Costa Rica (Pacific Coast)

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INTRODUCTION

While the Caribbean coast of Costa Rica is fairly straight and short, only 212 km long with a very narrow continental shelf, the Pacific coast is 1 016 km long, with numerous bays, three important gulfs and an extensive continental shelf. According to the National Geography Institute, Costa Rica's economic exclusive zone (EEZ) in the Caribbean Sea is 24 000 km^2, while in the Pacific Ocean it consists of 589 682.99 km^2, given Costa Rica's sovereignty over Cocos Island.

The Pacific coastal area features large extensions of mangroves, well protected as reproduction and larval development sites for various marine and inland species.

These characteristics plus the higher fisheries productivity of the Pacific in general, and specifically the large areas within the EEZ featuring significant upwellings, make the fisheries in that region very important for a small country like Costa Rica.

The most important fisheries in volume occur outside the 12-mile territorial waters and target migratory pelagic species such as tuna, mahi mahi and billfishes, particularly swordfish, marlins and sailfish as well as other offshore species including sharks.

Coastal small scale artisanal fisheries are very important from the socioeconomic viewpoint, as they benefit low income fishers. The most significant portion of these fisheries is found in the Gulf of Nicoya.

Other commercially significant fisheries include shrimp targeted by bottom trawlers and sardine captured with seine nets.

POLICY FRAMEWORK

The Fisheries and Maritime Hunting Law ("Ley de Pesca y Caza Marítima") N° 190 of 1948 is the framework law for the management of marine fisheries at the national level, with the support of the law that created the Costa Rican Institute of Fisheries and Aquaculture (INCOPESCA) in 1994 and a significant number of Agreements by the Board of Directors of this fisheries governing body and Executive Decrees; in both cases, some apply nationally and others apply regionally or to specific sites.

Article N° 30 of that Fisheries Law relative to sanctions for infractions to the fisheries legislation was declared to be unconstitutional by the Constitutional Court of the Judicial Power and this has caused serious problems in compliance with the norms regulating the activity.

In November 1998, the Costa Rican Institute of Fisheries and Aquaculture presented Draft Fisheries Law to Congress includes a series of modern elements in fisheries management, some of them contained in the Code of Conduct for Responsible Fisheries. Unfortunately, this Bill of Law has not been approved yet but is still in the legislative docket. To reduce the effects of this lack of modern legislation, in December 1998 the Board of Directors of INCOPESCA agreed to adopt the Code of Conduct for Responsible Fisheries and in June 1999 this adoption was ratified by Decree at the highest level of the Executive Power.

Protection of marine ecosystems is to be considered as a whole and therefore the Legislative Assembly approved the Inter-American Convention for the Protection and Conservation of Sea Turtles in Law 7906, published 24 September 1999.

In addition, the Board of Directors of INCOPESCA issued Agreement AJDIP/241-99 in July 1999, that prohibits fishing for tuna on fish aggregating devices (FADs), given that this fishing method is damaging to marine ecosystems because of the large bycatch affecting many species not targeted by the fishery and the large amount of discards of very small juvenile tuna.

Also in 1999, by Law of the Republic, Costa Rica ratified the International Dolphin Conservation Agreement that protects these marine mammals in the yellowfin tuna fishery.

In December 2000, the Legislative Assembly approved Costa Rica's accession to the Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks.

LEGAL FRAMEWORK

The Costa Rican Institute of Fisheries and Aquaculture, an autonomous institution with its own legal identity, is the governing body of all marine fisheries at the national level, but not of the harvesting of hydro-biological resources in inland waters that is regulated by the Ministry of Environment and Energy, although it is understood that some marine species utilise inland water ecosystems temporarily. Within the structure of INCOPESCA there is a Protection and Registration Department with specific functions that include managing the registry of fishing vessels and assisting in the monitoring and enforcement of fisheries legislation. By decision of the Constitutional Court, the officials of this department are not police authorities, so the weight of verifying compliance with fisheries regulation rests with the National Coast Guard Service, an agency of the Ministry of Public Security. By agreement signed between INCOPESCA and the Ministry of Public Security, INCOPESCA assists the National Coast Guard Service in surveillance tasks, contributing equipment and staff.

For the purposes of fisheries management in the Pacific, INCOPESCA has established four regional fisheries offices in key fishing areas. These offices are located in Playas del Coco, Puntarenas, Quepos and Golfito. Ancillary offices were also established in La Cruz, Nicoya and Isla de Chira in the Gulf of Nicoya. The officials travel from these offices along the coast collecting fisheries information to be processed and interpreted by specialists for later use in decision making for fisheries management. Surveillance activities are coordinated with the National Coast Guard Services from most of these offices.

The fishing licenses issued by INCOPESCA clearly state said authorization does not include fishing in National Parks and other protected areas. The Costa Rican Pacific has important National Parks and other protected areas that serve to protect marine species. One of the most important is the Cocos Island National Park, declared by UNESCO to be a World Heritage Site.

The Biodiversity Law also has the power to afford protection to marine species even in areas with management regimes.

STATUS OF THE PACIFIC FISHERIES

For practical purposes, marine fisheries in the Costa Rican Pacific can be divided into the following six categories:

1. Purse seine tuna fishery by foreign vessels under a system of licenses issued by INCOPESCA.
2. Longline fishery for major pelagic species.
3. Shrimp and bycatch species with bottom trawl nets with "Florida" type vessels.
4. Small scale fishery of coastal demersal and pelagic species by artisanal boats using mainly hook and line, trammel nets and handlines.

5. Coastal sardine fishery by boats using seine nets.
6. Recreational fishery of major pelagic and demersal species using poles and reels.

The purse seine tuna fishery is managed at the Eastern Tropical Pacific Ocean regional level by the Inter- American Tropical Tuna Commission (IATTC). Although this fishery captures several species of tuna, the most significant in Costa Rica's EEZ is yellowfin tuna. Historic catches in the area have averaged between 24 000 and 25 000 metric tons per year and 2002 landings totalled 32 000 metric tons (Table 1). The system used is the sale of licenses to foreign vessels which, under the Costa Rican legislation, must belong to IATTC member countries and participate in the International Dolphin Conservation Agreement. Twenty-four such vessels participated in this fishery in 2002. These vessels are not authorized to fish within the Costa Rican EEZ or to set on floating objects, and must only fish on dolphins or schools. Although the tuna fishery in the Eastern Tropical Pacific has been fairly stable, the IATTC has imposed limitations to increase carrying capacity or fleet size.

The second fishery in commercial importance for Costa Rica targets pelagic species with longliners, and has evolved significantly in the last ten years. This development began with the construction of small wood or fibreglass boats mainly targeting mahi mahi within the 12 miles. The fleet was later reconverted from shrimp boats to longliners and finally some fibreglass vessels up to 24 meters long designed specifically for that purpose entered the fishery, mainly Asian. Although it is true that catches of the main species in the fishery have increased, particularly yellowfin, skipjack and bigeye tuna, swordfish, marlins, mahi mahi and sharks, the duration of fishing trips has also increased.

Issuance of new fishing licenses for this fishery is totally limited. Currently 588 longliners are registered and include small vessels about 9 meters long as well as more advanced vessels up to 24 meters long, fishing within and outside the EEZ.

The third fishery in commercial importance captures several species of Penaeids, among them white, brown, pink and titi shrimp and deep water shrimp including "Camello", "Camellón" and "Fidel" and associated bycatch, with bottom trawl nets. The shrimp fishery shows serious overexploitation problems, resulting in a severe economic crisis within the sector. Fleet reduction measures recommended by FAO several years ago have not yet been implemented and an increase in the capture of white shrimp by the small scale artisanal fleet is probably also resulting in lower capture by the trawler fleet. An increase is evident when analyzing the landings of the shrimp trawl fleet for the period 1993 – 2002, but a detailed analysis of the catches shows the difference is due to a higher catch of fish, possibly suggesting the fleet is directing their efforts to capture high value fish species, given the reduction of shrimp stocks. Reduced shrimp captures explain the reduction of landing values from 1997 to 2002.

Seventy-two boats are registered in the shrimp fishery, although only 65 are currently operating and there is a decreasing trend given lower profitability for this fishery.

TABLE 1
Gross Landings and Values of the Three Most Important Commercial Fisheries in the Pacific

	Gross Landings (tonnes)			Gross Value of Catch (2002 US$ million)		
	2002	1997	1993	2002	1997	1993
Fishery 1 Tuna. Purse Seine Fleet	32 000*	33 109*	29 153*	32	33	29.2
Fishery 2 Pelagic Species. Longline Fleet	17 310	15 574	8 450	12.69	15.56	4.6
Fishery 3 Shrimp and Bycatch. Bottom Trawler Fleet	5 569	3 342	2 776	4.75	6.8	5.3

Note:
*Includes fish captured outside Costa Rica EEZ by foreign vessels operating under Costa Rica licenses.
Catches in CR EEZ total about 25 000 MT per year.

TABLE 2
Gross Landings and Values from the Small Scale Artisanal Fleet

	Gross Landings (tonnes)			Gross Value of Catch (2002 US$ million)		
	2002	1997	1993	2002	1997	1993
Fishery 1 Coastal demersal and pelagic species	3 177	2 650	1 558	11.93	15.12	4.07

The shrimp fishery is not subject to closures along the entire coast, as only temporary closures were established in small areas of the coast which were not enough for resource recovery.

There was an increase in sardine catch for 2002 along the middle area of the Gulf of Nicoya, near the port of Puntarenas with landings of 4170.3 metric tons compared to 1175.4 metric tons in 1997. The only two seiners currently fishing use Puntarenas as their operations base. The vast majority of the product of this fishery is sold to the canning industry and the rest is sold as bait.

Another fishery of great social and economic importance in the Costa Rican Pacific involves coastal demersal and pelagic species captured by small scale artisanal fleets in mainly three areas: the Northern Zone along the coast from Cabo Blanco to the Nicaraguan border, the highly productive Gulf of Nicoya consisting of about 1500 km^2 and the Central-South Zone from Punta Judas to Punta Burica near the border with Panama that includes Golfo Dulce (Table 2). This small scale artisanal fleet grew rapidly in the last 20 years, due to structural changes in the country's production, especially in the agriculture-cattle raising sector that resulted in rural unemployment and migration to coastal areas. The area of the Gulf of Nicoya, a large part of which is considered to be an estuary, is where most small scale artisanal fishers live and without doubt is the area with the highest percentage of immigration. Because of migration and the lack of fisheries legislation establishing sanctions for infractions to the norms, the fisheries resources have been under enormous pressure evident in the reduction of catch per unit of effort of the highest value species and the sizes of the fish and shrimp captured. As expected, given the high value of shrimp, these species are subject to the greatest pressure.

The closure system established by the State for several years for the Gulf of Nicoya, has not worked adequately and although subsidies are paid for fishers not to fish in certain areas, illegal fishing continues and there is little the authorities responsible for enforcement can do after the ruling of unconstitutionality of Article N °30 of the Maritime Hunting and Fisheries Law. Although other production alternatives have been sought for this significant area, such as aquaculture and tourism, none have been successful enough to mitigate decreased capture of the species with the highest economic value.

Coastal fisheries in other parts of the country are subject to minor fishing pressures in comparison to the Gulf of Nicoya, which contributed to an increase in total capture by the artisanal fishery in 2002.

A detailed survey was undertaken in 1999 of all boats comprising the small scale artisanal fleet on the Pacific coast. According to the survey, 2 421 small scale artisanal boats were registered, most built of fibreglass, an average length between 5 and 6 meters, powered by outboard motors.

Recreational fisheries in the Costa Rican Pacific have increased significantly in the last five years, mainly in three areas: Flamingo in the Gulf of Papagayo in the northern area of the country, Quepos in the Central Pacific and Golfito in the Southern Pacific.

This fishery targets the same species captured by the coastal longline fleet, causing some conflicts that have been solved in meetings between the stakeholders and through the establishment of specific areas for recreational fishing at certain times of the year.

The most important species targeted by this fishery are swordfish, marlins and others including mahi mahi and snappers.

TABLE 3
Estimated Values of Pacific Recreational Fisheries

	Estimated Gross Value of Catch (2002 US$ million)		
	2002	1997	1993
Pacific Sports Fishing	20	n.a.	n.a.

Note: n.a. = not available

The importance of recreational fisheries rests in the amount of foreign currency generated for the country. It is estimated that each foreign tourist spends approximately US$2 500.

The activity benefits some areas such as Quepos, hosting the highest number of tourists per year, in the generation of jobs. Costa Rica is heavily promoting this activity internationally and therefore growth is expected in the number of fishers. In 2002, 8 417 mainly foreign sports fishers spent around US$20 million in the country (Table 3). Ninety-eight recreational fishing boats are registered with INCOPESCA. Construction of new marinas in the Pacific coast will no doubt help foster this activity.

The State and all private operators promote capture and release of the fish as well as the use of round hooks to reduce harm to the animals. For these reasons, sports fishery is considered to be highly sustainable.

MANAGEMENT ACTIVITIES

Developing management measures for Costa Rican Pacific fisheries is the sole responsibility of INCOPESCA, following a process that includes the generation of biological information and fisheries statistics for the corresponding data analysis. The Executive President of INCOPESCA is responsible for submitting such information of the Board of Directors and for consultation meetings with the participants in the fisheries. The opinions of participants in the fisheries are not binding and the Board of Directors makes the decisions regarding measures to be applied in the form of an Agreement of the Board of Directors of INCOPESCA and upon publication in Official Journal La Gaceta, the fisheries management measures can be duly implemented.

Although a high percentage of Pacific fisheries (over 67 percent), have management measures that have afforded certain sustainability to the capture, at least two fisheries are facing serious problems (shrimp and small scale artisanal fisheries in specific areas such as the Gulf of Nicoya) representing about 20 percent of total marine capture, and require stronger State actions such as fleet reduction, seasonal and area closures and the generation of other productive activities to reduce fishing pressure over the target resources of those fisheries.

Even though fishing licenses are issued annually and the State has the power of not renewing licenses for overexploited fisheries without an obligation to indemnify the fisher, this has not happened in Costa Rica for purely political reasons and in fact, quite the opposite has occurred in the shrimp fishery where licenses have been issued against technical opinions indicating fleet capacity had already been exceeded.

Since three Pacific fisheries share the same resources (purse seine tuna, longline and recreational) it is important to prioritize them and to develop comprehensive management activities. The IATTC has already started to manage all tuna fisheries in the Eastern Tropical Pacific as a whole, including longline fishing. The purse seine tuna fishery has shown significant stability thanks to the regional management approach implemented by IATTC.

Marine resource management tools have not changed in the last ten years and it is evident a new Fisheries Law is required to enforce management measures resulting from scientific research and landing data analysis. Without the appropriate enforcement instrument it is very difficult to manage fisheries in an effective and sustainable manner.

COSTS AND REVENUES OF FISHERIES MANAGEMENT

INCOPESCA, as an autonomous institution of the Government of Costa Rica, received an allocation for the year 2002 from the national budget of US$900 000, equivalent to 45 percent of the total expenses of the Institute for that year of approximately US$2 million. The remaining 55 percent of the institution's expenses are financed through the sale of goods and services such as: fishing licenses to foreign and national vessels, fish transportation permits, sports fishing permits, fingerlings and reproduction stock for aquaculture, issuance of purchase orders to obtain fuel at preferential prices, technical assistance to aquaculture, etc. Most INCOPESCA expenses are for research, monitoring the state of the fisheries and assisting in surveillance actions to enforce the fisheries legislation, since the brunt of this responsibility is on the National Coast Guard Service under a budget allocated by the Government.

The legislation in force allows periodic reviews and updates to the sale of goods and services of INCOPESCA, to cover cost increases in fisheries management and this actions are even requested by the General Comptroller of the Republic. There is a trend at the government level to reduce contributions to many institutions, and this deficit must be paid from the sale of goods and services. Price increases are not well-accepted by the fishing sector and have caused some conflicts in the past.

In the last ten years, cost increases have affected both the fishing sector as well as fisheries management. Higher costs in fisheries management have resulted from more consultation with stakeholders, increased surveillance, increased enforcement and more frequent modifications, changes or amendments to fisheries management regulations.

IMPLEMENTATION OF GLOBAL FISHERIES MANDATES AND INITIATIVES

Costa Rica is a signatory country to several international agreements and conventions addressing sustainable fisheries management in coastal areas as well as the high seas. Costa Rica signed and ratified the United Nations Convention on the Law of the Sea (UNCLOS) as well as the Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks.

Other transcendental international agreements Costa Rica has adopted or accessed are: the Inter-American Convention for the Protection and Conservation of Sea Turtles and the Code of Conduct for Responsible Fisheries, and compliance with the latter is mandatory as the corresponding Executive Decree was issued.

Costa Rica is in agreement with the fisheries management measures established within the United Nations framework and therefore has prohibited the issuance of new fishing licenses for all fisheries except sports fishing because it promotes and implements capture and release fishing as a sustainable practice.

Regarding the protection of sharks, Costa Rica is one of the few countries in the world implementing control measures to eliminate "finning". For this purpose, INCOPESCA signed an agreement with the Association of Biologists of Costa Rica, so that specialised professionals from that body supervise and certify at the landing sites that the number of fins unloaded match the number of sharks captured.

To protect marine ecosystems, Costa Rica has unilaterally prohibited fishing for tuna by setting purse seines on artificial floating objects or FADs, based on the collection of scientific information gathered by IATTC showing the great bycatch mortality of many species, some of utmost importance for coastal fisheries such as mahi mahi, and of endangered turtles.

In the case of tuna purse seiners, Costa Rica only issues licenses to vessels participating in the programs of the regional fisheries management organization, the IATTC.

PARTICIPATION IN REGIONAL FISHERY BODIES

In the Pacific, Costa Rica is a member of three organisations: Organización del Sector Pesquero del Istmo Centroamericano (OSPESCA, "Organisation of the Fisheries Sector in the Central American Isthmus"), Organización Latinoamericana de Desarrollo Pesquero (OLDEPESCA, "Latin American Organisation for Fisheries Development") and the Inter American Tropical Tuna Commission (IATTC). OSPESCA and OLDEPESCA are political organisations and do not undertake fisheries management technical or scientific functions, as would be the case of IATTC, of which Costa Rica is a founding member.

The country has the legal mechanisms to implement the management measures recommended by the regional bodies to which Costa Rica is a party, as is clearly the case with IATTC. These measures can be rapidly implemented through agreements of the Board of Directors of INCOPESCA or by Executive Decree.

SUMMARY AND CONCLUSIONS

In general terms, fisheries data for Costa Rica show increased captures for most of its fisheries, which could lead to the conclusion that no overexploitation problems exist. More detailed analysis of the specific fisheries, such as trawlers targeting shrimp and small scale artisanal fisheries in areas of high concentration of fishers such as the Gulf of Nicoya, indicates serious overexploitation problems. In both cases, urgent decisions have to be made at the highest levels to reduce fleet capacity particularly among the vessels with higher extraction power, as well as to establish closure systems along the coast and the development of new productive activities specifically for the Gulf of Nicoya.

In order to guarantee the sustainability of other fisheries exerting pressure over the same species, it is necessary to undertake periodic assessments of the yield per unit of effort. In the case of highly migratory species, management measures should be channeled through the regional fisheries organization which in the case of the Eastern Tropical Pacific is the IATTC.

It is vital for the country to enact a new Fisheries Law in the short term, which together with an effective surveillance system, can guarantee the sustainability of the fisheries resources that are undeniably important for Costa Rica from the social and economic standpoint.

REFERENCES

Ley de Pesca y Caza Marítimas de 1948.

Ley de Creación del Instituto Costarricense de Pesca y Acuacultura (INCOPESCA) of 1994.

Ley de Creación Parques Nacionales of 1982.

Ley de Conservación de la Vida Silvestre of 1992.

Executive Decree N°21501 Accepting and Ratifying the United Nations Convention on the Law of the Sea.

Executive Decree N° 27919- MAG of June 1999 adopting the Code of Conduct for Responsible Fisheries.

Law for the Accession of Costa Rica to the Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks of 2000.

Law for Approval of the Inter American Convention for the Protection and Conservation of Sea Turtles of 1999.

1998-2002 Instituto Costarricense de Pesca y Acuacultura Report.

2002 Instituto Costarricense de Pesca y Acuacultura Annual Report.

Ley de Creación del Servicio Nacional de Guardacostas of 2000 N° 8000.

Interview with Mr. Alberto Laurencich, President of Club Amateur de Pesca of Costa Rica, November 2003.
Interview with Lic. Adán Chacón, Chief of the Fisheries Statistics Department of INCOPESCA, November 2003.

