

# An Overview of the Cuban Commercial Fishing Industry and Recent Changes in Management Structure and Objectives

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**Abstract.** The Cuban seafood industry has long been an important supplier of certain high-valued seafood products for the world market. In addition, the industry has historically played an important role in providing seafood products for the domestic markets in Cuba. Assistance from the Soviet Union during the 1960-70s led the development of a large distant-water fleet, which produced primarily low-valued seafood products for the domestic markets. The traditional, yet better organized, nearshore fleets continued to produce high-valued species for the export markets. The loss of Soviet assistance in the early 1990s dramatically affected the manner in which the Cuban fishing industry is managed and conducted. The passage of Decreto Ley 164 in 1996 ushered in a number of changes in the management strategies for the Cuban commercial fishing industry. The management of the nearshore fleet, associated service industries, and the processing sector is being conducted in a more decentralized manner, for example, via the creation of autonomous producer associations. This strategy allows much more control by fleet operators over the various harvesting activities. The Cuban fishing fleet now concentrates on the production of high-valued species such as spiny lobster, shrimp, reef fish, tunas, sponges, and others. The prospect of renewed trade with the US has important implications for harvesters, processors, and consumers both in the U.S. and Cuba.

**Keywords:** Cuban fishing industry management

## 1. INTRODUCTION

The commercial fishing industry of Cuba is an important source of fishery products originating from the Gulf of Mexico and Caribbean region. Cuba historically fielded a large distant-water fleet that was engaged in the harvest of many worldwide subtropical and temperate pelagic fisheries stocks. Given the evolution in the global political environment of the early 1990s, Cuba's commercial fishing industry changed dramatically. As a result, production emphasis has shifted from high volume, low-value, pelagic stocks toward high-valued, nearshore fisheries. Cuba has more recently played an increasingly important role in the world market for these high-valued finfish and shellfish seafood products harvested primarily within Cuba's nearshore waters.

As the U.S. seafood industry continues to strive to enhance its competitiveness in the global seafood market and as domestic fisheries managers attempt to be more effective in developing sustainable domestic and regional fishery management policy, a need exists to better understand the role Cuba plays in the total production of seafood products and recognize Cuba's importance in the world seafood market. And if political change in the region affords the opportunity of renewed trade between the U.S. and Cuba, an understanding of the resultant market impacts is crucial. In addition, given that the southeast U.S. region, Florida, in particular, and Cuba effectively share the same marine ecosystem, the sustainable utilization of the region's marine resources may be dependent on a shared understanding of appropriate management strategies. The management structure associated with Cuba's commercial and

recreational fisheries has undergone significant change in the last several years. This paper will thus provide a brief history of the Cuban commercial fishing industry and discuss the recently implemented management structure.

## 2. INDUSTRY HISTORY

The commercial fishing industry of Cuba has long been an important source of fishery products from the Gulf of Mexico and Caribbean region. Prior to the Cuban Revolution, the commercial fishing industry in Cuba was characterized by a fleet composed of small boats and vessels plying the island's nearshore waters. These craft, which were typically low capacity and technically unsophisticated, primarily targeted a complement of reef fish; spiny lobster; sponge; and a few pelagic finfish species such as mackerels, tunas, and billfish. The landings were handled by small-scale processing facilities and the products were then mostly directed into the local domestic markets and the tourism industry.

Following the Revolution, much attention was given to further developing the commercial fishing fleets. A viable modern fishing fleet would not only provide a badly needed source of domestic protein and export revenue, but would also enhance coastal surveillance capabilities, provide training opportunities for naval recruits, and reestablish relations with neighboring Latin American nations via bilateral fishery access agreements. However, the modernization of the Cuban commercial fishing industry would require considerable revenue, which unfortunately was in short supply as a result of production disruptions

caused by, among other factors, economic sanctions imposed against Cuba by the U.S.

During the early 1960s and the next two decades, a modernization program created port facilities that provided for the expansion of the Cuban fishing fleet, the seafood processing sector, and the various commercial fishing service-related industries. The Cuban fleet that emerged from this program was characterized by a level of technical sophistication and capacity unrivaled in the Caribbean and Central American region. Annual commercial fishery landings averaged about 20,000 metric tons (mt) before the Revolution [Food and Agricultural Organization of the United Nations (FAO)]. Following the period of commercial fishing fleet development, landings exceeded 100,000 mt by 1970 and approached 200,000 mt by 1976.

