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THE REPUBLIC OF GUYANA

FISHERIES SECTOR STRUCTURE

Guyana, with a land area of 215 000 km ^{2}, lies on the north coast of the South American subcontinent, between 1° and 8° North Latitude and 57° and 61° West Longitude. A Maritime Boundaries Act (1977) established a Fishery Zone of 200 n.mi., which later became recognized as an Exclusive Economic Zone (EEZ) by a Presidential Order in 1991.

Its coastline is 432 km long, and the EEZ encompasses 138 240 km ^{2}. The average width of the continental shelf is 112.6 km, being wider in the east and narrower in the northwest, giving a shelf area of 48 665 km ^{2}.

Guyana's marine environment lies within the area bounded by the Orinoco and Amazon rivers, and during the rainy season is greatly influenced by the heavy sediment load and great discharge of fresh water from these huge rivers, and its own large rivers of Essequibo, Demerara and Berbice. The fresh water affects the salinity, while the sediments (and nutrients) create a series of shifting sand bars and mud flats that cover the shelf out to about the 40-m isobath. Sand gradually becomes dominant beyond this depth and is replaced by coral at about 100 m depth. The mud supports a rich invertebrate fauna that nourishes a variety of demersal species.

Guyana's marine fishing activities are directed at exploiting its shrimp resources using shrimp trawlers, and its ground-fish resources using wooden vessels and a variety of gear by artisanal fishermen. There is limited exploitation of pelagic resources over the continental shelf and towards the continental slope.

It is accepted that, of the shrimp resources, the prawn have been overexploited, while there is concern that the seabob (a smaller shrimp) and sharks are showing signs of overexploitation. At the same time, some deep slope species and pelagic species are underexploited.

Freshwater or inland fishing activities are conducted in the rivers, lakes, swamps and flooded plains for subsistence. The only commercial exploitation in this sector is for ornamental fishes.

Aquaculture is pursued on a small scale on the coast in empoldered areas bordering the seashore, and in ponds.

The fisheries subsector of Guyana has three primary components, with further subdivisions.

- Marine fishery, including:

− industrial trawl fishery;
− deep slope fishery (semi-industrial red snapper fishery); and
− small-scale artisanal fishery.

- Inland fishery, including:

− subsistence fishery (for food); and
− ornamental fish fishery.

- Aquaculture, including:

− brackish-water culture; and
− freshwater culture.

Industrial Fishery

In the late 1950s, foreign companies established bases in Guyana and its neighbouring countries and commenced exploitation of four species of prawn (*Penaeus* spp.) found on the continental shelf. Eventually there was individual and state (Guyana Fisheries Ltd) participation in this fishery. The finfish by-catch was discarded. The late1970s saw a reduction in catch rates and the total catch of these species, which forced some companies to close operations and to sell their vessels to local entities. Many of these vessels were later converted the trawlers to catch seabob (*Xiphopenaeus kroyeri*). Simultaneously, regulations to retain some of the by-catch were introduced, and the government-owned company experimented with smaller trawlers to catch finfish. The trawl fishery for seabob started in 1984 and experienced rapid and impressive growth in terms of vessels numbers, total catch, number of processing plants and other infrastructure, peaking in 2000. It became the dominant activity of the industrial fishery during this period. Resource

management and sustainable exploitation, together with rising fuel costs, are currently the major concerns for this fishery.

The industrial fishery is based in the Demerara River close to Georgetown, the main port. It consists of a number of trawlers, seven major fish and shrimp processing plants, many wharves and dry dock facilities. Ice and freezing facilities servicing this fishery are owned and operated by participants within and outside the fishery sector.

In keeping with the Regulations, trawlers are registered and licensed by type, reflecting foreign or local ownership, length of vessel, and base of operations. The trawling fleet is also demarcated in terms of their fishing operations (prawn; seabob and finfish; finfish).

Currently, there are no foreign-registered or -licensed trawlers and all operations are based in Guyana. Upper limits were set for the number of trawlers in each type of operation. However, local owners and operators (with prawn licences) silently moved into the seabob and finfish sector, thus ignoring the upper limit set for seabob trawlers and creating a management problem. The Ministry of Fisheries in 2002 reviewed the classification and compromised by concluding that the upper limits would be 50 for prawn vessels and 102 for seabob vessels. In 2005, there was strict enforcement of seabob vessels catching seabob and prawn vessel catching prawn. In addition, currently the numbers of vessels actually fishing are below the number of licences issued, that is, there are only 31 vessels exploiting prawn and 85 trawlers exploiting seabob. There is no licensed finfish trawler.

Trawlers measure about 21 m LOA and use double outrigger shrimp trawl nets. The prawn trawlers usually operate in deeper waters (beyond the 34-m isobath) while the seabob trawlers fish in waters less than 34 m deep over the seabed of mud, gravel or sand.