ANNEX 1

Main Laws, Decrees, Regulations, and Agreements Regulating Costa Rican Fisheries

TEMA	ACUERDO O DECRETO	PUBLICACIONES
Ley de Pesca y Caza Marítima	Ley 190	28 de setiembre de 1948
Conservación de la vida silvestre.	Ley 7317	30 Octubre 1992
Atún (leyes)	Ley 6267	Octubre 1978
	Ley 7042	8 de setiembre de 1986
	Ley 7384	16 de marzo de 1994
	Ley 7938	26 de noviembre 1999
Atún (decretos)	Decreto 90554 MAG	29 de julio 1991
	Decreto 23943 MOPT-MAG	13 de enero 1995
Atún (acuerdos)	Acuerdo AJDIP/334-96	10 de febrero 1997
	Acuerdo AJDIP /282-99	30 de setiembre de 1999
	Acuerdo AJDIP /107-2000	4 de mayo 2000
Servicio Nacional de Guardacostas	Ley 8000	05 May 2000
Combustible a precio preferencial	AJDIP /138-98	Gaceta del 29 de nov 1994
	Acuerdo AJDIP/097-98	Gaceta 108 del 5 de junio 1998
	Acuerdo AJDIP/300-98	La gaceta 200 del 15 de oct 1998
	Acuerdo AJDIP/352-99	La gaceta 222 del 16 de nov 1999
	Acuerdo AJDIP/276-99	La gaceta 184 del 22 de set 1999
	Acuerdo AJDIP/104-2000	6 de abril del 2000
	Acuerdo AJDIP/112 -2000	12 de abril del 2000
	Acuerdo AJDIP /322-2000	3 de agosto 2000
	Acuerdo AJDIP /244	18 de septiembre 2001
Vedas	Acuerdo AJDIP/148-99	La gaceta 98 del 21 mayo 1999
	Decreto 28224-MAG.	Gaceta 221 de 15 de nov. 1999
	Acuerdo AJDIP/120-2000	La gaceta 91 del 12 de mayo 2000
	Acuerdo AJDIP/376-2000	21 de setiembre 2000
	Acuerdo AJDIP/153-	18 de mayo 2000
Cambute y Langosta	Acuerdo AJDIP/144-2000	La Gaceta 109 del 7-07-2000
Tarifas	Acuerdo AJDIP/387-99	La Gaceta 241 del 13-12-99
Moluscos Bivalbos	Decreto Nº 29.184/S/MAG	La Gaceta Nº 247 26-10-2000
	Acuerdo AJDIP/282-99	La Gaceta 190 del 30-09-99
		La Gaceta 85 del 4-5-2000
Jaivas	Acuerdo AJDIP/0662000	Gaceta 84 del 3-5-2000
Huevos de Tortuga	Decreto N° 28203-MINAE MAG.	Gaceta 232 del 30-11-99
Especies de Arrecife	Decreto 19449-MAG.	Gaceta 26 del 6-2-90
	Decreto 21761-MAG	Gaceta 3 del 6-1-93
Sardina	Acuerdo AJDIP/281-97	Gaceta 234 del 4-12-97
	Acuerdo AJDIP/279-97	Gaceta 234 del 12-4-97
	Acuerdo AJDIP/215-98	Gaceta 172 del 3-9-98
Protección Tortugas Marinas	Acuerdo AJDIP/273-98	Gaceta 192 del 2-10-98
	Acuerdo AJDIP/344-99	Alcence 86, Gaceta 217 del 9-11-99
Sustituciones	Acuerdo AJDIP/308-97	Gaceta 248 del 24-12-97
	Acuerdo AJDIP/327-97	Gaceta 4 del 7-1-98
Traspasos	Acuerdo AJDIP/160-98	Gaceta 130 del 7-7-98
Inactividades	Acuerdo AJDIP/132-98	Gaceta 104 del 31-5-99

APPENDIX TABLES

Current Management of Marine Capture Fisheries

Level of Management	% Fisheries Managed	% with Fisheries Management Plan	% with Published Regulations	Trends in the number of Managed Fisheries over ten yrs. (increasing/decreasing/unchanged)
National	80	33	80	increased
Regional(Pacific)	70	33	700	increased
Local				

Summary information for three largest fisheries (by volume)

Category of Fishery	Fishery	Volume million tonnes	Value* million US$	% of Total Volume Caught**	% of Total Value Caught**	Covered by a Management Plan?	# of Participants	# of Vessels
Industrial	Tuna Purse Seine Vessels	0.032	32	58.31	64.70	Yes	No data	24
	Longline	0.0173	15.56	31.54	25.67	Partial	1977	588
	Shrimp Trawlers	0.00557	6.8	10.15	9.61	Yes	390	72
Artisanal	Coastal demersal and pelagic.	0.003177	11.93	100	100	Yes	4000	2421
Recreational	Sport Pelagic and Demersal	Does not apply	20	Does not apply	Does not apply	Partial	8417	98

* Value in 2002 U.S. Dollars. ** % values are based on totals for each category of fishery.

Use of Fishery Management Tools within the three largest fisheries

Category of Fishery	Fishery	Restrictions				License/ Limited Entry	Catch Restrictions	Rights-based Regulations	Taxes/ Royalties	Performance Standards
		Spatial	Temporal	Gear	Size					
Industrial	Tuna Purse Seine Vessels	Yes	Yes	Yes	No	Yes	No	No	No	No
	Longline	Yes	No	Yes	Yes	Yes	No	No	No	No
	Shrimp Trawlers	Yes	Yes	Yes	Yes	Yes	No	No	No	No
Artisanal	Coastal demersal and pelagic.	Yes	Yes	Yes	Yes	Yes	No	No	No	No
Recreational	Sport Pelagic and Demersal	Yes	No	No	No	Yes	No	No	No	No

Costs and Funding Sources of Fisheries Management within the three largest fisheries

Category of Fishery	Fishery	Do Management Funding Outlays Cover			Are Management Funding Sources From		
		R&D	Monitoring & Enforcement	Daily Management	License fees in fishery	License fees from other fisheries	Resource rents
Industrial	Tuna Purse Seine Vessels	Yes	Yes	Yes	Yes	Yes	No
	Longline	Yes	Yes	Yes	Yes	Yes	No
	Shrimp Trawlers	Yes	Yes	Yes	Yes	Yes	No
Artisanal	Coastal demersal and pelagic.	Yes	Yes	Yes	Yes	Yes	No
Recreational	Sport Pelagic and Demersal	Yes	Yes	Yes	Yes	Yes	No

Compliance and Enforcement within the three largest fisheries

Category of Fishery	Fishery	VMS	On-board observers	Random dockside inspections	Routine inspections at landing sites	At-sea boarding and inspections	Other (please specify)
Industrial	Tuna Purse Seine Vessels	Yes	Yes	Yes	Yes	Yes	
	Longline	No	No	Yes	Yes	Yes	
	Shrimp Trawlers	No	No	Yes	Yes	Yes	
Artisanal	Coastal demersal and pelagic.	No	No	Yes	Yes	Yes	Inspections of fish transport trucks
Recreational	Sport Pelagic and Demersal	No	No	No	Yes	Yes	

Capacity Management within the three largest fisheries

Category of Fishery	Fishery	Does overfishing exist?	Is fleet capacity measured?	Is CPUE increasing, constant or decreasing?	Have capacity reduction programmes been used?	If used, please specify objectives of capacity reduction programme
Industrial	Tuna Purse Seine Vessels	No	Yes	Constant	Yes	To adjust size of fleet for economical reasons
	Longline	No	Yes	Constant	No	
	Shrimp Trawlers	Yes	Yes	Increasing	No	
Artisanal	Coastal demersal and pelagic.	Yes	Yes	Increasing	Yes	To ensure that the owners of the boats are fishing themselves
Recreational	Sport Pelagic and Demersal	No	No	Constant	No	

El Salvador

** Translated from the original Spanish*

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September 2003

INTRODUCTION

As decreases in capture volumes were observed in the 1990s, whether due to the increase in fishing effort and/or the presence of natural phenomena, which at the same time opened opportunities for harvesting other resources whose benefits had not been perceived by the country and when it was also necessary to establish the responsibility for the users in managing the fisheries resources, serious work involving the stakeholders began in 1997 to prepare fisheries and aquaculture management, administration and promotion instruments. As a result of these efforts, El Salvador has experienced an exceptional change in the management of its fisheries in the last four years.

Among the changes are the use of a participative approach to management, a new legal framework and national policy to support such efforts and to reflect international agreements, and an increase in the number of fisheries under some form of dynamic and flexible management; allowing for the use of a variety of management instruments depending on the specifics of the fishery.

FISHERIES POLICY FRAMEWORK

The work to design the National Fisheries and Aquaculture Policy for El Salvador, that incorporated aquaculture, artisanal and industrial fishers, culminated on 31/08/2000, in a public activity with broad participation presented to the country the National Policy that includes the following objectives:

Core Objective

To strengthen the bases for fisheries and aquaculture management to achieve sustainable development within a short, medium and long term strategic framework.

Specific Objectives

- To enable the optimum sustainable use of fishing resources guaranteeing their availability for present and future generations.
- To systematize and modernize a new regulatory framework for the fisheries sector that will enable adequate management of the fishing resources.
- To promote the orderly use of new competitive alternatives of production to guarantee an economic, social and environmental benefit.

The following specific strategies were established (listed only) to achieve those objectives:

- Fisheries and Aquaculture Management
  - Management Plan
  - New legal framework
  - The Code of Conduct
  - Registration for fisheries and aquaculture
  - Flagging of vessels
  - Control and surveillance
  - Other measures (avoiding pollution and deforestation)

- Institutional Development
  - Institutional role
  - CONAPESCA
  - Decentralisation
  - Institutional reinvestment
  - Institutional coordination
  - Institutional cooperation
  - Communications
- Scientific and Technological Research
  - Scientific research is a priority
  - Formulation of a research program
  - Applied research
  - Institutionalisation of research
  - Strengthening and equipping a special ocean research centre
  - Updating and standardizing statistical information
  - Monitoring species of highest commercial value and social interest
  - Potential of underexploited resources
  - Bio-security
- Fisheries Management
  - New Management Modes: Co-Management and Self-Control
  - Access to fisheries resources
  - Coastal resources
  - Under-utilised or non utilised resources
  - Aquaculture
  - Highly migratory species
  - Recreational fisheries
- Fisheries and Aquaculture Business
  - Reconversion and competitiveness
  - The fishing business
- Training
  - To technicians and producers
  - Interaction with the Ministry of Education, international organisations and friendly countries
  - Training for artisanal fishers and vessel captains
  - Openness for formal training of the technical staff of the productive sector
- Sectoral Security
  - Legal security
  - Social security
  - Operational and industrial security
  - Navigation and fishing security
- Economy, Marketing and Consumption
  - Specific account in national accounting system
  - Credit lines
  - Fisheries and aquaculture development fund
  - Quickness in marketing and export procedures
  - “Single window”
  - Promoting consumption of fisheries products
- Fisheries Infrastructure
  - Facilitating the creation and start-up of services connected to fisheries activities
  - Improvements to existing infrastructure
  - Development poles
  - Creation of pilot distribution centres for fisheries products

The National Policy is to be evaluated annually by the Ministry of Agriculture and Livestock and the National Fisheries and Aquaculture Council (CONAPESCA).

LEGAL FRAMEWORK

Historical Legal Framework

The first efforts to establish a legal framework for fisheries management in El Salvador are contained in the "Fisheries and Marine Hunting Law and Regulations" (Ley y Reglamento de Pesca y Caza Marina). The Law was enacted in November 1955 and the Regulations the following year. In October 1970 the "Law for the Promotion of Marine Fisheries and Fishing in the High Seas Fisheries" (Ley de Fomento a la Pesca Marítima de Altura y Gran Altura) was approved, sponsored by the Ministry of Economy. The articles of the 1955 Law did not explicitly state an objective, but Article 2 stated that "This Law establishes norms related to the exercise of fishing and marine hunting undertaken for the purpose of exploitation" (Ministerio de Economia, 1995).

The Fisheries and Marine Hunting Law was in force until 1981, when the "Fishing Activities General Law" (Ley General de Actividades Pesqueras), and its regulations were approved in September of 1983. The purpose of the Law was to: "Promote and regulate fisheries and aquaculture, for improved utilisation of fisheries resources and products". It included concepts such as research, protection of fisheries resources, international conventions. It contained a classification of fisheries according to their purposes, fishing gear and fishing areas and established a special regime for pelagic and migratory species (Ministerio de Agricultura y Ganaderia, 1981).

Between 1990 and 1992, the Fisheries Management and Development Plan for El Salvador was prepared, in collaboration with NORAD-OLDEPESCA.

As a decrease in capture volume was observed in the 1990s, whether due to the increase in fishing effort and/or the presence of natural phenomena, which at the same time opened opportunities for harvesting other resources whose benefits had not been perceived by the country and when it was also necessary to establish the responsibility for the users in managing the fisheries resources, serious work involving the stakeholders began in 1997 to prepare fisheries and aquaculture management, administration and promotion instruments.

The above-mentioned work included:

- Preparation of proposals for a new law. Funding: PRADEPESCA, European Union, and Government of El Salvador. 1997-2000.
- Creation of the Special Fisheries Commission that prepared the proposed strategy and institutional organisational structure alternatives for the fisheries and aquaculture sector. Funding: Ministry of Agriculture and Livestock – PRADEPESCA. July - September 1999.
- Preparation, approval and publication of the National Fisheries and Aquaculture Policy. Funding: Ministry of Agriculture and Livestock. 31/08/2000.
- Approval and enactment of the "General Law for the Management and Promotion of Fisheries and Aquaculture" (Ley General de Ordenación y Promoción de la Pesca y Acuicultura). Funding: Ministry of Agriculture and Livestock. 12/01 (Ministerio de Agricultura y Ganaderia, 2001).

The objective of the new Law is: Article 1: To regulate the management and promotion of fisheries and aquaculture activities, ensuring the conservation and sustainable development of hydro-biological resources.

The main two sources of inspiration of this Law are the Code of Conduct for Responsible Fisheries and the Law of the Sea (United Nations).

The efforts of the various sectors to reach agreement and obtain consensus about the Law have allowed the creation of spaces for discussion, agreement and guidance of the management of fisheries and aquaculture resources as well as for conflict resolution.

These above-mentioned initiatives were institutionalised with the creation of the "National Fisheries and Aquaculture Council" (CONAPESCA, Consejo Nacional de Pesca y Acuicultura (CONAPESCA), within the current legal framework, with representatives from industrial, artisanal and aquaculture sectors, among others.

The "National Fisheries and Aquaculture Scientific Advisory Committee" (Comité Consultivo Científico Nacional de la Pesca) was also created to advise CENDEPESCA in its areas of competency.

Competent Authority

The General Law for the Management and Promotion of Fisheries and Aquaculture (Dec./2001) establishes (Art. 7) the Ministry of Agriculture and Livestock as the governing body for policy and planning of the management and promotion of fisheries and aquaculture. In addition, Art. 8 of the said Law identifies the Centre for Fisheries and Aquaculture Development (CENDEPESCA) as the competent authority for application of the Law, its regulations and other applicable legal provisions; however, it leaves room for institutional evolution.

Support Institutions

The management plans and the norms deriving from them are monitored and applied by CENDEPESCA, but assistance is provided for field verification by the corresponding entities such as the Naval Force, in charge of authorizing the sailing of vessels, patrolling territorial waters and has the power to board any boat. The Naval Force collaborates with CENDEPESCA in routine inspection of turtle excluder devices and fishing gear and in the enforcement of time and area closures.

The National Civil Police (PNC) through its maritime and environmental division assists CENDEPESCA in verification during the implementation of the management plans. This entity may act alone or in collaboration with CENDEPESCA inspectors, and its most evident activities include routine inspection of landings, fishing gear inspection, enforcement of time and area closures, enforcement of capture sizes and of transportation of species during closures, among others.

The above-mentioned support entities (PNC and Naval Force) will soon be joined by the Maritime Port Authority (Autoridad Marítima Portuaria), which will take over some of the functions of the Naval Force, particularly in relation to port movements (e.g. sailing, arrival, loading, and unloading). CENDEPESCA as well as the rest of the entities described may act on their own initiative (*ex oficio*) or in response to claims.

Regionalisation

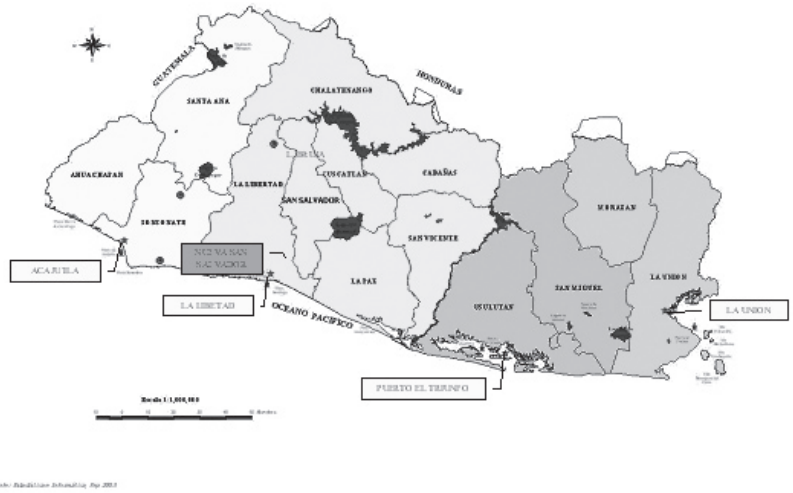
To make CENDEPESCA's work more effective, the institutional reorganisation created four regional delegations so far, each one of them with jurisdiction over one part of the Salvadorian coast. Each one of the regions has among its functions proposing, executing, monitoring, and publishing management plans; evidently most of the initiatives and those with the largest scope are issued by Headquarters. The regional offices also enjoy support from the above-mentioned institutions.

At the local level, fishing inspectors are only deployed in communities with particular characteristics, for example, with nuclei of organised fishers, or where they are part of protected areas. In communities where this is not the case, the regional office with jurisdiction over them establishes a programme of visits to implement management plans or to undertake other administrative activities.

Other Legislations

In general, marine fisheries resource management issues fall within the competence of CENDEPESCA; however, some issues such as the conservation of sea turtles are the responsibility of the Ministry of Environment and Natural Resources.

FIGURE 1
Regional offices of CENDEPESCA



Region I, with jurisdiction over the coastal departments of Ahuachapan and Sonsonate
Region II, with jurisdiction over La Libertad, La Paz and San Vicente
Region III, Usulután and San Miguel
Region IV, La Unión

The Scientific and Administrative Authority of CITES is part of the Ministry of Agriculture and Livestock; however, coordination with CENDEPESCA to deal with issues related with species also included in CITES is still deficient.

To date, flagging of foreign vessels fishing in jurisdictional or international waters has been carried out by the Naval Force, but the recently created Maritime Port Authority will take over this function. However, either entity must have CENDEPESCA's endorsement to flag a vessel.

Access to Fisheries

To deal with issues related with access to marine fisheries, particularly to the industrial ones, CENDEPESCA must have sufficient scientific bases to demonstrate that the level of exploitation of the stock can withstand the entry of new participants. CENDEPESCA's scientific base could be prepared by the institution, by international cooperation, or by the private sector (supervised by CENDEPESCA), so that no one can access the resources if a potential has not been demonstrated. Therefore, environmental impacts are evaluated by CENDEPESCA.

In the case of artisanal fisheries, great efforts have been undertaken to register fishers and boats, and to organise the landing sites; these two conditions are vital to regulate entry into the fishery, among others.

STATE OF FISHERIES

Marine capture fisheries in El Salvador until the middle of last century were mainly for subsistence or in the best of cases artisanal, and products were sold locally or marketed in Honduras and Guatemala, at best.

Industrial Shrimp Fishery

In 1954-55, with the arrival of Mexican vessels, some of them with Portuguese captains, industrial shrimp fisheries started (genus *Penaeus*, *Trachipenaeus* and *Xiphopenaeus*), and continue to be active.

The first fisheries management efforts relative to the until recently most important fishery (shrimp) in the country began in 1970 with the Regional Project for Fisheries

Development in Central America led by FAO (1968-1972) CA/FI/68/36. However, attempts to implement management measures for the shrimp fishery continued without much success until the late 90's due to the top-down approach taken in developing management measures.

Marine Artisanal Fishery

From the 50's to the 80's artisanal fisheries experienced continuous but gradual growth; however, toward the end of the 80s and beginning of the 90s, there was increased entry of artisanal fishers into the fisheries resulting from the social conflict in El Salvador during that period. The total number of marine artisanal fishers surveyed in 1995 was 13 004 (PRADEPESCA, 1995).

In the years 90-92 artisanal fishers began focusing more intensely on shrimp for commercial purposes, a resource that until that point had been targeted only by industrial fisheries. Activity over the same resource deepened the conflicts with the industrial fishers that had arisen in previous years and that lasted until the end of the last century.

"Morralleros"

In parallel to the development of artisanal and industrial fisheries, a group of "fishers" called "morralleros" appeared. They use artisanal boats and collect the by-catch fish, "chacalines" and molluscs that shrimp trawlers captured in their sets along with the target species. These morralleros play an important role in the fisheries and by 1998 they were marketing over US$ 10 million; representing over 70% of the by-catch extracted by shrimp boats (López, 1998).

Recreational Fishery

Recreational or sports fishing has been legally recognized in El Salvador for several decades, without registration or regulation until 2001.

Pelagic and Highly Migratory Resources

Since the 80's El Salvador had participated in meetings of the Inter-American Tropical Tuna Commission; but it is in 1998 that it aggressively, but responsibly begins to conquer the spaces it is entitled to as a coastal nation in the harvesting of pelagic and highly migratory resources.

Most Important Marine Fisheries

The most important marine fisheries in El Salvador currently are:

- Tuna and tuna-like species captured with purse seine nets mostly set on dolphins by the industrial fishery.
- Shrimp (including "chacalines") by an industrial trawler fleet and artisanal fishers using trammel nets of 2 ½ and 3 inch open mesh size.

TABLE 1
Selected characteristics of maine marine fisheries (2002)

Fishery	Landings MT	%	Value US $	%	Origin
Tuna*	14 400	57	12 960 000	39	Industrial fishery
Shrimp and small shrimp (camaroncillo)	1 966	8	12 020 355	36	Industrial fishery + Artisanal fishery
"Chilean" shrimp	3 156	13	1 817 740	6	Industrial fishery
Other crustaceans	4 362	17	997 386	3	Artisanal fishery
Other products	1 256	5	5 328 287	16	Industrial fishery + Artisanal fishery
TOTAL	**25 140**	**100**	**33 123 768**	**100**	

* Estimates based on information from CENDEPESCA
Source: CENDEPESCA

- Fish caught with gillnets 2 ½, 3, 4 and 5 inch mesh size and with "cimbra" (beach seines) by the artisanal fishery, and this group also includes the fish utilised by the "morralleros" and which are captured by the industrial shrimp fleet as bycatch.
- Other crustaceans are landed by artisanal fishers and "morralleros", among them species such as "chacalines" (*Trachipenaeus* sp. and *Xiphopenaeus* sp.), swimcrab (*Callinectes* sp.), lobster (*Panulirus* sp.), crab, among others. "Chacalines" and most swimcrab are part of the shrimp bycatch but are landed as artisanal catch; lobster and crab are caught with trammel nets.

The volumes landed and the values of the main marine fisheries in the country for 2002 are given in Table 1.

Marine Fisheries in the Economy

When analysing the participation of fisheries in the economy, it can be seen that for 1999, exports consisted of coffee, sugar and marine shrimp representing 21 percent, four percent and two percent respectively of total exports. The contribution of this fisheries sub-sector to the GDP in 1998 was 0.4 percent (IC NET, 2002); however, estimates from the Planning Department of CENDEPESCA show that for 2002 the contribution was only 0.3 percent, the 0.1 percent point decrease is due to lower shrimp prices and lower export volumes.

Breaking down the participation of the different component of the fisheries sub-sector in the 0.3 percent mentioned is difficult, because the national account system does not include this record, but it can be said with certainty that up to 2002, 95 percent of this contribution was dominated by shrimp. It is currently expected that participation of fisheries in the GDP for 2003 and future years will grow due to the operations of the new industrial tuna fishery in the country.

As noted above, until recently shrimp and "chacalines" were the most economically important resources in the country; however, given the diversification of fishing activities promoted by CENDEPESCA, the carrying capacity allocated by IATTC to El Salvador, the favourable conditions granted to investors for capturing and processing tuna, this has become the most important fishery in landings and by value.

The tuna fishery is regulated by the Commission regarding closure seasons, available stock volume, carrying capacity permitted for the participants, bycatch treatment, differentiated treatment of target species, among others.

The regulations agreed by the Commission for the management of tuna became part of the national legislation on the subject by virtue of Art. 5 and 79 paragraph "m" that considers as a serious infraction: Non compliance with international agreements signed and ratified by El Salvador.

FISHERIES MANAGEMENT

Fisheries management in El Salvador in the last four years has taken on a new dimension, a new course, an ambitious scope and probably most important, direct participation of stakeholders.