Whereas before the Revolution the Cuban commercial fishing fleet was primarily a nearshore fleet, the new Cuban fleet was comprised of four distinct components. The Flota Cubana de Pesca (FCP) was the distant-water fleet composed of purse seiners and midwater trawlers. This sector of the fleet represented a different form of fishing activity than that in which the Cuban fleet had traditionally engaged. The FCP developed into the largest distant-water fleet in all of Latin America and targeted low-valued species such as mackerels, herrings, and hake. These low-valued fish, harvested from southern and northwest Atlantic and Pacific regions, were destined primarily for the domestic market. The Flota Atunera de Cuba (FAC) was composed of tuna and swordfish longliners, which operated in the Gulf of Mexico and Mid-Atlantic regions. The Flota del Golfo (FG) contained bottom-longliners and other hook and line vessels that targeted bottom fish and reef fish in the Campeche's Bank and in the nearshore waters. Finally, the Flota de Plataforma (FP) was comprised of nearshore vessels, which possessed a wide variety of gear types such as traps, hook and line, trawls, and gill nets. The FP targeted a complement of high-value, nearshore species such as shrimp, spiny lobster, sponge, reef fish, and crab. The catch of the FCP (the fleet most supported by the preferential trading agreements with the former Soviet Union via advantageous oil prices) was primarily intended for domestic consumption, whereas the high-value catch of the FAC, FG, and FP was destined for lucrative export markets and represented an important source of new export revenue.

Although an impressive accomplishment, the development of the modern Cuban commercial fishing fleet was fraught with bad timing. This was particularly true for the FCP, FAC, and FG. Virtually all coastal nations in the Americas imposed 200-mile limits for their territorial waters in the late 1970s. With few exceptions, the exclusive rights claimed by these coastal nations excluded access by all other countries to the fisheries resources found in their territorial seas. With access denied (there were only a few exceptions throughout

the region), Cuba was left with a stable of large operationally-costly vessels (FCP), which were then forced into the role of only being able to operate in the even more costly open-ocean regions. The high cost nature of the fleet coupled with being forced to target low-valued stocks produced an economically less efficient operation. As a result, the FCP (which targeted low-valued species) was almost totally dependent on relatively inexpensive Soviet fuel oil in order to stay operational. However, Soviet assistance did allow the FCP to continue operations for a number of years, even as the aging and costly fleet continued by necessity to target low-value species for domestic markets, rather than generating export revenue as was the case for the other fleet components.

The breakup of the Soviet Union and the tightening of U.S. embargo regulations against Cuba in the early 1990s caused the virtual shutdown of the FCP and reduced operations of the FAC and FG. Thus, during the first few years immediately following the breakup of the Soviet Union (in Cuba this is referred to as the "special period") total fleet operations were constrained. In particular, the majority of vessels comprising the FCP were standing idle in Havana harbor. The cost of operation and maintenance, coupled with the lack of fuel, was fatal to FCP fleet operations. A few former FCP trawlers are reportedly being used as transport vessels. Thus, the distant-water fleet Cuban landings of all forms of finfish and shellfish decreased dramatically, with the majority of this decrease associated with reduced operations of the FCP and declines in landings of pelagic species. The vessels, which comprised the former FP, continue to operate in the nearshore waters producing a wide variety of high-valued species, the most important of which are spiny lobster, shrimp, sponge, and reef fish. The FAC and FG also continue to operate and target pelagics such as mackerels, tunas, swordfish, reef fish, and sharks. During 1996, 12 FCP trawlers were yet targeting hake in Canadian waters. A longstanding fisheries agreement with Canada provides access by the Cuban fleet. Thus, the high-valued species harvested by the remaining fleet components, particularly the FP, represent the economic backbone of the commercial fishing industry in Cuba today.

