' fishing skills are limited. Nonetheless, the people of Asseradores are eager to work with INPESCA, to develop their fisheries industry and create a more diversified and productive economy. The Norwegian aid agency, *Norsk Folkehjelp*, has been heavily involved with establishing a fishing center there. Not all fishing villages are so eager. Some fishing groups, such as the one at nearby Massachapa, down the coast, see little advantage to establishing a co-op. These reluctant people are often at older villages where there is no other enterprise, like cotton, to diversify the economy. As one European fishery developer said, "Asseradores is a good Christian community--when the

fishing is bad they go to church, when they get development aid, they go fishing. At Massachapa, the sea is their god, there is no choice, they have fished for generations, that is all they know how to do. They fish all the time." The Massachapa people have their fish economy vertically integrated: the men go to sea in their boats and catch the fish, the women take the fish on buses to surrounding markets to sell. In this way, Massachapa makes more money on its own than it would through INPESCA. (See Appendix F--Fisheries Economics).

The artisanal fisheries of the Atlantic Coast, as well as the river and lake systems, differ from the Pacific Coast. This is due to variations in local construction materials and cultural traditions, as well as in differences between the underlying European and indigenous economies.

In the colonial days, the Europeans in Latin America organized an area to specialize in the production of cotton, indigo, vegetables, etc. Public markets became necessary to bring different products from different villages together for redistribution. This economic tradition of public markets dominates the Pacific Coast today. Nicaragua is a country of few roads, little transportation, and less ice. Getting seafood to market in a fresh condition is a basic problem. A bus every other day or a collectively used vehicle are often the only ways for fishing families to transport their catch to the public markets of nearby cities. Where such public or collective transportation isn't possible, private fish-buyers come to the villages and haul fish in the back of a pick-up truck filled with ice. The vicissitudes of market sales create problems for these wholesalers and the villagers. Private fish buyers will show up one day and purchase all the catch. If the catch isn't sold in the market right away, the buyers might not return to the villages for several days, while fishing families are left holding several catches of rotting fish. The high price of ice, freezers, and storage facilities prevent the private sector from keeping fish in large quantities for long periods of time. Nicaragua is attempting to obtain better facilities and services for these areas, so they can have more economic self-determination--to somewhat mitigate dependence on erratic city distribution systems.

On the Atlantic Coast, every village has been traditionally self-sufficient--they harvested coconuts, hunted turtles, and fished for snook, crabs, seatrout, and grouper. The Indian and Black Carib villages had no need for markets, except for imported items and variety. Central markets are important mostly to city dwellers--to serve the government workers, miners, or non-indigenous people. Nor are there many roads, since most

local transportation is done along waterways. Most larger scale commercial activity has begun in only the last century with gold mining, logging, turtle hunting, and fisheries. The development of a cash economy and the importation of supplies associated with such commercial resource harvest has begun to make the indigenous people of the Atlantic Coast desirous of the items that only a cash economy can secure--outboard engines, canned foods, etc. They are now experiencing many of the contradictions and limitations that their fellow-fishers on the Pacific Coast have experienced for years--how to purchase limited supplies with even more limited income. The Contra-war has hindered the development of markets for fish on the Atlantic Coast (as well as along the northern border with Honduras and southern border with Costa Rica), which would bring in extra cash. Better transportation routes and facilities are necessary to develop markets for seafood. However, such facilities and regular shipments mean better targets for insurgents to attack. For example, there are excellent shrimp grounds in Wani Lagoon and a road runs north to Bismuna from the port center of Puerto Cabezas, but all transport in this area and along that road has been curtailed because of the Contra-war danger. Only two lagoons now sell fish to Puerto Cabezas.

INPESCA lacks the resources and money to provide every fishing community with a processing plant. This lack of resources is especially glaring in respect to cold storages. The current INPESCA ice and freezer plants were inherited from the Somoza days. They are very old and unreliable. Many of the freezer units are either broken or inadequate; so fish are just iced, rather than frozen. New units are being installed with credit and technical assistance from the East German government; they will double the supply of ice. So far, people and communities have to share resources. To further this necessary co-operation, INPESCA has set-up "Centros de Acopio"--fish storage and development centers, which have cold storages and machine shops along transportation routes. Since 1983, INPESCA has identified a half dozen locations for centralizing their efforts to aid fishing people--Perlas Lagoon and Lamlaya on the Atlantic Coast, Asseradores and Astillero on the Pacific Coast, San Carlos and Solentiname on Lake Cocibolca (30). Capital investments for these fisheries centers have come from international aid agencies based in Norway and Italy, private groups from Ireland and the United States, and government credit/investment from Peru and Germany (4 and Appendix D--INPESCA Activities).

Asseradores and Astillero are to be the two major centers for artisanal fisheries on the Pacific coast. At Asseradores, facilities will include a new ice plant/cold storage building that was scheduled to be operational in the fall of 1986. The plan is to build a self-sufficient village, where fishing people from areas either under attack by the Contras (such as El Ostional and Potosi) or that lack access to needed technology can relocate to. The local people are salt-water farmers, where both crops and fish are harvested. Cotton fields and cotton based co-op villages surround Asseradores. At the head of the five mile dirt road that winds down through cotton fields to Asseradores, a new school and a new hospital are under construction. A C\$100,000 water project is also being built to supply the village, and new housing is on the drawing boards. It is planned to eventually have six fish tenders service 20-30 dug-out canoes each, bringing the catch to the new fish plant on shore. Less than 25% of these boats fish here now.

Perlas Lagoon is considered the best place to begin development on the Atlantic Coast, since it is only about five hours by boat from Bluefields. The Lagoon used to be the site of a small group of Chinese shrimp buyers who had dried shrimp for an Asian market since the 1920's. However, within 24 hours of the 1979 Victory, the Chinese left Nicaragua, leaving a gap in this trade but a tradition for the Lagoon. At present, a packer is scheduled to make weekly rounds at five communities on Pearlas Lagoon, to pick up fish for delivery to Bluefields, but the vessel's schedule is too erratic to ensure fish quality. An ice plant is the Lagoon's number one priority, in order to keep the fish fresh until the packer's arrival. This area has been a constant area of Indian insurgency. INPESCA has been chary of establishing standard supply lines or schedules for fear they would come under attack. The recent advances made with the Indian autonomy conferences and popular consultations hold promise for a peace that will allow for much needed fisheries development.

A few disgruntled fishermen are convinced that INPESCA isn't doing a fair job of distribution and that a "mountain" of outboards are warehoused in Managua. Whenever expressed, other fishermen appeared bored by such accusations. No hidden stocks of government fishing gear were apparent. However, a concern over the danger of mass distribution of fishing gear was expressed by Managua administrators. Tipitapa was cited as an example of "difficult entry and easy exit." This fishing community on the Rio Tipitapa, between Lake Xolotlan and Lake Cocibolca (30), has a

population of 500 potential fishermen, but few boats or motors. If boats and motors were somehow obtained and given to everyone, the fish stocks in that area could be decimated and leave the people in a worse state than when they started--with no fish. Over-fishing is as much of a potential hazard as in British Columbia or Maine. INPESCA is trying to maximize the participation of those who want to fish, without endangering everyone with a monoculture approach to work (13).

In the early days, the new Nicaraguan government emphasized capital intensive development of the fishing industry and its export-oriented fishing fleet. This was to bring needed foreign exchange into the country. This is still true, to a large extent, but the current vision increasingly includes a mixed economy of the artisanal sector, as well as the industrial. The addition of artisanal fishing co-ops to INPESCA, in 1982, reflected the awareness that the artisanal sector will become even more vital to the development of Nicaraguan fisheries, society, and economics. The nationalized industrial plants, in 1982, purchased 33% of their production from artisanal fishermen and processed over 850 tons of fish for sale in Nicaragua (Conover). Physical factors also occasionally demand co-operation between the artisanal and industrial fleets. In 1984, El Nino, a shift in Pacific Ocean currents, forced fishermen to rediscover fishing grounds. It moved the fish further out to sea. In some cases, El Nino moved fish beyond the reach of the artisanal dug-out canoes, and it took the co-operation of the more sea-worthy industrial fleet to catch these relocated fish for the artisanal fleet's local use.

No matter the good intentions of INPESCA towards maximizing artisanal fisheries, it is considered an economic fact of life that industrial fisheries are most important to the nation's well-being and will receive the majority of funds earmarked for "Fisheries." It is from international aid projects that capital for the artisanal fisheries sector has come in the past, and must come in the future (Revoid).

INDUSTRIAL FISHERIES

Shrimp in Nicaragua are like salmon in the Pacific Northwest. They migrate to coastal rivers and lagoons during their spawning season, and are the mainstay of Nicaragua's Pacific industrial fishing fleet (14). Besides both an artisanal coastal fishery and an industrial off-shore fishery, the Nicaraguans are developing a unique enterprise of commercial shrimp farming with help from Peru. Shrimp and lobster are the only fisheries developed for export at this time, lobster being more important

on the Atlantic Coast. There are five major industrial plants that process shrimp and lobster in Nicaragua. Two plants are on the Pacific Coast--the ALINSA plant at Corinto in the north and the COPESCOSA plant at San Juan del Sur in the south. Another three plants are on the Atlantic Coast--COPESNICA at Bluefields, PESKASA at El Bluff, and PROMARBLUE on Big Corn Island in the Caribbean. (15). Shrimp is now the primary product at most plants except PROMARBLUE, where lobster is the traditional shellfish caught by the Corn Island residents.

Under Somoza, a small amount of filleted fish was sold to the United States from Bluefields. This was stopped after the 1979 Victory because the new government decided that the sales paid too little revenue and it would be better to concentrate efforts on higher value shrimp and lobster exports. The plants do fillet and freeze finfish for local consumption, but this harvest comes mostly from the incidental catch of the industrial fleet (16). Since processing finfish is more trouble and expense than they are worth to a commercial shellfish plant, it's customary to keep only those finfish caught in the last couple of drags of a vessel's trawl net. Those tail-end catches of finfish are then filleted and iced or frozen for local sale, as a benefit to the surrounding communities. It's a balancing act between common sense, social awareness, and cost efficiency.

Although shellfish are the primary export seafood, finfish take up the slack at times of transition. At the COPESCOSA plant at San Juan del Sur, a major shift in production was taking place. The plant's progress since the Revolution had been particularly dramatic. When one of our team members had been there in 1983, COPESCOSA had been just an abandoned shell of rust creaking into life again after eight years of inactivity. In February 1986, shrimp meal equipment from Peru had just been installed, but was not yet operational; preparation for the installation of a new German ice making machine was underway; a crew of fishermen and equipment from Canada was to arrive, in May, to help repair damaged vessels; technicians and material were expected soon from Managua to convert the plant floor to lobster processing; and most of the fleet of five new Peruvian vessels were out fishing. At this time of transition, workers were busy filleting a flounder-like fish for the local public markets.

Just now, the plants cost more to run than they earn from production. However, they fulfill a social & economic function, which is slowly paying dividends. The overseas sale of shrimp and lobster bring international currency into Nicaragua, which they can convert into dollars for the

purchase of foreign technology, like the Peruvian fishing vessels and shrimp meal equipment (17). The plants also provide employment for a significant number of local residents, as well as a primary source of income for the local communities. The plant at San Juan del Sur is run by a committee that meets once a month. It includes two representatives from the management, three from the union, and one from the Sandinista Party. At the COPESCOSA plant, the plant director and union rep explained how the plant has been run at a loss--for the benefit of San Juan del Sur. They said that the plant could get by with a core work-force of 80, but it will employ, at full capacity, a crew of 500. At this time of conversion, 250 people rotated 60 jobs between them, but when the plant floor is set-up for lobster, an extra 100 processors would be locally hired--thus employing 600 people.

The shrimp are cleaned, sorted, boxed, and frozen. Twice a month, a Canadian freezer ship leaves the ALINSA plant at Corinto with 25 tons of frozen shrimp in its hold. The ship picks-up shrimp at the COPESCOSA plant at San Juan del Sur, then proceeds through the Panama Canal. Since the embargo on trade with Nicaragua by the U.S. in May 1985, three out of every five ships go to Canada; the other two sail to Europe, where Spain has been a primary consumer of these shrimp. Before the U.S. embargo, almost all shellfish exports were destined for U.S. markets. The Corinto plant processes about 500 tons of shrimp per year.

ALINSA has more orders for shrimp than they can fill. The shrimp fishery is underutilized, due in part to a lack of vessels. Before the 1979 Victory, ALINSA was owned by the Somoza family and its 50 vessels fished out of Corinto. These shrimp boats are 70 foot, steel-hulled druggers (as you'd find at any Alaska or Nova Scotia port). In 1979, after the Somozas were driven from Nicaragua, 30 of these vessels were taken to Honduras, El Salvador, and Guatemala by Somoza personel. Some of the boats were later recovered by extradition, some had been abandoned, and some still fish out of these other countries under *Somocista* ownership. Although this dealt a blow to the new government's capital investments, external attacks on the fishing sector have been much more difficult from which to recover--worse problems soon followed the loss of these first 30 vessels.

Corinto is a large harbor. It is reputed to be the best deep water port in Latin America. Seafood is one of Nicaragua's largest exports--after cotton, coffee, sugar, bananas, and beef. Oil is also imported here. As

would be expected, a commercial center like Corinto has become a primary target for attack by the Contra's, the CIA, and their allies in the present war (see Appendix C--A Short History of Nicaragua). The United States continually violates Nicaragua's territorial waters by use of "grandfather" rights in the Gulf of Fonseca, which were arrangements made with the old dictatorships. You can see U.S. war ships from the beach, cruising along the horizon, well within Nicaragua's 200-mile limit.

In 1984, the United States mined Corinto's harbor. The majority of vessels sunk were shrimp boats--five of them, all belonging to the ALINSA plant. As we walked down the ALINSA dock, a dozen rusty hulks swung in the wind, quadruple berthed. Many of them had been recently raised from the ocean depths and were awaiting the caress of scrapers and paint.

These shrimp boats might **look** like any Alaska dragger, but they lack a lot of the Alaska vessels' sophisticated electronics--like sonar. There are six crew members to each dragger. The crews of the surviving vessels took turns scuba diving off the bow, looking for mines, everytime they left or returned to the harbor. France, Cuba, and Mexico later donated mine detection gear. Contrary to what the U.S. goverment and media tells us, fisheries workers reported that mines have been laid in Corinto's harbor as recently as the Fall of 1985. So, ever-ready vigilance is required to make sure that the vessels don't blow-up and sink just getting to the fishing grounds.

In 1984, the oil depot at Corinto was also sabotaged by the CIA. Twenty percent of Nicaragua's oil supplies were lost in this one attack. At that time, Nicaragua had a loan request pending to the Inter-American Development Bank--US\$31 million for fishing vessels. The U.S. representative on the international loan board tried to block the loan, insisting on a stipulation that Nicaragua have adequate fuel for the proposed fishing vessels (a previously unheard of qualification). One week later, U.S. backed saboteurs blew up Corinto's fuel depot.

Contra sabotage and damage in 1984 equalled the value of 70% of Nicaragua's annual export revenues in that year. Because of the US-Contra presence, Nicaragua has needed to divert 60% of its income to national defense purposes.

Sergio Martinez had told us, "Our problems are more politics than fish. There's no lack of fish, we don't have a fisheries regulation problem at this time. It's an "accident" for Honduran fishermen to poach in our rich Nicaraguan waters, but if one Nicaraguan fisherman strays into Honduran waters it's an invasion!" (28). Nicaragua has requested its fishermen to observe wide international buffer zones to minimize problems near their borders. This diverts funds that could otherwise go into fisheries and other development projects.

Problems also come from above water. On the way to the electronics shop, at the ALINSA plant, our conversation with the plant manager got drowned out by shrieking hammer blows and scrapers on steel. A crew of shipwrights in blue uniforms were repairing a rusted hulk. My translator said something about a "social rehabilitation program." I made a remark about "Somocista's..." to Sharman. The plant manager nodded his head and said, "That's who they are." He went on to explain how the "Arlenseu" had been fishing in Nicaraguan waters in the Gulf of Fonseca, which is shared with Honduras and El Salvador, in December 1983. It was attacked by Honduran helicopters. In the one-sided battle, the machine-guns killed two fishermen and seriously wounded three others. Since being brought back to Corinto, the "Arlenseu" has been given to imprisoned members of Somoza's National Guard to refurbish, as part of a work/rehabilitation program (18). After this "gift" to the prisoners, ALINSA workers started to refer to the vessel, tongue in cheek, as "Al Hijo de Somoza" (to the son of Somoza).

Besides these war casualties, vessels just normally break down. The plant's mechanics and shops could fix them, if they had the supplies to do it with. They don't. Much of their equipment is made in the United States and they need to get the replacement parts from the same U.S. companies. However, these U.S. companies are prohibited from dealing with Nicaragua by the Reagan Administration's embargo. For example, the boats are powered by 360 horsepower Caterpillar marine engines, which are made in the U.S. Unless parts can be locally fabricated in ALINSA's machine shop or can be cannibalized from other equipment, the broken-down vessels have to just sit at the dock. There is also a major need of technicians in all trades--especially electronics and refrigeration. As money does become available, business that would normally go to U.S. marine corporations, will go to other fishery manufacturers, as in Japan--due to the Reagan Embargo.

Out of a once functioning fleet of 50 fishing vessels at Corinto's ALINSA plant, only ten vessels now fish--30 were taken by the *Somocistas*, five were sunk by the U.S. mines, and five more are just broken down. If replacements and supplies could be obtained, the ten laid-up shrimp boats could get out fishing once more, doubling the size of ALINSA's present shrimp boat fleet.

FISH RANCHEROS AND SHRIMP WRANGLING

Two surprises hit us when we drove past the sign announcing Estacion Piscida "General Omar Torrijo," which is the headquarters for INPESCA's aquaculture program. The first came when woman after woman was introduced as a project leader or director. The fish station is almost totally run by women, which is rare even in a new agency like INPESCA. The second surprise was the creativity of their projects, which are oriented towards supplying fish to *campesinos* at rural farming co-ops.