Prawn trawlers have refrigerated holds, while seabob trawlers use ice to preserve their catch. Both types of fishing take on board finfish as by-catch.

The four species of penaeid shrimp caught by the prawn trawlers are *Penaeus brasiliensis, P. notialis, Panaeus (Litopenaeus) schmitti a*nd *P. subtilis,* while the seabob trawlers exploit Xiphopenaeus_*kroyeri,* which is smaller in size and occurs in shallower waters. By-catch from prawn trawlers includes seabob, lobsters, squid and crab, while by-catch for seabob trawlers includes prawn. A number of species of finfish also constitute by-catch from both fisheries, and a significant number of these species are important commercial species for the artisanal fishery, including sharks, sciaenid fishes, catfish and snappers.

Dumping of by-catch at sea still occurs. However, prawn trawlers are required to land 15 t of by-catch each year, and seabob trawlers seek to land fish to augment earnings.

Prawn production and seabob production over the last twenty years give an indication of the state of the resources (Table 1). There has been a steady decline in prawn total landings and a dramatic increase in seabob total landings, particularly in the late 1990s. A shift in the fleet effort from prawn to seabob could explain the increasing seabob catches, but the fall in prawn catches is considered to be a direct result of reduced resource.

Despite the lack of assessment studies or adequate scientific knowledge of the resources, there is sufficient information to cause all stakeholders and scientists involved to conclude that the prawn resource was overfished and that the seabob resource has reached its maximum sustainable level. Both fisheries require urgent management initiatives and there have been many recommendations made.

Table 1. **Prawn and seabob production by trawlers (tonnes)**

Year	Prawn	Seabob
1983	4 240	0
1984	3 430	222
1985	3 043	943
1986	3 806	884
1987	3 840	773
1988	2 995	1 566
1989	2 896	1 831
1990	2 504	1 864
1991	3 069	2 684
1992	2 370	2 681
1993	2 632	4 522
1994	3 024	6 737
1995	2 998	9 344
1996	1 260	11 292
1997	1 894	17 268
1998	1 935	10 515
1999	1 595	9 394
2000	1 132	16 098
2001	1 888	25 158
2002	1 522	18 405
2003	1 161	19 017
2004	1 086	11 422

Source: Fisheries Department of Guyana statistics.

The focus has been on reducing effort. The Ministry has separated the fleets and is opposed to cross-over (prawn to seabob or vice versa). Industry is now vigorously supporting this regulation and the capping of the fleets at their present level. An annual closed season of six weeks for both fisheries was introduced in 2001 as a result of advocacy by the industry, and a regulation is imminent to limit seabob fishing inshore of the 36-m isobath, while limits on prawn beyond the 36-m isobath has been advocated by the industry. Scientific investigations are needed to determine the best period for the closed season, and its optimum duration. Ironically, the present spiraling cost of fuel may have the effect of decreasing the fishing effort for a long time.

The seabob and finfish trawlers have been operating increasingly closer to shore, and this has produced a greater incidence of conflicts between industrial and artisanal fisheries.

At present, the mesh size of nets is not regulated in practice, for neither industrial nor artisanal fisheries. There is a law being enforced for the mandatory use of turtle excluding devices (TEDs) to avoid entrapment of turtles in the trawl nets. Reducing discards (by-catch) should be a priority in this fishery.

Participants in the industrial fishery have formed the Guyana Association of Trawler Owners and Seafood Processors (GATOSP), and its membership includes all six seabob and prawn processing plants, which also own trawlers, and nearly all other trawler owners. The association advocates the cause for the industry and as a unit keeps its members in line as regards fisheries management issues and government regulations.

The Deep Slope Fishery or Semi-industrial Red Snapper Fishery

Handliners have been used to exploit red snapper for a number of years, but they are now completely replaced by similar vessels using traps or longlines instead of handlines. The vessels measure up to 18 m LOA, and fish at depths of between 120 m and the edge of the continental shelf, for snappers and groupers.

This fishery was in decline, with only five handliners struggling with inefficient gear and high operating costs, but it revived in the late 1990s when an initial ten licences were granted to a foreign company and local fishers adopted the use of traps and converted their larger vessels to fish for snapper. A total of 71 licences were issued by the Ministry, but the active fleet over the past two years has been 42 vessels, one third of which was foreign. Table 1 shows that snapper landings average about 500 t/year.

A preliminary assessment done by the CARICOM Fisheries Unit (2003) indicated that the status of the red snapper resource was unclear, and recommended necessary data requirements in order to assess this multi-species, multi-gear fishery more accurately.

The other issues of concern to the Ministry are the need to control the mesh size of the traps and to deal with the important issue of poaching by foreign vessels.