### **3. CHANGES IN MANAGEMENT STRUCTURE AND OBJECTIVES**

The impact of the economic crisis of the 1990s in Cuba and the impact of the sudden lack of resources with which to maintain the existing fleets, particularly the distant-water fleet, contributed to a situation whereby the landing and processing of seafood products was significantly impaired. During the period from 1992 through 1994, the total volume of fisheries catch declined by 20%, while the volume of seafood exports declined by 8%. The distribution of seafood into the domestic market also declined 8%. These symptoms

were the result, as well, of various underlying problems, including technical deficiencies in the fleets, organizational problems in the processing sector, stagnation and obsolescence in the shipbuilding sector, and insufficient integration of scientific research into the management process.

In response to this situation, a series of measures were instituted in 1995 by the Cuban government and within the fishing sector itself. The measures included organizational changes necessary for Cuba's integration into the new world economic order, as well as measures designed to improve efficiency in production, commercial activity, and financial management in order to ensure competitiveness of Cuban products in the world market.

These measures included:

- Upper level administrative changes.
- Establishment of a clear, flexible, and dynamic Development Strategy for fisheries management.
- Implementation of a new organizational structure.
- Provide training regarding new management techniques for directors and managerial personnel.
- Strengthening of the links between the Cuban Ministry of the Fishing Industry (Ministerio de la Industria Pesquera -MIP) and the fisheries productions units.
- Imposition of regulatory guidelines to better ensure sustainable development of Cuba' fisheries.
- Decentralization of production and financial management responsibilities.

### 3.1 Structure

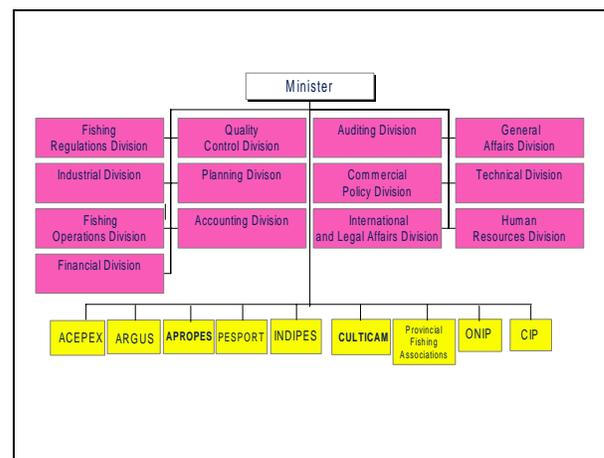
The Ministry of the Fishing Industry (MIP) is the agency in charge of directing, implementing, and governing the policy of the State and Government concerning research on and the conservation, extraction, breeding, processing, and marketing of fishing resources.

The former structure of the MIP did not correspond to the new management direction encouraged by these above changes, nor was it compatible with a newly instituted work method and strategy. The myriad of management entities within MIP — the enterprises engaged in fishing, processing, marketing, shipbuilding, export/import, etc. — were organized vertically with ten distinct management levels between the Minister and the actual producers. The large number of subordinate enterprises and the excessive vertical integration complicated and slowed the entire management process. The former structure made the systematic monitoring and controlling of the fishing industry virtually impossible.

With the objective of improving economic efficiency and sustainable use of fisheries resources, a change in

management focus was applied. Probably the most significant change in the MIP structure was an attempt to decentralize the day-to-day operations of the harvesting sector. The MIP was left in charge of the legal and regulatory activities (i.e., state functions, enforcement, stock assessment, etc.), while the production enterprises were delegated to control most day-to-day productive activities and services. To facilitate the introduction of policy changes aimed at decentralization, a new overall organizational structure was instituted within MIP. The central idea of the new MIP structure is to incorporate modern entrepreneurial and management techniques via more horizontal and flexible centralized structures — Associations. These Associations were created for the purpose of bringing decision-making and responsibility closer to the point of production, thereby increasing the efficiency of the economic activities (i.e. fleet operations) related to fisheries harvest.

The new MIP structure (Figure 1) consists of numerous Divisions, fisheries-related Associations, the National Inspection Office (ONIP) and the Fisheries Research Center (CIP). All of these units are subordinate to the Minister. The Associations consist of 15 Provincial Fishing Associations (PFAs) and six other Associations, which have specific logistical responsibilities. The latter six Associations (and their key responsibility) include ACEPEX (fishery exports), ARGUS (shipbuilding), APROPES (supply distribution and fishery imports), PESPORT (management of the fleets FAC, FG, and FCP), INDIPES (seafood processing and domestic distribution), and CULTICAM (shrimp culture). A Provincial Fishing Association (PFA) is located within each province, including the Isle of Youth.