A carp-like fish, Tilapia aurea, is the only species propagated at this time. (In the near future, an actual member of the carp family, Cyprinus carpio, is also slated for development.) The fish station's primary task is to develop breeding stock. Little research and no farming is done here. (Research is carried out in some of the larger lagunas, like Moyua, and in lakes north of Managua). The Station workers collect milt from the male Tilapia and artificially fertilize females. The eggs are hatched. The fry are raised for 45 days in one pond and then transferred to a dozen separate tanks for an additional 45 days. Water comes from the river flowing through the station's grounds, and the fish feed consists of a pellet mixture of bone and corn meal, which is made in Nicaragua. After three months of rearing, the fingerlings are transferred to a concrete pool, next to the frame and plank pathology lab, where they are inoculated, put in plastic garbage sacks that have been airtreated by oxygen tanks, and transferred to either ponds or reservoirs in the countryside. There they will grow an additional year or two before being harvested (19).

The aquaculture projects have only been underway since about 1983 years. But even aquaculture is not immune from the Contra-war. In 1984, a fish farming tank was blown up by Contra's near Estelli. Three Nicaraguan women coffee-pickers and a Swiss agronomist were machine gunned by

Contra's, just this year, near the aquaculture site at Somotillo, on the Honduran border. 1986 was the first full cycle harvest of hatchery grown fish. No complete growth cycle/harvest has yet taken place, although monthly samples have been made to estimate growth rates (20). After two years' growth, it is projected that they will increase to a one pound fish, which will then be sold locally to the campesinos. INPESCA loans the agricultural co-ops nets, boats, and other gear for capturing the fish. The local co-ops keep the sale money, which they plow back into their own projects. Thus, the fish are used to enrich both the local economy and the local nutrition.

After being taken around the facility, we were shown two slide presentations in a long and narrow office of desks (21). After the show, we asked about the large number of women at the station. They explained that, after the revolution, the new Nicaraguan government made an effort to involve more women in the field. Since the aquaculture project was a totally new program, it was easy to involve women from the start without causing animosity from displaced men. A hearty woman with chubby cheeks laughed about the community involvement effort that is so central to the aquaculture project. We'd asked if there were any fishermen in the areas where the reservoirs or rural ponds were. She said, "No, and it sometimes shows when we try to catch the fish!! Farmers and office workers! But we're learning. All of us. None of this existed before."

Shrimp farming has also been underway since the Revolution's Victory. Unlike finfish propagation, it's aimed at an industrial export harvest that brings in cash. Shrimp migrate into the coastal lagoons and rivers during the rainy season. This migration pattern is a double edged sword. On the Pacific Coast, it has led to an innovative form of shrimp farming, while on the Atlantic Coast it has the potential of a multiple disaster.

Towards the end of the Somoza Dictatorship, in the 1970's, an entrepreneur at Puerto Morazan began a project of raising shrimp for commercial sale in the overflow basin from an estuary of the Gulf of Fonseca. Later in the decade, the project fell into disrepair, but the idea remained. After the 1979 Victory, a dozen older men and women at Puerto Morazan resurrected the concept and formed a co-op (Cooperativo Edgar Lang Sacasa). The German branch of an international aid organization, Bread for the World, gave them some basic equipment. The Instituto Nicaraguense de Seguridad Social y Bienestar (INSSBI--the Nicaraguan Institute of Social Security

and Welfare) contributed some funding for the project, with the stipulation that a portion of the co-op's income would be donated to the community. The project succeeded and the collective contributed 20% of its income to Puerto Morazan to build a social center for the younger people of this coastal river area--with a sewing center, carpentry shop, and kitchen. The collective is now hoping to renovate its mud-based tanks and purchase bigger pumps to expand their project.

Inadvertently, because of the Contra-war and the co-op laws, competition has sprung up between the shrimp farming Cooperativa Edgar Lang Sacasa and the finfishing Coopertiva Herrera Membreno at Puerto Morazan, which fishes in the estuary.

A detachment of the army is stationed in Puerto Morazan to protect the villagers from Contra "Piranhas." The Contras attack in new speed-boats (Piranhas) and machine gun dug-out canoes, if the fishermen have new outboard engines on their vessels (indicating Sandinista support, to their minds). The fishermen claim a U.S. woman mercenary is active with the Piranhas on the Estero Real. Puerto Morazan's fishing co-op, Herrera Membreno, had three fishermen killed and several kidnapped by Contras in 1984 alone, and INPESCA recently had to abandon a successful project of shrimp traps in this area because of the continuing Contra attacks from western Honduras. Such violence has led to administrative problems. Local fishermen must work closer to home, rather than venture into the Gulf of Fonseca or far down the Estero Real after fish. The fish co-op developed a program of shrimp rearing in *salinerias* (22), to supplement their Contra-restricted activities.

However, because of the way the co-op laws are written, only one fisheries project can be funded in any one area. They therefore come into competition with the shrimp farming Cooperativo Edgar Lang Sacasa, even though there is no actual conflict over markets and resources or duplication of techniques. (See Appendix D--INPESCA Activities).

Further down the Pacific Coast, at Puerto Sandino, another fishing cooperative is developing from *salinerias* work. INPESCA, having seen the good work at Puerto Morazan, offered technical assistance. Research was done, and the existing project run by local *salinerias* workers was refined. Shrimp larvae were brought from the coastal waters in boxes especially built for the dug-out canoes (rather than relying on the tides), water levels in the *salinerias* were experimented with and adjusted to optimum shrimp rearing depths, pumps and inclines were set up to streamline the operation from buckets and boards. Puerto Sandino *salinerias* workers

formed a shrimp farming co-op, Cooperativo Abraham Zapata Perez, and acquired a loan from Nicaragua's National Development Bank (*Banco Nacional Desarrollo*). Peruvian technicians came in and advised the shrimp farmers. Over the last couple of years, the co-op has succeeded well enough to begin wholesaling their hatchery shrimp to Peru and Cuba.

This pioneering of Pacific shrimp farming has developed a new tradition that doesn't promote competition between the off-shore shrimp draggers and the coastal artisanal and aquaculture fishers. However, this is a different picture from the trouble brewing on the Atlantic Coast, where a potential problem of species use could become every bit as serious as the troller versus seiner or Native versus White harvest conflicts of salmon in the Pacific Northwest of the U.S.

On the Atlantic Coast, the shrimp fleet operates out of the COPESNICA plant at Bluefields. The vessels spend about a week at a time at sea, on the drag from Punta Mono in the south to the Cayos Miskitos in the north. As on the Pacific Coast, a freezer ship takes the shrimp to Canada and Europe for sale. The Atlantic Coast's shrimp fleet is scheduled to drastically grow with last year's purchase of 30 vessels, which are about the same size as the Corinto boats (23). Their delivery is in progress. Such a large capital investment is the result of that optimistic survey of Nicaragua's fishery resources, when INPESCA targeted shrimp and lobster as the prime species for industrial development and export. However, lobster and shrimp are very susceptible to over-fishing. And INPESCA is also committed to the development of artisanal fisheries in the local villages. This leads to a conflict of interest, which could expand.

If the coastal villages of the Atlantic try to develop an artisanal fishery in their lagoons for spawning shrimp, this could limit the off-shore migration for the industrial harvest. Since payments must be kept up to justify the expense of such large capital investments as industrial trawlers and processing plants, it is easy to see which way government harvest priorities might go, as we've seen with the limited entry programs in Alaska (24). To complicate matters further, the financial necessities of a state run industrial fleet could go beyond just a gear dispute, since the Atlantic Coast is an area of contention on the issue of Indian/Local autonomy versus Latino/Managua authority (see Appendix C--A Short History of Nicaragua). Although the potential conflicts between in-shore and off-shore shrimp harvest have not fully developed (due, in part, to the Contra-war's effect on both sectors), some problems have already appeared in the Corn Islands.

CORN ISLAND CONFLICTS

The Corn Islands are populated by the descendents of English pirates, Black insurgents, and Miskito Indians (see Appendix C--A Short History of Nicaragua). The primary languages are English, Spanish, and Miskito (25). In the days of Somoza, the Corn Islands were a big resort area for foreigners. We were told that a group of rich Canadians from the old days still return every year to vacation there. As a Canadian farm mechanic observed, "Every *internacionalista* that comes to work in Nicaragua prays to get assigned to the beaches of San Juan del Sur or the Corn Islands." Off the east coast of Nicaragua, the Corn Islands illustrate the recent conversion from a subsistence to a cash economy.

For centuries, a local subsistence fishery for lobster has continued, caught primarily by diving or in wooden traps. In the 1960's, a North American came in a boat, bought lobsters from the Corn Islanders, and resold them in Panama. The next year, he set up a tent on Little Corn Island and paid for the lobsters in goods--C\$1 worth per lobster. This signaled that a profit could be turned from the decapod crustaceans, and Somoza built a processing plant on Big Corn Island and entered the competition. The North American sold out to a Nicaraguan and Honduran partnership, which fell apart during the Revolution. The Nicaraguan partner, who got control of the operation, absconded with four boatloads of lobster to Miami after the 1979 Victory and is now reputed to be a Caribbean drug runner. The North American, who originally began the lobster commercialization, is still reportedly involved in the area, despite the Reagan Administration's embargo and Nicaraguan marketing strategies (26). The Nicaraguan government took over both Corn Island plants, since they had been abandoned by *Somocistas*. The plant on Little Corn Island didn't have enough boats to keep operating, so INPESCA closed it and concentrated their efforts at the PROMARBLUE plant on Big Corn Island.

At present, PROMARBLUE (still called, "the Company" by local residents) works 17 large boats, seven crew to a boat. Three hundred are employed at the plant, mostly women and Miskito Indians. In addition to a wage, fishermen also earn a percentage of the catch (C\$16/pound), as well as additional incentives (27). The PROMARBLUE plant also processes shrimp. They ship 30 tons of lobster and 50 tons of shrimp per month to Canada and Europe. The fishing has recovered to such an extent, since it's interruption by the Revolution and Contra-war, that 25 new lobster vessels from Mexico have recently been added to PROMARBLUE's fleet.

Fifty privately owned boats also trap lobster in the Corn Islands. There are problems for private fishers in a limited economy--with a government that has the general public's overall welfare as its priority. At the Corn Islands, private boats get C\$220 per pound for lobster. They run about 100 traps, provided through INPESCA, but have to buy their own gas and gear. The bulk of PROMARBLUE's lobster is still caught by these artisanal fishers, who sell their catch to the plant. However, their fleet is extremely dilapidated, with a severe lack of working outboard engines.

Local lobster traps are traditionally made of wood. However, a shortage of both good wood and reliable transportation to forest sites put trap wood at a premium. INPESCA has experimented with non-wood designs from Brazil and soft-wood models from Cuba, but they don't work as well as the traditional designs and therefore haven't been put to commercial use. Fishermen presently make do with what they have.

Most of the 120 private fishermen on Big Corn Island work with Johnson outboards. Since the Reagan Administration's embargo halts replacements and parts, INPESCA is promoting non-US brands. A new Yamaha 40 horsepower outboard goes for C\$120,000 (US\$160)--if you can find one. INPESCA just bought 120 new Yamahas (about half of them are slated for the Atlantic Coast) for sale to the private sector, who have two years to pay and can set up deductions from their sales to the INPESCA managed plants. US\$160 is a very good price to pay for a new outboard, a new one in the U.S. would run around US\$2500; the difference is subsidized by the government.

Supplies on the Corn Islands run two to three times the prices on the mainland--while income from fish sales are the same as on the mainland. This causes dissent over, for example, the price of gasoline. Subsidised gas costs C\$390/gallon (US\$0.50). The gas drums are shipped by boat to the Corn Islands. Supply lines have come under attack by Miskito insurgents in the past, with a resultant drain of money away from civilian goods and transportation to defense expenditures. Gas and other material have become sporadic and scarce on the entire Atlantic Coast. Although INPESCA provides material aid to both co-ops and individuals, a general lack of supplies forces them to make decisions that favor survival of their public sector--the private sector doesn't always get the first crack at the materials they want. The lack of fuel and equipment and their costliness make it a lot more attractive, in many ways, for fishermen to

work for the government plant and get priority treatment. Nonetheless, in 1983, 67% of Nicaragua's total lobster production came from small scale fishermen (Conover). However, as the lobsters have been fished out close to the islands, they have become more and more inaccessible to the private sector artisanal fishermen and available only to the more seaworthy and subsidised public sector industrial fleet.

Besides lobster traps, a diving fishery is also conducted for lobster, as well as for black coral. Lobster divers get tanks and equipment from the PROMARBLUE plant and are eligible for workers' compensation and pensions. However, once a diver gets the tanks, it's a big temptation to then also dive for black coral, which sells for C\$3,000/lb. Many of the divers aren't well trained in Scuba diving. Since black coral grows at depths of up to 180 feet, this has lead fishermen to spend too much time at too much depth. Some have been permanently crippled or killed by the bends. When such tragedy occurs the question is raised, "What were you diving for--coral for yourself or lobster for the company?" Several labor disputes over compensation are in litigation right now.

The bountiful waters of Nicaragua's Atlantic Coast have made it a favorite target for "pirates" from not only neighboring Honduras and Costa Rica (28), but also from the Columbia-owned Island of San Andres, even further off-shore (29). San Andres has a fish processing plant which offers better prices for shellfish than the PROMARBLUE plant. There is a mighty temptation to sell shellfish to the better non-Nicaraguan market, which is illegal.

Almost all the fishermen on Big Corn Island gathered in January 1986 to protest the government's arrest of one of their friends for smuggling lobsters to San Andres, as well as to voice their dissatisfaction with the lack of supplies and their high cost. These situations have caused some hard feelings to develop in the Corn Islands, between locals and the government. But improvements are being hammered out. An agreement of mutual forbearance was reached. Such arrests would stop and prisoners would be released, in return for cessation of smuggling. Also, the government would provide better supplies and lower costs for the fishermen, in return for their patience with the shortages and expense of goods.

As one fisheries worker told us, "There has been a loss of earning power, and imports do cost more, but you have to evaluate the cost of living and wages--it (the relative cost of living) is about the same now (as it was under Somoza). The big difference is that now we have seen a lot of progress in education and health since the Revolution."

THE LAKES & RIVERS & ATLANTIC COAST

The western coast of Nicaragua is pocketed with lakes, reservoirs, and ponds. The lakes are mostly volcanic craters, but the ponds and reservoirs were built for farm projects and are filled with fresh water. The largest and most used lakes are Cocibolca (Nicaragua), Xolotlan (Managua), and Apanas (30). There are 46 species of fish that live in the lakes, but only 12 are harvested for food. On Lake Cocibolca are two cities--Granada in the north and San Carlos in the south, in addition to numerous fishing villages on the clusters of islands at the southern end of the lake. Lake Xolotlan has the village of San Francisco Libre and the capital, Managua; it is the only one of the lakes that has a significant problem with contamination from farm run-off. Lake Apanas is an artificial lake located in Jinotega.

As with the coastal people, the lake people fish from dug-out canoes. The wood for these canoes is a problem to obtain, as elsewhere in Nicaragua. For example, the wood for the boats of Lake Cocibolca comes from the island of Ometepi in the middle of the Lake. Access to building materials for boat repair is crucial and, as elsewhere, expensive and difficult. The fishermen work mostly from dug-out canoes (cayucos) and plank skiffs (pangas) of about 20 feet in length. The resale value of a dug-out canoe is about C\$30,000 and has a life-span of around six years. Their boats are powered more by oars and sail than the coastal vessels, which tend to rely on outboard engines for the high seas. The fishermen work about eight hours per day, at distances of up to 20 km. from their homes. (Martinez). Bows & arrows, atarraya's, fish traps, and harpoons are used more on these inland and eastern waters than on the Pacific Ocean (see Appendix H--Types of Artisanal Fishing Gear). The most important fresh water fish are:

- 1). **Tiburón**, a fresh water shark, is caught with a nets and is sold as a fresh/frozen fillet.
- 2). **Pez sierra**, a saw-fish, is mostly caught with a bottom tangle-net. It is mostly sold as a fresh/frozen fillet.
- 3). **Gaspar**, a garfish, is taken by harpoon from boats at night. It is sold dried or salted.
- 4). **Mojarra**, a medium sized bluegill-like fish, is mostly caught in rather shallow water by atarraya or a fish trap. It is sold fresh or frozen in the round.
- 5). **Guapote**, a very popular bass-like fish, is caught in a bottom-purse net and with hooks and line. It is sold fresh/frozen in the round.

The larger fish (except for saw-fish and shark) are sold in the round and served in restaurants entire, on a platter. Some crabs are obtained with traps and by hand. Only since 1971 has an industrial fishery been attempted, and this only for pez sierra and shark; by 1976 there had occurred a noticable decline of these species. This commercial harvest stopped prior to the Revolution, but is now being reactivated (see page 27). Around 1500 fishers work the continental waters of western Nicaragua, catching over 1-million pounds of fish each year. (Martinez).

Between the eastern and western coasts of Nicaragua is a mountain range, which lies closer to the Pacific Ocean than the Atlantic. The western drainage is very short, down a comparatively steep coastal plain. As one researcher pointed out, this complicates the pattern of pollution. Nicaragua was a heavy user of pesticides on crops under Somoza, and it continues to depend on pesticides for certain crops (such as cotton). Since the 1979 Victory, stringent environmental laws and regulations have come into effect, such as banning pesticides outlawed in their country of origin. But decades of poisoned land and the continued economic need for chemical agriculture leave their legacy in the soil and water table. Since agriculture is concentrated on the Pacific side, the short drainage doesn't act as a sufficient filter to pick-up and break-down the poisons. The lack of a wide coastal plain prevents the soil from adequately filtering the water and, therefore, pesticides flow into the ocean. Unfortunately, little study of contamination of fish habitat and shrimp spawning grounds has been done.

Unlike the Pacific, the drainage of the Atlantic coastal plain is long and flat. Its surface is veined by many rivers that twist through jungles and run off into an equally wide continental shelf under the Atlantic Ocean. The shelf is filled with lagoons, reefs, shoals, and islands. One researcher described this mottled world of rivers and jungle on the one side and shelves and shoals on the other as the extended wings of a butterfly, with its dark back lying along the coastline. More than two dozen Indian villages perch on the rivers and lagoons. From south to north, this is the territory of the Sumo, Rama, and Miskito Indians. They live in communal villages that are based on hunting, fishing, and gathering. Most of the Indian villages along the coast, especially in the northern half of the region, are inhabited by Miskito Indians. The Sumo Indians live primarily along the rivers, by the mining communities. (31)

Three major cities lie along the butterfly's back--San Juan del Norte in the south, Bluefields in the middle, and Puerto Cabezas in the north. Timber, fisheries, and gold mining are the primary industries of this region. Substantial cyanide pollution of the local watersheds has resulted from the gold mines at Bonanza, Rosita, and Siuna. The mines have been closed down for several years, due to Contra attacks and a lack of capital, but they are now being reactivated with the help of German aid and the peace negotiations with Indian insurgents. Bluefields has the primary commercial processing plant for shrimp, although El Bluff and the Corn Island plants also may process them, too. On the Atlantic Coast, itself, Exsuiza and SwissAid are contributing material to fishers in Pearlas Lagoon, and a fishing vessel was donated to those on Rama Key by SwissAid.