Resource management in the years prior to the end of the century was based on vertical actions generated by CENDEPESCA. This situation resulted in some sectors supporting measures while others rejected them and the absence of consensus; the measures therefore were fragile, easily refuted by the different sectors; in addition, some of the management measures were based on scientific evidence largely unknown to the users, so the majority were rejected.

It should be highlighted that after two years of the existence of the new legal framework, the following were implemented:

- Research and monitoring of the second most important fishery in the country, shrimp;
- Establishment of a reserve area;

- Training of vessel captains;
- Establishment of the Artisanal Fisheries Trust (APESCAR);
- Decentralisation of the institution through the creation of area offices;
- Establishment of closures for crustaceans and molluscs as fisheries management instruments;
- Full incorporation of users (CONAPESCA);
- Development of applied research as a fundamental instrument of fisheries management;
- Improvement and equipping laboratories for marine research;
- Construction of port infrastructure.
- Consolidation of the National Fisheries and Aquaculture Scientific Advisory Comité (Comité Consultivo Científico Nacional de la Pesca y la Acuicultura)
- Promulgation of the Fisheries and Aquaculture Code of Ethics (Código de Ética de la Pesca y Acuicultura de El Salvador [CODEPESCA]).

These are just a few of the elements where the fisheries policy has been successfully applied. Table 2 compares fisheries management before and after 2000.

TABLE 2
Fisheries Management before 2000 and now

Parameter	Before 2000	Currently
Origin of Management Plan	National or international technicians formulated the management plan	Arises from users, technicians, managers or other groups
Generation of regulations	Sometimes national technicians members of CENDEPESCA were consulted	-Discussion with stakeholders
		-Work planning
		-Research
		-Discussion of results
		-Consensus on measures to be used
		-Presentation of management plan or measure to be taken to the competent authority
		-The competent authority makes technical adjustments to the plan or regulation and discusses the issue with the users again
		-Once a consensus is reached between the competent authority and the users, it is published
Strength of regulations or of management plan	Very weak	Broadly supported
Possibility for adjustments	Given the manner in which it was prepared, it becomes rigid	The measures can be adjusted in accordance with resource dynamics
Responsible	CENDEPESCA	CENDEPESCA + Users
Managed fisheries	Shrimp, lightly (includes "chacalines")	Tuna, shrimp, prawn, some fish, some molluscs. Probably 85% of the most important fisheries in the country are under some type of management
Management tools	Legislation in force	-User participation
		-More scientific contributions
		-Respect of international agreements
		-New legislation
		-Permanent consultation with users
		-Transparency and broad dissemination
Trend toward the use of certain management instruments		Protected areas
		Closures
		Monitoring
		Fishing gear regulations
		Registration of fishers and vessels
		Landing sites
		Permits and licenses

Origin of the Change

The substantial changes that have occurred in fisheries management did not come about from spontaneous generation and probably everything began with the Regional Fisheries Development Support Program for the Central American Isthmus (PRADEPESCA, "Programa Regional de Apoyo al Desarrollo de la Pesca en el Istmo Centroamericano"), at the beginning of the 90s.

One of the most evident positive aspects of this program is having fostered sectoral organisation: new artisanal fishing cooperatives were formed in each Central American country and existing ones were strengthened. This organisation effort aided in the constitutions of the Confederation of Artisanal Fishers of Central America (CONFEPESCA, "Confederación de Pescadores Artesanales de Centro América"), currently chaired by Salvadorian fisher Norberto Romero.

On the other hand, the chambers and organisations of industrial fishers were stimulated and also formed a regional organisation, the Organisation of Central American Aquaculture and Fisheries Entrepreneurs (OECAP, "Organización de Empresarios Centroamericanos de la Acuicultura y la Pesca"). Aquaculture specialists are organised in each country but have not formed a regional organisation.

This organisation effort lasted almost ten years and has been fruitful. In El Salvador these organisations formed the basis for user participation in resource management tasks.

PRADEPESCA also promoted activities at the regional level to establish contact between marine and inland fisheries stakeholders throughout Central America. These allowed Central Americans to realise they had common problems, learning from each other and recognition that fisheries resources know no boundaries.

Positive Influences and Follow-Up

The institutional restructuring efforts that began in 1999 also positively influenced a new approach to fisheries management, to the point of enabling a new legal framework.

The political decision to support fisheries and aquaculture has been vital to this change in attitude.

Now El Salvador is interested in permanently evaluating the state of the resources. Since 2000 when monitoring of shrimp began in a systematic manner and with an ecosystem approach, efforts have not ceased and it is not only the institution that participates (CENDEPESCA) but also international cooperation, private sector, aquaculture and artisanal fishers and NGOs.

The tuna fishery is subject to permanent evaluation. The behaviour of red crab stocks (*Pleuroncodes planipes*) is still closely watched by the private sector with the periodic supervision of CENDEPESCA. Deep water shrimp stocks (*Heterocarpus* sp.) have been evaluated and determined to be an untapped resource.

Of all the fisheries subjected to management and follow-up, one of them, shrimp, shows signs of overfishing. The reduction in capture cannot be attributed only to an increase in fishing effort as natural phenomena occurring frequently such as El Niño or with high impact such as hurricane Mitch have complicated management. As mentioned, a plan has been designed to help the stock recover, including protection of larvae and post-larvae in estuaries, coastal lagoons, sanitary monitoring, continuous follow-up and the closure, perhaps the most visible and widely accepted measure.

It is still too soon to evaluate the impact of the fisheries management measures, but it is evident they have contributed to a change of attitude among users and the public at large regarding the sustainable use of fishing resources.

Weaknesses

There is weakness in the knowledge and monitoring of some fisheries such as snapper (*Lutjanus* sp.), weakfish (*Cynoscion* sp.), lobster (*Panulirus gracilis*) and some crabs,

BOX 1
Case Study: Shrimp Resource Management

Shrimp capture volumes, including "chacalines" and "camaroncillos", showed a growing trend in 1990 through 1994 and captures peaked in 1995 and 1996. By 1997, catches were decreasing and the situation worsened in 1998. However, the impact of hurricane Mitch (in late 1998) obscured this reality as this natural catastrophe dragged the cultivated shrimp from pools in Guatemala and mainly Honduras and Nicaragua, and left them in open seas, where trawlers caught them and artificially increased their yield.

But the effects from Mitch were not limited to increased capture; large amounts of sediment, agrochemical run-off from agricultural fields and the spread of viral diseases in estuaries and coastal lagoons from shrimp farms resulted in unfavourable conditions for shrimp reproduction and development in their natural environment. The situation was further complicated by excess fishing capacity from artisanal and industrial fleets.

The ensuing decrease in production caused alarm and one of the first measures adopted in 1999 was a resolution suspending the issuance of new industrial fishing licenses; the industrial shrimp fleet was fixed at 1990 vessels. However, industrial fishers were concerned about the absence of limitations to artisanal fishers targeting the same resource and acting without any restriction.

Efforts led by CENDEPESCA were made in 2000 to obtain consensus among the artisanal, industrial and aquaculture sectors. In May 2000, in an unprecedented action, the Federation of Artisanal Fishing Cooperatives of El Salvador joined efforts with the Chamber of Fisheries and Aquaculture of El Salvador and with CENDEPESCA to finance an assessment of the shrimp resource, as well as to forecast its behaviour for the next six months and to present considerations and recommendations for better resource management (López, 2000).

The study did not follow the traditional historical capture analysis or applied known mathematical models, but rather studied the resource as a complex unit under an ecosystem approach, analysing parameters such as:

- fertility of white shrimp in artisanal and industrial fisheries and of "chacalines" in the industrial fishery;

that although not among the most important, it is necessary to know about their potential and state.

Fisheries management is a cultural process based on the participation of the sectors, so it should make rapid progress as the sectors work in harmony and for this to occur, it is necessary to increase the efforts to convince more artisanal fishers to become associated.

If at this time CENDEPESCA would abandon the working strategy it has used in recent years or if it lost political support, it could be predicted that the management measures created and implemented would suffer a severe impact. This means institutional protection is still required.

COSTS AND FUNDING (INCOME) OF FISHERIES MANAGEMENT

Budget

The annual budget for fisheries and management in general terms has increased in the last ten years (US$800 000 – US$914 000); however, the largest percentage has gone to paying salaries. The line item for operating costs has not been higher than 6 percent, the -remaining 94 percent is only for salaries. Nevertheless, in the last three years there has been more investment in fisheries infrastructure (docks, research stations), thanks to special funds from the Central Government in the amount of US$2 971 428 between 2001 and 2002 and US$300 000 in 2003.

In 2003, the Central Government also created an artisanal fisheries trust fund of US$800 000 earmarked for productive projects presented by artisanal fisher groups

- presence of disease among shrimp juveniles and adults;
- post-larval and juvenile stocks in estuaries;
- fishing yield and catch composition;
- environmental conditions;
- pesticides (pollutants) in estuaries.

The organisation, design, preparation, execution and discussion of the results of the research enjoyed full participation of stakeholders and sponsors, achieving good acceptance of the results.

The year 2001 was decisive to the new fisheries management scheme. On the one hand, the earthquakes the country endured in January and February of that year caused severe uncertainty in the sector; on the other hand, the work necessary to reach a consensus among the stakeholders in order to propose a new Law, brought a new understanding of the risks, challenges and common problems that exist in shrimp fisheries as well as of the need to establish more effective and responsible management measures in order to help the resource in its recovery. In addition, CONAPESCA (National Fisheries and Aquaculture Council) was consolidated in 2001 and witnessed the birth of a new legal order for fisheries and aquaculture. An immediate result of all this coordination and participation by users was the first 30 day closure for artisanal and industrial shrimp extraction in 2002. This closure was the most visible management measure, but other measures were implemented in estuaries to protect larvae and juveniles. The decision to close was made with participation from aquaculture, artisanal and industrial fishers, technicians, marketers and institutions such as the National Civil Police, the General Customs Directorate, the Ministry of Environment and Natural Resources, the National Scientific Consultative Committee on Fisheries and Aquaculture, the Naval Force, among others.

The initiative was well received and in 2003 Nicaragua joined the effort and the number of closure days increased to 40. Thanks to broad user participation, it was carried out without any problems. A 60-day closure was implemented for 2004. Guatemala is expected to join the effort, resulting in a total of approximately 1 000 km of coastal area where no shrimp or bycatch will be captured for 60 days.

It is probably too early to evaluate the impact of closures on resource recovery; however, the success of the measure as far as user participation, public approval from all sectors and stimulation of the sustainable resource harvesting culture indicates we are on the right track.

BOX 2

Participative Approach to Developing a Management Plan

- Users, technicians, managers or any interested person or group submits a concern to the competent authority about the manner in which the resource is being exploited.
- CENDEPESCA invites the users or stakeholders to discuss the issue.
- There is full discussion among all present as to whether it is necessary to take immediate action based on previous experiences, or to apply the precautionary principle while scientific information is obtained and/or whether it is necessary to start an investigation to clear any doubts.
- The technical team responsible for preparing the research plan is designated.
- The research plan and case details are discussed with the stakeholders, a requirement to begin work under this scheme.
- The research is carried out by the technicians and interested fishers.
- The results are discussed with all stakeholders.
- The discussion yields viable proposals, measures to be applied and the management plan (not always).
- Proposals agreed by consensus are presented to the Competent Authority that reviews them in the light of the technical requirements of resolutions and again discusses them with the stakeholders.
- The final document that will become the Law to regulate exploitation of a particular resource, of mandatory compliance, results from this final discussion.

or associations. In addition to providing money for project funding, the Fund aims to stimulate associations, as preferential credit is given to organised artisanal fishers.

Cost of Fisheries Management

The cost of managing fisheries has increased in the last ten years due to, among others:

- Increases in supervision costs
- Better coverage
- Greater participation in events related to the issue
- Organization of stakeholder events and
- Training courses.

Although not equal to the costs, income from fishing licenses and from fines for infractions has increased. This has been possible because during the discussions about the new legislation the sectors understood the need to increase the amount of the fees related to fisheries.

IMPLEMENTATION OF GLOBAL FISHERIES MANAGEMENT MANDATES AND INITIATIVES

United Nations Convention on the Law of the Sea

El Salvador has not ratified the United Nations Convention on the Law of the Sea; however, it is conceptually one of the bases of the General Law for the Management and Promotion of Fisheries and Aquaculture, together with the Code of Conduct for Responsible Fisheries.

Full participation in the Inter-American Tropical Tuna Commission (IATTC) and in the Agreement for the International Dolphin Conservation Program (AIDCP), as well as compliance with their regulations, show the will to comply with the provisions regarding the conservation and management of straddling and highly migratory fish stocks.

International Plans of Action (IPOAs)

The development of activities related to the International Plans of Action (IPOAs) has not been homogenous, for example:

Two actions have been undertaken for the conservation and management of sharks; the first has been the preparation of a research project with the participation of three organisations: CENDEPESCA-IATTC-CCCNPESCA. The main purpose of the research is to collect information about sizes, species, location of captures, fishing gear, among others, and with computer support, to determine the state of shark stocks landed in Acajutla, the most important shark port in El Salvador.

The information collection program is under execution and the implementation of shark tagging has been recommended but not funded.

The second action is the preparation of a preliminary shark management plan that will be adjusted as research progresses.

For the International Plan of Action for sharks as well as for the other Plans, Management of Fishing Capacity; International Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing and for Reducing Incidental Catch of Seabirds in Longline Fisheries, the Central American region, including El Salvador, presented a project to FAO, on occasion of the last COFI meeting in Rome, regarding technical cooperation to advance these issues.

However, even though the country has no definite plans, various actions are carried out that contribute to prevent, deter and eliminate illegal, unreported and unregulated fishing, such as:

- Mandatory prior notification of the arrival of fishing vessels, particularly those operating in the high seas

– Registration of vessels and verification of origin
– Verification of capture and place of origin
– Product inspection and registration of destination.

Fisheries and Aquaculture Code of Ethics (Código de Ética de la Pesca y Acuicultura de El Salvador (CODEPESCA))

The Fisheries and Aquaculture Development Center within the Agriculture and Cattle Ministry has enacted, by Resolution in May, 2004, Fisheries and Aquaculture Code of Ethics.

The elaboration and application of the Code have their legal foundation in Article 96 of the "General Law for the Management and Promotion of Fisheries and Aquaculture" (Ley General de Ordenación y Promoción de la Pesca y Acuicultura). This Code applies throughout the national territory and holds accountable the stakeholders in the various fisheries and aquaculture sectors; however, this Code is directed to all individuals involved, whether direct and indirectly, in fishing and aquaculture.

The objectives of the Code are:

- To promote ethical and moral values in the use of the aquatic resources.
- To encourage the protection and sustainable use of the living aquatic resources, their environments, as well as coastal areas and of aquatic reserves.
- To establish and to apply the principles and criteria, under the umbrella of international rights and norms, so that fishing and the aquaculture activities are conducted in a responsible manner.

The various Articles comprised within the Code include:

- Public/Common Goods
- Ethical Values
- Moral commitments in Fisheries and Aquaculture
- Fisheries and Aquaculture Education
- Participatory Management
- Social Security
- Relationships with other Normative Instruments
- Ethics Committee and
- Diffusion of the Code of Ethics.

PARTICIPATION IN REGIONAL FISHERIES ORGANISATIONS

The recent development of a tuna industry in the country and the associated need to flag vessels, requires that El Salvador act responsibly in its participation within the IATTC and in the Agreement for the International Dolphin Conservation Program, in both cases as a full member.

Signature and ratification of the above mentioned fisheries international instruments, their recognition in the General Law for the Management and Promotion of Fisheries and Aquaculture, transform the regulations emanating from these organisations into national laws and any violation is subject to sanctions (Art. 5 and 79, paragraph m).

In addition, the country participates and is a full member of other regional fisheries organisations, such as:

– Organisation of the Fisheries and Aquaculture Sector of the Central American Isthmus, OSPESCA (Organización del Sector Pesquero y Acuícola del Istmo Centroamericano), part of the Central American Integration System.
– Latin American Organisation for Fisheries Development, OLDEPESCA (Organización Latinoamericana de Desarrollo Pesquero)

SUMMARY AND CONCLUSIONS

In the area of fisheries management, El Salvador has taken a qualitative and quantitative leap in the last four years; the origins of this change are probably to be found in

the work undertaken by the Regional Fisheries Development Support Program for the Central American Isthmus (PRADEPESCA, "Programa Regional de Apoyo al Desarrollo de la Pesca en el Istmo Centroamericano").

Among the most visible elements of this change are:

- A new legal framework: General Law for the Management and Promotion of Fisheries and Aquaculture
- National Fisheries and Aquaculture Policy
- Broad participation of the sectors in all stages of fisheries management
- Creation of participation, discussion of measures and conflict resolution mechanisms
- Creation of organisations of technical and scientific advice
- Larger number of fisheries under management
- Diversification of fisheries
- Creation of the scientific base to support resource management
- Establishment of the necessary measures such as time and area closures, protection of reproduction and hatching areas
- More income to counteract the impact of cost increases
- Effective and responsible participation in regional fisheries management organisations, among others
- Transparency in resource management
- A new Fisheries and Aquaculture Code of Ethics

One of the weaknesses is the lack of information about some species of fish and crustaceans including snapper, weakfish, and lobster; it is necessary to increase the number of associated artisanal fishers and to finish registering them and their boats. If the institution CENDEPESCA changes the manner in which it has been working, a significant impact is foreseen for fisheries management in El Salvador.

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APPENDIX TABLES

Current Management of Marine Capture Fisheries

Level of Management	% Fisheries Managed	% with Fisheries Management Plan	% with Published Regulations*	Trends in the number of Managed Fisheries over ten yrs. (increasing/decreasing/unchange)
National	> 67	< 33	> 67	Increasing
Regional	n.a.	n.a.	n.a.	n.a.
Local	n.a.	n.a.	n.a.	n.a.

* In other cases of managed fisheries where no regulations have been published , licences with conditions/rules are issued to participants under the Fisheries Act
** Only one fishery is concerned

Summary information for three largest fisheries (by volume)

Category of Fishery	Fishery	Volume tonnes	Value* US$ million	% of Total Volume Caught**	% of Total Value Caught**	Covered by a Management Plan?	# of Participants	# of Vessels
Industrial	Atùn	14 400	12.96	76	55	Yes	156	3
	Camarón y camaroncillo	1 317	8.63	7	37	Yes	900	90
	Langostino	3 156	1.82	17	8	Yes	98	7
Artisanal	Pescado	6 251	6.33	56	44	Yes	9 403	4 283
	Camarón	649	3.39	6	24	Yes	2 400	800
	Otros crustaceós	4 362	4.54	39	32	Yes	1 200	600
Recreational	Pez vela, dorado	n.a.	n.a	n.a	n.a	Yes	n.a	n.a
	Marlin, dorado	n.a.	n.a	n.a	n.a	Yes	n.a	n.a
	Pez Espada, dorado	n.a.	n.a	n.a	n.a	Yes	n.a	n.a

* Value in 2002 U.S. Dollars.
** % values caught and % volume caught are based on totals for each category of fishery.
n.a: not available

Use of Fishery Management Tools within the three largest fisheries

Category of Fishery	Fishery	Restrictions				License/ Limited Entry	Catch Restrictions	Rights-based Regulations	Taxes/ Royalties	Performance Standards
		Spatial	Temporal	Gear	Size					
Industrial	Atùn	Yes	No	No	No	Yes	No	No	Yes	No
	Camarón y camaroncillo	Yes	Yes	Yes	No	Yes	No	No	Yes	No
	Langostino	Yes	No	No	No	Yes	No	No	Yes	No
Artisanal	Pescado	Yes	No	Yes	No	Yes	No	No	No	No
	Camarón	Yes	Yes	Yes	No	Yes	No	No	No	No
	Otros crustaceós	Yes	Yes	Yes	No	Yes	No	No	No	No
Recreational	Pez vela, dorado	Yes	No	No	No	No	No	No	No	No
	Marlin, dorado	Yes	No	No	No	No	No	No	No	No
	Pez Espada, dorado	Yes	No	No	No	No	No	No	No	No

n.a: not available

Costs and Funding Sources of Fisheries Management within the three largest fisheries

Category of Fishery	Fishery	Do Management Funding Outlays Cover			Are Management Funding Sources From		
		R&D	Monitoring & Enforcement	Daily Management	License fees in fishery	License fees from other fisheries	Resource rents
Industrial	Atùn	Yes	Yes	Yes	Yes	No	No
	Camarón y camaroncillo	Yes	Yes	Yes	Yes	No	No
	Langostino	Yes	Yes	Yes	Yes	No	No
Artisanal	Pescado	Yes	Yes	Yes	Yes	Yes	No
	Camarón	Yes	Yes	Yes	Yes	Yes	No
	Otros crustaceós	Yes	Yes	Yes	Yes	Yes	No
Recreational	Pez vela, dorado	No	Yes	Yes	Yes	Yes	No
	Marlin, dorado	No	Yes	Yes	Yes	Yes	No
	Pez Espada, dorado	No	Yes	Yes	Yes	Yes	No

n.a: not available

Compliance and Enforcement within the three largest fisheries

Category of Fishery	Fishery	VMS	On-board observers	Random dockside inspections	Routine inspections at landing sites	At-sea boarding and inspections	Other (please specify)
Industrial	Atùn	n.a.	Yes	Yes	Yes	Yes	n.a.
	Camarón y camaroncillo	n.a.	n.a.	Yes	Yes	Yes	n.a.
	Langostino	n.a.	n.a.	Yes	Yes	Yes	n.a.
Artisanal	Pescado	Yes	n.a.	Yes	Yes	n.a.	n.a.
	Camarón	Yes	n.a.	Yes	Yes	n.a.	n.a.
	Otros crustaceós	Yes	n.a.	Yes	Yes	n.a.	n.a.
Recreational	Pez vela, dorado	n.a.	n.a.	n.a.	Yes	n.a.	n.a.
	Marlin, dorado	n.a.	n.a.	n.a.	Yes	n.a.	n.a.
	Pez Espada, dorado	n.a.	n.a.	n.a.	Yes	n.a.	n.a.

* May be required to take observer on board. There is no observer programme.
n.a: not available

Capacity Management within the three largest fisheries

Category of Fishery	Fishery	Does overfishing exist?	Is fleet capacity measured?	Is CPUE increasing, constant or decreasing?	Have capacity reduction programmes been used?	If used, please specify objectives of capacity reduction programme
Industrial	Atùn	No	Yes	Constant	No	n.a.
	Camarón y camaroncillo	Yes	No	Decreasing	No	n.a.
	Langostino	No	No	Constant	No	n.a.
Artisanal	Pescado	No	No	Decreasing	No	n.a.
	Camarón	Yes	Yes (partially)	Decreasing	No	n.a.
	Otros crustaceós	No	Yes (partially)	constant	No	n.a.
Recreational	Pez vela, dorado	No	No	Increasing	No	n.a.
	Marlin, dorado	No	No	Increasing	No	n.a.
	Pez Espada, dorado	No	No	increasing	No	n.a.

n.a: not available

Guatemala

** Translated from the original Spanish*

Rodolfo Fuentes
UNIPESCA, Ministerio de Agricultura, Ganadería y Alimentación, Guatemala
February 2004

INTRODUCTION

Fishing sector activities in Guatemala are socio-economically important to the country, but it is difficult to estimate their effective participation in the nation's gross domestic product (GDP) due to poor information management and statistics. Within the social framework, fishing contributes to food supply, but it is estimated that demand for marine products is low and the eating habits and structure of the population does not show a trend towards increasing consumption, except for the medium class that does steadily demand fish.