**Figure 1. The New Organizational/Structure of the Cuban Ministry of the Fishing Industry.**

These PFAs are responsible for producing shellfish and finfish landings in compliance with the species-specific harvest plans. These plans are developed by the associations themselves, then consulted and approved with/by the Executive Board of the MIP. The PFAs have independent

legal and jurisdictional authority, with independent control over productive resources (i.e., vessels, fuel, supplies, ice, labor, etc.). The PFAs also have control over the number of vessels, as well as ensuring the enforcement of size restrictions, gear restrictions, closed seasons, etc. The other six Associations provide the necessary resources and logistical support for the PFAs. They also assist in feasibility studies of proposed projects with the overall purpose of broadening fisheries market potential, finding new business opportunities, and further developing other activities of common interest.

### 3.2 Objectives

The PFAs have been given an unprecedented amount of autonomy regarding day-to-day operations of the fleet. Recent changes have interjected the notion of "profit maximizing" among vessel captains and crew. For example, each PFA has a target level of annual production for each species. With a fixed annual per-unit price per each species, the PFA (which manages a given number of vessels targeting species indigenous to the region) attempts to achieve the harvest objective at the minimum cost possible. The unit price for the target species is set with MIP staff and representatives from each PFA. In the case of the domestic market, the price is set in correspondence with operational costs, qualitative value of the product, and governmental pricing policies. In the case of foreign markets (exports), prices are determined according to costs and international market supply and demand. The Association sells the landings to the enterprises charged with fisheries product commercialization, ACEPEX and INDIPES. Each vessel's trip expenses (i.e., ice, bait, tackle, etc.) are then covered with the total revenue earned from the trip by that vessel (major repairs to the hull and deck equipment are paid for by the PFA). The Association returns the difference between total revenue and trip costs (referred to as "margin") back to the individual vessels. The captain for each vessel distributes the margin for that trip back to the crew via a predetermined share system. The captain uses his discretion to determine the share each crew member receives. Thus, the crew has an incentive to minimize costs such that the net returns back to the vessel, and the crew, is maximized. The crew share is reportedly paid in dollars (20%) and pesos (80%). This process, which applies across all PFAs, is a radical departure from the previous system where the captain and crew members received a fixed annual salary along with perks determined via a complicated and generally ineffective incentive system. Because the margin is the main source of income to the crew, a strong incentive therefore exists to operate the vessels as efficiently as possible. In addition, the price received by the vessel can be a function of quality. So, a high premium is placed on handling the catch such that quality is preserved. This new payment system for the PFAs, referred to as the "Special Working Contract", is as yet evolving and very much the trial stage. The FP fleet, which

produces the majority of high-value, exportable finfish and shellfish products, is the primary participant in this new program.

The structural changes instituted at the PFA level have increased the efficiency of production activity, but have created a risk situation for overexploitation of coastal fisheries resources. This results from the natural inclination to increase productivity and, thus, income, under the "Special Working Contract." The previous set of fisheries regulations established in 1936 has become outdated with respect to the current fisheries industry. Thus, the need to develop a new regulatory framework became evident. In September 1996, the new Decreto Ley 164 ("Decree Law") went into effect. This new regulatory framework incorporates a number of new features and resolutions, including:

- Creation of a broader judicial mandate for fisheries management.
- Introduction of fisheries licensing procedures for commercial, recreational, and research purposes.
- Adoption of measures to protect threatened and endangered marine species such as sea turtles, manatees, and black coral.
- Increased monitoring and enforcement of marine resource conservation and coastal water quality measures.
- Introduction and enforcement of system of fines and penalties to ensure sustainable use of fisheries resources.