The Atlantic Coast has the largest number of fishers, but the least amount of fisheries aid. Basic investigation of river fisheries hasn't been tackled by INPESCA's Research Division and we failed to obtain much material ourselves. Although a similar net-fishing technology is used, as on the western continental waters and ocean, some unique techniques are also current. Two soldiers who had been stationed in the northwest State of Zelaya described how the Miskito Indians use a machete and a flat piece of board to decapitate fish resting in shallow pools. Unlike the male dominated fishing in the rest of Nicaragua, they also reported that women fish with the men, hand-lining along the Rio Wawa. (About the only fishery, as a whole, that Nicaraguan women participate in is oyster and clam harvesting). There are several international aid projects sending

fisheries assistance to the Atlantic river people. In two of these, OXFAM Canada is providing fishing hooks and lines to the Miskito Indians resettling back to their old territories, and SwissAid has a project on the Rio Grande de Matagalpa to provide three fishing boats and six fish packers with gear.

BOATBUILDING

Although the industrial fleets of both the Atlantic and Pacific Coasts look very similar, the artisanal fisheries are very different. The yin/yang of each coast is reflected in the two regions' fishing crafts. Both coasts do use dug-out canoes. Trees are important, but they're used differently.

At Poneloya, on the Pacific Coast, the village fishermen have to travel up to 50 miles away to get logs large enough to make into canoes. When the fishers can get access to a vehicle, they travel to the slopes of Volcano Momotombo to harvest logs and bring them back to their shore-based community (32). It's a brutally expensive and difficult proposition for the fishermen at Poneloya to, first, find a truck and, then, afford the gasoline for the trip. Once they do haul some logs, then they build their canoes with chain saws, axes, and adzes. The construction takes about a month, and this Pacific Coast timber isn't what you'd call quality wood either. The heartwood is usually rotten. In a dug-out canoe this isn't a problem until you get to the bow--where you scoop out the heartwood. However, the bow takes a beating at sea. You can't have a rotten stem. So, these shipwrights build a compound bow from two or three pieces of solid timber. The completed 20 foot canoes are very rough looking, but consistently fish up to six miles off-shore. The populous, agricultural, Mestizo-based economy of the Pacific Coast has led to a rather stunted, spotty tradition of fishing and boat building, but it is a very functional tradition. Fishermen from as far away as Massachapa (50 miles down the Pacific Coast) will come to Poneloya to buy dug-out canoes when they cannot get adequate timber in their own area.

The Atlantic Coast canoes, however, are a centuries old tradition, a refined art of sea-based Native life-style. The Atlantic Coast has been the home of excellent wood. It's huge forests of towering trees and myriad waterways have given the fishermen access to fine boat building materials from which to make their 30 foot dug-out canoes for extensive turtle hunting and trade throughout the jungle rivers and along the east

coast of Central America (33). These forests were primeval until relatively recently. While early Spanish enterprise had destroyed the Pacific Coast trees, the Atlantic forests came under the commercial axe only in the last century, when British merchants created a market for exploitation of the mahogany forests. This exploitation continued under Somoza's reign, through leases to multi-national timber companies. However, the difficult terrain and remote stands of trees insured that the Atlantic Coast could not be denuded of trees in the same fashion as the Pacific Coast. What slowed commercial exploitation, aided local subsistence. The combination of river access, isolation, and wealthy aquatic environment contributed to a very well developed Atlantic Coast tradition of indigenous boat building and fishing. Nonetheless, the forest harvest of over a century has resulted in a shortage of good wood for even houses, let alone for fishing vessels, and has led to recent reforestation and silvaculture activities, with the aid of nations like West Germany.

At the moment, INPESCA is coordinating two clusters of boatbuilding projects--one on Lake Cocibolca on the Pacific Coast interior, and the other near Bluefields on the Atlantic Coast. These are in addition to other efforts at shipwrighting around Nicaragua (34). Granada, on the northern end of Lake Cocibolca, serves as the regional INPESCA headquarters and supply depot for "the Lake." The gate is opened by a friendly guard with a smile and an AK-47 (35). Inside the compound sits an ice maker and an administrative office. A fleet of freezer trucks comes and goes. Next to the ice house is a long concrete building, containing the hull of a fishing vessel. It will be 36 feet long by 12 feet wide, powered by a 30 horsepower Yamaha diesel inboard engine. A crew of a half dozen fishers will run it for several days at a time, for fresh-water shark. Under construction for three years, the design is based on a Caribbean model. It is an experiment to test the commercial value of a high yield vessel against dug-out canoes--to see if the higher production will justify the higher costs of maintenance. At the other end of the Lake, at the community of San Carlos and among the Solentiname Archipelago, a Catholic solidarity group from Italy called *Manitese* is involved in a local boat-building project of 12 thirty-foot boats for catching shark and saw-fish to process at the San Carlos plant.

In the old days, before the 1979 Victory, fishing vessels on the Pacific Coast were hauled out of the water at boat-yards in Costa Rica. Because of the recent political tensions in Central America, this is no longer possible. So, the fishing vessels at the COPESCOSA plant at San Juan del

Sur are now either hauled up on the sandy beaches for repair, or taken to the ALINSA plant in Corinto to a rudimentary set of ways (36). There is a large backlog of vessels awaiting repair in Nicaragua.

Some help has come to the COPESCOSA plant from the United Fishermen and Allied Workers Union of Vancouver and the British Columbia Federation of Labour (Canada). Each year one of the B.C. Fed's unions establishes a link with a Nicaraguan union. The whole Federation then pitches in to help get a project off the ground in Nicaragua. In 1985-86, the UFAWU had a project to repair beached vessels with one of the Nicaraguan fish plant unions--the Sindicato de Che Guevera, at the COPESCOSA plant at San Juan del Sur. Supplies were sent down on the *Tools for Peace* ship in 1986 and were transferred to San Juan del Sur. British Columbian fisheries workers followed. They attempted to refit 20 damaged fishing boats that they dubbed the "Solidarity Fleet." However, the final assessment showed the damaged fleet to be too far gone to salvage, and the UFAWU redirected their efforts towards maintenance of working ships and obtaining replacement vessels.

It is a different story on the Atlantic Coast, where, at Bluefields Lagoon, there already is a private boat yard called PICSA. They have built large steel hulled boats for years, and have only just lately begun making smaller fiberglass vessels. In winter 1985, an agreement was reached between INPESCA and PICSA to build even smaller fiberglass vessels for local artisanal fishermen. The introduction of wooden boat construction, which would not be dependent on costly inputs like fiberglass, has not met with much success so far. At nearby Perlas Lagoon, an innovative development center for boat design is also planned with the Norwegian aid group, *Narsk Folkehjelp* (Norwegian People's Aid). This site is projected to eventually include a naval architect and a computer that can configure hull design. The goal is to be able to research Caribbean Basin boat designs and match various fishing gear technologies with them, in order to come up with efficient combinations and appropriate technologies.

INTERNATIONALISTAS

I was surprized by the large number of international workers in Nicaragua, even in fisheries, and often in odd circumstances. One day, leaning over the second floor rail at INPESCA, a blonde haired man with a well trimmed beard came out of the office. He looked like a Stanford biologist.

Before I could say "Hi!" he turned to a rotund balding man in horn-rimmed glasses and, speaking Russian, disappeared down the stairs. They were part of an oceanographic ship helping Nicaragua chart their coastal waters and make estimates for a tuna and sardine joint venture between the Russians and Nicaraguans, which was signed in the winter of 1986 (37). Some other fisheries aid projects have been cited in other parts of this report. The following paragraphs will elaborate these projects, and discuss those not yet touched upon.

The primary fisheries aid agency in Nicaragua is *Norsk Folkehjelp*, Norwegian People's Aid (38). In Latin America, they are called *Ayuda Popular Noruega* (APN--Norwegian Popular Aid). Nicaragua is the only country in which Norway funds fisheries development. A full time fisheries economist from Tromso (Norway), as well as other APN workers, lived in Managua, co-ordinating projects between *Norsk Folkehjelp* and INPESCA in 1986. *Norsk Folkehjelp* is funding a development center at Asseradores on the Pacific Coast, as well as at Perlas Lagoon near Bluefields and at Lamlaya near Puerto Cabezas--on the Atlantic Coast (see page 10). The co-ops make time payments on the supplies they receive from *Norsk Folkehjelp*. This nominal payment is then put in a development fund at the Nicaraguan National Development Bank for funding additional fishing projects. This refinancing plan was to have applied for all fisheries aid to co-ops, but thus far only the payback on the Norwegian aid has been deposited in this revolving account.

The Food and Agriculture Organization (FAO) of the United Nations, the Latin America Economic System (SELA), and other international advisory bodies have projects underway in Nicaragua, usually in conjunction with some of these agencies listed in this report. A number of sister-city and sister-state projects have also begun supplying fisheries aid, in addition to their general assistance projects. Portland (Oregon) is a sister-city of Corinto. We provided Portland with a list of the ALINSA plant's needs and they are attempting to send some fisheries assistance. (See Appendix J--List of Nicaragua Sister-Ports).

OXFAM (Oxford Famine Relief) is active through its several national agencies. OXFAM America has sent money for new outboard engines for the Bluefields area. OXFAM England has provided a generator for the fisheries center at Astillero. OXFAM Canada is supplying fishing hooks and lines, among other gear, to the Miskito Indians that are relocating back to their villages along the Rio Coco, as well as arranging tours of Nicaragua for Canadian fisheries workers.

British Columbia (Canada) has contributed significantly to Nicaraguan fisheries relief (see page 28). Alert Bay, on the north end of Vancouver Island, has set up a sister-port project with San Juan del Sur. They hope to provide a day care facility for the women workers at the COPESCOSA plant, a badly needed service. Most of the line workers are women, who have 300 children between them (39). The large Canadian *Tools for Peace* program, itself, actually grew out of as the efforts of a dozen Canadian fisheries workers who had gone to Nicaragua, as part of a tour, in the summer of 1981. One of them stayed an extra few weeks, thinking that he could help some of the Nicaraguan fishermen with marine mechanics, electronics, or any number of things. He was sadly disappointed. The most basic equipment and infrastructure were not available for him to plug into. Back in Vancouver he told his friends about the problem. While talking, they looked out the window, over the docks, along the Fraser River, and saw a Nicaraguan wheat ship in port. They ran around for three days, collected \$25,000 worth of nets and other fishing gear, and loaded them on the deck of the vessel for shipment to Nicaragua. From the success of this collection grew both the annual *Tools for Peace* campaign and the British Columbia Federation of Labor's projects, both of which now work in many areas other than just fishing. A fund raising project last year involved a Port Hardy cannery in British Columbia. The proceeds from one day's salmon pack, both labor and sales, went to the *Tools for Peace* project. Both projects work with Canadian University Students Overseas (CUSO) and OXFAM Canada.

Some projects are hard to track down. We asked the Director of CUSO in Managua, Wes Maultsaid, about other projects relating to fisheries in Nicaragua. He said he'd heard about an Irish group sending aid to the community of Astillero, halfway down the Pacific Coast, which is one of INPESCA's fisheries centers. Try as we could, we couldn't locate anyone who could fill us in on this elusive Irish aid agency in five weeks of inquiry. Then, one night, at the end of my stay, I ran into a volunteer coffee picker from Dublin. We began playing music, singing, and talking about fishing. He mentioned how Mick McCaughan, a member of the Student Union at Trinity College, had returned to Dublin from Nicaragua in September 1985 and had been organizing "battles of the bands" and other musical fund-raisers for the fisheries center at Astillero.

The Norwegians and others have begun to experience difficulties due to the Reagan Administration's 1985 embargo on trade with Nicaragua. After Reagan's recent meeting with Miguel de la Madrid, President of Mexico, in January of 1986, an accord was reached--to block the flow of computer

technology to the Eastern Block, which somehow included Nicaragua. In response to this accord, the Mexican authorities confiscated the computer and software that had been shipped from Norway, through Mexico, for a Norwegian fisheries economist, working at INPESCA. He's still trying to get it back. Before 1985, Miami had been a primary port for Nicaraguan fisheries. INPESCA had initiated a trade triangle with two European corporations--Volvo-Penta and its subsidiary Witte International. INPESCA would transfer shrimp to Witte International and Volvo-Penta would then supply engines, parts, and training to INPESCA. These transactions were all done through Miami. Only one shipment had been made between INPESCA and Volvo-Penta before U.S.-Nicaraguan trade was closed down due to the embargo. A search is underway now for a new port through which to reactivate this important trade arrangement. A similar problem arose with the Norwegian material aid for fisheries, which had been purchased in Miami until the embargo. The Norwegians are also looking for a new port and a non-U.S. corporation to deal with.

This has all proved a drawback for both Nicaragua and U.S. business. Over 80% of Nicaragua's fisheries gear and equipment had been of U.S. origin before the Reagan Administration's embargo, and the cost of finding new sources of supply has cost Nicaragua an estimated US\$1.2 million. The effect on potential U.S. sales has been ten times greater. Ironically, US-made equipment is admired and much preferred by many Nicaraguans, even when Russian and other Eastern Bloc equipment is clearly better--as with Polish and East German industrial engines.

Carla Roman (Director of International Economic Relations at INPESCA in 1986) told us about a fisheries conference in Jamaica where a group of North Americans had asked her, "Why do you accept help from the Russians?" She told them, "We don't have equipment, we need knowledge about the seas, we need oceanographic and fisheries help, we have two people in all of Nicaragua working on an assessment of the country's fishing gear and methods--they need materials to go out into the countryside to help improve the fisheries. We get help from a lot of nations and groups. We don't have the luxury to refuse help from anyone."

THE UPHILL STRUGGLE

The majority of problems are both political, as Sergio Martinez reported, and technical. INPESCA is attempting to solve these problems on many fronts. They hope to increase industrial production of shrimp and lobster

through use of higher technology. It is hoped that these increased exports will earn more foreign exchange for Nicaragua--with which to further capitalize the artisanal and subsistence sectors, and increase the consumption of fish in Nicaragua. INPESCA's overall goal is for more self-reliance and a higher quality of living for the fishing people of Nicaragua, as well as a better diet for Nicaraguans in general.

However, there is a problem with increased technology. The Peruvian and Cuban models are ones of high technology and many of INPESCA's workers have learned their fisheries from that model (40). The inexperience of INPESCA, coupled with a desire for high-tech fisheries, has already led to difficulties, as in the case of the Norwegian druggers and the Volvo-Penta outboards for the artisanal fleet at Asseradores (41). Sergio Martinez summarized the technology dilemma they all faced: "If you give fishing people a boat, an engine, oars, ice makers, the trucks...by this time the outboard is broken down and an oar needs replacing..." A bank of materials and skills are needed. This is agreed on by everyone from the Canadian consulting firm to the Soviet oceanographers.

Because of shortages, co-operative activity is necessary. Many of the older fishermen were said to be "lone wolves," not wanting to share. This led one United Nation's representative to conclude, "We need to train the young fishermen, not the old ones who just try to get ahead for themselves and not help others."

INPESCA's purchase and retail sale of fish is primarily (at this time) an aid to people who are not yet skillfull fishermen and to the consumers. This strategy diversifies and improves Nicaragua's economy and diet. INPESCA was described by a European organizer as "the way of the future"--pioneering the improvement of fish quality, consumption, marketing, health, and price. Most Nicaraguans are trying to help eachother get ahead. It is this spirit of mutual aid that can make the new Nicaragua succeed.

APPENDICES

- A. The Nicaragua Fisheries Project
- B. Structure Chart of INPESCA.
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Appendix A
The Nicaragua
Fisheries Project

APPENDIX A

The Nicaragua Fisheries Project

At Thanksgiving in 1985, thirty of us in Southeast Alaska watched a movie about the war in Nicaragua (see Appendix C--A Short History of Nicaragua). One scene in the film showed a fishing village that looked like any fishing village in Alaska...except for two big differences--all the boats were in port and all the marine engines were up on the dock. The film's narrator quickly reported that, since the Reagan Administration's embargo on trade with Nicaragua, it's impossible for the fishermen to get replacement parts for their U.S. made engines and that their fishing fleet has been reduced to a fraction of its former self because of breakdowns alone. Half the audience were fisheries workers from boats, canneries, cold storages, and the Alaska Department of Fish & Game. After the film, we began asking ourselves what we could do to help our fellow fishermen in Nicaragua.

If Alaska has anything, it has fish and fishing people. Commercial fishing is Alaska's Number One industry. In 1985, Alaska's fisheries produced \$700 million of wholesale revenue alone. Over 100,000 Alaskans fish commercially or for subsistence--20% of our population. The Alaskan State Legislature even tried to ban the use of the word "salmonella" because of the bacteria's negative sound-alike association with our salmon industry!! So, it was only natural for Alaskans to feel an immediate empathy for their fishing neighbors in Nicaragua, as well as be in a unique position to help them.

In the summer of 1985 Sharman Haley and I made a circuit of Alaskan fishing communities to assess the possibilities of a fisheries aid project for Nicaragua. One Alaska fisheries expert did caution us to expect very little fisheries resources in tropical waters. Fortunately, we found this to be a misguided simplification. The overall result of this Alaska tour was one of overwhelming interest and potential resources. A federation of Alaskan fisheries people and solidarity groups were then networked into the *Alaska-Nicaragua Fisheries Project*. Contact was made with the Nicaraguan Fisheries Institute that Fall, and in the winter of 1986, four of us went to Nicaragua to make a survey of their fisheries. Sharman Haley (Alaska) went as translator and economic advisor, Conrad Muller (Alaska) as marine technical advisor, Nancy Conover (California) as a translator and administrative advisor, and myself (Alaska) as project co-ordinator. We went to determine exactly what their needs were, what size nets they use, the most common type of outboard engines, etc. The trip was a real eye-opener.