In the economic aspect, the sector generates direct and indirect employment especially in coastal communities and in some cases constitutes the only work alternative for the population. In recent years, artisanal fishing has increased in these areas, as it is an activity available to people displaced from other regions affected by social and economic problems.

While both fish and shrimp are exported, the latter is stronger for the sector. Efforts are being undertaken at government level to preserve fishing resources to expand and incorporate new export flows, particularly from shrimp farms.

Fishing does not take place in an orderly framework; activities such as research, management and planning do not occur as part of a plan that may strengthen sustainable development of the resource for industrial and artisanal fisheries.

POLICY FRAMEWORK

In February 2002, the Ministry of Agriculture, Livestock and Food (MAGA), through the Strategic Policy and Information Unit (UPIE), presented the policy to develop hydro-biological resources. The general objective provides the guidelines for achieving the sustainable and responsible development of national fisheries and aquaculture. Specific objectives include promoting the sustainable and responsible harvesting of hydro-biological resources, supporting the development of scientific, economic and social research, technically and financially strengthening the Fisheries and Aquaculture Management Unit (UNIPESCA), promoting the development of the infrastructure necessary to facilitate fishing operations, promoting the update of the legal framework, supporting training and the development of technology to promote the effectiveness and competitiveness of the sub-sector, supporting producer organizations and promoting the development of a domestic market and of exports.

Actions were proposed to accomplish the objectives set forth in the following areas:

- Fisheries and aquaculture management through a management plan that includes coordination with municipal authorities issuing artisanal fishing licenses, inter-institutional coordination for protecting and managing fragile habitats, wetlands and ecosystems important to fisheries and aquaculture production, promoting and implementing specific aquaculture projects and application of the precautionary principle in the conservation, management and exploitation of hydro-biological resources;

- Statistical records through the implementation of an information management system for landings, fishing effort, biological information and aquaculture production;
- Control and surveillance; UNIPESCA shall coordinate control and surveillance actions and define strategies for enforcing fisheries and aquaculture regulations;
- Legal framework; promotion of a new fisheries and aquaculture law consistent with national reality and international regulations in force. It should be mentioned that there is a new fisheries and aquaculture law Decree number 80-2002 of the Congress of the Republic dated 17 December 2002;
- Scientific and technological research;
- Institutional development; the Competent Authority should have sufficient technical and financial capacity to carry out its functions efficiently;
- Fisheries management through the revision and modernization of technical and administrative processes for concession, renewal and cancellation of fisheries and aquaculture permits and licenses, certifications, inspections and other related activities;
- Development of fisheries infrastructure;
- Training and technological development;
- Development of domestic market and exports;
- Sectoral organization and coordination of unorganized producers and groups to propose fisheries development actions and mechanisms; and
- Sectoral security through coordination with naval bases to improve at sea security for fishing boats, training crews in compliance of fisheries regulations and facilitating and promoting gradual implementation of satellite vessel monitoring systems.

The Guatemalan fisheries law dates from 1932, known as Government Decree 1235, although it has been modified, expanded and corrected by a series of legal provisions issued since. Modifications to the law have been in the form of lesser hierarchy instruments, resulting in a confusing and uncertain legal framework. The new Fisheries and Aquaculture Law was enacted in December 2002 through Decree No. 80-2002 of the Congress of the Republic and it considers international regulatory aspects such as the Code of Conduct for Responsible Fisheries.

LEGAL FRAMEWORK

Within the institutional framework, the Ministry of Agriculture, Livestock and Food (MAGA) is the governing body for fisheries and aquaculture in Guatemala. To exercise this function, it is supported by the Fisheries and Aquaculture Management Unit (UNIPESCA), that has the objective of managing fisheries resources and enforcing the new fisheries law Decree No. 80-2002 and its regulations, by undertaking the inspection and surveillance activities as well as determination of prohibitions and other provisions pursuant to its objectives and functions, with the support of the corresponding authorities (Article No. 10 of the new Fisheries and Aquaculture Law). It also provides technical advice to MAGA on decisions to be made in the area.

In Guatemala there are few public entities directly involved in fisheries and aquaculture activities with the governing institution.

Reforms have also been made to Decree 4-89, the Law on Protected Areas that establishes protected areas for fishing and requires environmental impact studies for individuals or companies involved in fishing activities. This regulation is managed by the Ministry of Environment and Natural Resources.

STATUS OF THE FISHERIES

One of the fishing sector's greatest weaknesses is production data collection and management; therefore, there is no technical or statistical foundation to establish the

condition of marine resources. There are industrial and artisanal fisheries, but based on comments by fishers and on catch information, shrimp resources are overexploited and Pacific fish show possibilities for increased capture, particularly in areas distant from the coast.

The artisanal sub-sector is currently the most dynamic within the fisheries sector and it has become the most technically apt and economically convenient system to capture pelagic species for export.

MANAGEMENT ACTIVITY

According to the legal framework in force, the new Fisheries and Aquaculture Law, the Ministry of Agriculture, Livestock and Food is responsible for the sustainable management of fisheries resources through the Fisheries and Aquaculture Management Unit.

Guatemala has an industrial fishing fleet consisting of large and medium-size vessels. In 1998 there were 43 large and 26 medium vessels, for a total fleet of 69 boats.

In the case of marine and inland artisanal fishers, the study conducted by the Programa Regional de Apoyo al Desarrollo de la Pesca en el Istmo Centroamericano (PRADEPESCA)[1] in 1995 found a total of 15 779 fishers.

The new Law creates four management areas: commercial, recreational, scientific and subsistence fisheries and requires the establishment of a National Fisheries and Aquaculture Register as well as a Fisheries and Aquaculture Statistical System, to provide better information.

The 1994 PRADEPESCA technical report estimates artisanal capture of about 26 000 MT, of which 21 840 were in the Pacific coast and 4 750 MT in the Atlantic region. At a rate of 175 fishing days per year, the average per fisher is 13 kg in the Pacific and 9.7 kg in the Atlantic. These figures are probably underestimated, particularly for the Pacific Ocean.

The management measures established in the new Law include fishing gear regulations; UNIPESCA is to specify their characteristics taking into consideration the type of fishery and fishing vessel. This regulation does not exist at present; however, it is at the proposal level.

The main obstacles for effective fisheries management include: average age of the fishing fleet, especially shrimp boats, estimated at over 15 years, most of them beyond their useful life and with obsolete equipment; operational inefficiencies; poorly trained crews and deficiencies in young fishing captain training to handle the product on board; high fuel use and, perhaps most important, the economic problems of producers without the resources for boat maintenance resulting from low efficiency and economic performance indices.

COSTS AND REVENUES OF FISHERIES MANAGEMENT

Fishing is an economic activity that comprises dissimilar functions in its various components such as product capture and processing. This is also evident in the lack of coordination to manage its different components including research, management and development.

The fisheries economic system includes a complex set of rules and traditions to regulate participant behaviour, but there is no official data to establish the productivity of industrial processing and transformation activities, marketing and consumption of fishing products.

For these reasons, it is difficult to establish fisher costs and income from a true and official basis.

[1] http://www.una.ac.cr/serio/pradepesca/

IMPLEMENTATION OF GLOBAL FISHERIES MANDATES AND INITIATIVES

Global fisheries have progressed towards solving new problems and challenges, some inherent to the development of the activity itself and others deriving from external factors such as the development of a global economy that have resulted in overfishing and overcapitalization. On the other hand, there is growing international interest in establishing rational conservation and protection schemes with a sustainable and responsible approach.

As mentioned above, Guatemala modified its fisheries law after 71 years, strengthening a great weakness of fishing activities within its legal framework. Starting in 2002, interest has been shown in legislating based on the international legal framework and participating in organizations to strengthen this.

To respond to this challenges and to actively participate, activities have been carried out to safeguard and promote the interests of the country, to guide fisheries policy in principles for the defense and exercise of sovereignty over the fishing resource in our Economic Exclusive Zone, to strengthen and participate in multilateral fora and organizations involved in fisheries activities and has promoted signature of cooperation agreements in economic, commercial, technological and scientific areas to foster the development of new schemes.

The new legal framework provides the principles for establishing and developing a fisheries management plan to benefit the resource. Specific regulations are to be prepared for recreational, tuna and scientific fisheries, aquaculture and other important activities; specific prohibitions and closures are established and there are provisions for the legal possibility of adopting management measures from international organizations where Guatemala is a member.

PARTICIPATION IN REGIONAL FISHERY BODIES

As mentioned above, Guatemala has the legal framework to adopt fisheries management measures from regional and international organizations where it is a member. The state budget to be able to comply with the commitments accepted to date and to be acquired in the near future will be considered in 2004.

Guatemala currently participates in the Inter-American Tropical Tuna Commission as a member country and has also adopted measures for the protection of dolphins and sea turtles.

SUMMARY AND CONCLUSIONS

The Guatemalan fisheries sector moderately contributes to the country's economy by supplying food, exporting fresh and frozen products especially to the United States and generating employment and income mainly in coastal and rural areas.

Currently there is no adequate science-based official method to collect and generate information on production and management of fisheries products. There are only estimates and observations of fishing trends, capture and availability of marine resources with no scientific foundation.

Fishing resource exploitation is calculated from volumes and commercial value, especially in the case of shrimp.

After 71 years of a law with great deficiencies and weaknesses, in late 2002 Guatemala enacted its new fisheries and aquaculture law, making great progress towards national and international fisheries management.

Existing gaps in scientific and technological research related to current and future availability of fishing resources as well as of their exploitation and management must be overcome, for responsible fisheries with a long term vision to protect existing resources.

Organisational strengthening and training are necessary in order to comply with the new legal provisions.

The new legal framework is very recent and although it represents great progress, it must be validated and implemented in a very complex sector.

Fishing fleets and processing plants must be modernized and substituted to make this activity more profitable and attractive to new investors.

There is no financial scheme or credit support mechanism for fisheries. Financial agents must specialize in fisheries and aquaculture, and schemes and mechanisms must be specifically designed according to the productive characteristics of the sector. It is important to establish a state programme to encourage financing and to orient more and better resources, to provide certainty to investment flows.

UNIPESCA-MAGA shall strengthen its efforts in fisheries, sanitary and industrial issues and coordinate actions among various government levels and must ensure active and co-responsible participation of the sectors involved in this activity.

It is important to obtain official data and information to enable analysis of annual fisheries production, in order to establish production goals.

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APPENDIX TABLES

Current Management of Marine Capture Fisheries in Guatemala

Level of Management	% Fisheries Managed	% with Fisheries Management Plan	% with Published Regulations	Trends in the number of Managed Fisheries over ten yrs. (increasing/decreasing/unchanged)
National	-----	-----	80	Increasing
Regional	-----	-----	10	Increasing
Local	-----	-----	10	Increasing

Note: ----- = none

Summary information for three largest fisheries (by volume) in Guatemala (2004)

Category of Fishery	Fishery	Volume tonnes	Value* mil US$	% of Total Volume Caught**	% of Total Value Caught**	Covered by a Management Plan?	# of Participants	# of Vessels
Industrial	Shrimp	565	..	..	..	Yes	10 vessel owners	64
	Shark	359	..	..	..	No	3 000	2 000
	Tuna	70 784	..	..	..	Yes	2 vessel owners	4
Artisanal	Shark	..	..	..	..	No	..	..
	Shrimp	..	..	..	..	Yes	..	..
	Mahi mahi	..	..	..	..	Yes	..	..
Recreational	Swordfish	..	..	..	..	Yes	74	74
	Mahi mahi	..	..	..	..	Yes	..	..
	Sailfish	..	..	..	..	Yes	..	..

Note: There are no official data, so any response is based on personal observations and data; .. = unknown
* Value in 2002 U.S. Dollars.
** % values are based on totals for each category of fishery.

Use of Fishery Management Tools within the three largest fisheries in Guatemala

Category of Fishery	Fishery	Restrictions				License/ Limited Entry	Catch Restrictions	Rights-based Regulations	Taxes/ Royalties	Performance Standards
		Spatial	Temporal	Gear	Size					
Industrial	Shrimp	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Shark	No	No	No	No	No	No	No	No	No
	Tuna	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Artisanal	Shark	No	No	No	No	No	No	No	No	No
	Shrimp	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Mahi mahi	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recreational	Swordfish	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Mahi mahi	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Sailfish	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: There are no official data, so any response is based on personal observations and data.

Costs and Funding Sources of Fisheries Management within the three largest fisheries in Guatemala

Category of Fishery	Fishery	Do Management Funding Outlays Cover			Are Management Funding Sources From		
		R&D	Monitoring & Enforcement	Daily Management	License fees in fishery	License fees from other fisheries	Resource rents
Industrial	Shrimp	Yes	No	No	Yes	Yes	No
	Shark	Yes	No	No	Yes	Yes	No
	Tuna	Yes	No	No	Yes	Yes	No
Artisanal	Shark	Yes	Yes	No	Yes	No	No
	Shrimp	Yes	Yes	No	Yes	No	No
	Mahi mahi	Yes	Yes	No	Yes	No	No
Recreational	Swordfish	No	Yes	No	Yes	No	No
	Mahi mahi	No	Yes	No	Yes	No	No
	Sailfish	No	Yes	No	Yes	No	No

Note: There are no official data, so any response is based on personal observations and data.

Compliance and Enforcement within the three largest fisheries in Guatemala

Category of Fishery	Fishery	VMS	On-board observers	Random dockside inspections	Routine inspections at landing sites	At-sea boarding and inspections	Other (please specify)
Industrial	Shrimp	No	Yes	Yes	Yes	No	
	Shark	No	Yes	Yes	Yes	No	
	Tuna	No	No	Yes	Yes	No	
Artisanal	Shark	No	No	Yes	Yes	No	
	Shrimp	No	No	Yes	Yes	No	
	Mahi mahi	No	No	Yes	Yes	No	
Recreational	Swordfish	No	No	Yes	Yes	No	
	Mahi mahi	No	No	Yes	Yes	No	
	Sailfish	No	No	Yes	Yes	No	

Note: There are no official data, so any response is based on personal observations and data.

Capacity Management within the three largest fisheries in Guatemala

Category of Fishery	Fishery	Does overfishing exist?	Is fleet capacity measured?	Is CPUE increasing, constant or decreasing?	Have capacity reduction programmes been used?	If used, please specify objectives of capacity reduction programme
Industrial	Shrimp	Yes	No	Constant or decreasing	No	
	Shark	No	No	constant or decreasing	No	
	Tuna	Yes	No	constant or decreasing	No	
Artisanal	Shark	..	No	constant or decreasing	No	
	Shrimp	..	No	constant or decreasing	No	
	Mahi mahi	..	No	constant or decreasing	No	
Recreational	Swordfish	No	No	..	No	
	Mahi mahi	No	No	..	No	
	Sailfish	No	No	..	No	

Note: There are no official data, so any response is based on personal observations and data; .. = unknown

Honduras (Pacific Coast)

** Translated from the original Spanish*

Luis Morales Rodríguez
Secretariat of Agriculture and Livestock, Honduras
December 2003

INTRODUCTION

Fishing in Honduras takes place in the Caribbean and Pacific coasts, in Lake Yojoa and in Hydroelectric Reservoir Francisco Morazán (El Cajón).

The Pacific coast includes part of the Gulf of Fonseca, the littoral and the islands belonging to Honduras, the most important being El Tigre, Zacate Grande, Exposición, San Carlos and Inglesera. There are only artisanal fisheries in this area and landing takes place all along the coast and in the islands. The most important species is whiteleg shrimp (*Litopenaeus vannamei*) with an annual production averaging 1 000 metric tons according to information provided by the fishers. The artisanal sector also includes capture of post-larvae undertaken by more than 4 000 "larveros" who supply more than 30 percent of post-larvae utilised by shrimp farms. The most relevant activity in the Pacific coast is the industrial shrimp cultivation; from which production in recent years has been higher than industrial shrimp catch in the Caribbean.

FISHERIES POLICY

Fisheries policy is part of the general government policy and therefore aimed at developing the fisheries to obtain foreign currency to strengthen the national economy, as a source of employment and as part of the diet of Honduran people. The policy is based on:

- Exploitation of traditional resources: lobster, shrimp, conch and fish.
- Research and management of exploited resources
- Promoting of the exploitation of new resources
- Monitoring of management measures

LEGAL FRAMEWORK

The legal framework is based on the General Fisheries Law and its Regulations. The General Fisheries Law was approved in 1959, and the regulations were prepared and approved 42 years later (2001), leaving many legal voids that were partially filled through Ministerial Resolutions.

However, fisheries management still lacks an updated legal framework to satisfy the needs of Honduran fisheries. One of the clearest examples is found in international fishing activities undertaken by vessels with flags of convenience targeting tuna or billfish. These vessels are flagged by the Directorate of the National Merchant Marine, pursuant to an opinion of the Secretariat of Agriculture and Livestock (SAG). They fish in both oceans, in the Convention Areas of the International Convention for the Conservation of Atlantic Tuna (ICCAT) and the Inter-American Tropical Tuna Commission (IATTC).

In addition, the Fisheries Law has legal voids relative to scientific research, fisheries management measures, surveillance, sanctions, etc. The Fisheries Law pays little attention to aquaculture and inland fisheries and to date these activities have been regulated through Ministerial Agreements.

Given the need to develop fisheries in Honduras, cooperation from the Organisation for the Fisheries Sector in Central America (OSPESCA) was requested in late 2002. In April 2003, this organisation sent to Dr. Alfredo Garcia Mesinas to Honduras, and together with a group of DIGEPESCA professionals, he prepared a new draft General Fisheries Law that in general covers all voids that exist in the 1959 Law.

The 2003 Bill of Law was submitted for discussion to the authorities of the Secretariat of Agriculture and Livestock and other state and private institutions involved in the Honduran fisheries sector; however, no progress has been made to date in the process of approval by the National Congress. Therefore, everything related to fisheries activities is still regulated by the 1959 Law or by the Resolutions issued by SAG.

STATE OF THE FISHERIES

Artisanal Fishing in the Gulf of Fonseca

The Honduran part of the Gulf of Fonseca has a coast of 162 km including mangrove forests, large beaches, a bay, river mouths, inlets, islands, islets, etc. Most of the population of the coastal communities makes a living from fishing, and to a lesser extent work in agriculture or shrimp farms. As apposed to fishers in the Caribbean, artisanal fishers in the Gulf use relatively more technology: boats with outboard motors and nets manufactured by themselves with material purchased in El Salvador.

Most species in the Gulf of Fonseca are targeted by fishers; however, three groupings comprise the most important species targeted:

- Fish: snook, meagre, jack mackerel, "caguachas", grouper, snapper, mullet, shark, rays, etc.
- Crustaceans: shrimp, lobster, "chiquirines", etc.
- Molluscs: oysters, "cascos de burro", "curiles", mussels, etc.

In addition, the eggs of sea turtles are collected during the nesting season in the Gulf beaches. Fishing gear consists of fish and shrimp trammel nets, beach seines, casting nets, hooks, etc.

Shrimp Fishery in the Gulf of Fonseca

The fishery in Gulf waters exploits two species of white shrimp (*Litopenaeus vannamei* and *Litopenaeus stylirrostris*) in three modes: 1). Artisanal exploitation juveniles and adults. 2) Exploitation of larvae for aquaculture farms. 3). Fishing of juvenile and adults with casting nets in winter lagoons from May to September.

Juveniles and adults are captured by artisanal vessel owners and independent fishers. Owners usually have between 10 and 20 fiberglass boats with 15 to 25 hp outboard motors and 15 to 30 trammel nets. The owners hire fishers for minimum wage and provide them with boats, nets and fuel; once the catch is obtained it is delivered to the owners. The catch consists of U-7 to U-30 shrimp. Once the product is landed, it is kept in freezers and sold to Honduran packers or in the Salvadorian market, depending on prices.

State of the Resources

Upon consultation with the fishers and after analyzing existing data on artisanal fisheries in the Gulf of Fonseca, the target resources in the Honduran Pacific are overexploited. This conclusion has been reached for the following reasons: a) Decreased catches per unit of fishing effort. b) Increased number of boats and fishers. c). Extraction by the population of the coastal communities of almost 100 percent of the existing species. d) Capture of small individuals that have not reached the juvenile stage.

MANAGEMENT ACTIVITIES

Management activities are the responsibility of the Secretariat of Agriculture and Livestock through the General Directorate of Fisheries and Aquaculture; its objectives, strategies and plans of actions are based on the following:

General Objectives

- To develop the fisheries and aquaculture sector through the sustainable management of the exploited resources.
- To increase the source of employment in the country by promoting the creation of new fisheries and aquaculture projects.
- To stimulate the development of new fisheries and aquaculture projects, especially aimed at the industrialisation of fishing products or at the cultivation of new species.
- To increase income for Honduran families and to obtain foreign currency to strengthen the national economy.
- To improve the diet of the population by promoting consumption of fisheries and aquaculture products.
- To frame the fisheries and aquaculture policy within the global governmental policy.

Specific Objectives

- The sustainable harvesting of fisheries resources through the implementation of management measures for the exploited target species.
- To support scientific research of the fisheries and aquaculture resources, in order to obtain the foundation for resource management.
- To increase cultivation of fisheries and aquaculture species in pens and floating cages.
- To provide technical training to medium and small producers in the aquaculture sector to improve project production.
- To establish marine and inland reserve areas for the purpose of protecting and assisting in the recovery of the existing species.
- To establish fisheries and aquaculture development programs or cooperation agreements with other countries or international organisations.
- To implement fisheries and aquaculture education through the inclusion of related themes in the programs of the Ministry of Education and of the careers of Biology and Agronomy of Universidad Nacional Autónoma de Honduras.
- To strengthen fisheries and aquaculture through the integration of plans of action with other state and private institutions involved in fisheries or aquaculture activities.
- To preserve threatened or endangered species as well as habitats susceptible to damage.
- To coordinate with the fishing industry and the naval force a mechanism to control and monitor the measures established to regulate the exploitation of fisheries resources.

COSTS AND FUNDING OF FISHERIES MANAGEMENT

The General Directorate of Fisheries and Aquaculture (DIGEPESCA) had a total national budget of US$ 632 230 for 2003. Of this total, 80 percent was earmarked for paying the staff and only 20 percent for payment of various activities in the departments of Marine Fisheries, Surveillance and Control, Inland Fisheries and Aquaculture, Research and Technology and the Statistics Unit.