The 1996 Decree Law also provided for the establishment of The Advisory Commission on Fishing, which consults with the Minister on issues related to administration, organization, and rational use of coastal fisheries resources. Recent measures established by the Commission address creation of protected areas, species-specific closed seasons, minimum legal sizes for given species, prohibition of retention of potentially toxic species, recreational fishing quotas, gear restrictions, licensing/authorization guidelines, and sanitary/health regulations for processors. To ensure regulatory control and compliance with these measures, the MIP created the National Office for Fishing Inspection (ONIP), whose mission is to enforce the conservation and rational use of aquatic resources within Cuba's commercial zone, territorial seas, and inland waters. The ONIP utilizes 15 Provincial Offices for Fishing Inspection, with over 200 inspectors and specialists distributed on the basis of the economic importance of fishing among the provinces.

The adoption of the 1996 Decree Law, formation of The Advisory Commission of Fishing, restructuring of the MIP, creation of the Provincial Fishing Associations, and implementation of the "Special Working Contract" has reportedly resulted in an increased landings, improvement in the operational efficiency of the fleets, enhancement of the

distribution of seafood products into the domestic market, and increased export revenues derived from seafood (Table 1). During the 1996-1999 period, total landings increased by 9.4%, seafood distributions to the domestic market increased by 5.3%, and exports increased by 7%. In addition, tons of fuel utilized by fishing vessels per ton of catch was reduced from 0.9 tons to 0.5 tons, thus providing evidence that incentives to minimize operational costs have succeeded. The advances made since the advent of the "Special Period" demonstrate not only that the strategies adopted were effective, but that it is possible for a state enterprise to come back from the point of crisis.

**Table 1. Recent Change in the Cuban Fishing Industry.**

Average Annual Growth between 1995 y 1999 (%)	
Total Catch	9.4
Total Catch, Aquaculture (Finfish)	30.0
Distribution in the Domestic Market	5.3
Total Income	8.3
Exports	6.9
Industrial utilization levels of lobster and shrimp -- 65% y 84% respectively	
The Aquaculture catch reached 80,500 tons in 1999, the highest in its history.	
Fuel utilization per ton of catch was reduced to 0.467, for an average annual decrease of 15.5% between 1995-99	

#### 4. OVERVIEW OF LANDINGS, PROCESSING AND TRADE

##### 4.1 Landings

Total landings by the Cuban commercial fishing fleets increased steadily during the 1960s and 1970s. By 1980, landings had increased to 186,500 mt. Further developments in the distant-water fleet led to the most recent peak in landings volume of 245,000 mt by 1986 (FAO). During this period, Cuba's landings of finfish and shellfish exceeded all of other countries in the Central American and Caribbean region, with the exception of Mexico. In 1988, less than five years prior to the loss of the preferential conditions, Cuba fishery landings were estimated to be 231,200 mt, second only to Mexico's reported landings of 1.4 million mt. However, following the collapse of the Soviet Union, Cuban fisheries landings decreased by approximately two-thirds to 88,000 mt in 1994. During this same period, most countries in the region, with the exception of Mexico, experienced *increases* in fisheries landings. During the "Special Period", commercial fisheries landings have increased steadily to approximately 145,000 mt in 1999.

Cuba's fishery landings are characterized by an impressive

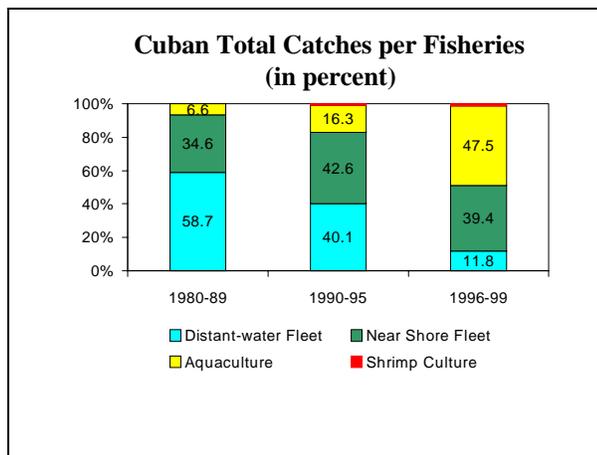
array of species. Cuba has the third most diverse array of target species among all countries in the Western Hemisphere. During the 1984-89 period, Cuba reported landings for at least 135 different species or species groups (FAO). This diversity is exceeded only by the species mix reported by the United States and Canada.