We saw the construction of traditional 20 foot dug-out canoes at Poneloya, the joint agri/aqua-culture projects at interior farming communities, the shrimp draggers sunk by the CIA's mines at Corinto, a trawler machine-gunned by Honduran helicopters in the Gulf of Fonseca, the hopeful results of Nicaragua's first comprehensive survey of resident fish stocks, the far-sighted plans for a combined research and production center at Perlas Lagoon, an innovative combination of salt distillation and shrimp farming on coastal rivers, an incredible fresh water saw-fish and shark fishery in Lake Nicaragua, and a lot more. We also spent much time talking with fisheries workers from the Nicaraguan Fisheries Institute, as well as from the many foreign aid projects in the country, in order to make sure that our project will complement, but not duplicate, on-going programs.

Nicaragua's most basic fisheries problem is a lack of gear and technology for both the large and small scale fleets. They have two fleets. Their industrial fleet of 70 foot, steel-hulled vessels catches lobster and shrimp for an export market to Canada and western Europe. Their small scale fleet of 20 foot dug-out canoes catches fish for local subsistence and public markets. Both fleets are in a ramshackle condition and can't keep up with the demands. The Nicaraguan Fisheries Institute is creatively struggling to improve their local fisheries, but with very limited funding. The present national defense efforts caused by the Contra-war eat up 60% of Nicaragua's national budget, which would otherwise be available for development of resources and self-sufficiency. The Nicaraguan Fisheries Institute is receiving foreign aid for refrigeration, transportation, and shipwrighting from Norway, Ireland, Germany, Italy, and Canada. They are getting fisheries training from Cuba, industrial vessels from Mexico and Peru, and joint fishing ventures from the Russian and the U.S. fleets. However, the people who are most in need of help, and who receive the least aid, are the small scale fishermen. They need the most basic fishing materials: hooks, nets, lines, spark plugs, wrenches, pliers, buoys, outboards, etc. (See Appendix G--Artisanal Fisheries Needs). And this is precisely the area where us Alaskans figured that we could be of most help.

On 11 February 1986, a memorandum of agreement was signed between the Alaska-Nicaragua Fisheries Project and the Nicaraguan Fisheries Institute in Managua. Arrangements were made with the Ministry of External Cooperation for warehousing and distributing the material aid we send. Primarily, we will provide material assistance for the small scale fishing

people. Secondly, we will help to arrange special projects as opportunities permit; these could include a fisheries tour of Nicaragua, cooperation between Alaska and Nicaragua fisheries agencies and organizations, and facilitation of joint fishing ventures or recruitment of marine technicians to work in Nicaragua. The aid we provide is humanitarian in nature. Therefore, it meets with the federal guidelines for humanitarian assistance to Nicaragua. We plan to send 50% of the aid to the Atlantic Coast and 50% to the Pacific. The agencies who will help in the actual distribution are broad-based. Besides the government's Nicaraguan Fisheries Institute and the Regional Administration of the Atlantic Coast of Nicaragua, representatives from the Moravian and Catholic Churches, international aid agencies, and solidarity groups are also working with us. Based on the above survey, we figure more than ever that the supplement of fisheries gear is one of the most important activities we could be involved with--both to raise the consciousness of a segment of the North American population that is seldom reached--fishing people--and as an important material intervention to help Nicaragua's fishing people.

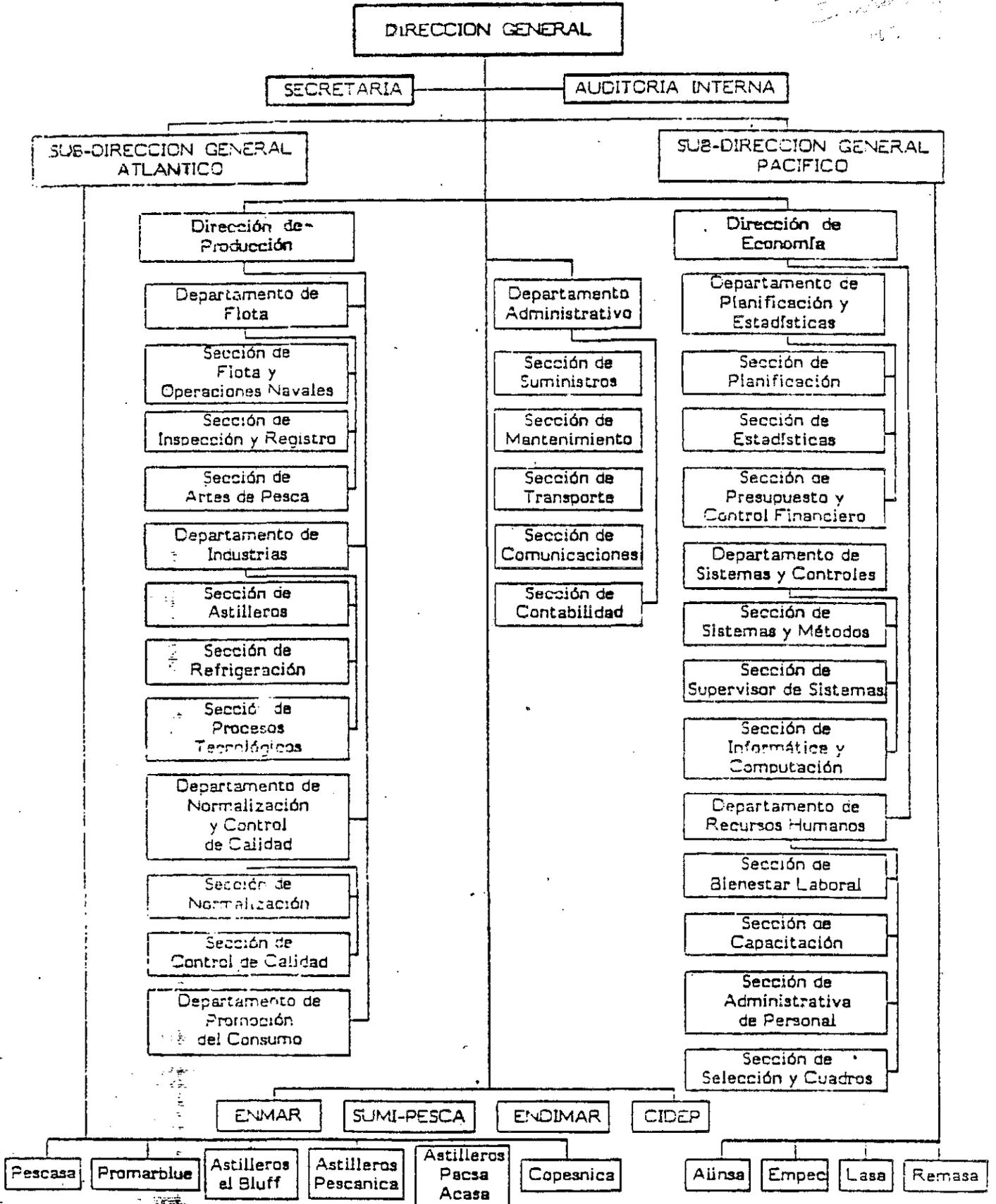
Appendix B
Structure Chart of
INPESCA.

(Note: Example only. This is an early chart and is very much out of date).

Appendix B
 Structure Chart of
 INPESCA.

ORGANIGRAMA
 INSTITUTO NICARAGUENSE DE LA PESCA
 (INPESCA)

art of info



Appendix C
A Short History of
Nicaragua

APPENDIX C

A Short History of Nicaragua

Nicaragua is about the size of northern New England--2.5 million people in about 57,000 sq. miles. Nicaragua's aboriginal population was a combination of Indian peoples from both north and south.

The Spanish settled and exploited the Pacific Coast in the early 1500's and the English did likewise on the Atlantic Coast 100 years later. Central America lacked quantities of gold; land and its resources came to be the primary attraction for the Europeans. Slaves, to work the land, came to be the primary denomination on which the extraction of agricultural wealth hinged. Early *conquistadores* used Central America as a source of labor--200 Spaniards sold 500,000 Pacific Coast Indians into slavery within 25 years of their entrance into Nicaragua.

English pirates and traders settled the Atlantic Coast as a base of operations from which to raid the Spanish colonies and recruit workers for their Caribbean plantations and dye-wood harvests. Hence, the English names for Nicaraguan communities on the Atlantic Coast are common (42). The English used the Atlantic Coast's Miskito Indians as proxies to fight the Spanish and subordinate the other Indian tribes of the region. Insurgent Black slaves from Caribbean plantations also settled the area. There has been a long history of independent militancy on the eastern Coast and long-standing distrust of the Spanish descendents who came to claim all of Nicaragua as their own.

As a part of the Latin American revolt against Spanish colonialism, Central America declared itself an independent republic in 1821. However, internal dissention combined with European and U.S. intrigues, by 1838, to break up the United Federation of Central American Provinces.

Ironically, many of the Sandinista programs for universal health care and education, access to land, and secular government are a continuation of programs that Liberal Party governments in Central America attempted to provide, at the time of their independence from Spain 150 years ago. The parallels between the Liberals of 150 years ago and Sandinistas today are striking. The attempt to change injustices quicker than even the victims of conservative oppression could sometimes comprehend, with occasional impatient coercion, resulted then, as now, with some of the intended beneficiaries joining with the opposition conservatives in bloody civil war.

Nicaragua emerged as one of the five original Central American nations. Both Great Britain and the United States struggled to expand their control of the new country. This Anglo-American effort was for a variety of reasons. The shared reason was domination of Nicaragua's overland passage between the Atlantic and Pacific Oceans. The importance of such a short-cut became highlighted by the thousands of stampedeers rushing to the California gold fields in 1849--in the days before the transcontinental railroad or the Panama Canal. A Nicaraguan short-cut, financed by Cornelius Vanderbilt of New York, was preferred to the longer and more expensive voyage by clipper ship around Cape Horn. To help secure this overland passage, a small army of U.S. mercenaries, backed by U.S. capital and tacitly endorsed by the U.S. government, invaded Nicaragua in 1855. Walker became part of the larger effort of the southern United States to add Central America and the Caribbean territories to the U. S. as slave states--to offset northern United States' expansion of "free states" in the West. (This decade also saw several invasions of Cuba for the same purpose and was a prelude to the U.S. Civil War and later wars of the 20th Century).

Two years later, after much bloodshed, the North American force was finally driven out--after the Panama railroad across Central America had become established as the preferred route and the California gold stampede had died down. The mercenaries' commander, William Walker, had declared himself President of Nicaragua and organized another "invasion," but without much of his former backing. Walker, by then, was then considered rather immaterial to the mainstream Anglo-American plans. The British captured him on this subsequent expedition, and turned him over to the Honduran authorities, who shot him in 1861. The British finally abandoned their official claims to the Atlantic Coast in 1860, but continued to use the Miskito Indians as a client army for their economic ends, through a Miskito "King," designated to rule for them. United States' expansionism had almost exclusively replaced British interests by the time of the First World War. The banana imports of a Boston sea captain in 1870 had steadily grown into the United Fruit Company. It became the major enterprise in Nicaragua and a major U.S. corporation--expanding into transportation, communication and other commodities. Additional U.S. corporations, coordinated under the Brown Brother Banks, moved into the country. Nicaragua was virtually run from the boardrooms of New York City. Although some improvements in health care and shipping facilities did come from these U.S. companies, oppressive labor and living conditions brought about rebellion in the early 20th Century. When Nicaragua attempted to expand its trade to Japan and Europe, the United States responded by sending in troops, invading Nicaragua five times and maintaining an army of occupation for a total of 25 years.

General Smedley Butler of the U.S. Army summarized his military career of this era in the banana belt: "I helped in the rape of half a dozen Central American republics for the benefit of Wall Street." The U.S. government forced a treaty for a Nicaraguan Canal in 1916, even though the Panama Canal had opened two years earlier. Resistance against this military and corporate colonization developed into a full scale revolution. The insurrection was only slowed down by the assassination of rebel leader General Augusto Sandino in 1934.

Nicaragua developed differently than the rest of Central America from this point on, because of its long ties with the U.S.--more progressive forces flourished than in other more conservative nations. North American interests considered that such progressive influences would be a deterrent to revolution. When too many U.S. boys began to be killed and an election defeated the U.S. sponsored candidate, a proxy Nicaraguan government and army was set up in 1934 under the Somoza family--much as the English had done with the Miskito "King" 300 years earlier.

Under the Somoza family, Managua grew into the primary capital of Nicaragua--at the expense of the traditional centers of Leon and Granada. Ironically, as the export of coffee, beef, and cotton brought more money into the country, the standard of living dropped for the majority of Nicaraguans. To make yet more money, the Somoza's demanded more time and resources be taken away from food production and channeled into export crops like cotton and beef. Their profits were banked and invested abroad. The Somoza family acquired ownership of over half of Nicaraguan agriculture, industries, and natural resources. When the elder Somoza died, his two sons or their representatives took office as president. Tachito Somoza bragged publically, "Nicaragua is my farm." U.S. patronage and military support protected their dynasty. When the Somoza's refused to share their wealth with the major families, those families split away and joined the opposition movement. A major outrage began within the middle class in 1972, when the Somoza's appropriated all of the foreign aid that had been sent to Nicaragua for earthquake relief.

Resistance had turned into revolution by 1961 with the formation of the Sandinista Front for National Liberation (FSLN--Frente Sandinista de Liberacion Nacional). Over the next 18 years all but the most reactionary sectors had united with the Sandinistas against the Somoza dictatorship in one of the world's most popular revolutions of business people, farmers, journalists, and factory workers. The ensuing Revolution resulted in

50,000 killed; 40,000 orphaned, 100,000 injured, and 500,000 homeless (43). Now, nearly half of the present population of Nicaragua is under 13 years of age. This is a result of the death not only of so many adults during the Revolution, but also an indication of the increased birth rate and decline in infant mortality since 1979.

The "Revolutionary Victory" of 1979 marked a major change of life in Nicaragua, embarking on a mixed economy of private and public enterprise. The new Nicaraguan government instituted vast reforms in public health, housing, agriculture, education, and the economy. It channeled the majority of aid to those at the bottom of the economic ladder, confiscating only the property of the Somoza family and their associates. A sizable part of the confiscated land was given to peasants to farm individually. Large tracts were kept intact as state farms or organized as co-ops. About 65% of Nicaragua's economy is owned by private enterprise--more than is privately owned in the United States. But the priority of aid to the poor was not without protest from more elite sections of Nicaraguan society and U.S. commercial interests. By 1982, Nicaragua was at the point of being able to feed itself--a feat never even approached in the Somoza era. But then, the Reagan Administration's policies began to take effect and pulled Nicaragua back from the brink of self-sufficiency.

The opposition that had brought about the defeat of the Dictatorship had consisted of diverse elements of lawyers, union leaders, housewives, doctors, workers, and members of other wealthy families. After the 1979 Victory, some wanted a return to the same status quo that existed before and others wanted more extreme expropriations. Several opposition parties voiced their differences with the Sandinistas.

The new Reagan Administration came to power in the United States, in 1980, shortly after the Nicaraguan Victory. For economic and ideological reasons, the Reaganites reversed the token assistance that had been given the new government of Nicaragua by the previous Carter Administration. They privately considered the new Nicaraguan government a threat to U.S. control in Central America, but publicly objected to the smoke-screen of a socialist presence. In 1981, Reagan's appointees began to suspend AID programs to Nicaragua, to block international assistance money, and to supply the Contras based in Honduras (44). A number of nations had been generous with foreign aid to Nicaragua in its earlier days of reconstruction. Then, the Reagan Administration began tightening down

the fiscal screws. Mexico, Brazil, Peru, and other nations are all large debtors to the World Bank and the International Monetary Fund, which, although they are "international," are dominated by U.S. interests. The IMF and World Bank, once the Reagan Administration took power, threatened to reduce funding to these other nations, if they continued aid to Nicaragua. For survival's sake many Latin American nations were forced to comply.

Nicaragua declared itself a non-aligned nation. Contrary to Reagan's propaganda, a majority of Nicaragua's help has come from Western Europe and Latin America, not the Soviet Block. As promised by the Sandinistas, as soon as Nicaragua was set back on an even keel, national elections were held--in 1984. International observers rated the 1984 elections as being extremely fair, even by US or European standards. The Sandinista Party won 67% of the vote; 4% went to parties further to the Left, 29% went to parties further to the Right. As a part of their destabilization program, the Reagan Administration convinced several Nicaraguan opposition leaders not to run; the U.S. government then complained that the elections weren't fair because all the opposition didn't compete. By this time the Reagan Administration's intervention was reaching new heights. Over 3,000 Nicaraguans had been killed by the Reagan-backed Contra's--women and children, as well as health care workers, school teachers, and peasants.

The Somoza family had left Nicaragua saddled with enormous foreign debts that had been used to purchase weapons with which to suppress the people and advance their family's extravagant lifestyle. They had also absconded with over half of the Nicaraguan treasury, much as Marcos in the Philippines did seven years later. Nonetheless, the new Nicaraguan government had continued to make payments on this foreign debt. But, having seen the U.S. sponsored Contras kill their people and destroy their public facilities, they cancelled their payments on the US\$600 million foreign debt that the Somoza's had run up with US banks. The Reagan Administration, already threatened with the call by Garcia (Peru) and Castro (Cuba) for the Latin American nations to repudiate their debt to U.S. banks--in the light of U.S. oppression against the Latin American people--could not let little Nicaragua get away with this. If they did, then so might huge Brazil with its \$83 Billion debt, which would just raise hell with the U.S. banks.

After the 1984 elections, the Reagan Administration stepped-up its war in Nicaragua. They mined the harbor in Corinto and blew up the oil depot there. They published a manual on terrorism, sabotage, and assassination.

Over \$100 million of illegally raised U.S. public funds and an undetermined amount of private funds supported illegal U.S. advisors and agents in the infamous National Security Council's Iran-Contra Gate Scandal. Over 12,000 Nicaraguans were killed by this U.S.-backed military intervention. Not to mention the terror and intimidation inspired by these acts.