The income obtained from the Caribbean and Pacific fisheries (e.g. payment of tonnage from industrial fishing vessels, artisanal fishing permits and commercialization and fees from land leases for shrimp farms) is received by the General Treasury of the Republic, where it is allocated according to the needs observed by the Secretariat of Finance.

IMPLEMENTATION OF GLOBAL FISHERIES INITIATIVES AND MANDATES

Understanding the concept of global fisheries as the totality of Honduran fisheries, objectives have been proposed according to the needs observed in the fisheries and to achieve these objectives, the following strategies and actions have also been proposed:

Strategies. 1) To recover and maintain the yields per vessel of the industrial fleet to levels that will significantly improve the economic returns of the activity. 2) To recover and maintain the biological potential of the resource. 3) To increase the national capacity for design, implementation, surveillance and monitoring of management measures. 4) To monitor, evaluate and manage in a coordinated manner the stocks shared with neighbouring countries in the Caribbean region and the Gulf of Fonseca.

Four basic actions have been proposed to implement the above-mentioned strategies: 1) Regulating extraction activities by the industrial fleet. 2) Regulating extraction activities by artisanal fishers in the Caribbean coast, the Gulf of Fonseca and inland waters. 3) Limiting access to industrial fisheries. 4) Scientific-technical coordination with neighboring countries in the Caribbean region and the Gulf of Fonseca.

PARTICIPATION IN REGIONAL FISHERY BODIES

As a country with important fishing activities, Honduras is a member of regional organizations such as OLDEPESCA, at the Latin American level and OSPESCA at the Central American level.

In the decade of the 80s, OLDEPESCA was involved in fisheries development activities in Honduras through cooperation from FAO and NORAD. In addition, during part of the 90s, it was involved in fisheries activities for the Central American region through PRADEPESCA with European Union cooperation.

OSPESCA recently sent Dr. Alfredo Garcia Mesinas to coordinate the elaboration of the new draft General Fisheries Law.

SUMMARY AND CONCLUSIONS

Fishing in Honduras is carried out along both coasts (Caribbean and Pacific) by industrial and artisanal operators:

Industrial fisheries are based in the Bay Islands, particularly in the fishing ports of French Harbor, Oak Ridge, Jonesville and Guanaja. The industrial fleet is divided by fisheries resource: lobster, shrimp, conch and finfish, and operate in coastal waters (shrimp) and on the fishing banks north of parallel 14º59'08" (maritime border with Nicaragua), and Misteriosa and El Rosario north of Islas del Cisne. The fishing methods include bottom trawling (shrimp), traps and diving (lobster), diving (conch) and reels, longlining and trolling (finfish).

Artisanal fishing in the Caribbean takes place all along the coast, with some differences between the eastern region (La Mosquitia) and the western region. Fishing targets coastal finfish species with the exception of the artisanal lobster fishery in Bahía de Omoa, and the artisanal shrimp fishery in the coastal lagoons of La Mosquitia. In the eastern region most are rowboats while in the western region about 50 percent have outboard motors.

Artisanal fisheries in the Pacific Coast are undertaken by fishers living in communities along the coast and on the main islands. The most representative fishing communities are San Carlos (Bahía de Chismuyo) and Guapinol in the municipality of Marcovia. Most boats are fibreglass or aluminum and the majority are powered by outboard motors between 15 and 25 hp.

The most common fishing gear includes 3" mesh size nylon filament trammel nets, in addition to beach seines, hooks and "chayos" for capturing post-larval shrimp. The species harvested range from fish, crustaceans and molluscs to sea turtle eggs. The capture of white shrimp with trammel nets is a particular case, where the sizes captured range in size from U-6 and U-7 to U-25. There is a group of artisanal vessel owners

with between 10 and 20 boats, and 20 to 40 shrimp trammel nets. Each owner hires two fishers per boat and they are paid according to the catch, which is later sold at market prices to Honduran or Salvadoran packers.

Conclusions: The conclusions drawn from the description of Honduran fisheries are as follows:
a) The fishing industry faces problems due to the reduction in capture caused by the overexploitation of traditional target species.
b) Overexploitation of industrial target species have led shrimp and lobster fishers to request permits to fish in foreign waters.
c) The management measures decreed by the fisheries management authority are largely violated by the fishers because of the lack of surveillance by the responsible institutions.
d) Industrial fisheries have only targeted traditional resources and not new species that could be exploited to reduce pressure on the traditional resources.
e) The Fisheries Management budget is insufficient to cover the needs of the fisheries sector in the fields of research, management, surveillance and control of fishing activities.
f) Illegal fishing by national and foreign vessels is one of the main problems affecting fishery resource management.

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APPENDIX TABLES

Current Management of Marine Capture Fisheries (Caribbean and Pacific coasts)

Level of Management	% Fisheries Managed	% with Fisheries Management Plan	% with Published Regulations	Trends in the number of Managed Fisheries over ten yrs. (increasing/decreasing/unchanged)
National	33	0	33	unchanged
Regional	-	-	-	-
Local	-	-	-	-

Summary information for three largest fisheries (by volume) (Year 2002) in Pacific Honduras

Category of Fishery	Fishery	Volume tons	Value* mil US$	% of Total Volume Caught**	% of Total Value Caught**	Covered by a Management Plan?	# of Participants	# of Vessels
Industrial	Camarón	9 822	88.2	58.8	39.56	No	22552	156
	Langosta	1 458	26.4	8.73	11.84	No	15800	109
	Caracol	1 358	5.5	8.13	2.47	No	2164	15
Artisanal	Corvinas, pargos y jureles, camarón	1 764.6	58.683	10.56	26.31	No	1795	449
	Camarón, tiburones y rayas	1 303.1	25.668	7.8	11.51	No	1888	511
	Jaiba	1 001.5	18.511	5.99	8.30	No	947	257
Recreational	Pez Espada	no data	no data	no data	no data	No	no data	no data
	Pez Vela	no data	no data	no data	no data	No	no data	no data
	Sábalo	no data	no data	no data	no data	No	no data	no data

* Value in 2002 U.S. Dollars.
** % values are based on totals for each category of fishery.

Use of Fishery Management Tools within the three largest fisheries in Pacific Honduras

Category of Fishery	Fishery	Restrictions				License/ Limited Entry	Catch Restrictions	Rights-based Regulations	Taxes/ Royalties	Performance Standards
		Spatial	Temporal	Gear	Size					
Industrial	Camarón	Yes	Yes	Yes	No	Yes	No	No	No	No
	Langosta	Yes	Yes	Yes	Yes	Yes	No	No	No	No
	Caracol	Yes	Yes	Yes	Yes	Yes	No	No	No	No
Artisanal	Corvinas, pargos y jureles, camarón	Yes	No	Yes	No	Yes	No	No	No	No
	Camarón, tiburones y rayas	No	No	Yes	No	Yes	No	No	No	No
	Jaiba	Yes	No	Yes	No	Yes	No	No	No	No
Recreational	Pez Espada	Yes	No	No	No	No	No	No	No	No
	Pez Vela	Yes	No	No	No	No	No	No	No	No
	Sábalo	Yes	No	No	No	No	No	No	No	No

Costs and Funding Sources of Fisheries Management within the three largest fisheries in Pacific Honduras

Category of Fishery	Fishery	Do Management Funding Outlays Cover			Are Management Funding Sources From		
		R&D	Monitoring & Enforcement	Daily Management	License fees in fishery	License fees from other fisheries	Resource rents
Industrial	Camarón	Yes	Yes	Yes	No	No	No
	Langosta	Yes	Yes	Yes	No	No	No
	Caracol	Yes	Yes	Yes	No	No	No
Artisanal	Corvinas, pargos y jureles, camarón	No	Yes	No	No	No	No
	Camarón, tiburones y rayas	No	Yes	No	No	No	No
	Jaiba	No	Yes	No	No	No	No
Recreational	Pez Espada	No	No	No	No	No	No
	Pez Vela	No	No	No	No	No	No
	Sábalo	No	No	No	No	No	No

Compliance and Enforcement within the three largest fisheries in Pacific Honduras

Category of Fishery	Fishery	VMS	On-board observers	Random dockside inspections	Routine inspections at landing sites	At-sea boarding and inspections	Other (please specify)
Industrial	Camarón	No	No	No	Yes	Yes	No
	Langosta	No	No	No	Yes	Yes	No
	Caracol	No	No	No	Yes	Yes	No
Artisanal	Corvinas, pargos y jureles, camarón	No	No	No	Yes	Yes	No
	Camarón, tiburones y rayas	No	No	No	Yes	Yes	No
	Jaiba	No	No	No	Yes	Yes	No
Recreational	Pez Espada	No	No	Yes	Yes	No	No
	Pez Vela	No	No	Yes	Yes	No	No
	Sábalo	No	No	Yes	Yes	No	No

Capacity Management within the three largest fisheries in Pacific Honduras

Category of Fishery	Fishery	Does overfishing exist?	Is fleet capacity measured?	Is CPUE increasing, constant or decreasing?	Have capacity reduction programmes been used?	If used, please specify objectives of capacity reduction programme
Industrial	Camarón	Yes	No	Decreasing	No	
	Langosta	Yes	No	Decreasing	No	
	Caracol	Yes	No	Increasing	No	
Artisanal	Corvinas, pargos y jureles, camarón	Yes	No	Increasing	No	
	Camarón, tiburones y rayas	Yes	No	Increasing	No	
	Jaiba	Yes	No	Increasing	No	
Recreational	Pez Espada	No	No	n.a.	No	
	Pez Vela	No	No	n.a.	No	
	Sábalo	No	No	n.a.	No	

n.a. = not available

Mexico

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El Colegio de México, Mexico
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INTRODUCTION

It took twenty years, since 1940 -when 70 000 tonnes were caught- to 1960, for Mexico to reach 200 000 tonnes of annual catches. More than half of that were tuna and shrimp for the international market. The next ten years brought only a 40 000 tonnes increase. However, during the seventies, catches increased five times. This growth came mostly from two sources, the small pelagics (sardine and anchovy) industrial fisheries of on the hand side and small-scale artisanal fisheries on the other (CONAPESCA, 2001).

Since the early eighties, when the collapse of the anchovy fisheries occurred, national catches have stabilized, oscillating around 1.2 million tonnes annually. According to the National Fisheries Chart, and data released by the National Fisheries Institute (1998 & 2000) more than 60 years of economic promotion of fisheries have placed fish stocks in an awkward situation (as it will be discussed under Status of Fisheries in the Country).

Mexican industrial fisheries are unevenly distributed with those in the Pacific concentrated in the Gulf of California. Around 70 percent of the 2 407 shrimp trawlers, 78 percent of the 132 tuna seiners and longliners and all the 89 sardine seiners operate in waters off Sonora, Sinaloa, Baja California and Baja California Sur states. In the Gulf of Mexico, the most industrialized fleet (shrimp trawlers) are found mainly in Tamaulipas and Campeche.

Mid size and small vessels in artisanal or semi-industrialized fisheries are more widely and evenly spread along Mexican coasts. Most of these fisheries operate fiberglass, outboard-engine powered small vessels (up to 36 ft long) called "panga". Out of the 106 425 vessels of the national fleet, 102 807 (96.6 percent) belong to these class of boats. This percentage is similar to those found in other Latin American countries (Thorpe *et al*., 2000). Little more than half the artisanal fleet (54 percent) is found in the Pacific coast, 46 percent in the Gulf of Mexico, and only 27 percent of it in the Gulf of California.

The number of industrial vessels has diminished since the early eighties, although technological changes have increased their fishing power (Fernandez *et al*. 2000 for the shrimp fishery). In contrast, the number of artisanal vessels rose at a rate of 1 800 new ones per year before 1982 and 3 600 new vessels annually after that, resulting in an increase of 700 percent in the period of 1970-2001 (CONAPESCA, 2001).

Fisheries-derived income is very unevenly distributed. A five-fold difference in average income exists between fishermen of the states around the Gulf of California and those in the Gulf of Mexico (INEGI, 2000). Nadal (1996) reported that 67 percent of (artisanal) fishing units in Mexico receive just 2.8 percent of the total fisheries income.

POLICY FRAMEWORK

Mexico's fisheries policy is undergoing a process of evolution. During the seventies and the eighties emphasis was put on production increases. The Ministry of Fisheries was formed in 1982. Despite the fall in catches in 1981 that resulted from the anchovy fisheries collapse, the Fisheries Development Plan 1984-1988 aimed then to reach

catches of 2.2 million tonnes per year, that meant more than doubling the catch level of that period in four years (SEPESCA 1984). Research seemed to be oriented only to estimate potential catches (Carranza, 1985) although some early warnings of overcapacity and overexploitation were given for the shrimp fishery industry since the early seventies (Lluch -Belda, 1974). The National Fisheries Development Plan 1988-1994 set as an objective to reach the "Maximum Sustainable Yield", without actually explicitly defining the term (SEPESCA, 1988).

In the early nineties, a change of emphasis began to take shape in part as a result of the international fora held at that time. Mexico became an active promoter of the Code of Conduct for Responsible Fishing. As a result, Fisheries sector was incorporated in 1994 in the newly formed Ministry of Environment, Natural Resources and Fisheries (Secretaría de Medio Ambiente, Recursos Naturales y Pesca, SEMARNAP), as an Undersecretariat, and as part of a global policy aimed at attaining sustainable development. The new Fisheries Plan stated sustainability as a goal and the Precautionary Principle and Ecosystem approach as a guideline. Research was aimed more purposefully at finding the natural limits of exploited populations and as a tool for sound management (Arenas and Díaz-de-León, 1998; INP, 1998; 2000; Hernandez and Kempton, 2003). As will be discussed later, changes in legislation facilitated stockholders´ participation in the decision-making process.

However, management and management objectives remain rather vague in the national legislation. The Federal Fisheries Law (decreed in June of 1992, amended in January 2001) states that its objective is "to warrant conservation, preservation and rational use of marine resources and establish the basis for their adequate development and management". Objectives, set in some particular fisheries' Mexican Official Standards (NOMs) are equally general. For example, the one regulating the shrimp fishery (NOM-002-PESC-1993) states as its objective to "attain an adequate development of the fishery and an optimum exploitation from the biologic and socioeconomic point of view".

Since the end of the year 2000, at the beginning of the new federal administration, fisheries institutions were transferred to the (now) Ministry of Agriculture, Livestock, Rural Development, Fisheries and Food (Secretaría de Agricultura, Ganadería, Desarrollo Rural, Pesca y Alimentación, SAGARPA) with emphasis seemingly shifting again to "economic promotion" ("fomento") (SAGARPA Plan Sectorial, 2001). This change in objectives makes the development of the process described above look uncertain at the moment.

LEGAL FRAMEWORK

Besides the fisheries-specific legislation, some federal laws have indirect impact on the management of national fisheries. Mexican legislation related to the management of natural resources is based on the National Constitution Article 27 and includes the General Law of National Properties (1982, 1994), Law of National Waters (1992), Law of Rights and General Law of Ecology and Environmental Protection (1988 1996).

The highest ranking instrument of Mexican fisheries legislation is the Federal Fisheries Law (Ley de Pesca). It gives general guidelines to regulate fisheries and can be modified through the intervention of the Chamber of Deputies and the Senate.

The Union Congress has issued eight laws on fisheries: in 1925, 1932, 1938, 1948, 1950, 1972, 1986 and the amended law of 1992. The first three pointed towards a permits and concessions regime establishing basic attributions to the authority for resource management. The 1948 and 1950 laws dealt with marine boat engines, resulting in an increase in the capture fisheries effort and economic importance of fisheries.

Since the Law of 1948 some high economic value species were reserved for the exclusive use of fisheries cooperative groups. Such an exclusive regime survived until the enactment of the actual Fisheries Law of 1992. This law provides the entrance

to all other social and private agents, enabling them to participate and obtain any concession, permits and authorization as established by this legal instrument. The 1972 Law intended to offer a launch base for a new fisheries policy with a main purpose to approve increments in subsidies for fisheries cooperatives which were released through a mechanism called the National Fund for the Promotion of Fisheries Cooperatives (Fondo Nacional de Fomento Cooperativo Pesquero). However, such funding was insufficient to cover all the existing fisheries cooperatives in the country and to extend funding for renovation of fisheries fleets. Considering such limitations to the 1972 and 1986 fisheries laws, they were intended to advance the shaping of public instruments for fisheries administration and regulation through out institutions such as the National Consultative Commission, National Fisheries Public Registry, and the National Fisheries Institute which was in charge of overseeing applied fisheries research to management, particularly for those with exploitation potential (Diaz y Diaz, 2001).

Despite the fact that reserved species was a favourable economic and conflict negotiation instrument for cooperatives (Díaz-de-León, pers.op), it is important to highlight some drawbacks of this species regime. There was always an association between private agents and cooperatives and increase private funding and investment to fisheries cooperatives. They used their work force and boats, apparently flying under the flag of the fisheries cooperatives with the most ingenious legal procedures. Over the time such move weakened the fishermen's links with private investors, thus they began to lose legal protection as workers, and became marginated from the legal Mexican labour and social security regime. Therefore, the reservation of species to cooperatives never provided a social benefit to most fishermen. However, these activities promoted the rapid growth of private capital and entrepreneurs dedicated to the fisheries industry. Under these circumstances, during President Salinas's administration, it was decided to eliminate the reserved species regime, allowing any and all entrepreneurs free access to fishing concessions and licenses (Diaz y Diaz, 2001).

The 1992 Law was emphatic in its determination to "guarantee the conservation, preservation and rational use of marine resources…" This legal mandate empowered the authorities to determine "volume of permissible fishing stocks; to regulate with appropriate instruments at the time: the number of fishing vessels, fishing gear, equipment, personnel and fishing techniques; to determine fishing seasons, size and minimum weight of capture specimens and to propose specific norms and standards for their management, conservation and transport". These cumulative faculties of the authorities were in favour of the federal government; however, its capacity to attend and to fully manage fisheries resources, has left them exposed to the ongoing pressures and disputes among artisanal and industrial fishermen (Diaz y Diaz, 2001).

From the Fisheries Law stems the Fisheries Regulation (Reglamento de la Ley Federal de Pesca) made by the Executive on the basis of the general guidelines given in the Federal Law. It deals with particular aspects and can be modified directly by the Executive Power without the intervention of the Legislature, which results in some degree of flexibility.

Particular instruments of legislation are the Mexican Official Standard (Normas Oficiales Mexicanas, NOMs) that deal with specific aspects such as regulating mesh sizes, gear types used, spatial restrictions and the like that need to be changed from time to time and which, if included in a more general instrument, would make the regulating process cumbersome. The process that shapes (or modifies) NOMs involve the participation of stakeholders, NGOs and other interest groups in committees.

Such committees also meet to be consulted upon issues such as setting dates for closed seasons for selected fisheries (like shrimp). The National Fisheries Institute (Instituto Nacional de Pesca, INP) presents relevant research and monitoring results at those meetings to assist in the decision making process. The decision, result of the meeting, is made official by being published in the Federation's Official Registry

(Diario Oficial de la Federación). Passing of NOMs and decisions related to them require a Regulatory Impact Statement (Manifestación de Impacto Regulatorio, MIR) that assesses the regulatory impacts expected from the implementation of the NOMs.

The (relatively new) process and instruments described in the last paragraph are regulated by the Federal Metrology and Normalization Law (Ley Federal de Metrología y Normalización). Although the Fisheries regulatory agency (at present CONAPESCA) is the one that makes the final decision (and bears full responsibility for it) this process is further enhanced by stakeholder participation.

At present, this process is far from perfect. Only a few committees have been formed so far. The functioning of those already established still has to be perfected. Most artisanal fishermen organizations have yet to have consultants who could assist them on technical issues. And recently, full representation of those invited to attend the meetings has yet to be achieved.

The latest implemented general instrument in Mexican fisheries management is the National Fisheries Chart (Carta Nacional Pesquera, CNP2000, SEMARNAP, 2000a). Although the Fisheries Law mentioned, in general terms the CNP as a mere inventory, a modification made to the Fisheries Regulation (amended in September 1999) gave it the function of defining levels of fishing effort applicable to species and groups of species in specific areas and giving guidelines, strategies and provisions for conservation, protection, restoration and management of aquatic resources that could affect their habitat and ecosystems.

This modification of the Fisheries Regulation gave the CNP2000 a binding character that must be considered in the process of decision-making by management authorities. The Fisheries law empowered the National Fisheries Institute (INP) to compile and publish the CNP. The INP strived to incorporate the Precautionary Principle and guidelines from the Code of Conduct for Responsible Fishing. Participation in making the CNP was opened to academic institutions and the public at large. In this way the CNP became a channel for public participation. The first version of the CNP, incorporating marine and inland fisheries, aquaculture, fishing gears, species subject to conservation schemes (like marine turtles and whales) and relevant ecosystems like coastal lagoons was published in 2000 (SEMARNAP, 2000a; Álvarez *et al.* 2002; Hernandez and Kempton, 2003). A useful -in flexibility terms- characteristic of the CNP is that it can be actualized on a yearly basis.

With the transfer of fisheries sector and management to the Ministry of Agriculture, the now Ministry of Environment and Natural Resources (Secretaría del Medio Ambiente y Recursos Naturales, SEMARNAT) retained the function of sanctioning the CNP to ensure compatibility with resource conservation and sustainability strategies. At the time of this writing the new version of the CNP has not been yet sanctioned by SEMARNAT.

Besides the above mentioned sanction by SEMARNAT of the CNP, that Ministry retains other functions related to fisheries, such as participating in determining measures such as closed seasons (although it has not participated in them so far). SEMARNAT also is in charge of managing Natural Protected Areas (Áreas Naturales Protegidas, ANPs). Fishing takes place in some marine ANP's, like the upper Gulf of California and in those areas SEMARNAT and SAGARPA have had to share responsibilities. In such issues, as well as in others, like the ecological implications of the Mexican Official Standard for Shark Fisheries Management (NOM-029), full inter-agency cooperation has yet to be achieved and production and conservation-related objectives reconciled.

The current Sectoral Plans, such as the Agriculture, Livestock, Rural Development, Fisheries and Food (Plan Sectorial de Agricultura, Ganadería, Desarrollo Rural, Pesca y Alimentación), issued by SAGARPA in 2003 presents general objectives (e.g. "Promote increments in economic and social profitability of the fishing and aquaculture sector") and programs to be implemented during the administration term.

Management Plans (Planes de Manejo) are new governmental instruments aimed to provide guidelines and strategies to manage particular fisheries stated as a particular objective in the recent Sectoral Plan. However, at least presently, no legal support is given to these plans (i.e. they are not defined in the law and are not, therefore, legally binding).

STATUS OF THE FISHERIES

For the sake of brevity, we will divide the 32 Mexican states in five regions. Region I comprises four states Sinaloa, Sonora, Baja California and Baja California Sur (surrounding the Gulf of California). Region II comprises Nayarit, Jalisco, Colima, Michoacán, Guerrero, Oaxaca and Chiapas (from the mouth of the Gulf of California down to the border with Guatemala). Region III includes Tamaulipas, Veracruz and Tabasco (Northern Gulf of Mexico to the Southern limit of Campeche Sound). Region IV is composed of Campeche, Yucatan and Quintana Roo (the Campeche Sound, the Yucatan Shelf and the Mexican Caribbean coast). Region V includes the states without a marine coast.