Small-Scale Fishery

The small-scale or artisanal fishery sector provides food, in both rural and urban areas, and it is increasingly growing in importance as a source of employment, income and export earnings. It experienced rapid growth, both in numbers of participants and volume of landings, until 1992, but since then has stabilized, with a focus on boat replacement. In addition to friction with the industrial fishery, there are increasing complaints by drift seine fishermen that they have to spend longer periods at sea, use longer nets, and fish farther

from shore to maintain their catch. This is not reflected in the statistics since total landings continue to increase. In terms of species, shark production in particular has been increasing, and as a result there are increased landings of cabio, mackerel and bonito, species that occur in areas where shark is harvested.

The artisanal or small-scale fishery sector consists of approximately 1 300 vessels ranging in size from 6 to 18 m LOA, propelled by sail or outboard or inboard engines, and using gear that include Chinese seine (a fyke net), pin seine (beach seine), cadell lines and handlines, drift seine, gillnets and circle seine. Gillnets are the most widely used gear. Gear such as the pin seine, the Chinese seine and the nearshore nylon gillnet do substantial damage to the resource by catching juveniles and crustaceans. This fishery has landing sites all along the coast of Guyana.

The larger vessels have ice boxes and go on fishing trips that last as long as eighteen days, while most of the smaller vessels have no ice boxes and their operations are either tidal or diurnal. The use of ice boxes is increasing as more emphasis is being placed on quality. Most artisanal vessels are flat-bottomed dory types, with little draft, thus affording great manoeuvrability over shallow muddy and sandy bottoms. The large snapper boats and drift seine vessels, which may or may not be decked, are typical.

There are about 5 000 small-scale fishers. Of these, about 1 000 are boat owners. Sixty to seventy percent of the boat owners are members of fishermen′s cooperatives (thirteen in all), which acquire and sell fishing requisites to their members. Activity in the inshore artisanal fishery is pursued exclusively by Guyanese. Guyanese artisanal fishers from the Corentyne have been experiencing difficulties in obtaining fishing licences to fish in the waters at the mouth of the Corentyne River, which separates Guyana from Suriname, and off the Suriname Coast.

The development of onshore infrastructure (wharves, ramps, workshop, fuel depots, chandleries, ice machines, and fish storage bins) at eight sites along the coast, financed by the government with assistance from CIDA and the EU, has been completed. Four of these complexes have been leased to the local fishermen′s cooperative, for management and operations. The remaining four have been leased to joint-venture arrangements with private companies.

An increased number of artisanal boats means a higher demand for ice, and the Georgetown area has not been able to meet the demand for ice, that seabob trawlers also require. The availability of ice has been found to be strongly correlated with production in the artisanal fishery, and was a limiting factor. Increased capacity at co-op sites and the establishment of three new enterprises has eased this problem.

Artisanal fishermen mainly exploit the demersal fish and shrimp species. The Chinese seine captures the whitebelly shrimp (*Nematopalaemon schmitti*), along with the seabob, which is also exploited by trawlers. The commercial species of fish are captured by both artisanal vessels and trawlers. Assessment of the stocks has been attempted for the main demersal species by the CARICOM Fisheries Unit (2003). There was no clear indication as to the state of the stocks of bangamary (*Macrodon ancyclodon*) nor of the Guyana seatrout (*Cynoscion virecens*), but there are concerns, since the juveniles of both are taken by Chinese seine and trawlers.

The pelagic resources are lightly exploited by artisanal fishermen. There is a directed fishery for sharks, but all others are caught incidentally by the various fishing gears. There is a limited amount of harvesting, especially of crab, in intertidal and shallow sub-tidal

areas along the coast, without the use of vessels. The main crab species taken are the blueback or blue sheriga (*Callinectes bocourti*), the bunderi (*Cardiosoma guanhami*) and the red sheriga (*Portunus rufiremus*). Better access to cold storage or processing facilities could add considerable value to this fishery, particularly in the rural northwest region of the country, where there is high seasonal abundance of crabs.

STATUS OF THE STOCKS

Geer (2004), in an overview of the fisheries sector in Guyana, presented a summary of report findings, as outlined below.

As early as July 1994 there were indications that fisheries resources were on the decline. A Fisheries Background Report prepared by CIDA in 1994 for the Department of Fisheries and Agriculture, conducted by a diverse group of fisheries personnel, indicated that:.

"Shrimp landings by the industrial trawler fleet have been in decline in recent years, and some rationalization of the fleet has occurred as a result. With the surge in demand for finfish products, however, there is concern that important artisanal stocks are being exploited at or near their maximum sustainable yield levels."

In April 2000, FAO and CARICOM Fisheries Resource and Management Program (CFRAMP) conducted a workshop in Guyana to undertake stock assessment of the main commercial species of shrimp and ground-fish along the Brazil−Guiana.