The transition from the devastation of the Somoza era is eloquently expressed by the fact that Nicaragua earned \$294 million from exports in 1985, but needed to import three times that amount in medicine and other essential articles. In 1985 Reagan declared a trade embargo against Nicaragua, by his special powers as the President--to "protect the security of the United States." This was no small imposition, since 90% of Nicaragua's machinery and equipment had come from the U. S. and parts were now impossible to obtain. Having to find new markets and suppliers alone cost Nicaragua US\$93 million. The current Reagan Administration embargo against Nicaragua is rather selective. It does not curtail all trade with Nicaragua, but deprives Nicaraguan enterprises from obtaining full value for the products. Before the Embargo, almost 20% of Nicaragua's income from trade with the United States came from shrimp exports. Now, since this trade is cut off, INPESCA sells its shrimp to Canadian corporations, which repackage some of the shrimp and resell it in the U.S. under their labels.

Nicaragua attempted to redress this situation of open aggression through international tribunals; requesting a total of US\$1 billion for specific damages. The day after the U.S. Congress voted to aid the Contras with US\$100 million, the United Nation's World Court found the United States guilty of hostile actions. It ordered the aggression stopped and compensation to be paid to Nicaragua by the United States. The United States has refused to abide by the World Court's decision.

In 1985, US\$27 million in "humanitarian" aid was channelled to the Contra's by the Reagan Administration. Over US\$14 million of that aid has vanished and is alleged to have gone into drug trafficking and other illicit activities, carried on by agents of the CIA, the National Security Council, and organized crime. The Congressional vote for the additional US\$100 million in aid for the Contra's occurred in 1985, under much political pressure from the Reagan Administration, but in opposition to public opinion polls of U.S. citizens. This sum equals to all the money the Contra's had received from the Reagan Administration up to that point (45), and has provided an extreme escalation of Contra attacks on Nicaraguans. In addition, the CIA is now authorized to release up to

four-times that amount in training, technical assistance, and logistical supplies to aid the Contra's.

As opposed to the U.S. policies towards Nicaragua, the Contadora Group of Nations (Mexico, Panama, Columbia, and Venezuela) has consistently advocated negotiations and a halt to military intervention. The present peace initiative of Central American leaders has established internal guidelines that promise a potential for peace, and which has been taken up by the Nicaraguan government in its appointment of Cardinal Obando y Bravo to act as negotiator between them and the Contra's. The outrage of U.S. citizens over the blatant deception of the Iran-Contra Gate Scandal has furthered opposition to the Reagan Administration's policies in Central America. The end is not yet in sight.

Appendix D
INPESCA Activities

APPENDIX D

INPESCA Activities

Attending a meeting of INPESCA is like sitting down at a board meeting of Icicle Seafoods in Petersburg--working out everything from the need for a new ice machine, to wage demands by the union locals, and new strategies for increasing fish consumption. There are two markets within Nicaragua --public and private. Eighty percent of Nicaragua's fisheries are handled by middle-merchants of the private sector and 20% are administered by INPESCA. Two divisions of INPESCA run the marketing of fish. ENMAR works the Overseas market, ENDIMAR functions inside Nicaragua.

ENDIMAR is the agency within INPESCA that is responsible for internal fish marketing, it manages the public fish sector, buying fish from private fishermen and then retailing them through the Pescafresca or Pescafrito chain stores. These outlets are an attempt to popularize fish among the Nicaraguan peoples, who have never been big fish consumers (4).

Pescafresca is a fresh fish outlet; ten of them are set up in the public markets of the major Nicaraguan cities. The Pescafresca stands have "Fogel" display cases and freezers for the fish and maintain a relatively high standard of sanitation and quality. Their prices are equivalent to the neighboring private stands, which only consist of a basket of ice and a scales & balance. Although the Pescafresca stands offer fresher fish at equivalent prices, it was said that the private stands tend to have better sales because they allow prospective buyers to feel and smell the fish, which the public sector regulations disallow. The Pescafresca stands have a problem of keeping up with the demand. Although they list a half dozen types of seafood for sale, from lobster to shark, only a couple of species are usually in stock at any one time.

Pescafrito is a seafood restaurant chain in Managua and Granada. There are nine of these very attractive, open-air cafes made of brick and stucco. Although "frito" implies fried food, a wide variety of seafood is offered at very reasonable prices--lobster, shrimp

cocktails, pargo broiled whole, etc. However, like the Pescafresca stands, there is a problem of keeping up with the demand. Often, only a couple of the items on the menu are available at any one time (See Appendix F--Fisheries Economics).

Fish promotion is also done with employers. In a time of such austerity, as today, it is a major benefit in Nicaragua if your place of work provides mid-day meals. INPESCA provides seafood for these food programs.

ENMAR, the export division of the Nicaraguan Fisheries Institute, wholesales shellfish to Canada. Some is repackaged there for sale Overseas, some to the United States. Thus, the Reagan Administration's embargo notwithstanding, the United States is still a prime consumer of the "dreaded socialist shrimp." Such is the contradiction of diplomatic and economic reality. The embargo merely prevents Nicaragua from realizing the full value of their exports in trade with the United States, by forcing them to sell in the United States through foreign middle-merchants, who are oftentimes mere subsidiaries of U.S. owned multi-national corporations. Nicaraguan shrimp are now sold to the U.S. through Canadian corporations and some private U.S. fishermen are reported to still clandestinely fish joint ventures in Nicaraguan waters (See page 20).

SUMIPESCA, assesses the material needs of Nicaraguan fishers and processors, helps acquire the requested gear and equipment, and distributes it to both co-ops and individuals. SUMIPESCA works closely with the *Banca Nacional Desarrollo* (BND--the National Development Bank), which obtains funding for material needs. SUMIPESCA acts as a co-signatory and responsible agency for both the fishers and producers.

While 60% of Nicaragua's economy is through the open market system, a sizable percentage is by co-ops. Co-ops are considered exceptionally important as a framework for fisheries development--as a means to spread out the risks and buffer the losses that are unique to water-based work. Co-ops are organized by several different agencies. INPESCA provides infrastructure and technical resources, the National Development Bank provides credit and accounting help, and two divisions of the Ministry of Labor (the Department of Co-operation and the Center of Capacitation for Co-operation) provide organizational structure. Co-ops are organized under two different laws--the 1971 General Co-operative Law and the 1981 Agrarian Reform Law. Fisheries come under the former, which has created a problem (see page 18 about the co-ops at Puerto Morazan).

The first Centro de Acopio was started in 1983 at Astillero--as a processing and storage center for fish, to aid three co-ops in the area. Shortly thereafter, a similar project was started at Asseradores (see page 10). The purpose is "to create small, self-sufficient enterprises that will sell their distribution to the state" (Conover). This system is intended to increase Nicaragua's fish consumption through promotional programs, which would reduce the nation's reliance on expensive beef that could be exported, thereby freeing up more foreign exchange and increasing the income of workers through an underutilized industry of fishing. This has all been somewhat frustrated by a lack of capital (46). INPESCA has been unable to provide experienced fishermen with much inducement to join a co-op, since they get little as co-operative members from INPESCA, at this stage. However, loans for fishing gear from the National Development Bank are much easier to obtain through co-operatives, than as individual fishers. Still, better equipped fishermen generally remain independent. Given the present poor economy, the government may be the only source of equipment for the poorest fishing people. There will come a time, though, when even the better equipped fishermen will see the advantage in joining co-ops--to get replacements for their depreciating gear.

The inability of the public sector to keep up with the demand for fish is another basic problem. There are several reasons for this. Not enough fish are caught at any one place to maintain a steady supply. The "IFA" trucks that INPESCA uses to pick-up and deliver the fish are larger vehicles than are necessary for the small co-ops that they service. Also, the freezer units on the trucks are in disrepair, so fish are just thrown in amongst flake ice in the back of the truck. Flake ice and gasoline are in high demand and are scarce. In theory, fish are delivered to the Pescafresca and Pescafrito markets once a week from the processing plants and once a day from the fishing co-ops. This scheduling doesn't always work. There are not sufficient ice machines at INPESCA or a sufficient abundance of gasoline to allow frequent trips between the fish co-ops and the markets. This is another reason for the attempt to establish fisheries centers--to consolidate the artisanal fishermen at a few, well-developed sites that can be easily serviced by INPESCA.

Appendix E
Common/Latin Fish Names

APPENDIX E

Common/Latin Fish Names.

Pacific Ocean

1. Pargo--*Lutjanus guttatus*.
2. Curvina--*Cynoscion stolzmani*, *C. reticulatus*.
3. Macarela--*Scomberomorus sierra*.
4. Brunt???
5. Tiburon Mantillo--*Sphyrna lewini*,
6. Tiburon Aleta Negra--*Carcharhinus limbatus*,
7. Cason--*Carcharhinus porosus*, *Rhizoprionodon longurio*.

Lakes

1. Tiburon--*Carcharhinus leucas*.
2. Pez Sierra--*Pristis pectinatus*, *P. perotteti*.
3. Gaspar--*Atractosteus tropicus*.
4. Mojarra--*Chichlasoma citrinellum*.
5. Guapote--*Cichlasoma dowii*, *C. managuense*,
C. friedrichsthalii.

Appendix F
Nicaragua Fisheries
Economics

APPENDIX F Fisheries Economics.

(NOTE: The exchange rate and inflation change extremely rapidly. The figures used in this section, and in this report as a whole, are those at the time of our survey in Nicaragua in January and February of 1986. Much has changed since then.)

It is difficult to thread your way through the exchange rates to arrive at comparisons between U.S. and Nicaraguan buying power. There are five official exchange rates that are used on different occasions. As of February 1986, seventy cordobas to the dollar was used for overseas transactions. At the government exchange houses you can obtain C\$750 for a U.S. dollar. The black market will pay as much as C\$1200 for a greenback. U.S. banks, following the Reagan Administration's lead, pay only a fraction of the minimum Nicaragua rates for cordobas. Food is subsidized. You can eat on a dollar a day in Managua. Imports are very expensive. A roll of Japanese color film that would sell for US\$4 in Chicago will cost C\$5,000 (US\$6.70) in Managua--a week's wage for a secretary. A wristwatch will cost a crew-member two month's wages. A round trip ticket from Anchorage to Managua will equal the annual income of five blue-collar workers. A house will rent for C\$1200 a month or sell for C\$1,000,000. But, there is not the wide disparity of incomes that occurs in the United States. A middle level administrator makes only twice as much as a secretary in Nicaragua, whereas in the Alaska s/he would make up to five times as much. All this is complicated by a 300% inflation rate.

INPESCA wages (Cordobas per month):

Regional Administrator-----	C\$50,000	US\$67
Fisheries Biologist-----	35,000	47
Fish Inspector-----	27,000	36
Secretary-----	20,000	27
Cold Storage worker-----	12,000	16
(for a six hour day)		
Janitor, Pescafrito cafe-----	11,000	15
Vessel Captain-----	18,000	24
Engineer-----	16,000	21
Crew-----	15,000	20

On the Pacific Coast, where a private marketing sector has successfully developed, there are advantages to fishing privately. If you both catch and market your own fish, then it is worthwhile to enter the private market --you can make C\$100/pound for the shark you caught. If you sell to a private buyer who comes through your village in a truck, he will pay the fisherman C\$30/pound and will wholesale it in the city for C\$90/pound. It will be retailed in a public market for C\$120. If you sell to INPESCA, they will pay you C\$35/pound and will sell it at the public market for C\$100/pound. At a restaurant in San Juan del Sur, we had a plate with a 1-1/2 lb. Bargo and vegetables for C\$600; the owner had bought the Bargo for C\$100/lb.

Prices for fish sold to the public sector are set in meetings between INPESCA, the fish co-ops, and private fishermen. With a co-op, after the gas price is deducted, 2/3's of the fish sales goes to the individual fishermen and 1/3 goes to the co-op. According to the best estimates, from the fresh continental waters of western Nicaragua: 36% of the catch is sold directly to consumers, 47% to retailers, and 17% to wholesalers.

As in other parts of Nicaragua's economy, primary items are subsidized by the government. For example, without a subsidy on gasoline, a fisherman could not afford to go to sea. These subsidies are further allowed by international assistance. If the Soviet Union did not provide gasoline at such low rates to Nicaragua, Nicaragua could not pass on such low rates to the fisherman. Such subsidies cannot be kept up forever, and other methods of reducing the costs must be found. In the case of petroleum consumption by fishermen, this means getting the fishers used to fishing more economically, with smaller motors--after being accustomed to higher speed outboard use. (Revoid).

Appendix G
Nicaragua Artisanal and
Industrial Fisheries Needs

Nicaragua Fisheries Gear Needs & Projects.

(Please note that this is only an outline of projects and gear needs. We have a much more detailed report that is available, and new ideas are welcome).

Gear Needs

Outboard Engines:

25 horsepower Evinrude & Johnson outboards are the most common; 8, 10, 15, 18, 35, and 40 hp. are also used, as well as the occasional Mercury and, lately, Yamaha 40 and 50 hp. Long shafts are used for ocean fishing. Any and all engines can be used. Even broken engines are useful to cannibalize parts from--especially water pumps, impellers, props, and lower units that get damaged during the spring rains that put a lot of debris and sand into the water and from beach landings.

Nets:

The nets most in use are approximately 300-600 feet long by 12 feet deep; 4-6 inch mesh; 3/8's-5/16's cord; clear nylon monofilament and colored multifilament. These are tangle nets that catch everything from bluegills to hammerhead sharks--virtually any net will help; the local people cut and weave nets to their local needs. The fishers also need twine, weights, buoys, anchors, lines, net-weaving bobbins, etc. The industrial fleet is in need of standard shrimp trawl nets & gear.

Miscellaneous:

Hooks--#4, 5, 7, 8-13, and 2 inch shark hooks.

Lead sinker weights--2 ounce.

Spark plugs (to match the above engines).

Line--1/8th, 1/4, 5/16's, 3/8's, 7/16's, and 1/2 inch polypropelene.

Axes, hatchets, adzes, cross-cut saws, buck-saws, handdrills, augars, planes, etc. for boatbuilding.

Chainsaws and their maintenance kits.

Boat winches.

Plastic cannery gloves, aprons, and sleeves, filleting knives, stones & steels.

Furuno electrical testing apparatus--see list on page 8.

Gas welder.

Compressor for sand blasting.

Radios--cb's, am sets, VHF, batteries, generators, etc.

rods and reels and fishing line for jigging.

Marine Paint (in large quantities; for the steel-hulled, industrial shrimp boats--there is no marine paint in Nicaragua).

Vehicles for ice & fish transportation.

Floats (Y-17) and weights.

Rolls of Hex-18 wire for lobster traps & *18 galvanized wire.

Volkswagon or chainsaw lumber mills that would allow lumbering in the back-country.

Steel rods to make harpoons for fishing.

Outboard repair kit--see Conrad's list on page 7.

Pocket calculators.

Fisheries literature and articles for the aquaculture section of the Ecology Department at the University of Central America in Managua and the Fisheries Library at INPESCA--see Project 6 on page 6.

Lobstering gear--see Ingrid's list on page 7.

INPESCA Research Gear:

Limnology kits--water quality, reagents, etc.

Laboratory gear & chemicals--detailed list can be provided on demand.

Diving gear--fins, snorkels, masks, tanks & regulators.

35 mm Cameras, slide projectors, film (b/w or color prints).

English-Spanish dictionaries & learning courses (cassettes & written)--most fisheries research is published in English.

Projects:

1). **A central outboard repair shop on each coast.** The outboard engines that we collect and send to Nicaragua could be disassembled there and warehoused at two central shops--one on each coast. When an engine breakdown occurs in a village, the engine would be sent to the nearest shop, where it would be repaired and returned. Such a shop would also be used to train fishers in outboard mechanics, so they could eventually do their own repairs in each village. In addition to the second-hand engines that we find, we're looking for:

- a). Tools, building supplies, and money for getting the two shops built. (Nicaragua has the construction workers).
- b). A volunteer outboard mechanic and warehouseperson, who can speak Spanish--to set up such a shop and train local technicians and fishers.
- c). Tool kits to repair outboards (see the list of "Conrad's Outboard Repair Kit", on page 7). Tim Feller, in Anchorage, tells us that \$15 will buy one of these kits at Costco.

2). **A re-outfitted electronics repair shop at the ALINSA shrimp processing plant at the port of Corinto.** The one that they have there is an open shack, on a wharf, over the ocean. It needs to be insulated from the elements, so corrosion won't hurt the equipment. So, just like the repair shop in item #1, above, we need money and building supplies for the shop, an air-conditioner to filter out the rust-causing sea air, all the Furuno electronic testing apparatus listed on page 8, and a volunteer marine electrician to help set the new shop up.

3). **Corrosion control for the industrial fleet.** Their industrial shrimp vessels lack material for the control of corrosion. Money that is donated for this project could be used to buy zincs or electronic corrosion control systems. Zincs sell for about \$2 per pound and about 350 pounds are needed every two years on each vessel. There is an alternative to such expensive zinc replacement--an electronic corrosion control system for each vessel that would cost about \$4000 and would pay for itself in six years. This project could work as "save a shrimp boat"--where a community could "adopt" a vessel to help. Unless something is done soon their boats could start to sink in 2-3 years. It's easy to say that this should be a priority of the Nicaraguans to fund for themselves, but the present Contra-war prevents the bucks from going to fishing people.

4). **A Fisheries Tour of Nicaragua.** We will arrange a tour for fishers, cannery workers, biologists, divers, fisheries administrators, and other interested parties to go on a tour of Nicaragua's fisheries sites. It would be a fantastic opportunity to visit the plants, talk to researchers, to go fishing with local villagers and the industrial fleet, meet the administrators of the Nicaraguan Fisheries Institute, swap information with the international fisheries aid personnel around the country, and get a hands on feel of how fishing is developing in a new country.

5). **Information for Joint Ventures and Technicians.** For those who might wish to work in fisheries in Nicaragua or engage in joint fisheries venture, we will provide the contacts for setting such a project up. Those seriously interested in joint fish ventures would need to develop a specific draft contract for presentation. Technicians are needed in certain fields such as outboard mechanics, refridgeration, and marine electronics, but they need to speak Spanish and have a resume. If interested, we will put technicians in touch with the proper Nicaraguan agencies.

6). Fisheries Information exchange and coopertaion. For those involved in fisheries research or library science, we would like to help provide a mechanism for information exchange between researchers and libraries, as well as for cooperation between fisheries institutions--for example between aquaculturists or commercial fishing associations. Those interested should contact us with suggestions.

In addition to the above gear and projects, we are in extreme need of money to ship the material to Nicaragua. For every item that you donate, if you could raise some money for shipment, that would be a huge help for us.

LISTS

Conrad's Outboard Repair Kit:

Set of wrenches & 3/8's inch sockets:

- American
- Metric.