Prior to the reduction in distant-water fishing activities, the majority of the landings volumes was reported by the distant-water fleet. Landings increased from 116,500 mt in 1980 to a high of 152,700 in 1986. Landings then began an erratic, though steady, decline to 18,700 mt in 1997 (FAO). The most important species by volume harvested by the distant-water fleet were Cape horse mackerel, Chilean Jack mackerel, Araucanian herring, and Pacific/Silver Hake. These species were landed in the southeast Atlantic or the southeast Pacific by the FCP, regions that become infeasible to target without the cheap oil supplies from the former Soviet Union. In fact, landings of Chilean Jack mackerel and Cape horse mackerel were eliminated by 1993. Silver hake production in the north Atlantic has continued via fishing agreements with Canada. Although most of the FCP capacity became idle, some redistribution of overall fleet effort occurred.

Landings of low volume, but high-valued species such as spiny lobster, shrimp, reef fish, sharks, tunas, and others have been maintained by the FP, FG, and FAC fleets. Of these three fleets, the FP has remained the most important. Landings by the FP also declined during the special period, although not as dramatically as for the FCP. Landings have averaged 51,000 mt since 1995. The most important species landed by the FP include spiny lobster, pink shrimp, and snapper. Since the advent of the "Special Period", spiny lobster landings have averaged 9,300 mt annually. Landings of pink shrimp have declined from 2,300 mt in 1992 to 2,000 mt in 1997 (FAO). Snapper landings have increased from 3,200 mt in 1992 to 4,500 mt in 1997 (MIP).

In addition to species produced by the traditional capture fisheries, other species have also become more important for aquaculture purposes. For example, the harvest volume of cultured finfish has increased from 17,300 mt in 1994 to 80,500 mt in 1999 (FAO). Silver carp, channel catfish, blue tilapia, and tenca have been important species for freshwater aquacultural production. Penaeid shrimp are being cultured in impoundments within the southeastern region of Cuba. Shrimp production has been somewhat erratic, with harvest volumes increasing from 800 mt in 1993 to 2,000 mt in 1997 and then decreasing to less than 1,600 mt in 1999 (FAO). This overall trend in finfish and shrimp culture suggests a growing expectation for aquacultural production to augment the supply of fishery products for the Cuban domestic and international trade markets. For example, the relative percentage share of total fisheries production accounted for by aquaculture has increased from 6.6% for the 1980-89 period to almost 50% for the 1996-99 period. The volume of

fishery products lost due to the idling of the FCP, however, has not yet been recovered by aquaculture (Figure 2).



**Figure 2. Distribution of Fisheries Production in Cuba among Key Industry Sectors.**

## 4.2 Processing and Trade

Forty major facilities exist in Cuba for the processing of seafood products. These facilities handle the freezing, canning, smoking, and salting of a variety of products. Among these are 14 plants dedicated to processing lobster, shrimp, canned tuna, and fish. They are located in La Coloma, Isla de la Juventud, Batabanó, La Habana, Matanzas, Cienfuegos, Casilda, Caibarién, Santa Cruz del Sur, Niquero, Manzanillo, Santiago de Cuba, Guantánamo, and Nuevitas. The processing facilities of Regla, Hacendados, and Cojimar are located in Havana. A large percentage of the products processed in these facilities is destined for export markets. The Fishing Terminal de Regla also processes a variety of species, but these products are utilized in domestic markets (Garcia, 1996). Additionally, there are over 20 smaller processing facilities all over the country. As mentioned earlier, the processing activities are managed by the INDIPES association and the provincial fisheries associations.