Region I has important upwelling -high productivity- zones, and terrestrial areas are mostly desert, with important coastal lagoons in Southern Sonora and Sinaloa. Region II is characterized by a narrow shelf caused by the presence of subduction trenches offshore and relatively low productivity. Region III has a moderately wide shelf with important coastal lagoons (Laguna Madre, Tamiahua, Alvarado and others). Region IV, in Campeche and Yucatan has a very wide, shallow continental shelf and karstic mainland. Terminos Lagoon, an important coastal lagoon, lies on the limits with Tabasco, in Region III.

The composition of catches varies noticeably from region to region. The tables below show the composition of catches in the four marine regions. "Others" include tens of species of finfish and shellfish caught by artisanal fisheries. In the other regions, this category comprises most of the catch. The appendix tables show these fisheries' importance in terms of volume, value and vessels involved in their exploitation.

Inland fisheries (mostly including Region V) catches amounted to 90 387 tonnes in 2001 (73 percent tilapia and 23 percent carp). The equivalent figures in 1990 (the historic maximum) was ca. 128 000 tonnes/year. Catch composition has remained more or less the same since the late seventies. The only noticeable change comes from a 90 percent fall in reported catches of the family *Chirostomidae* that comprises several endemic species of cultural and biological value (CONAPESCA, 2001).

Estimations of the contribution of fisheries to the Gross Domestic Product go as low as around 0.3 percent (INEGI, 1988). However, using the gross value of catches (CONAPESCA, 2001) and the 2001 GDP (Banamex, 2003) (both in thousands 2002 US$) of 1 418 759 and 175 860 126, respectively, a value of 0.8 percent is obtained. The contribution of the agricultural sector (including fisheries) amounts to ca 6 percent.

According to assessments made by the National Fisheries Institute (INP, 1998; 2000, SEMARNAP, 2000a; Hernandez and Kempton, 2003) around 82 percent of the national fisheries assessed are fully exploited or overexploited. Of these, 25 percent

TABLE 1
Composition of catches (in percentage) in the four marine regions

Primary species	Region I	Region II	Primary species	Region III	Region IV
Sardine	50.54	0	Shrimp	6.75	7.09
Tuna	10.78	29.34	Sharks	2.6	4.67
Sharks	1.14	6.19	Tuna	0.47	0.07
Shrimp	6.38	6.78	Grouper	0.55	10.60
Giant Squid	5.42	0	Octopus	0.01	24.69
Others	25.71	57.67	Others	89.53	52.06

TABLE 2
Status of selected species

Fishery	Classification INP	Remarks
Sardine	Potential for increase	Abundant but highly variable
Tuna	Potential for increase	Highly migratory
Sharks	Coastal sharks fully exploited	Decrease of ca 1 200 tonnes /year since 1997
Shrimp (Pacific)	Fully exploited or overexploited	Decrease of ca 2 000 tonnes /year since 1997
Shrimp (GoM)	Fully exploited or overexploited	Decrease of ca 1 000 tonnes /year since 1995
Giant Squid	Potential for increase	Pulse abundance but highly variable
Grouper	Fully exploited or overexploited	Decrease of ca 500 tonnes/year since 1991
Octopus	Fully exploited	

are fully overexploited urgently needing recovery plans. The table below shows the fisheries examined in this review with their classification by the INP.

INSTITUTIONAL FRAMEWORK AND MANAGEMENT ACTIVITY

At present, the agency responsible for fisheries management, monitoring and enforcement is the National Commission of Aquaculture and Fisheries (Comisión Nacional de Acuacultura y Pesca, CONAPESCA), a "descendant" of the Ministry (1982-1994) and Undersecretariat (1994-2000) of Fisheries. This agency has suffered from downsizing, as it will be discussed later.

Marine Fisheries, and most inland fisheries, are under Federal jurisdiction. Mexican Constitution establishes that the central federal government is empowered to manage all marine and inland fisheries resources as they are found within federal national waters. Fisheries legislation and management is a responsibility of federal government, leaving no room for local governments to manage fisheries resources.

So far, only some states have specialized fishing agencies and at times, fisheries are under the state secretariats for industrial development or agriculture. Even in those states with specialized agencies, jurisdiction is limited to the promotion and development of fisheries and not their management which is fully Federal. Usually, states have representatives in the above mentioned committees and informal mechanisms of participation have existed for some time. In any case, at present, management and research capabilities (in terms of facilities, institutions and personnel) are not yet developed in most states and this is an urgent issue to address in order to achieve their full involvement.

The National Fisheries Institute (INP) bears responsibility for, among others, research and assessment of the status of national fisheries as well as the evaluation of fishing gears. Usually, regulations arise from the detection of an actual or potential problem. For example, INP research resulted in implementation of closed seasons for the shrimp fishery in the Gulf and the Pacific regions (Castro *et al.*, 1976: Sierra *et al.* 2000) as well as quotas for the Yucatan octopus fishery industry (Solis *et al*. 1998). The INP makes periodic monitoring and systematic assessments of most of the important fisheries (although it lacks personnel and means to cover many artisanal fisheries).

On most occasions the management agency has developed and implemented regulations based on research. The present legal framework and regulatory instruments (described under Legal Framework) give some flexibility to this process.

Sometimes, regulations arise to solve specific conflicts between groups of stakeholders like commercial longliners catching billfishes and sport fishermen or groups of artisanal octopus fishermen in Yucatan and Campeche. In these cases, measures like reserved zones for sportfishing or limited access for fishermen of different states has been included in the Fisheries Law or the Regulation (as in the former case) or implemented as a temporary restriction (in the latter). Stakeholders´ possibilities of involvement are discussed under Legal Framework.

TABLE 3
Fisheries regulated through Official Standards (NOM)

Fishery	NOM year	SL	QL	GS	SC	AC	EL	TED	BED
Tuna	1994	X		X			X		X
Shrimp	1994			X	X	X	X	X	
Sardines	1994	X*		X		X*(1)	X		
Lobster	1994	X		X	X	X	X		
Abalone	1993	X	X	X	X	X	X		
Octopus	1993	X	X*	X	X	X*(2)	X		
Scallops	1993		X	X	X	X	X		
Sea Urchin	1993		X	X	X	X	X		
Skates	1994			X		X			
Totoaba	1994			X	X	X			
Queen Conch	1995	X	X	X	X	X	X		
Oyster	1995			X	X	X	X		
Recreational fisheries	1995	X	X	X	X	X	X		
Sharks	Not yet approved	X		X		X	X		

Notes:
The NOM year is the first time that regulations appeared in this instrument.
Regulations included in the NOM are: size limit (SL), quota limit (QL), gear specifications (GS), season closures (SC), area closures (AC), effort limit (EF), turtle excluding devices (TED), by-catch (mammals) excluding devices (BED).
X* = Not included by Hernandez and Kempton.
(1) Limited effort in certain areas.
(2) To avoid conflicts between fishermen of Campeche and Yucatan states.
Source: Modified from Hernandez and Kempton, 2003

From 1994 to 2000, several NOMs, were developed which included traditional regulations such as permits, gear specifications, season closures, area closures, size limits, quota limits, turtle excluding devices (TEDs), and by-catch excluding devices. Until 2000, only 14 fisheries were regulated under NOMs. These are shown in the next table (taken from Hernandez and Kempton, 2003). Fisheries included in the table comprise around 63 percent of total catches. Other fisheries have had to be regulated mostly with licenses with the INP being consulted, most of the times, on the possibility of awarding them.

The process of incorporating research results into the regulating process went a step further in 1998 and 2000 when the INP published the results of the Health State of Fisheries "Sustentabilidad y Pesca Responsable en México; Evaluación y Manejo 1997-98 and 1999-2000" (Sustainability and Responsible Fishing in Mexico; Assessment and Management, 1997-98 and 1999-2000), providing guidelines and pointing out needs for management. However, this attempt was not formalized in the law. In order to implement this, the National Fisheries Chart 2000 came into force in year 2000 incorporating all scientific findings and management instruments available into it, the National Fisheries Chart (described under Legal Framework), remains as an important legal binding instrument for incorporating research results into regulations that have yet to be fully utilized. The CNP includes the majority of national fisheries and gives general guidelines, regarding mainly, but not exclusively to the limitation of effort.

However, particular regulations regarding many species, like most of those included under the generic denomination of "escama" (finfish) or sectors as the artisanal one are lacking.

The most commonly used management tool has been closed seasons. This kind of regulation has been applied to the Pacific shrimp fishery for more than four decades (Díaz-de-León, 1993), gear regulations have widespread. There have been restrictions on the kind of gear allowed (e.g. kind of nets in the shrimp fishery, Sierra *et al*., 1998)

or gear specifications (mesh sizes in many fisheries, driftnet or longline length and number of hooks in large pelagics fisheries). Other equipment has also been regulated, like the horsepower of outboard engines in shrimp lagoon fisheries. (Sierra *et al*., 2000; Fernandez *et al*., 2000, Ulloa *et al*., 2000).

Size limits are used in certain fisheries where individual animals can be easily measured, like in the abalone fishery (Muciño *et al*., 2000) and lobster fishery (Gonzalez-Cano *et al*. 2000).

Area closures are used in some fisheries like shrimp (trawl bans in depths under 5 fathoms, prohibition to fish in an area from shore to 15 nm offshore around the Yucatan Peninsula) or large pelagics (reserved area for sport fisheries from shore to 50 nm. (Fernandez *et al*. 2000; Ulloa *et al*., 2000).

Quotas and total allowable catch (TAC) limits have been used in particular fisheries like abalone, octopus and grouper although in the latter case the quota is an allocation tool within Cuba-Mexico fishing agreements. (Díaz-de-León and Seijo, 1993; Solís *et al*., 1998; Monroy *et al*., 2000).

Effort restrictions have a not so successful history in Mexican fisheries, from a reluctance to adopt them as a tool (Lluch-Belda, 1974, in the shrimp fishery; Solis *et al*. 1998 for the Yucatan octopus fishery) to lack of observance and lack of enforcement capacity (Monroy *et al*., 2000 for the Grouper fishery, Fernandez *et al*. 2000 for the Gulf of Mexico shrimp fishery). However, recognizing the degree of overexploitation in Mexican fisheries will make recommendations on effort restrictions ever more frequent in the future. It can be said that effort restrictions face the strongest resistance from fishermen, who see them as "a lack of flexibility in management" and name them, along with "lack of investment" as one of the biggest problems in Mexican fisheries (Comisión de Pesca de la Camara de Diputados, 2001).

Economic instruments such as transferable quotas and rights or innovative management approaches such as multi-criteria integrated management (Diaz-de-Leon and Seijo, 1993) or a Large Marine Ecosystems approach (Duda and Sherman, 2002) have been explored for selected fisheries and ecosystems but seldom attempted or applied yet.

Introduction of new regulations have contributed to improving some fisheries performance in the short term but social constraints have tended to erode their effectiveness with time. For example, the implementation of a closed season in the Tamaulipas shrimp fishery in 1993 doubled catches in offshore fisheries, but rigidity in its implementation (given that it restricted only the lagoon fishery, minimally affecting the industrial offshore fishery) has resulted in the closed season becoming (involuntarily) an instrument of allocation, greatly diminishing its effectiveness with time (Fernandez *et al*., 2000).

Constraints to management

The main impediments to effective management are:

Social constraints. It should be taken into account that effort restriction is a way to negate entry to a very large number of stakeholders. In countries, like Mexico, where unemployment and inequalities in distribution of income drive more and more people into an activity with lax restrictions (like fisheries), managers will be hard pressed to enforce such regulations and design effective institutions.

Legal vacuums. Lack of definition of particular issues like overfishing, entry limitation, overcapacity –especially in the shrimp fishery- and lack of legal and practical guidelines to face it is a problem that has yet to be overcome. Notwithstanding all the noticeable advances in Mexican Fisheries Legislation, the number of laws in this regard issued by the federal government and despite the new management instruments introduced, the inclusion of a definition and objectives of Fisheries Management and Orderly and Sustainable development concepts have never been included within the

body of the Law. In this regard, attention to this most important issue is lacking as well as a true commitment or operational definitions towards conservation of marine natural resources, particularly when fish stocks are deteriorating, overexploited or severely damaged. In part, this is due to the fact that the present Fisheries Law was approved by the Mexican legislature before FAO issued the Code of Conduct for Responsible Fisheries (1995), or the Agenda 21 came to light after the 1992 World Summit of Rio.

Generally speaking, the fisheries law should clearly state the need to achieve the sustainable use of marine resources, take into account the fragile coastal ecosystems, the finite nature of their natural resources and ways and means to achieve economic viability and social acceptance.

However, the intricate balance of costs and benefits required by sustainable development becomes more difficult as the context becomes more specific.

Policy definition. Mexican fisheries policy should seek to address the problems of undesirable development and protect the interest of individuals, communities and the society. However, to a large degree, there is a reluctance to translate such a delicate balance of policy issues into any kind of binding legal requirement. As fisheries management is used in Mexican fisheries just as a policy but not within the legal framework, much work remains to be done in applying the concept as a direct basis for allocating binding legal rights and duties in fisheries and related environmental contexts.

Institutional framework. Movements towards a more decentralized institutional scheme empowering state, municipal governments, local communities and their organization should be done, without weakening federal institutions. Perhaps, Mesoinstitutional or regional arrangements are needed.

Institutional performance. Improving transparency, accountability, and public information, conflict resolution and informed and effective stakeholders´ participation mechanisms in decision-making is a must. Integrated public policies among the different institutions and actors are challenging the current practices.

Institutional capabilities. Management agencies, as well as research institutions have seen their capabilities, as well as their spatial coverage, decrease noticeably in the last years. In the last three years, downsizing of fisheries related institutions and management budget reductions have been the norm rather than an exception. In contrast more resources are devoted to subsidies like diesel price subsidies for industrial vessels and compensations to fishermen who don't catch a fixed quota (like that applied to the artisanal shrimp fishery in Sinaloa in 2002).

Technical problems. Technical level and human resources of management and research institutions should be improved. Raising technical standards and the level of coordination of research institutions should be considered as a way to provide a better basis for decision-making and management.

Obstacles to fisheries management

Existing policies and legal instruments are fit to follow fisheries management process at the industrial level which accounts with 3 000 vessels, whereas the artisanal fleet accounts over 100 thousand small vessels. Thus, considering the broad geographic expansion of the artisanal fleets and recognizing the large number of people involved in this activity, the effectiveness of such instruments is to be seen and might be insufficient under the current arrangement.

Recent capture fisheries yields and analysis revealed a high degree of deterioration occurred in Mexican national waters during the past two decades, with the already mentioned increasing number of vessels that have jointed the fisheries fleet, both sectors, the industrial and artisanal fleet (3 000 and 100 000 vessels respectively) having reached a number that exceeds their capacity to exploit available marine fisheries of Mexico. This component of the Mexican fisheries should be understood and analysed by

policy decision makers to pursue short term adjustments to overcapacity -particularly in industrial shrimp and selected artisanal fisheries- that will bring otherwise, deeper impacts on the society, economy and the natural resources at large.

Effective management of fisheries should be based on clear, transparent and updated statistical and scientific information, to accomplish main objectives set in the fisheries management plans (orderly), including wider, effective and informed stakeholder participation. However, current statistical information is build based on scattered information released in small fisherman villages to that captured at main fishing ports. Fisheries official annual statistics figures are released one or two years behind schedule at an aggregated level, thus results in a lack of confidence for the sector and for the interested public. In addition, the level of information aggregation being released by government fisheries administrators, does not allow complete analyses nor to understand fully the real situation of all marine resources, especially those overexploited.

COSTS AND REVENUES OF FISHERIES MANAGEMENT

From 1987 to 2001, budgets earmarked for federal government's fisheries institutions have decreased at least 63 percent. In 2001 the approved budget was around US$36 million (2002 exchange rate).

As a result of its transfer to SAGARPA, the former Undersecretariat of Fisheries (now CONAPESCA) was downsized, and its state delegations (formerly one in every one of the 32 states) were reduced in number and incorporated into SAGARPA delegations, losing their hierarchical direct link to the present CONAPESCA.

In 2001, personnel in federal fisheries institutions was reduced to 55 percent of the number assigned to them in 2000 (Comisión de Pesca, Camara de Diputados, 2001a). Personnel numbers were reduced further in 2002 and 2003 as a result of government workers´ retirement programs. Some Regional Centers of Fisheries Research -dependent from National Fisheries Institute- saw their ranks reduced to two researchers in 2003. Economic liberalization, state structural reform and maybe, a perception of the relatively small contribution of fisheries to GDP is the driving factor behind those reductions.

The fisheries activity is under a special favorable revenue regime and revenues obtained from fisheries management -payments to obtain a fishing permit for example- are very low. In 2000, the cost of a permit for a research cruise to assess shrimp population was close to US$20 (at 2002 exchange rate). As the payments are made directly to the Federal Treasury, little returns, if ever, contribute to the fisheries institutions´ or management budget.

Recently it has been recognized that entry and permanence fishing rights does not reflect the resources value and that there is a form of indirect subsidy. The Finance Ministry has these rights tariffs under a scrutiny and adjustment process.

After President Fox' third yearly Address on the State of the Nation (Informe Presidencial) Secretary of Agriculture, Mr. Usabiaga informed that "..last two years' the official budget has been above 400 million pesos (around US$36.3 million (at 2002 exchange rate) (Senado de la República, 2003). However, it should be pointed out that the increase includes budget earmarked for coastal lagoon dredging, which is not directly related to fisheries management. Within his message, it was announced that subsidies on gasoline for artisanal fishermen outboard engines were to be added to the direct subsidies on diesel already given to industrial fishermen. The amount of those subsidies is not known at present. It was also announced that the government's resources were not to be destined for the purchase of new small vessels or fishing gear or to renew fishing vessels (despite that being an objective set in the Sectoral Plan).

While Management budgets have decreased in recent years, management cost due to depleted resources, institutional downsizing, a liberal myopic orientation and social

conflicts have increased noticeably making the state intervention weak, governance a difficult issue and in the future a very complex matter. Considering the associated risks before mentioned and instead of actual government adoption of short-term subsidies that would not solve – but prolonged – fisheries overexploitation and constraints nor ease its situation. Items such as facing reality, improve transparency, and establishment of recovery action plans and sound management approaches are yet to be implemented and urgently need.

IMPLEMENTATION OF GLOBAL FISHERIES MANDATES AND INITIATIVES

In December 1982, in Montengo Bay, Mexico signed the United Nations Convention on the Law of the Sea (UNCLOS), after approval by the Senate and was published in the Federation Official in June 1983. Previously, in year 1976, Article 27 of the National Constitution was modified to include the 200 nm EEZ. In 2003 (April 10), Mexico signed the Agreement relating to the implementation of Part XI of the Convention. In March 1999, Mexico signed the Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas.

In October 1995, Mexico signed the Code of Conduct for Responsible Fisheries of which Mexico has been an active promoter.

Mexico participated actively in both the Rio World Summit on Environment and Development in 1992, adopting Agenda 21, and last year in the Johannesburg World Summit on Sustainable Development, where it adopted the Declaration and the Plan of Implementation. Therefore, specific actions to comply the mandate as the restoration of overexploited marine populations to Maximum Sustainable Yield levels, the use of ecosystem approach and the increase and orientation of the current 26 Marine Protected Areas as a restoration mechanism remain to be implemented.

Mexico is an acting part of the Convention International on Trade of Endangered Species (CITES).

The implementation of a NOM-029 addressing shark fishery management could be seen as an action compatible with the IPOA for shark management, as it promoted spatial and temporal restriction to protect reproductive events and forbid catching sharks only for their fins. However, it faced stern opposition (that ended in its being revoked) from sport fishermen, NGOs and artisanal fishermen on the grounds that it (in its present form), because its level of generality, will not address effective shark conservation nor better management and would promote the use of longlines in areas reserved for sportfishing, would affect seabirds, marine mammals and turtles and have detrimental effects on artisanal shark fisheries. A NOM that addresses these issues has yet to appear.

PARTICIPATION IN REGIONAL FISHERIES BODIES (RFBS)

Mexico participates in several regional bodies:

- Management Bodies (RFBs that directly establish management measures)
  - International Whaling Commission (IWC)
  - International Commission for the Conservation of Atlantic Tunas (ICCAT)
  - Inter-American Tropical Tuna Commission (IATTC)
  - International Agreement for the Protection and Conservation of Dolphins (IAPCD-APICD)
- Advisory Bodies (RFBs that provide members with scientific and management advice)
  - Western Central Atlantic Fishery Commission (WECAFC)
  - Commission for Inland Fisheries of Latin America (COPESCAL)
  - Organización Latinoamericana de Desarrollo Pesquero (OLDEPESCA)

SUMMARY AND CONCLUSIONS

Mexico's fisheries policy is undergoing a process of evolution. Since the early eighties total catches oscillate around 1.2 million tonnes and almost 82 percent of fisheries are fully exploited or over exploited. Industrial fisheries are concentrated in the Gulf of California. At the national level catch and income derived from fisheries are very unevenly distributed. The number of small artisanal vessels has increased around 700 percent in the period of 1970-2001, increasing 1 800 vessels/year before 1982 and 3 600 vessels/year after that year since 1970. In the mid nineties concepts like Sustainable Development, Fisheries Management or the Precautionary and Ecosystems Approach and results from Global Initiatives began to be incorporated in fisheries planning. Also, new management instruments like the National Fisheries Chart and consultative committees were introduced. However, many concepts (including those mentioned) have yet to be incorporated explicitly in legislation, and those instruments have yet to be used at their full. The present Fisheries Law dates to 1992. Despite the status of national resources, a renewed emphasis on production over conservation seems to be made in the present administration since the end of year 2000 using subsidies as their main tool, hampering depleted fishery recovery efforts. Fisheries with specially devised management instruments are less than 33 percent of the national fisheries, however those comprise around 66 percent of the total capture fisheries volume.

- In line with the new paradigms of sustainable development, precautionary approach and fisheries management (orderly), the Mexican Fisheries Sector is undergoing an evolutionary process, especially more intense in the last ten years.
- Most fisheries resources (82 percent) are fully exploited or deteriorated, with a noticeable increase in fishing effort and capacity in the last decades.
- Although, in the last decade, the above mentioned concepts pertaining to Fisheries Management, Sustainable Development and best practices such as the Code of Conduct for Responsible Fisheries were incorporated in the planning process, they have yet to be incorporated along with the Global Initiatives within the current legal framework.
- Policy, legal and Institutional frameworks have yet to be improved and balanced with legal binding aspects, with a long term perspective towards improving fisheries resources' situation. Failing to do such integration, in a scenario of periodical changes in the fisheries administration and policies, could result in a higher risk for marine and fisheries resources with further damage, deeper impacts, decreasing economic and social benefits, food security and a consequent loss of governance.