3/8's inch impact wrench.

3/8's inch torque wrench.

Set of slotted & phillips screw drivers.

Set of crescent wrenches.

Spark plug wrenches & gap gauges.

\$2.00 spark test probe.

Flywheel pullers for Evinrude & Yamaha outboard engines.

Pliers.

Ballpeen hammers--10 oz., and 16 or 20 oz.

Ingrid's List of Corn Island Lobsterman's Needs:

2 barrels of fiberglass and hardener.

400 gallons of copper bottom paint and oil paint.

Heavy rubber gloves.

Lobster trap wire.

2-1/2",3",4", 5" galvanized nails.

Weather jackets.

Divers gear.

Alinsa

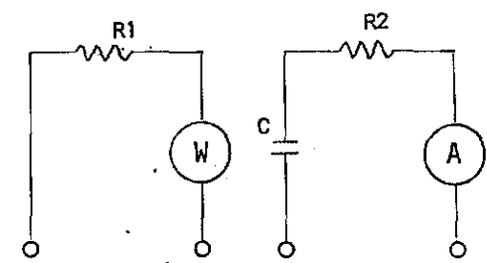
Chapter 2. ADJUSTMENT

* = Most important

Necessary Testing Instrument

Name	Specifications	Recommended Model	Purpose
* Multimeter	DC: 0.25V - 1kV (10 kohms/V) AC: 10V - 1kV (5 kohms/V)	Sanwa K-30D11	General Volt- age Check
* Frequency Counter	Freq. Range: 10Hz-100MHz Sensitivity: 25mVrms	Takeda Riken TR5142G	Freq. Check (Tone, IF, CH freq. etc)
* Oscilloscope	Bandwidth: DC-100MHz Sensitivity: 5mV/div	Sony Tektronix Type 465	BM, Osc. wave- form & Digital cct Check.
HF Signal Generator	Freq. Range: 50kHz-50MHz Output Level: -24 to +132dB	Anritsu MG439A1	Rx Sensitivity Check
Precision RF Voltmeter (VTVM)	Volt Range: 1mV-100V dB Range: -60 to +50dB (Input impedance; more than 10Mohms)	Anritsu Model ML-69A	Rx/Tx Level Adjustment
Extension Board (option)	 Type: 05P0017 Code No.: 05P-001-702		PCB Check
Trimming Tool	Non-Inductive screwdriver		POT's, Trimmer, Transformer Adjustment.
Dummy ANT.	1) Wattmeter with 50Ω dummy -- 50Ω ANT. 2) MF: 5-50Ω + 200pF -- Reactive ANT. 3) HF: 50-400Ω		RF Power Check

30-50 Millihertz Oscilloscope would be okay.



R1: 50Ω, 200W
W: Wattmeter 200W
(or RF ammeter 2A)

C: 200pF, 3kV
R2: 5-50Ω, 200W
A: RF ammeter 5A

If available, the following instruments will be useful for accurate adjustment or measurement.

- * AF Signal Generator with Attenuator
- * AF Voltmeter
- * Distortion Meter

8 of 7

Appendix H
Types of Artisanal
Fishing Gear

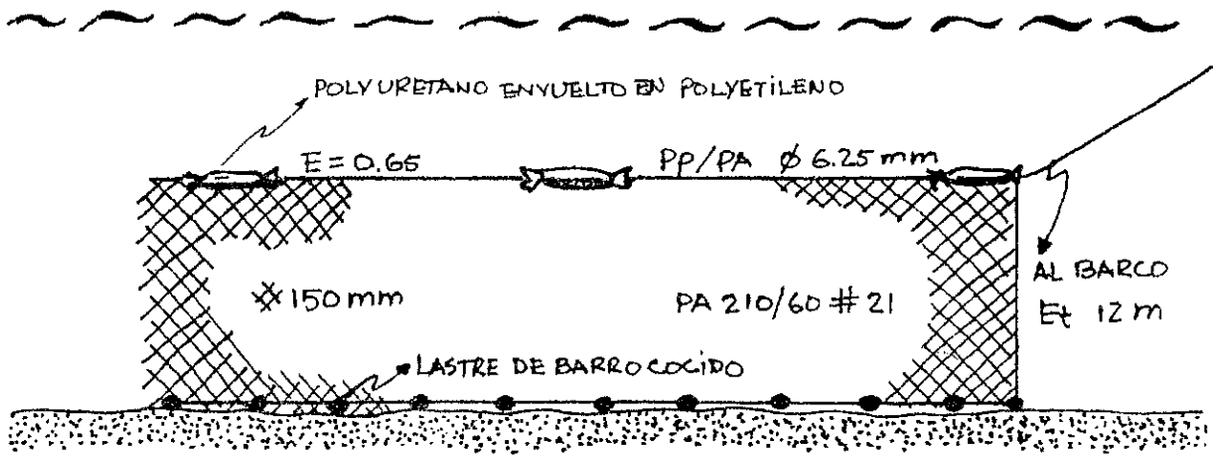


FIG. 1.- ENREDADOR DE FONDO PARA LA CAPTURA DE PEZ SIERRA.-

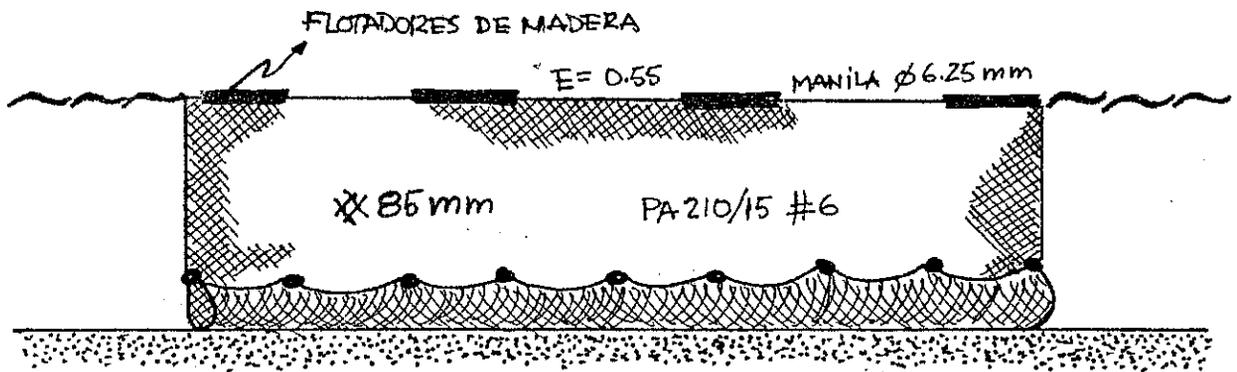


FIG. 2.- ENREDADOR DE BOLSO (CHINCHORRO).-

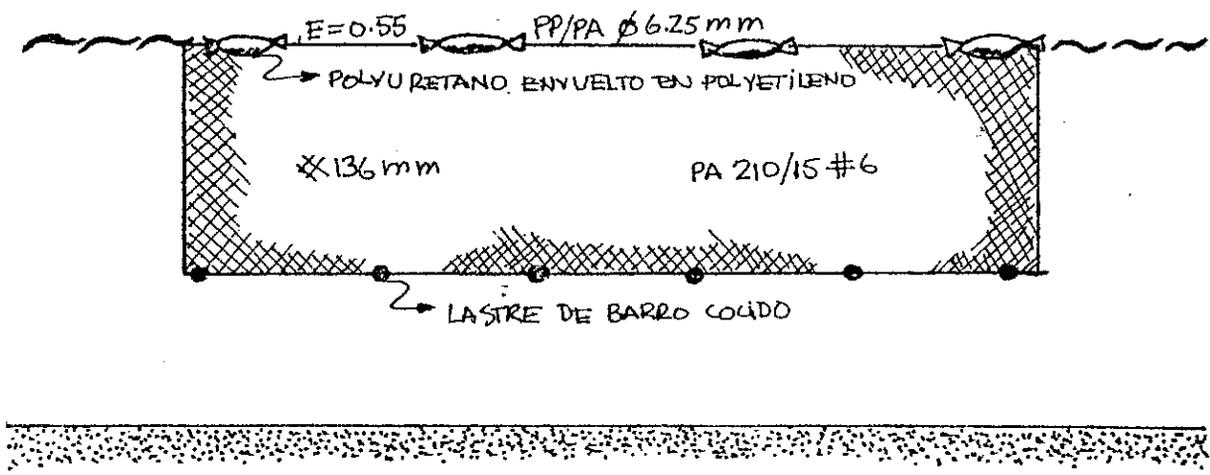


FIG. 3.- ENREDADOR DE SUPERFICIE.-

FIG. 5.- PALANQUE RUDIMENTARIO USADO EN EL LAGO APANAS

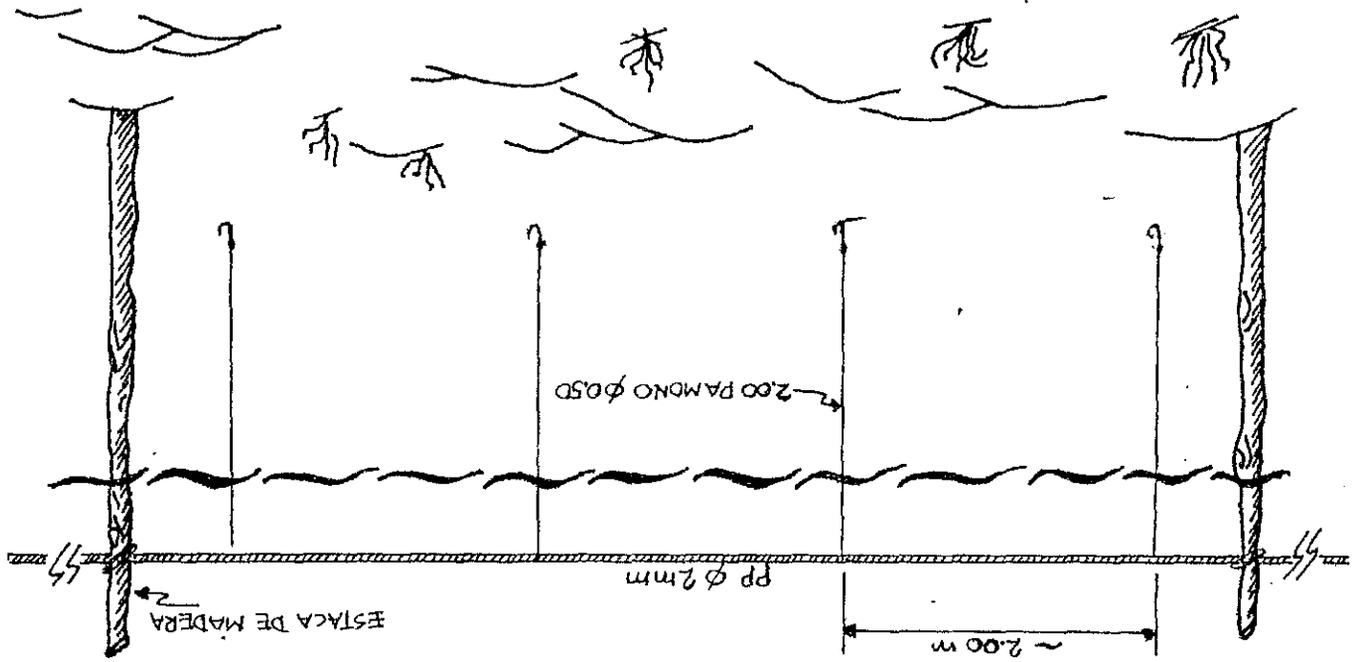
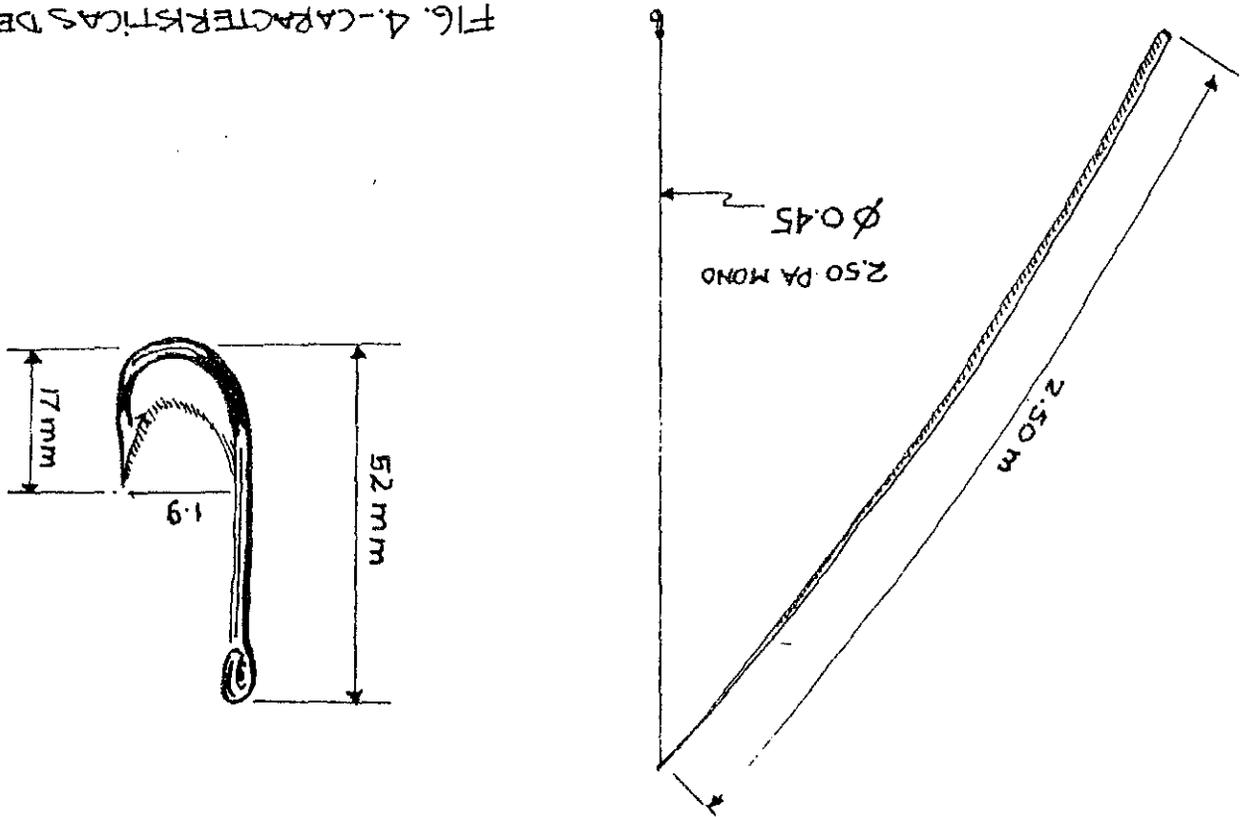


FIG. 4.- CARACTERÍSTICAS DEL EQUIPO PARA PESCA FONDEADO (ANZUELO, LÍNEA Y PÉRTIGA).



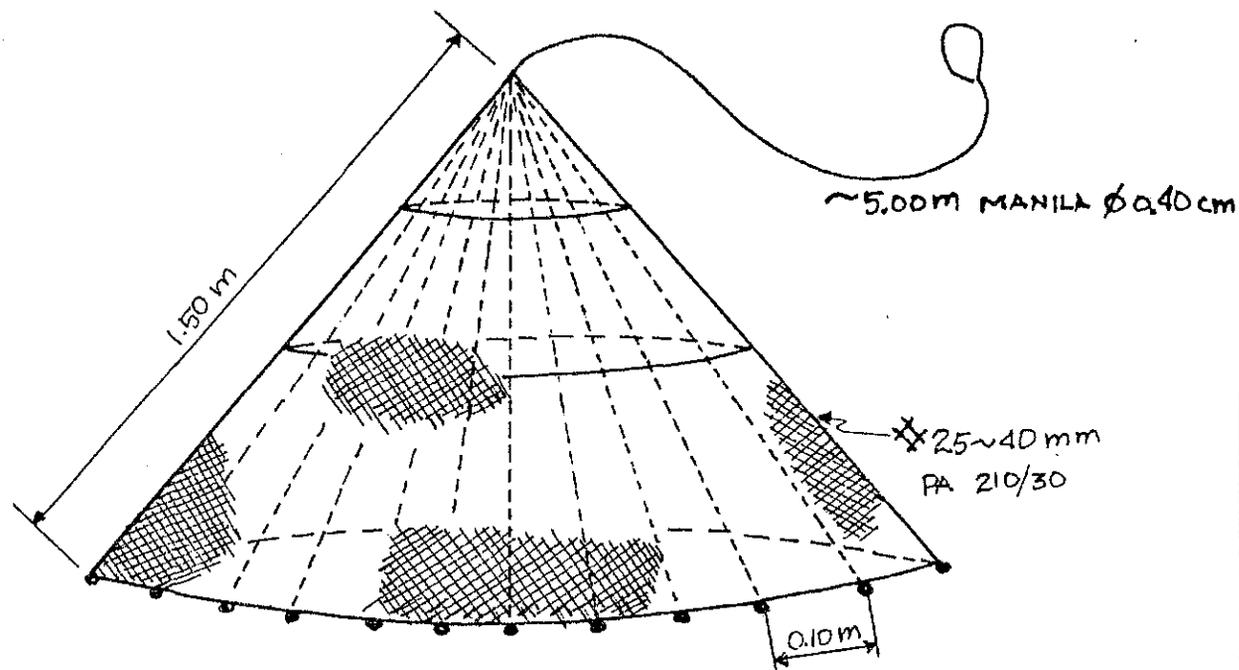


FIG 6.- ATARRAYA -- RED CIRCULAR PARA AGUAS SOMERAS.--

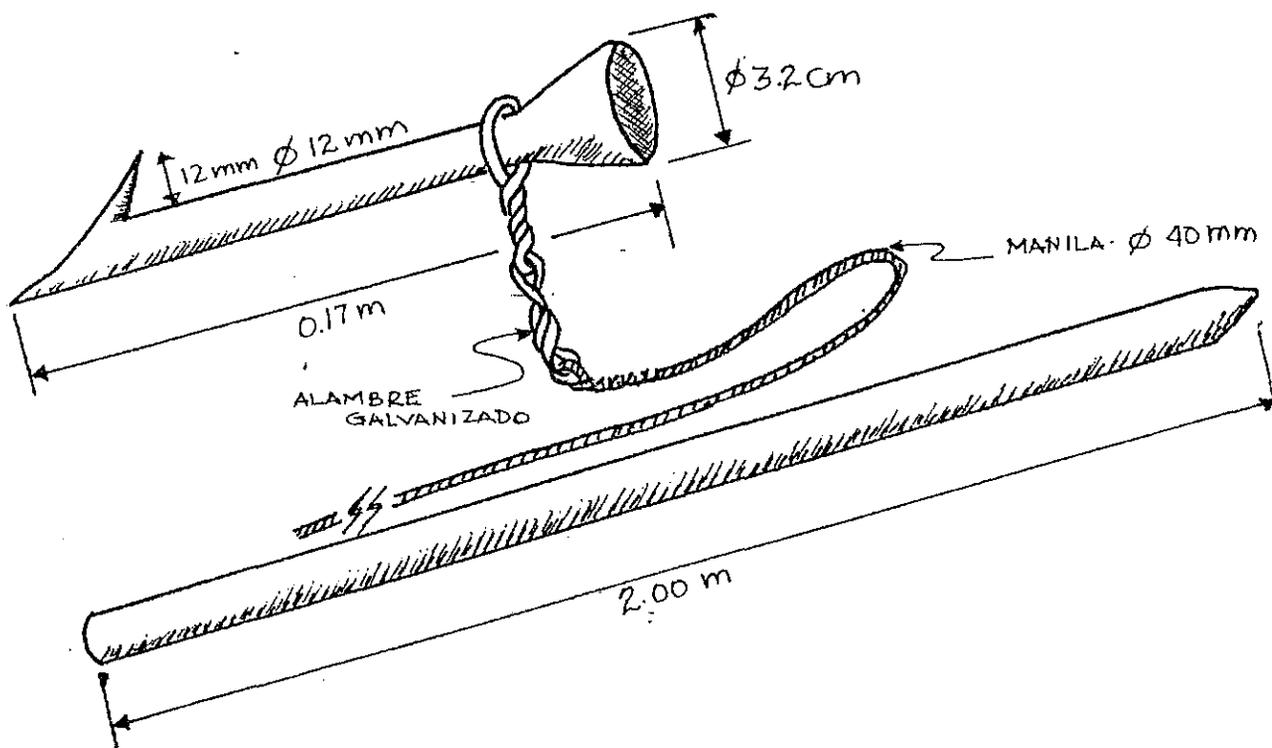


FIG. 7.- ARPÓN Y PÉRTIGA PARA PESCA DE GASPAR.--

Appendix I
International Agencies
Assisting
Fisheries in Nicaragua

APPENDIX I

International Agencies Assisting Fisheries in Nicaragua

Canadian University Students Overseas.