Quality and safety assurance has become of paramount importance to the Cuban seafood industry, particularly as seafood has become an increasingly important source of export revenue. Although the economic conditions that have prevailed in Cuba since the "Special Period" have kept import volumes to a minimum, the exportation of high-valued finfish and shellfish continues to be important, with quality and safety being major demand determinants. Since 1992, annual seafood imports volume and value have averaged 41,100 mt and \$ 19.2 million, respectively (FAO). And although average annual export volumes have been relatively small over the same period (10,100 mt), average annual value has remained high (\$ 107 million). The major trading regions include Asia (particularly Japan), Canada, Europe, and Latin America. The adoption of Hazard

Analysis and Critical Control Points (HACCP) procedures by importing countries worldwide has created new standards of quality and safety to which exporting countries must strictly adhere. During 1995, in accordance with these changing international standards, the Cuban seafood industry began instituting HACCP programs in all MIP seafood processing plants. Improvements in processing plant sites, equipment, and infrastructure due to HACCP contributed to the satisfactory outcome of a recent series of European Community Inspection Visits resulting in renewed approval for importation of Cuban fisheries products by European Union countries. A total of 15 seafood-processing facilities have now been approved for exporting to the European Union. Since the adoption of HACCP standards began in 1995, the average total cost per ton for quality control measures has decreased by almost 45%, which suggests that spoilage, waste, and shipment rejections have declined dramatically.

### 4.2.1 Fresh or Frozen Crustaceans and Molluscs

Four processed product forms are reported for this category. Spiny lobster is reported in whole, frozen form, and frozen meat/tails. Shrimp are reported as frozen and frozen shell-on tails. Total production of these four processed product forms has declined over the 1988 to 1994 period. Total production decreased from 11,600 mt in 1988 to 9,000 mt in 1994 (FAO). With the exception of shrimp tails, most categories exhibited a similar trend. No imports of these products have been reported recently. However, virtually all of the reported production has been exported. A comparison of export volumes and landings totals indicates that a large percent of the total landings of spiny lobster and shrimp are exported. In terms of total value, the major markets for Cuban spiny lobster are Japan (28%), France (24%), Spain (19%), Italy (15%), and Canada (10%). A percentage of the revenues generated from export sales, which averaged \$109 million annually during the 1988 to 1994 period, are reportedly utilized to purchase low-valued seafood items for greater domestic consumption. As well, export revenues are reinvested in the development of the fishing industry and contributions are made to other sectors of the economy. Export value increased to \$125.4 million in 1996.

### 4.2.2 Fresh or Frozen Finfish

The production of frozen finfish products has declined dramatically, from 111,700 mt in 1988 to 16,600 mt in 1994 (FAO). This is likely linked with the decline of the production of mackerels and herrings by the FCP, species that were destined for domestic consumption. At the same time as the production and exportation of these products was declining, the importation of similar products increased from 9,000 mt in 1991 to 45,600 mt in 1994 (FAO). Total import volumes continued to decline through 1997. The volume of seafood for domestic consumption has declined significantly

following the idling of the FCP. The decline in availability of seafood products for domestic consumption is readily apparent from estimates of Cuban per-capita seafood consumption. Annual per-capita consumption has declined from 21.8 kilograms during the 1985-87 period to 11.8 kilograms during the 1991-93 period (FAO). Per-capita consumption continued to decrease to 11.6 kilograms during the 1994-96 period. However, in recent years this situation has begun to reverse, especially as a result of increased aquaculture production for domestic consumption.

#### 4.2.3 Canned Products

Small amounts of canned finfish products are produced in Cuba. The total volume of these products declined from 6,000 mt in 1988 to 700 mt in 1994 (FAO). Tuna and bonito were the most important individual species utilized for this process. Prior to 1992, Cuba imported a significant amount of canned seafoods. However, the volumes imported declined from 15,400 mt in 1988 to 5,700 mt in 1992. Relatively small amounts of canned products are also exported. Smaller amounts of oily fish meal and smoked fish are also produced.

### 5. CONCLUSIONS AND RECOMMENDATIONS

The Cuban fishing industry, an important source of high-valued tropical seafood for the world market, has experienced considerable change during the last decade. In an attempt to enhance the economic efficiency of the industry, the Ministry of the Fishing Industry has also been substantially restructured. A key goal of this restructuring process is to decentralize the fleet management process, thereby providing incentives for vessel operations to minimize costs, enhance production, and increase revenues generated by the commercial fishing fleets. Since 1995, total fisheries catch has increased 9.4%, total income derived from fishing has increased 8.3%, and seafood exports have increased 6.9%. In addition, the Cuban seafood processing industry has made recent strides toward enhancing the quality and safety of domestically produced seafood, thereby ensuring a future share growing world market for high-valued seafood products in Asia, Europe, and North America.

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