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APPENDIX TABLES

Current Management of Marine Capture Fisheries in Mexico

Level of Management	% Fisheries Managed	% with Fisheries Management Plan	% with Published Regulations	Trends in the number of Managed Fisheries over ten yrs. (increasing/decreasing/unchanged)
National*	Less than 33%**	Less than 33%***	Less than 33%	Increasing
Regional				
Local				

Notes:
* All marine fisheries are under Federal jurisdiction. Legislation allows for the formation of Federal and State Consultative Committees (see Legal Framework). However, most of these committees have yet to be formed.
** Fisheries with specially devised management instruments are less than 33% of the National fisheries, however those comprise around 66% of the total volume.
*** see Legal Framework

Summary information for three largest fisheries (by volume) (2001) - Pacific Coast Mexico

Category of Fishery	Fishery	Volume tonnes	Value* thousands US$	% of Total Volume Caught**	% of Total Value Caught**	Covered by a Management Plan? (Yes/No)	# of Participants	# of Vessels
Industrial	1 Sardine	489 536	27 983	36.92	1.97	No (1)	n.a.	89
	2 Tuna	136 142	117 653	10.26	8.29	No(1)	n.a.	104
	3 Shrimp	14 495	144 678	1.09	10.19	No(1)	n.a.	1665
Artisanal	1 Giant Squid	21 031 (estimated)	5 003	1.58	0.35	No(2)	n.a.	At least 986
	2 Sharks	20 633	24 699	1.55	1.74	No(2)	n.a.	At least 3 938
	3 Shrimp	9 843	62 518	0.74	4.40	No(1)	n.a.	n.a.
Recreational	1 Striped Marlin, Blue Marlin, Sailfish	Around 18 000 Individuals. No separate data available	At least 60 million US$ (maybe up to 100 million) for the whole country	Around 80% of the total sportfishing catch	n.a.	No(1)	n.a.	Up to ca 7 500
	2 Dolphinfish	n.a.			n.a.		n.a.	Plus around 11 000 foreign (tourist) vessels
	3 Roosterfish	n.a.			n.a.		n.a.	

Notes: n.a. = not available
* Value in 2002 U.S. Dollars.
** % values are based on totals for each category of fishery.
(1) Management Plan in preparation; Regulated by a NOM
(2) Management Plan in preparation.

Summary information for three largest fisheries (by volume) (2001) - Gulf of Mexico and Caribbean Coast Mexico

Category of Fishery	Fishery	Volume tonnes	Value* thousands US$	% of Total Volume Caught**	% of Total Value Caught**	Covered by a Management Plan? (Yes/No)	# of Participants	# of Vessels
Industrial	1 Shrimp	6 603	65 904	0.49	4.64	No(1)	n.a.	742
	2 Octopus	6 587	11 499	0.49	0.81	No(2)	n.a.	514
	3 Grouper	6 312	14 700	0.47	1.03	No(3)	n.a.	539
Artisanal	1 Octopus	13 998	24 435	1.05	1.72	No(2)	n.a.	Ca 2 418
	2 Sharks	8 308	10 238	0.62	0.72	No(2)	n.a.	n.a.
	3 Shrimp	4 419	28 070	0.33	1.97	No(1)	n.a.	n.a.
Recreational	1 Tarpon	n.a.	At least 60 million US$ (maybe up to 100 million) for the whole country	Around 20% of the total sportfishing catch	n.a.	No(1)	n.a.	Ca 3 500
	2 Dolphinfish	n.a.			n.a.		n.a.	Plus around 1 800 foreign (tourist) vessels
	3 White Marlin, Blue Marlin, Sailfish	n.a.			n.a.		n.a.	

Notes: n.a. = not available
* Value in 2002 U.S. Dollars.
** % values are based on totals for each category of fishery.
(1) Management Plan in preparation; Regulated by a NOM
(2) Management Plan in preparation.
(3) Management Plan in preparation. Bilateral agreement award a quota to Cuban vessels

Use of Fishery Management Tools within the three largest fisheries - Pacific coast Mexico

Category of Fishery	Fishery	Restrictions				License/ Limited Entry	Catch Restrictions	Rights-based Regulations	Taxes/ Royalties	Performance Standards
		Spatial	Temporal	Gear	Size					
Industrial	1 Sardine	Yes	Yes	Yes	Yes	Yes	No	No	No	No
	2 Tuna	No	Yes (2)	Yes (1)	No	No	No	No	No	Yes (1)
	3 Shrimp	Yes	Yes	Yes	No	Yes	No	No	No	No
Artisanal	1 Giant Squid	No	No	No	No	Yes	No	No	No	No
	2 Sharks	No	No	No	No	Yes	No	No	No	No
	3 Shrimp	Yes	Yes	Yes	No	Yes	No	No	No	No
Recreational	1 Striped Marlin, Blue Marlin, Sailfish	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No
	2 Dolphinfish	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No
	3 Roosterfish	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No

Notes:
(1) related to the need of lowering dolphin mortality
(2) Prohibition of night operations

Use of Fishery Management Tools within the three largest fisheries - Gulf of Mexico and Caribbean Coast Mexico

Category of Fishery	Fishery	Restrictions				License/ Limited Entry	Catch Restrictions	Rights-based Regulations	Taxes/ Royalties	Performance Standards
		Spatial	Temporal	Gear	Size					
Industrial	1 Shrimp	Yes	Yes	Yes	No	Yes	No	No	No	No
	2 Octopus	Yes (1)	Yes	Yes	No	Yes	Yes	No	No	No
	3 Grouper	No	No	No	No	Yes	Yes (2)	No	No	No
Artisanal	1 Octopus	Yes (1)	Yes	Yes	No	Yes	Yes	No	No	No
	2 Sharks	No	No	No	No	Yes	No	No	No	No
	3 Shrimp	Yes	Yes	Yes	No	Yes	No	No	No	No
Recreational	1 Tarpon	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No
	2 Dolphinfish	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No
	3 White Marlin, Blue Marlin, Sailfish	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No

Notes:
(1) To avoid conflicts between fishermen of Campeche and Yucatán states
(2) Bilateral agreement award a quota to Cuban vessels

Costs and Funding Sources of Fisheries Management within the three largest fisheries - Pacific coast Mexico

Category of Fishery	Fishery	Do Management Funding Outlays Cover			Are Management Funding Sources From		
		R&D	Monitoring & Enforcement	Daily Management	License fees in fishery	License fees from other fisheries	Resource rents
Industrial	1 Sardine	Yes	Yes	Yes	No	No	No
	2 Tuna	Yes	Yes	Yes	No	No	No
	3 Shrimp	Yes	Yes	Yes	No	No	No
Artisanal	1 Giant Squid	Yes	Yes	Yes	No	No	No
	2 Sharks	Yes	Yes	Yes	No	No	No
	3 Shrimp	Yes	Yes	Yes	No	No	No
Recreational	1 Striped Marlin, Blue Marlin, Sailfish	No	No	No	No	No	No
	2 Dolphinfish	No	No	No	No	No	No
	3 Roosterfish	No	No	No	No	No	No

Costs and Funding Sources of Fisheries Management within the three largest fisheries - Gulf of Mexico and Caribbean Coast Mexico

Category of Fishery	Fishery	Do Management Funding Outlays Cover			Are Management Funding Sources From		
		R&D	Monitoring & Enforcement	Daily Management	License fees in fishery	License fees from other fisheries	Resource rents
Industrial	1 Shrimp	Yes	Yes	Yes	No	No	No
	2 Octopus	Yes	Yes	Yes	No	No	No
	3 Grouper	Yes	Yes	Yes	No	No	No
Artisanal	1 Octopus	Yes	Yes	Yes	No	No	No
	2 Sharks	Yes	Yes	Yes	No	No	No
	3 Shrimp	Yes	Yes	Yes	No	No	No
Recreational	1 Tarpon	No	No	No	No	No	No
	2 Dolphinfish	No	No	No	No	No	No
	3 White Marlin, Blue Marlin, Sailfish	No	No	No	No	No	No

Compliance and Enforcement within the three largest fisheries - Pacific coast Mexico

Category of Fishery	Fishery	VMS	On-board observers	Random dockside inspections	Routine inspections at landing sites	At-sea boarding and inspections	Other (please specify)
Industrial	1 Sardine	No	No	Yes	No	Yes	
	2 Tuna	No	Yes	Yes	No	Yes	
	3 Shrimp	No	No	Yes	No	Yes	
Artisanal	1 Giant Squid	No	No	Yes	Yes	No	
	2 Sharks	No	No	No	No	No	
	3 Shrimp	No	No	No	Yes	No	
Recreational	1 Striped Marlin, Blue Marlin, Sailfish	No	Yes	Yes	No	No	
	2 Dolphinfish	No	Yes	Yes	No	No	
	3 Roosterfish	No	Yes	Yes	No	No	

Compliance and Enforcement within the three largest fisheries - Gulf of Mexico and Caribbean Coast Mexico

Category of Fishery	Fishery	VMS	On-board observers	Random dockside inspections	Routine inspections at landing sites	At-sea boarding and inspections	Other (please specify)
Industrial	1 Shrimp	No	No	Yes	No	Yes	
	2 Octopus	No	No	Yes	No	Yes	
	3 Grouper	No	No	Yes	No	Yes	
Artisanal	1 Octopus	No	No	Yes	Yes	No	
	2 Sharks	No	No	No	No	No	
	3 Shrimp	No	No	No	Yes	No	
Recreational	1 Tarpon	No	No	No	No	No	
	2 Dolphinfish	No	No	No	No	No	
	3 White Marlin, Blue Marlin, Sailfish	No	No	No	No	No	

Capacity Management within the three largest fisheries - Pacific coast Mexico

Category of Fishery	Fishery	Does overfishing exist?	Is fleet capacity measured?	Is CPUE increasing, constant or decreasing?	Have capacity reduction programmes been used?	If used, please specify objectives of capacity reduction programme
Industrial	1 Sardine	No	Yes	Increasing (1)	No	
	2 Tuna	No	Yes	Constant	No	
	3 Shrimp	Yes	Yes	Decreasing	No	
Artisanal	1 Giant Squid	No	No	Decreasing (1)	No	
	2 Sharks	Yes	No	Decreasing	No	
	3 Shrimp	Yes	No	Decreasing	No	
Recreational	1 Striped Marlin, Blue Marlin, Sailfish	?	Yes	?	No	
	2 Dolphinfish	No	Yes	Constant	No	
	3 Roosterfish	?	Yes	?	No	

Note:
(1) Highly variable

Capacity Management within the three largest fisheries - Gulf of Mexico and Caribbean Coast Mexico

Category of Fishery	Fishery	Does overfishing exist?	Is fleet capacity measured?	Is CPUE increasing, constant or decreasing?	Have capacity reduction programmes been used?	If used, please specify objectives of capacity reduction programme
Industrial	1 Shrimp	Yes	Yes	Decreasing	No	
	2 Octopus	No	Yes	Constant	No	
	3 Grouper	Yes	Yes	Decreasing	No	
Artisanal	1 Octopus	No	No	Constant	No	
	2 Sharks	Yes	No	Decreasing	No	
	3 Shrimp	Yes	No	Decreasing	No	
Recreational	1 Tarpon	?	Yes	?	No	
	2 Dolphinfish	No	Yes	Constant	No	
	3 White Marlin, Blue Marlin, Sailfish	?	Yes	?	No	

Nicaragua

Sergio Martínez Casco
CIPA / AdPesca, Nicaragua
September 2003

INTRODUCTION

Around the world, fisheries are taking a premium role that leads the newspapers heading, partially because the depletion of some of the most important stocks, but also because of the poor performance that countries are showing in the conservation, preservation and friendly management of the remaining stocks and their environment. The lack of proper management seems to be constant in the coastal zones of poor countries and a big task in the open ocean, where the fleets of the rich countries do their catches; the oceanic patterns are no longer a mystery, and big boats can reach any corner to take advantage of their electronic help and fancy fishing gear, which produce a big amount of fish, usually more than biological production can support.

Those reasons are good enough to know the management practices all around the world, and FAO is involved in the process to help fisheries managers and stockholders in the hard work of administrating the fishing resources we have in our care. This document is part of that initiative and pretends to describe the fisheries management of the marine capture in Nicaragua.

POLICY FRAMEWORK

Nicaragua is a small country with less than six million people, but with two oceans and a large quantity of water bodies, all of them suitable for fisheries activities. In fact, the Caribbean Sea and Pacific Ocean are the marine frontiers of the country, but less than 10 percent of their biomass is landed.

For that reason, the main objective of the Government at national[1] level is: "to obtain the sustainable use of the fisheries and the aquaculture, by the means of the optimization of the use of the fisheries and traditional aquaculture, the promotion of the non traditional, maintaining the quality of the environment and ecosystem that support them, in the search of a better revenue for all economic actors involved in the fishing activities[2]"

The legislation ruling Nicaraguan fishery was adopted in 1961, and is in the form of an Especial Law for the regulation of the fisheries exploitation. After this law, five new proposals have been written (1983, 1993, 1995, 1998, 1999), all of them trying to include a modern concept of the fisheries and correlated items, giving special attention to the Code of Conduct for Responsible Fishing (CCRF) from FAO. In the meantime, a number of agreements, decrees and resolutions have supplied the lack of a new law, and at the moment, the version from 1998 has been approved by the National Assembly in its general aspect, but it need to be approved in a second revision in a more specific way.

LEGAL FRAMEWORK

The agency responsible for the marine capture administration is the Fisheries and Aquaculture Administration Direction (AdPesca), under the Ministry for

[1] National means that covers all national territory
[2] Decreto No. 100-2001

Development, Industry and Trade (MIFIC). This Direction has the mandate to "execute the promotion of the fisheries development activities, including research, technical assistance, training, administrative optimization, gathering of funds and demonstrative projects, conduct technical evaluation for the concessions, execute the monitoring, surveillance and control of the fishing activities, and in coordination with the General Direction of Natural Resources (DGRN) - under the same ministry (MIFIC) - to define the sectorial policy and also the general and specific policies related to the adequate use of the natural resources – fisheries resources – under the domain of the State of the Republic of Nicaragua".[3]

In this sense, AdPesca is the governmental agency responsible for the fisheries management as well as for the research, monitoring and enforcement at national level, but this has to be done in coordination with the DGRN, which is the agency responsible for the administration and extending the concessions of aquaculture and licenses for fisheries as well as for the ships permits. This proceeding is described in the regulation of the Law 290, which takes out the Legal Office from AdPesca and command at the DGRN to keep the registry of all licenses, permits and concessions for legal purposes. In practice, AdPesca do the technical work and send the assessments and technical evaluations to the DGRN, whom in a juridical language write the legal dispositions, keeping a register of all the information.

AdPesca also has a very close contact with the Ministry for Environment and Natural Resource (MARENA), to deal with the regulations for endangered species (CITES), and those related with the marine protected areas legislation, even when the country has only one species under the Appendix II (*Strombus gigas*), and the protected areas are open for the artisanal fisheries.

STATUS OF FISHERIES IN THE COUNTRY

Since the beginning of the industrial fisheries in Nicaragua, largest marine catches are shrimps and lobsters, even when in recent years finfish is the major product by volume. Table 1 shows the largest marine catches produced by each ocean during the year 2002, in volume and value.

In the industrial fisheries, shrimp is the major fisheries by volume (73.7 percent) followed by lobster (25.2 percent), and finfish (1.1 percent); artisanal fisheries is totally different, and the major landings are for finfish (68.8 percent), lobster is the second (26.5 percent) and shrimp at last place (4.7 percent). In terms of value, industrial and artisanal fisheries keep the same pattern, in the order of which first place is for lobster, second for shrimp and last for finfish; contribution to the gross domestic product (GDP) from fisheries is 1.52 percent[4].

Industrial and artisanal fisheries are the major division for statistical purposes; due to the reduced tourism offer, recreational fishery is not a traditional activity and is reduced to sporadic tournament designed for people who owns their own boats, and there is no information of the catches or the species caught in those events.

MANAGEMENT ACTIVITY

Political history in Nicaragua has marked the process for the administration of natural resources, including fisheries, which started in the 1960s with a small office to counterpart the FAO/PNUD fisheries development project in Central America. The evolution of this office into a Fisheries Division conducted to the administration of the shrimp and lobster fisheries until 1979, when the change of government also changed all the patterns and it became the owner of the fishing resource, and the management

[3] Reglamento de la Ley 290

[4] Central Bank; calculation is over the basis of millions of Nicaraguan currency from 1980 (US$ 1.00 = C$ 10.00)

TABLE 1.
Largest marine catches by volume and values

Category of Fishery	Fishery	Volume (tonnes)	Value* mil USD	% of Total Volume Caught**	% of Total Value Caught**
Industrial	1: Shrimp	1 871	9.5	73.7	30.8
	2: Lobster	641	21.2	25.2	68.8
	3: Finfish	27	0.1	1.1	0.3
Artisanal	1: Shrimp	115	0.5	4.7	1.8
	2: Lobster	649	21.4	26.5	76.6
	3: Finfish	1 686	6.4	68.8	22.6

Source: Anuario Pesquero y Acuicola de Nicaragua; Año 2002

agency became a Ministry of Fisheries, with a large number of worker and technicians dealing with a big task of a state-producer system. More recently (1990), after another change in the government, the fisheries administration looked for the free enterprise and the maximum sustainable yield, in the form of a facilitating state that allows to the stakeholders a more confident investment and participation, with less budget and control of the traditional fisheries.

AdPesca is responsible for the fisheries administration is – under the legal framework described before – in collaboration with the DGRN for the legal register and support, and even when the process is not written, there is a participatory forum with the stakeholders where discussion about total allowable catch limits (TACs), closed season, effort reduction, etc., takes place. The process for the management of the main fisheries is also agreed, suited to the needs for each of the fisheries. This is, the specific problems derived from the shrimp fisheries have a different forum than the lobster fisheries problem, so there is not a plan for each fishery management, but a general frame for the decision-making and solution of the problems.

During the last meeting for the 2003-04 TAC, the participation of the stakeholders in the reduction of the fishing fleet for both, lobster and shrimp fisheries, was totally in agreement with the management authority about such reduction, and spontaneously, they accepted to remove some fishing units on behalf of the health of the fisheries.

At the moment, there are three industrial fisheries that are totally managed for AdPesca: shrimp and lobster at the Caribbean and shrimp at the Pacific Ocean, even when other fisheries are in developed like finfish, deep water shrimp and langostino chileno[5]; the first three of them since the beginning of the industrial activities, and the later in which started a couple of years ago. Artisanal fisheries are free access and are very difficult to manage, because of the large number of fisher and the little presence of AdPesca staff in the communities.

Main fisheries (shrimp and lobster at the Caribbean and shrimp at the Pacific), are evaluated annually and a TAC is set for each stock. Except for the fish stocks in both oceans, shrimps and lobsters stocks are having problems of being overfished, and measures have been taken for the adjustment of the effort, to enforce the close seasons and nursery areas protection, and increase surveillance to avoid the catch and trade of under sized animals. Also there is a campaign over the use of proper fishing gear and methods, to reduce the unwanted product and give a break to the recruitment population, as well as to the bycatch. In this sense, there are prohibitions about the use of illegal gear and to fish in areas where the recruitment or spawning takes place; in both oceans, shrimp trawlers are prohibited from operating in the three nautical miles close to the shore line.

[5] Langostino Chileno is squat lobster (*Pleuroncodes planipes*)

All the measures taken by the fisheries administration have been on their way for many years, but there seem to be no positive results at the end of the road. The main problem is lack of budget present in the right places at the right moment to gather information, and even when the stakeholder admit the need for a major commitment, most of the time ships skippers and small-scale fishers were found violating the law and promoting the chaos; middlemen and corrupted personnel to do the rest.

COSTS AND REVENUES OF FISHERIES MANAGEMENT

Cost of fisheries management are covered by the government, and this include research and development, monitoring, surveillance and travels; all of them have suffered substantial increments during the last ten years and they can't be afforded in a optimal way due to the reduction of the budget during the same period. This is the reason why the fisheries administration is asking for donations and external funds to support some of the indispensable activities like monitoring and research. Private stakeholder usually contribute to research with their own ships and sometimes, with extra money for traveling.

IMPLEMENTATION OF GLOBAL FISHERIES MANDATES AND INITIATIVES

Nicaragua has already signed and ratified the United Nations Convention on the Law of the Sea (UNCLOS), but failed to sign other conventions, including the UN Fish Stocks Agreement and the Compliance Agreement. Instead, the country is trying to include in all governmental decree and agreement, the obligatory use of the content of the Code of Conduct for Responsible Fishing (CCRF), as a way to promote a more reasonable framework for the administration of the fisheries, even though no national plan of action (NPOA) has been written.

PARTICIPATION IN REGIONAL FISHERY BODIES (RFBS)

Nicaragua is part of the Central America Isthmus, and has been working with the sub-regional projects that the different agencies have developed. In this sense, the country is part of the group of WECAF, and when possible because of the budget, the fisheries administration attend the meeting of the working groups, or the regular meetings every two years.

The country is also a part of the Inter-American Tropical Tuna Commission (IATTC), attending the regular and extraordinary meetings and keeping all the agreements for the tuna fisheries in the OPO region. As part of the fishing capacity, Nicaragua has an assignment for this fishery.

Nicaragua is member of OLDEPESCA and OSPESCA[6], and even when these two organizations are not linked for regional fisheries management, the country keeps its presence at the meeting and cooperate with regular statistic information.

SUMMARY AND CONCLUSIONS

Marine capture fisheries management in Nicaragua is done by the Direction of Fisheries and Aquaculture Administration (AdPesca), under the Ministry of Development, Industry and Trade (MIFIC), with the collaboration of the General Direction of Natural Resources (DGRN) under the same Ministry (MIFIC). The fishing law that rules the fishing activity is form 1961, but many instruments in the form of agreement, decrees and resolutions allow the national administration the management of at least three major fisheries: shrimp, lobster and fish; recently, deep water shrimp and langostino chileno fisheries also started. The main problem for the failure of a full fisheries administration is the lack of political will, in the form of an optimal budget

[6] La Organización Latinoamericana de Desarrollo Pesquero and La Organización del Sector Pesquero y Acuícola del Istmo Centroamericano.

and the lack of management plans for each of the different fisheries. During the year 2000, the country fishing export was more than US$120 million, but the assignment for the national administration was less than US$0.4 million. In this sense, the management activity is decreasing even when the main fisheries present signs of overexploitation and more fisheries are being promoted. This has to recall for a general use of the management plans and the full acceptance of the implementation of global fisheries mandates and initiatives, but at the moment, only UNCLOS has been signed and ratified; no NPOA has been written and the participation of the country in regional fishery bodies is conservative.