OXFAM Canada, OXFAM England, OXFAM America.

Tools for Peace, Canada.

United Fishermen and Allied Workers Union, Canada.

British Columbia Federation of Labour, Canada.

Norsk Folkehjelp, Norway.

Pan Para del Mundo, Germany.

Manitese, Italy.

Nicaragua Fisheries Project, Alaska.

Food and Agriculture Organization, United Nations.

Latin American Economic System (SELA), Latin America.

Appendix J
Nicaragua
Sister-Ports

APPENDIX J

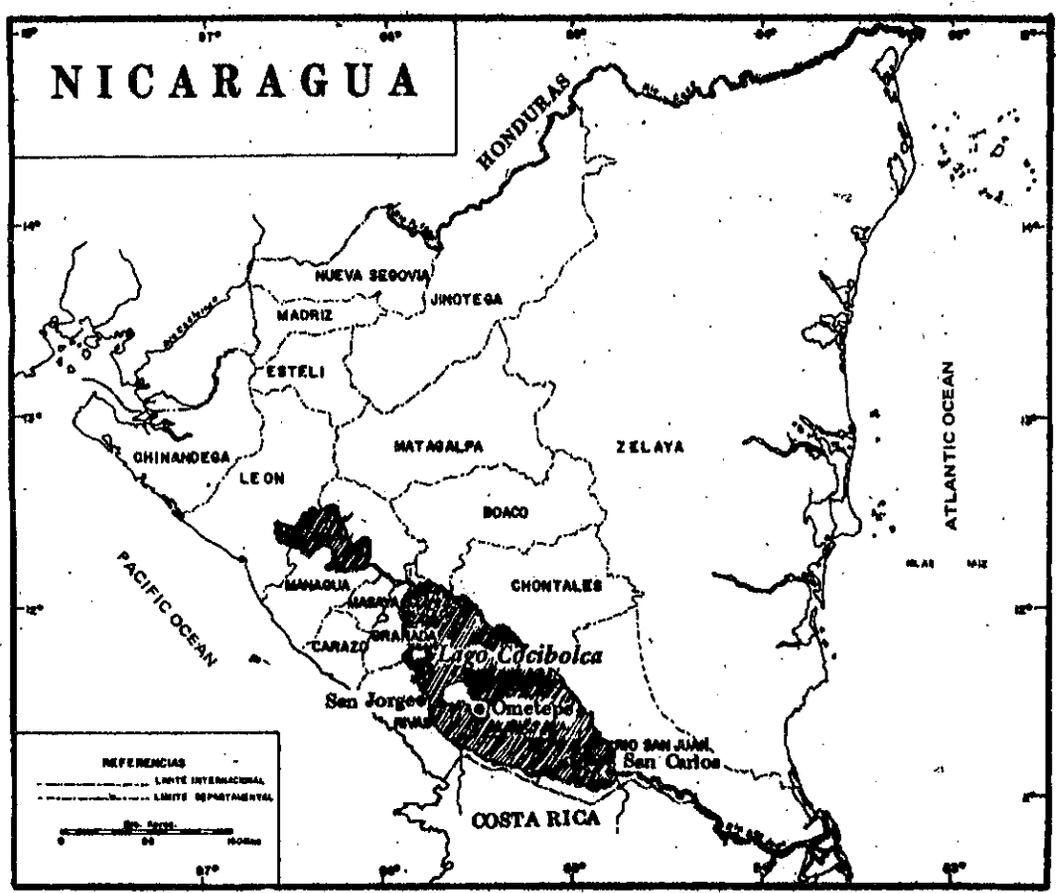
Nicaragua Sister Ports

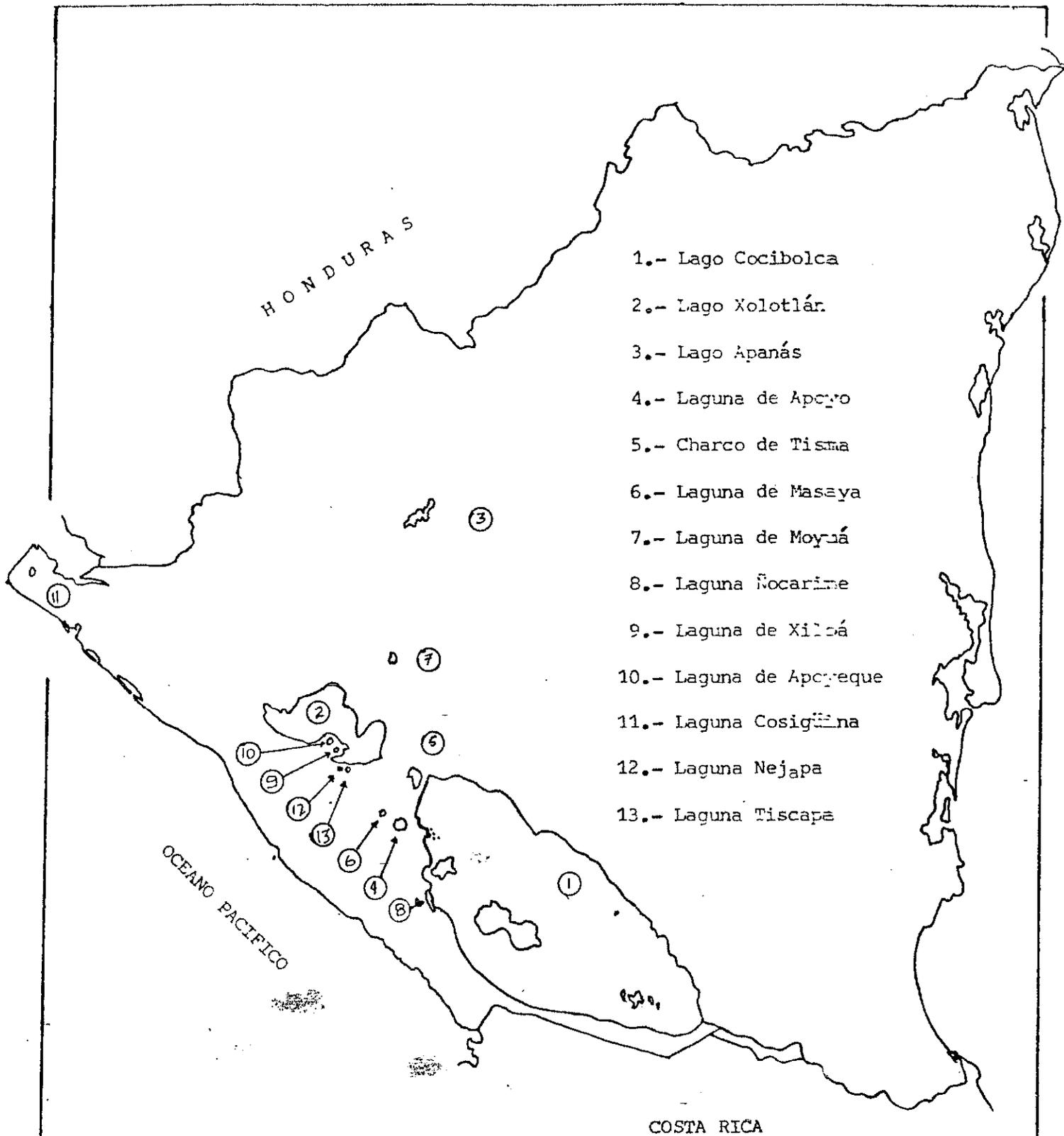
Bristol (England)-Puerto Morazan
Burlington (Vermont)-Puerto Cabezas
Hesse (West Germany)-Nicaragua
Hull (England)-Cardenas
Indiana (USA)-Nicaragua
Lower East Side (New York, USA)-Bluefields
Portland (Oregon)-Corinto
Montclair (New Jersey)-Perlas Lagoon
Seattle (Washington)-Managua
Washington D.C. (USA)-Bluefields
Wisconsin (USA)-Nicaragua

Appendix K
Nicaragua Maps

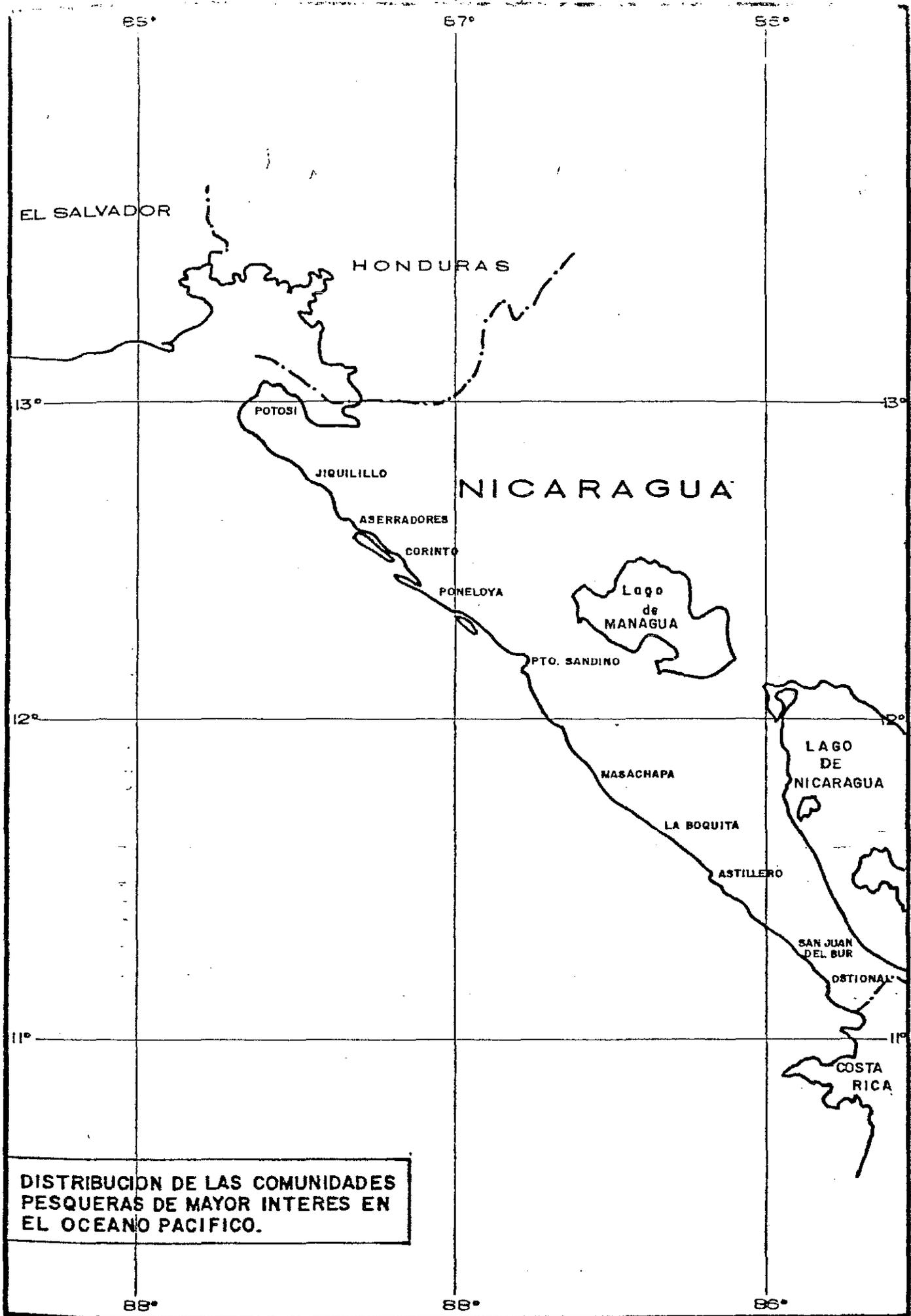
APPENDIX K.

MAPS.





.....
 MAPA Nº 1.- AGUAS CONTINENTALES EN NICARAGUA.-



DISTRIBUCION DE LAS COMUNIDADES PESQUERAS DE MAYOR INTERES EN EL OCEANO PACIFICO.

July 28/1971

FOOTNOTES

FOOTNOTES

1. Fish co-ops did exist before INPESCA. Somoza claimed to have encouraged grass-roots economic activity by allowing co-ops in agriculture, timber, and other resources under the 1971 General Co-operative Law. However, many of these co-ops existed only on paper or failed due to an externally imposed structure. Four co-ops had existed for fisheries, with three on the Pacific Coast. By 1976, all of them had dissolved (Conover). Since foreign aid agencies require a governmental structure into which they can channel assistance, Somoza's co-op bureaucracy, as it turned out, had funneled much international development money into his private accounts overseas. Nor had Somoza's government performed either fisheries research or management; his regime had no fisheries department. Seafood had been taken from the water solely for profit--without a thought given to maximum sustained yields, harvest quotas, or multiple resource management. The departments of biology at Nicaragua's universities had done fisheries research and projects, though. Many of these academic pioneers joined INPESCA at its creation after July 1979.

2. "Fish," in Nicaragua, refers only to finfish like mackerel or shark, while other waterlife like shrimp and lobster are called by their specific name.

3. Coffee and cotton are examples of non-staple resources which are dependent on the vicissitudes of a world market. In 1986, Nicaragua made a windfall gain of C\$80 million because of the failure of the competing Brazilian coffee crop, but they lost almost as much on cotton because of a world-wide glut.

4. Even today, fisheries development does not receive the proportional government interest or funding that, say, agriculture does. INPESCA has the authority and responsibility of a ministry, but not the resources or finances of one. An overall decrease of fishing co-ops has resulted since responsibility for fisheries was transferred from IRENA to INPESCA in 1982. Shrimp and lobster exports had been developed in Nicaragua, which is why INPESCA was originally established--to manage this valuable export resource, but small scale fish coops were an after-thought, added on two years later. Small scale fishing has always been considered a localized, sporadic, and non-commercial enterprise. Fishing villages, on

the average, have a lower standard of living than agricultural communities; and as of about 1973, agricultural co-ops receive loans at 8-11% interest, while fishing co-ops receive only 12% loans. This disparity occurred for several reasons.

It is to Nicaragua's advantage to provide incentives to the most dominant sector. Agriculture supplies 75% of Nicaragua's total export earnings and 42% of the total employment, while fisheries count for only 7% of earnings and 1% of employment. Co-ops for fisheries and agriculture are organized under different co-operative laws. And, although INPESCA uses co-ops as a basis for their small scale fisheries development, the Nicaraguan government has established a priority of assistance for co-ops that will substitute local materials for present imports--like textiles, concrete manufacture, etc., instead of fish. Fish has never been an import for Nicaragua. (Conover). The polarity between agriculture and fisheries is also due, in part, to tradition. Latin Americans do not eat much fish, even in the midst of good fishing grounds, except for the traditional salt fish during Roman Catholic Holy Week. Nonetheless, attitudes about fish are changing in Nicaragua, as this survey elaborates.

5. The vessels are being repaired now and will be used in the future as craft with which to test new fishing gear. This experience at Asseradores emphasized the importance of sponsoring technologically appropriate projects such as the fisheries center at Perlas Lagoon (See page 26), which will draw heavily on traditional Caribbean experience in boat building.

6. At the time of the 1979 Victory over 50% of the population of Nicaragua could neither read nor write. This had been a way for the Dictatorship to maintain its power structure. If people couldn't read or write (radio technology being out of reach), then the communication of dissent and the organization of opposition was slowed down. When the Sandinista's came to power, one of the first things they did was to send teachers into the countryside. Over the last seven years their Literacy Campaign has increased the number of Nicaraguans who can read and write to 90%.

7. Such a team would consist of 2 biologists, a co-op promotor, a net maker/gear technician, and a fisherman.

8. "Artisanal" is a word that U.S. fisheries administrators would do well to adopt. It encompasses both subsistence and small scale commercial fisheries.

9. "Enterprise" is a generic word in Nicaragua that refers to any organized operation--whether run by individuals, co-ops, or the government.

10. The old Ministry of Health was an example of such problems. Some of the doctors, administrators, and other workers dragged their heels on implementing the public health program. Warehouses full of medical supplies became filled, but not disbursed. Incompetence, blackmarket-eering, and desire for private practice had all led to this blockage. In 1985, when the situation became apparent and unresolvable, the entire administration of the Ministry of Health was replaced.

11. This reflects a basic situation in Nicaragua--men and women walking "out of the jungle" to become ambassadors and administrators after years of hardship, warfare, starvation, and illness. The new Nicaraguan government does not have the centuries of experience in administrative and diplomatic functions that are common to European and North American government. This is the real reason that the new Nicaragua is considered a "revolution"--it is a revolution of everyday people running their own programs and learning by their own mistakes and successes.

12. A number of seafoods are not yet major market items, but INPESCA is looking at them for potential development. A joint venture was recently signed with the Russians to catch tuna and sardines, the only migratory species in Nicaraguan waters, and INPESCA hired a Canadian consultant this year to research potential resources and markets. There is talk of developing larger markets for crab, squid, eel, red snapper, oysters, shark, and conch (of which the Hondurans are very fond). These ideas of diversification are not new; a Japanese man came to the Bluefields area to check out a dungeness-like crab about ten years ago. He developed pots for catching them. Sergio Martinez, Chief of Research, reported that this man came away very happy with the shellfish he had located, but he kept his information secret--so secret that no one knows to this day what he found or the type of pots and techniques he developed. That research will have to be done over again. It might be awhile before all these potential fisheries can be developed because of the lack of available funds.

13. Monoculture is the reliance of a country's economy on one, or at most, a very few crops--to the exclusion of all else. A series of exportcrops have come into fashion and gone out of fashion in Central America. With the development of the mechanical loom in Great Britain in the late 1700's, resources for the cotton industry came into high demand--cotton,

indigo and dye barks. Then the closer and cheaper cotton of the southern United States supplanted Central American cotton and synthetic dyes displaced organic dyes around 1850. Coffee became an important crop in the late 1880's, then bananas followed around 1900.

The typical pattern of monoculture in Central America is as follows. As the rich landholders saw money could be made with each of these products, they expanded their lands and control of workers--with government assistance. The expanded production of the cash crop reduced the amount of food crop production. Food had to be imported and only kept the workers at starvation level. The increase of the export crop led to an over-supply and a decrease in demand, and therefore in the price paid for it overseas, which led to a further crop expansion, a further price drop, and a further dependence on food importation. In this way, many of the staples and basic goods, such as leather, that each Central American country had once produced for themselves, were abandoned. They then had to be imported. The imports were more costly than the locally produced items. Fewer people could afford what everyone once could. The cash crop became concentrated in fewer hands and those hands came to hold the reins of government and military. Hence, this loss of self-sufficient diversification has directly led to the right-wing dictatorships, which have automatically aligned themselves with the First World consumers of their products. In this way, monoculture creates revolution.

14. Before the U.S. government placed a trade embargo on Nicaragua in 1985, shrimp made up 19% of Nicaragua's commerce with the United States. Since the Embargo, Canada has become the primary importer of Nicaraguan shrimp.

15. The custom in Nicaragua is to use an acronym for the plant's name. However, many folks have forgotten what the abbreviation stands for!

16. For every 12 pounds of shrimp that are caught by the industrial fisheries, it's estimated that 88 finfish are lost--about 11,000 tons per year.

17. The inexperience of Nicaragua with commercial fisheries produces difficulties. It was reported that the 12 Peruvian draggers had technical problems that went unnoticed for a long time.

18. The plant manager at the ALINSA plant read enough English to decipher Sharman's T-shirt about ending violence to women. While the Sandinistas outlawed capital punishment, they have made it a mandatory six months in prison for any man that hits a woman. Nicaragua is known for having a progressive penal system.

19. The rural pond project is an ecologically balanced system of water use. Water, during the dry season, is a precious commodity. The *campesinos* build a small pond, 20 x 40 feet, of banked earth. Water from the mountainsides is channeled through livestock pens (where it picks up nutritive wastes), flows into the fish ponds, and then out into crop lands. Thus, the water nourishes the wild mountainside flora, cleans domestic animal pens, feeds and nourishes the fish, and goes on to irrigate crops--before flowing into the rivers and ocean: efficient multiple-use conservation. After two years, the ponds are drained and the fish harvested.

The large reservoirs are almost all associated with large irrigation projects for the sugar cane crops--permanent man-made lakes. The reservoirs vary in size from 15 to 32,000 hectares in surface area. About 60% of the reservoir is used for fish rearing, while 40% is drained for irrigating the cane fields. The fish are harvested by gillnet.

20. Estimates are different for different projects--varying by food, density, species, etc. Take an example. Tilapia, after four months growth at the aquaculture station, will weigh almost half a pound--about the size of a small bass or perch.

21. The slide shows were organized through the help of the *Canadian University Services Overseas* (CUSO). Cuso has been described as the Canadian Peace Corps. It has 600 volunteers working overseas in 30 different countries; 15 work in Nicaragua in projects varying from dairies to soil science.

22. In *salinerias*, low coastal land is flooded and dammed. The salt slowly dehydrates out of the trapped water under the sun's heat, is collected, and then sold.

23. Twenty-five vessels were bought with US\$ 7.5 million of credit from Mexico and five with US\$500,000 credit from Peru.

24. The Miskito Indians call shrimp "sea worms" in their language and only eat them as a back-up food to their staple of turtle. This cultural tradition would mitigate competition with the industrial fleet but for the development and desire for a cash economy and the items this economy can buy.

25. The Miskito Indians on the islands are temporary workers at the fish plant.

26. Prior to 1985, U.S. fishing vessels worked in joint ventures with Nicaraguans, docking and making arrangements ashore. Since the Embargo, four U.S. vessels pay US\$12,000 per year to catch shellfish on the Atlantic Coast, but they don't dock now, in order to meet the technicalities of the Reagan Administration's embargo.

27. If they land more than 45,000 pounds in a year, the whole crew gets a bonus of C\$200,000 to divide between themselves, as well as further bonus' for each 5,000 pound increment above 45,000 pounds. There are additional incentives for crews that burn less fuel, the best fisherman, etc. Similar programs exist for the land based fisheries workers. Last year, a machinist won a new house. This system might well be more exemplary and localized. It has been said that there are a lack of individual incentives on the Pacific Coast.

28. There is a significant lobster and shrimp processing facility on Isla Roatan in the Bay Islands of Honduras. The Honduran fisheries have greatly declined in recent years. Many boats that work out of the Roatan plant fish in the rich Nicaraguan waters. Although, if caught, it means confiscation of the boats and the return of the crew to Honduras; many of the Roatan fishermen consider it a worthwhile risk. There are few Nicaraguan patrol boats bothering fishermen, because Nicaraguan efforts are diverted by the Contra-war.

29. The United States "gave" the San Andres Islands to Columbia in partial compensation for taking the 1914 Panama Canal Zone. The San Andres Islands fall within the 200 mile limit of Nicaragua, but its Columbian ownership isn't disputed.

30. As in Alaska, where local people use the original Athabaskan Indian name of Denali, rather than the recent name of Mt. McKinley; the original Indian names of these three lakes are now preferred in Nicaragua.

31. Native interactions have been complex since European entrance into this area. Native "insurgency" is not as clear-cut as the Reagan Administration would have us believe, neither now nor in the past. The Sumo's were once the dominant society on the Atlantic Coast, but suffered geographic dispersal and relocation away from the coast, at the hands of the Miskito Indians, who became armed clients of British merchants in the 19th century. Today, the phrase "anti-Sandinista insurgent" can mean many things, from Fourth World autonomy to brigandage. For example, a nightclub owner from Bluefields complained about bandits in the area, posing as Contras, who, for an outward display of ideology, can get free U.S. equipment, arms, money--and then hold-up the local people to robbery and extortion. This concierge considered both these bandits and the Sandinistas to be equal nuisances.

32. Momotombo is the site of a German/Italian geothermal electrical generation project that became famous under Somoza when he sold the volcano three times and pocketed the money from each sale. The initial German project failed, but is being finally completed with Italian aid, since the 1979 Victory.

33. Turtles were the backbone of Miskito subsistence, shared out in very established cultural tradition. When the English first came to Nicaragua's Atlantic Coast in the 1700's, they learned how to hunt turtle. Markets developed for turtle meat and the ingredients of turtle soup. Natives from other English colonies in the Caribbean came into the Miskito territory and hunted turtles, under contract with the Somozas' government. The turtle populations dropped. In the late 1960's, the foreign hunters were excluded, but two foreign companies based in Puerto Cabezas and Bluefields hired the Miskito Indians to hunt turtles. This created a major internal conflict between subsistence and cash economies. The new Nicaraguan government, after the 1979 Victory, has adopted a conservation program for the remaining turtles (Nietschman).

34. Other shipyards are in Nicaragua. For example, the Diamond Shipyard, near Granada, is a collaboration between the Dutch government and the Nicaraguan Port Authority. They are building transport vessels.

35. Schools, health clinics, power stations, fish plants, and other community services have come under attack by the Contras. It is customary for the local militia to post personel at the entrance to public facilities--to act as guides, as much as guards.

36. A lack of adequate harbors on the Central American Coast is a major problem. Often, ports merely consist of docks stretching out from a beach or a lighter service. Recently, the merchant ship, "Monimbo," which had been donated by Cuba, washed up on the beach at San Juan del Sur. It was rescued and is being repaired with assistance from Panama.

37. The Wisconsin State Journal reported, in their edition of 30 June 1986, that Soviet and East European engineers were in Nicaragua surveying ports where Soviet warships could dock. The ports they named were all fisheries sites and the construction projects were in aid to shipping and fisheries. Such reportage was as if Pravda had reported that Juneau City is the site of warship facilities because we have a U.S. Navy vessel dock here every Fourth of July for the annual celebration.

38. They operate in Africa, the Middle East, and Latin America. Their funding comes both from public donation and the Norwegian government. During the start of Ethiopian famine relief, *Norsk Falkehjelp* needed a way to get food and equipment to off-road areas. So, they sponsored a "Buy a Camel" campaign amongst Norwegian school children, which was very successful. Kids from many schools pooled their money and bought several \$600 camels for *Norsk Falkehjelp*.

39. The problems of single mothers is a major one throughout Nicaragua. Although many men were killed in the Revolution, the problem goes beyond wartime casualties. More than 50% of mothers in Managua are single, the majority having been left by husbands or partners. There is a lack of birth control devices; families tend to be large. Women end up trying to be both mothers and bread-winners, and children have large responsibilities thrust on them at an early age.

40. Nicaragua, in Somoza's time, was reknowned throughout Latin America for having the best phone-tapping operations in Latin America. However, the new Nicaraguan government considered the Cubans to be the best technicians in Latin America. So, among other things, they adopted the Cuban methods of phone tapping, with a dramatic decrease in effectiveness!

41. The application of such technology is also a problem, too. At San Juan del Sur, a group of boat owners organized a co-op and obtained assistance from INPESCA. After the aid was provided, it was discovered that the boatowners were not fishermen, merely investors that took 80% of the catch value and paid only the remaining 20% to their fishermen.

42. Puerto Cabezas (Bragman's Bluff), San Juan del Norte (Greytown), and the current Bluefields and Corn Islands.

43. This would tantamount to all the residents of Southeast Alaska being killed and the rest of the Alaskan population having their houses burned down.

44. Supplying of an enemy based over the border in Honduras is thought by many to be designed to provoke a border incident that would "justify" a U.S. invasion, in the style of the US intervention in Grenada.

45. The Contras are not one group. For convenience, the special interest groups that had resorted to armed insurgency against the present Nicaraguan government had been bundled under one label--"Contra's" (Counter-revolutionaries). They included such natural oppositions as Indian separatists, some social democrats, farm workers forced to join opposition groups, mercenaries, bandits, Somoza's national guardsmen, and death squads.

At the moment, treaties with the many separate Atlantic Coast Indian insurgent groups is being negotiated. This negotiation is proceeding under the efforts to establish regional autonomy for the Atlantic Coast peoples. This process, begun in December 1984, has included popular consultations with villages throughout the region, and with representation from all ethnic groups. This would create an autonomous region of the Atlantic Coast--under the immediate control of the Atlantic Coast peoples, themselves. The Native-Sandinista conflict today has been severely escalated by CIA operations trying to drive a wedge between the negotiating parties. Some Miskito rebels and the Sandinistas may not be as far apart as they appear. One Miskito insurgent proudly proclaimed, after listing the sins of the Sandinistas, "Our people are **real** communists, not like in Managua!" Ironing out points of agreement between community-based mutualism and national-based collectivism is a larger difficulty than is apparent, though.

Eden Pastora's Contras, based in Costa Rica, recently withdrew from its war with the Nicaraguan government. The major Contra group now being funded by the U.S. government and trained by U.S. military and CIA advisors is the FDN, led by the universally hated ex-National Guardsmen of the deposed dictator, Somoza. Lacking any support in Nicaragua, these terrorists are based in Honduras and make raids across the border, attacking mostly civilian targets, including fishing people.

It is thought that the recent \$100 million appropriated by the US Congress is to be used for the Contra's to seize a portion of Nicaragua. The US government could then "recognize" a new government "of Nicaragua," which would then "ask" for US "help." This is a very old manuver, resurrected only because Nicaragua has not significantly violated Honduras' border--to reach the Contras based there.

46. For lack of other material, the inland fresh-water fishermen have begun to weave nets and atarryas from double strands of 5 mm polypropelene ribbon, the same material that industrial storage sacks are made from. The durability of this material is questionable.

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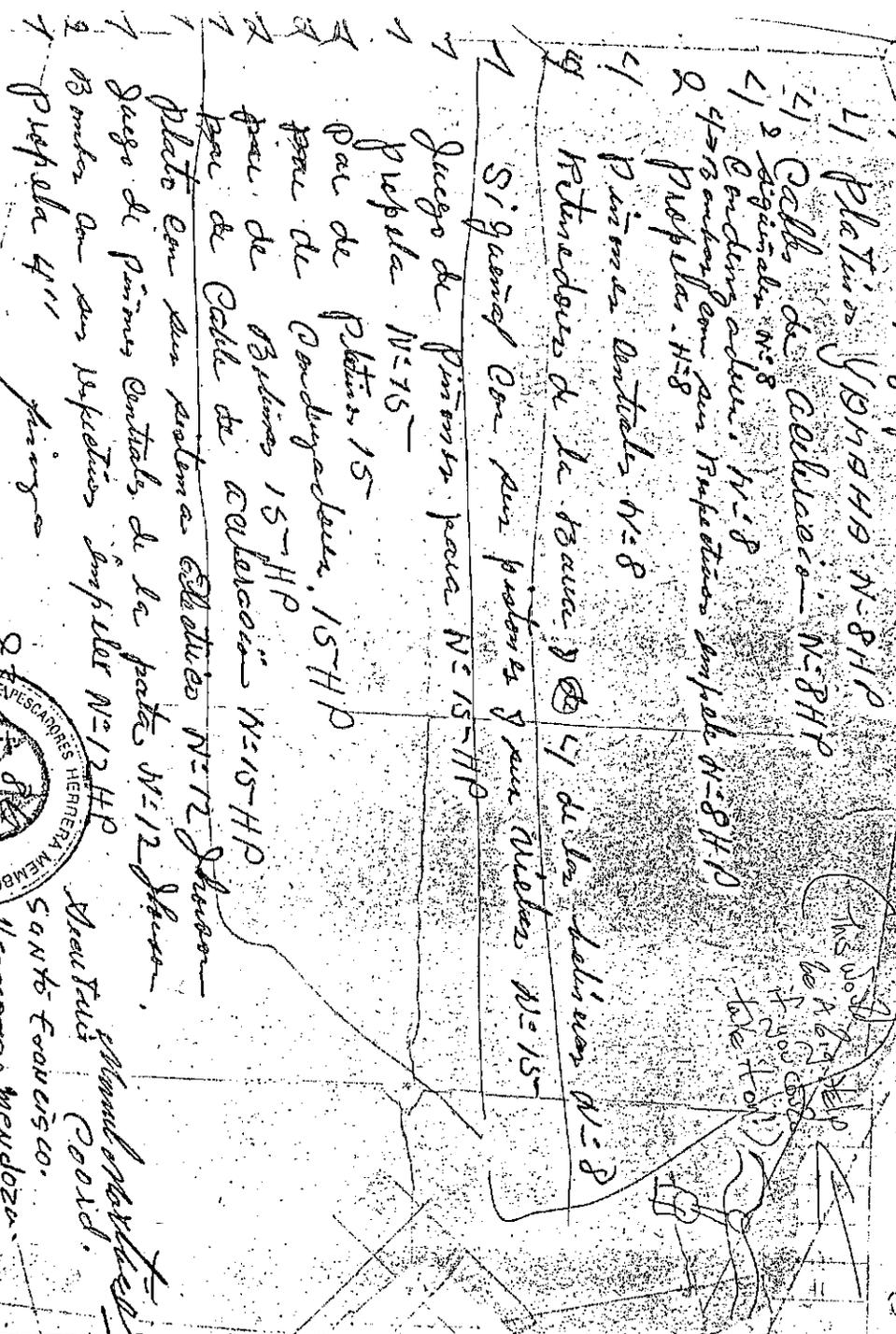
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Repuestos de motor

Needs of the Firing Co-ops At Puerto Moreno's Nicaragua



PORTIRIO APALAM.



SANTO FERRERES
HERNAN MENDOZA

- 8 hp Yamaha
 - 4 ignition coils
 - 4 sets points
 - 4 throttle cables
 - 2 crank shafts + bearings
 - 4 condensers
 - 1 complete water pump kits
 - 2 props.
 - 4 pinion gears
 - 4 5/8" connectors for electric valves
- 15 hp Yamaha
 - 1 complete set with bearings, piston, etc.
 - 1 set pinion gears
 - 1 prop.
 - 2 sets of points
 - 2 condensers
 - 2 ignition coils
 - 2 throttle cables
- 12 hp Johnson
 - 1 plate for ignition system (below flywheel)
 - 1 set of covered pinion gears
 - 2 water pump kits with impeller
 - 1-1/2" prop.