The fishery statistics and stock potential indicates that Nicaragua has enough resources to become an important fishery country but there is a lack of political will to promote such state. Fishery Law has been in discussion for almost ten years and there is no signs that show any further change. To this problem, the budget and the confused institutional framework must be added because they are delaying the optimum capacity of the fishery agency to respond to the ever changing fisheries activity. AdPesca and the rest of stakeholders agree that there is the need of a change in the way fisheries administration is done, especially in the conception of the institutional and legal framework, in order to have an agile, modern and efficient fisheries management institution.

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APPENDIX TABLES

Current Management of Marine Capture Fisheries in Nicaragua

Level of Management	% Fisheries Managed	% with Fisheries Management Plan	% with Published Regulations	Trends in the number of Managed Fisheries over ten yrs. (increasing/decreasing/unchanged)
National	33 % - 67 %	Less than 33 %	33 %	Increasing
Regional				
Local				

Summary information for three largest fisheries in Nicaragua (by volume) (Year 2002)

Category of Fishery	Fishery	Volume (tonnes)	Value* mil US$	% of Total Volume Caught**	% of Total Value Caught**	Covered by a Management Plan? (Yes/No)	# of Participants	# of Vessels
Industrial	1: Shrimp	1 871	9.5	73.7	30.8	No	All country	93
	2: Lobster	641	21.2	25.2	68.8	No	Direct	96
	3: Finfish	27	0.1	1.1	0.3	No	2 216	25
Artisanal	1: Shrimp	115	0.5	4.7	1.8	No	All country	All country
	2: Lobster	649	21.4	26.5	76.6	No	Direct	Artisanal
	3: Finfish	1 686	6.4	68.8	22.6	No	13 553	4 188
Recreational	1: n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

Notes: n.a. = not available
* Value in 2002 U.S. Dollars.
** % values are based on totals for each category of fishery.

Use of Fishery Management Tools within the three largest fisheries in Nicaragua

Category of Fishery	Fishery	Restrictions				License/ Limited Entry	Catch Restrictions	Rights-based Regulations	Taxes/ Royalties	Performance Standards
		Spatial	Temporal	Gear	Size					
Industrial	1: Shrimp	Yes	Yes	Yes	No	Yes	No	No	No	No
	2: Lobster	Yes	Yes	Yes	Yes	Yes	No	No	No	No
	3: Finfish	No	No	Yes	No	Yes	No	No	No	No
Artisanal	1: Shrimp	Yes	Yes	Yes	No	No	No	No	No	No
	2: Lobster	Yes	Yes	Yes	Yes	No	No	No	No	No
	3: Finfish	Yes	No	Yes	No	No	No	No	No	No
Recreational	1: n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

Note: n.a. = not available

Costs and Funding Sources of Fisheries Management within the three largest fisheries in Nicaragua

Category of Fishery	Fishery	Do Management Funding Outlays Cover			Are Management Funding Sources From		
		R&D	Monitoring & Enforcement	Daily Management	License fees in fishery	License fees from other fisheries	Resource rents
Industrial	1: Shrimp	Yes	Yes	Yes	Yes	Yes	Yes
	2: Lobster	Yes	Yes	Yes	Yes	Yes	Yes
	3: Finfish	Yes	Yes	Yes	Yes	Yes	Yes
Artisanal	1: Shrimp	Yes	Yes	No	No	No	No
	2: Lobster	Yes	Yes	No	No	No	No
	3: Finfish	Yes	Yes	No	No	No	No
Recreational	1: n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

Note: n.a. = not available

Compliance and Enforcement within the three largest fisheries in Nicaragua

Category of Fishery	Fishery	VMS	On-board observers	Random dockside inspections	Routine inspections at landing sites	At-sea boarding and inspections	Other (please specify)
Industrial	1: Shrimp	No	No	Yes	Yes	Yes	
	2: Lobster	No	No	Yes	Yes	Yes	
	3: Finfish	No	No	Yes	Yes	Yes	
Artisanal	1: Shrimp	No	No	Yes	Yes	Yes	
	2: Lobster	No	No	Yes	Yes	Yes	
	3: Finfish	No	No	Yes	Yes	Yes	
Recreational	1: n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	

Note: n.a. = not available

Capacity Management within the three largest fisheries in Nicaragua

Category of Fishery	Fishery	Does overfishing exist?	Is fleet capacity measured?	Is CPUE increasing, constant or decreasing?	Have capacity reduction programmes been used?	If used, please specify objectives of capacity reduction programme
Industrial	1: Shrimp	Yes	Yes	Decreasing	Yes	
	2: Lobster	Yes	Yes	Decreasing	Yes	
	3: Finfish	No	Yes	n.a.	No	
Artisanal	1: Shrimp	Yes	Yes	Constant or Decreasing	No	
	2: Lobster	Yes	Yes	Constant or Decreasing	No	
	3: Finfish	No	Yes	Increasing	No	
Recreational	1: n.a.					

Note: n.a. = not available

Panama

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INTRODUCTION

The Republic of Panama is located between the 7°12'07" and 9°38'46" of North latitude and between the 77°09'24" and 83°03'07" of West longitude. Panama is bordered by the Caribbean Sea to the north and the Pacific Ocean to the south. It occupies the southeastern end of the Central America isthmus forming the land bridge between Latin America (Costa Rica) and South America (Colombia). It has a tropical climate, with average daily rainfall 28 mm. (1 in.) in winter.

General Physical Data

Land area:	75 517 km²
Area of the islands:	1 488 km²
Coastal length in the Pacific Ocean:	1 700.6 km
Coastal length in the Caribbean Sea:	1 287.7 km
Continental Shelf (200 NM):	250 892.9 km²
Territorial Sea (12 NM):	32 115 km²
Inland waters (include the Historical Bay):	36 816 km²
Exclusive Economic Zone (EEZ):	218 777.9 km²

POLICY FRAMEWORK

The fishery legislation was first adopted on July 9, 1959 (Decree Law N°17) by which fisheries are regulated by Law. Since then, the legislation has not been revised as a whole. Some new Decrees have been created to regulate some specific activities, but the original legislation still remains.

In 1998, a new law was enacted (Decree Law N° 7) to create the Panama Maritime Authority (PMA), unifying the national institutions with maritime competences, including the General Directorate of Marine and Coastal Resources, into the PMA.

In both legislations, the fisheries management policy is mentioned and it gives a legal framework for the management of marine living resources at the national, regional, and local levels.

Although the legislation has not been revised during the last ten years, some new Decrees have been created, as mentioned above; taking into consideration some of the recent international fisheries management mandates (e.g. Code of Conduct for Responsible Fisheries, UN Fish Stocks and the Compliance Agreement).

Other than that, there is non-fishery specific legislation that can impact the overarching objectives.

LEGAL FRAMEWORK

The General Directorate of Marine and Coastal Resources (GDMCR) of the new created PMA is responsible for fisheries management at the national, regional, and local levels.

It is responsible for monitoring and enforcement although part of this work is made with the collaboration of the National Maritime Service and with Local Governments. The GDMCR deals at a national jurisdictional level in the whole country.

There are other agencies responsible for other aspects and with different jurisdictional levels but they are not involved directly in fisheries. Anyhow if these agencies are planning some activity that can involve fisheries in some degree they should coordinate these activities with the GDMCR.

The legal framework for fisheries management is influenced by non-fisheries specific legislations that sometimes affect fisheries but they were not adopted for the purpose of fisheries management. As an example it can be said that the Environment National Authority is responsible for the creation of marine protected areas. In many cases they have created regulations inside these areas regarding fisheries and this has brought some conflicts with the fishermen in those sites. Nowadays there is an agreement with both Authorities (Maritime and Environment) that states that when a marine protected area is going to be created it should be revised by the GDMCR, which is the only Institution that can define fisheries management inside those areas.

STATUS OF FISHERIES IN THE COUNTRY

Fisheries in the country can be easily divided into two categories: industrial fisheries and artisanal fisheries.

Industrial fisheries

Traditionally two activities were recognized in this fishery: the herring and anchovy fisheries, exclusive used for fishmeal and the shrimp fisheries. In the recent years fisheries were diversified, and today the fisheries for snappers and groupers is considered one of the most important.

Anchovies and herrings

This activity began in the late 50's when it was very important for the tuna fisheries. From analysis based on eggs and larvae surveys data, it was concluded that the Maximum Sustainable Yield is 250 000 tons. The mean annual catch is around 120 000 tons; however in 1985 the catch reached 241 000 ton. This catch is directed to fishmeal and oil production. Actually there are 32 vessels dedicated to this activity. The fishing season takes place from April to September, due to the availability of the fish resources to the fishing gears and their migration to less deep waters. These vessels have between 21 and 22 m of length, its hold capacity is up to 150 tons and their engines have between 265 and 340 HP and are not equipped with refrigerating systems.

The catch fluctuation could be explained by the changes in the fish abundance due to the February – April upwelling.

This activity is done only in the Pacific Ocean.

Snappers and groupers

By the end of the 80's and considering that there were serious problems with the capture of shrimps, some small-scale fishermen decided to start fishing these new resources. It suddenly became a very important activity producing great incomes for those involved in the activity. They started changing their small boats into bigger ones and today there are 238 boats involved in the activity. The production during the year 2002 was of 26 642 tons, generating an income of US$67 557 451.

Actually there are no studies that can determine the Maximum Sustainable Yield for this fishery, but considering the observed fact of a small decline in the capture size, some regulations have been applied and today this species can only be caught using longlines. No other fishing gear is accepted. The product is usually sent to international markets.

All the catch comes basically from the Pacific Ocean.

Shrimps

There are studies that show that the white shrimp fishery reaches its Maximum Sustainable Yield between 4 and 5 million pounds of shrimp tails, corresponding to 200 vessels. The production for the year 2002 was of 3,159 tons (including different types of species). It has been observed a declination in the captures and there are several hypothesis that try to explain the problem, like the increase of the number of vessels, the increase of the artisanal fisheries which is competing for this resource, the use of forbidden gears in the shrimp nursery areas and the use of the mangrove for aquaculture and other activities.

Actually there are 213 vessels with license for the shrimp fishery that catches also several shrimp species. These are "Florida type" trawlers. Since 1985 there is a legislation that does not allow the replacement of the shrimp vessels, in order to reduce progressively the fishing capacity; for that reason, the vessels are quite old (more than 20 years). Most of them have a length between 18 and 20 m, engines between 150 and 380 HP, refrigerated holds and a tonnage between 50 and 150 GRT. They use beam trawls and operate in surface waters or up to 200 m in deep waters (Executive Decree 10, 1985).

Most of the activity is done in the Pacific Ocean and only a few vessels realize some operations in the Caribbean during two or three months of the year.

Artisanal fisheries

Vessels with less than 10 GRT with outboard motors characterize the artisanal fisheries and in their majority have low autonomy and little technology in their fishing system.

Caribbean coast

The artisanal fishing is mainly directed to the capture of lobsters, shellfish as the Strombus gigas, octopus and the Caribbean King Crab. From all of them lobster is the most important, which is caught by diving with the help of a stick and a slipknot. There are strong indicators that the lobster is overexploited and the people mainly dedicated to this activity, established in the Native Congress in San Blas, a fishing prohibition for lobsters and king crabs. Although there are other legislations that establish the minimum size and the prohibition of catching females with eggs these are not fully accomplished. The statistical information shows that there are 508 vessels and 1 524 fishermen in the sea bream artisanal fishery. These numbers do not include the native districts.

Pacific coast

The greatest fishing activity takes place in the Pacific coast. In the vessels registration, a total of 6 156 vessels with 18 468 fishermen involved in the activity can be found.

There is a great competence between the artisanal and the industrial fishing because of the resources. Concerning the shrimps the increase in the use of gillnets has enormously influenced its catches. The fishing gear was introduced in the country until 1975; at that time the shrimp mean annual catch was 4 million pounds of tails. To stop the increase of new fishermen in the activity there is a regulation that no new artisanal vessels may ask for a permit for fishing shrimps.

All the artisanal boats need a permit given by the GDMCR. This is a way to control the number of people involved in the activity.

The main resources are shrimps, fishes, shellfish, and crustaceans.

Annex Table 1 shows details of both industrial and artisanal fisheries.

MANAGEMENT ACTIVITY

The management measures have been developed and implemented following most of the time the pressure of different groups instead of the measures that are really directed to a rational and sustained fishing. The implementation measures that have been implemented do not accomplish completely the objectives, and if they were applied they could give an effective answer to the needs of the marine resources conservation.

The General Directorate of Marine and Coastal Resources is responsible for the implementation of management measures; however, and although stakeholders are not always involved they urge the fishing administration to implement measures that can benefit them instead of the stocks, sometimes.

Of all the main fisheries in the country only two are managed. The shrimp fisheries have a complete management plan and actually there are two close seasons during the year (one in February - March, and the other in September – October) where nobody can fish for shrimps; this includes industrial and artisanal fisheries. In the case of anchovies and herrings, there isn't a management plan as a whole, but certain measures have been taken during the last years to preserve the stock. There is a fishing season that opens under the direction of the GDMCR and it closes also following the indications of the fishing administration. This measure is based on the size of the anchovies and herrings, and they can only be fished when they are adult.

It can be said without no doubt that less than 33% of the whole fisheries in the country have some form of management.

During the last ten years some changes have been observed in the fisheries under management. This includes a management plan for the shrimp fishery and the anchovies and herring fisheries. More recently, during the last five years some other fisheries have also felt the pressure of new measures to ensure the stocks that are under exploitation.

Considering that the number of people involved in the artisanal fisheries and in the fisheries of snappers and groupers have increased during the last ten years, some actions were taken to exercise some control in the pressure that have been fulfilled in some stocks. These measures include the need of a permit for artisanal boats, and no new permits are given for the artisanal fishery of shrimp. In the case of snappers and groupers all the vessels involved in the activity need a fishing license from the GDMCR. All the information exists in a database in the main office of the GDMCR.

The only stocks that are regularly assessed to determine their status are shrimps and anchovies and herrings. From this information it has been observed that the shrimp fishery is overexploited. In the case of anchovies and herrings there is no scientific evidence that it is close to an overexploitation. Although there are no other fisheries under assessment, it has been observed by the size of the fish landed, in the case of snappers and groupers that their size has become more or less the same, and that could be an indication that the stock is getting close to full utilization.

In all the cases the GDMCR is legally authorized to adopt measures to address overfishing and rebuilt depleted stocks. In order to do this job, new Decrees have been created to ensure the stocks under exploitation. These include close seasons; marine protected areas where no fishing activity could be done, marine reservations with special fishing permits, the need of special licenses, special fishing gears, and a restricted number of vessels involved in the fisheries, among others.

It is important to mention that there are some fishing gears prohibited: in the case of artisanal fisheries gillnets have to be with a minimum mesh size of 3" and 3 ½ inches during the shrimp's close season. No trawl nets are permitted in the artisanal shrimp fishery. In the case of groupers and snappers, only longlines are accepted. These measures were adopted to prevent a fully depletion of the resources.

The introduction of management measures during the last ten years has slightly improved the stocks under exploitation. It can be said that although some measures

exist for the industrial fishing activity, the number of artisanal fishermen grew up during the last ten years also and there are some conflicts between both activities. Probably in the near future these measures can demonstrate their effectiveness.

Annex Table 2 shows the use of Fisheries Management Tools within the three largest fisheries.

The principal impediments to more effective management include the lack of an adequate budget for the GDMCR and more qualified technicians.

COSTS AND REVENUES OF FISHERIES MANAGEMENT.

The government is in charge of financing the management costs of the main fisheries in the industrial sector, where it develops some research and development in the shrimp and herrings and anchovies fisheries. It is also in charge of financing the surveillance in these two main fisheries. But regarding the costs that the fishery administration should assume there is no legislation in the country that helps in recovering the costs that these activities involve.

During the last ten years the budget has decreased; meanwhile the costs have risen for these actions during the same period of time.

The only external help that is received by the fishery administration comes from external sources, such as International Cooperation Organizations.

IMPLEMENTATION OF GLOBAL FISHERIES MANDATES AND INITIATIVES.

The country has ratified UNCLOS and it's now a law of the Republic (Law 38, June 4, 1995). Regarding the UN Fish Stock Agreement and the Compliance Agreement, the country is signatory of both of them. They have been applied in the National normative as shown in the Executive Decree No. 49 of November 13, 1997 by which International Fishing Licenses are regulated for International vessels, and in Resolution No. 1791 of December 20, 2001. Both of them establish a control on fishing vessels, conservation and management measures for tranzonal and highly migratory species, and with this all the vessels must report information on their status and their captures. The Maritime National Strategy takes into consideration the established support to ratified and approve both of these Agreements.

Recently the country has adopted a lot of measures to ensure what has been established in International Plans of Action. Nowadays there is legislation, mentioned above (Resolution No. 1791) where a lot of steps have been implemented to control international fishing. As a matter of fact all the international vessels should have an International License providing information about the vessel, the ship owner, kind of species to fish, and a VMS system among others. It also establishes that no International Fishing License will be given to those vessels requesting a fishing permit in a competent fishing area of a regional or sub-regional body, for vessels asking to fish some species that are regulated in certain areas, when the vessel appears in an IUU list, to new longliner vessels, or to those vessels that have unfulfilled management and conservation fishing measures of a regional or sub-regional body. It also established measures regarding the information that should be provided by the vessels to the Panamanian government. In the same Resolution there are some points related with the fishing activity in the high seas mostly when they transship fish into other vessels.

Finally it also establishes that all the information will be sent to FAO and all the fishery regional or sub-regional bodies by the GDMCR protecting the confidence of the information given by the ship owner.

PARTICIPATION IN REGIONAL FISHERY BODIES (RFBS)

Panama actively participates in the Inter American Tropical Tuna Commission (IATTC). In the case of the International Convention for the Conservation of the Atlantic Tuna (ICCAT) there has not been a physical presence in the meetings since

1999, however there is a constant communication with this body and the norms are fulfilled by the country.

The decisions adopted in regional fishery bodies are internalized by Administrative Resolutions or by Resolutions of the GDMCR.

SUMMARY AND CONCLUSIONS

It has been observed that the Fisheries National Legislation is an old one and it is managed through Decrees and Resolutions. It is necessary to reinforce the national legislation incorporating the new International Agreements, and the concept of Fisheries Management. Regarding the international situation, Panama has compliance with the International Agreements and it has been doing a very good job in international matter to control IUU.

An increment in national fisheries is noted causing an increase in the surveillance costs. In the meanwhile the budget is lower year after year. Many of the decisions are concerted with the stakeholders.

New measures should be developed to control the compliance of national fisheries.

Actually there are no programs related with the reduction of fishing capacity.

There are no legislations for recovering the cost of surveillance and research associated with the exertion of fisheries programs.

Sport fisheries are not regulated at all by the government. There is only one resolution that states that some of the species caught in this activity should be released again to the sea. Most of the activity is controlled by private enterprises.

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APPENDIX TABLES

Summary information for three largest fisheries (by volume) (Year 2002)

Category of Fishery	Fishery	Volume mil tons	Value* mil US$	% of Total Volume Caught**	% of Total Value Caught**	Covered by a Management Plan?	# of Participants	# of Vessels
Industrial	1 Anchovies/herrings	209	6 675	84.95	6.66	Yes	288	32
	2 Snappers	27	67 557	10.85	67.37	No	1 428	238
	3 Shrimps	3	25 046	1.29	24.98	Yes	1 065	213
Artisanal	1 Fish	25	43 487	87.27	52.66	No	19 992 ***	6 664 ***
	2 Shellfish	1	12 955	3.12	15.69	No	n.a.	n.a.
	3 Mollusk	1	2 070	4.24	2.51	n.a.	n.a.	n.a.
Recreational	1 Various demersals and pelagics****	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

Notes: n.a. = not available
* Value in 2002 U.S. Dollars.
** % values are based on totals for each category of fishery.
*** There is no specific information for vessels or fishermen.
**** Swordfish, Mahi Mahi, Sailfish, tuna, marlins, etc.

Use of Fishery Management Tools within the three largest fisheries

Category of Fishery	Fishery	Restrictions				License/ Limited Entry	Catch Restrictions	Rights-based Regulations	Taxes/ Royalties	Performance Standards
		Spatial	Temporal	Gear	Size					
Industrial	1 Anchovies/ herrings	Yes	Yes	Yes	Yes	Yes	No	No	No	No
	2 Snappers	No	No	Yes	No	No	No	No	No	No
	3 Shrimps	Yes	Yes	Yes	Yes	Yes	No	No	No	No
Artisanal	1 Fish	No	Yes	Yes	Yes	Yes	No	No	No	No
	2 Shellfish	No	Yes	Yes	Yes	No	No	No	No	No
	3 Mollusk	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Recreational	1 Various demersals and pelagics****	No	No	Yes	No	No	No	No	No	No

n.a. = not available

Costs and Funding Sources of Fisheries Management within the three largest fisheries (Yes/No Response)

Category of Fishery	Fishery	Do Management Funding Outlays Cover			Are Management Funding Sources From		
		R&D	Monitoring & Enforcement	Daily Management	License fees in fishery	License fees from other fisheries	Resource rents
Industrial	1 Anchovies/herrings	Yes	No	No	Yes	No	No
	2 Snappers	No	No	No	Yes	No	No
	3 Shrimps	Yes	Yes	Yes	Yes	No	No
Artisanal	1 Fish	No	No	No	Yes (*)	No	No
	2 Shellfish	No	No	No	No	No	No
	3 Mollusk	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Recreational	1 Various demersals and pelagics****	Yes	No	No	No	No	No

n.a. = not available
(*) Fishing permit

Compliance and Enforcement within the three largest fisheries (Yes/No Response)

Category of Fishery	Fishery	VMS	On-board observers	Random dockside inspections	Routine inspections at landing sites	At-sea boarding and inspections	Other (please specify)
Industrial	1 Anchovies/herrings	No	No	No	No	No	No
	2 Snappers	No	No	No	No	No	No
	3 Shrimps	No	No	Yes	Yes	Yes	No
Artisanal	1 Fish	No	No	No	No	Yes	No
	2 Shellfish	No	No	No	No	Yes	No
	3 Mollusk	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Recreational	1 Various demersals and pelagics****	No	No	No	No	No	No

n.a. = not available

Capacity Management within the three largest fisheries (Yes/No Response)

Category of Fishery	Fishery	Does overfishing exist?	Is fleet capacity measured?	Is CPUE increasing, constant or decreasing?	Have capacity reduction programmes been used?	If used, please specify objectives of capacity reduction programme
Industrial	1 Anchovies/herrings	No	No	Constant	No	No
	2 Snappers	?	No	Increasing	No	No
	3 Shrimps	Yes	Yes	Decreasing	Yes	Yes
Artisanal	1 Fish	No	No	Increasing	No	No
	2 Shellfish	No	No	Increasing	No	No
	3 Mollusk	n.a.	n.a.	n.a.	n.a.	n.a.
Recreational	1 Various demersals and pelagics****	No	No	n.a.	n.a.	n.a.

n.a. = not available