The ground-fish assessment − citing various research surveys over the years − indicated that some fish stocks were being exploited at or above sustainable levels. Stock assessments of bangamary and butterfish indicated that the long-term sustainability of these stocks were under threat. Production statistics also showed that annual shrimp production had been falling. The analysis indicated that there was full exploitation of the southern pink shrimp (*Penaeus notialis*), the southern brown shrimp (*Penaeus subtilis*), and overexploitation of the red spotted shrimp, (*Penaeus brasileinsis*). Seabob trawlers were staying longer at sea and the average size of this small crustacean appears to be declining.

CARICOM Fisheries Unit (CFU), in June 2001, prepared a Status Report and Recommendations for Management of the Shrimp and Ground-fish Fisheries of Guyana. Fishing operators and stakeholders had expressed concerns regarding the decline in fish and shrimp landings from the Guiana−Brazil shelf. The CFU reviewed the state of the resources for the period 1995 to 2001, assessments conducted by CFRAMP and FAO, in collaboration with the Departments of Fisheries in the countries. Penaeid shrimp tails showed a 36% reduction by volume over a ten-year period. Shrimp stock assessment results suggested that the decreases in landings were due to a steady decline in the abundance of the three main species of shrimp exploited by the Guyanese fleets. The status of exploitation of the stocks indicated that brown and pink shrimp were fully utilized at the time, while similar assessments of pink-spotted shrimp indicate that this species has been overexploited.

An analysis of ground-fish fisheries expressed some concerns as to the harvesting and levels of certain species such as bangamary, butterfish, grey snapper and gillbacker. Special emphasis was placed on the bangamary, especially regarding the capturing of juvenile ground-fish by Chinese seine gear. In May 2002, an FAO Mission to Guyana prepared a report entitled Programme for the Organizational and Operational Strengthening of the Department of Fisheries of Guyana. As part of the analysis of the DOF, issues and concerns related to the fisheries resources were included. It stated that

stakeholders involved in the harvesting and processing of fish and shrimp confirmed a declining trend in the sector. They confirmed there was a decline in landing in both shrimp and fish over previous two years (2001 and 2002).

CARICOM (through CFRAMP) and EU (ICRAFD Project) conducted for Guyana and Suriname a workshop on Ground-fish Resource Assessment, in November 2003. The preliminary results for Guyana are considered below.

- **Seabob –** "Unless immediate action is taken, this fishery is likely to collapse. The effort (vessels) in this industry is three times that which was registered, thus a cap should be placed on the number of vessels in the fishery, with an eye to reducing same."
- **Trout and Bangamary** – "These two ground-fish species showed that they were fully exploited by gillnets and trawl fishery. The artisanal gillnet is an open access fishery and measures should be taken to restrict the effort in the fishery".
- **Red Snapper** – "the deep and slope fishery for southern red snapper was assessed and the initial results show that the fishery is underexploited. However, only one gear type was used in the assessment and further analysis needs to be done for a complete picture of this fishery, so it would be unwise to add any new vessels to the fishery at this time".

The concerns expressed and observations of stakeholders in the fisheries sector are generally:

- the seafood industry lacks unity on matters relating to multi-sector activities;
- the fisheries are highly productive, but the industrial fishery is oversubscribed, capital intensive and realizing diminishing returns;
- Guyana lacks professional fisheries scientists, management and data collection staff;
- to date, fisheries management has not been based on sound scientific evidence;
- the prawn fishery collapsed from overfishing;
- the seabob (*Xiphopenaeus kroyeri*) fishery is threatened by overexploitation;
- some fishing methods are extremely destructive and need to be curtailed or banned;
- finfish stocks should be better monitored;
- the export demand for high quality fish is greater than the industry can supply;
- prices are generally increasing for export quality fish;
- fishers need to upgrade their quality control;
- there are a number of underexploited, potentially valuable fish further offshore;
- over-the-side sales at sea by captains is hurting the industrial fishery. Estimates for this loss to the owners range from 15 to 25%;
- there are foreign vessels operating in distant parts of the shelf and fishery zone; and
- monitoring and regulating of the cottage industry should be intensified.

INLAND FISHERY

Subsistence Fishery

Freshwater fishing is conducted in rivers, creeks, lakes and reservoirs, canals, and in savannah areas where the seasonal increase in rainfall gives rise to large expanses of seasonally flooded lands. The activity tends to be influenced by the down period in agriculture and the availability of other economic activities. For example, in the estate areas, the intensity of fishing varies with the harvesting of sugar cane and rice. The activity is carried out with small, flat-bottomed, dory-type vessels using cast nets, seine or handlines.

The limited data available indicate that most inland fishing is carried out by Amerindians. Near the coast and in the vicinity of logging and mining communities situated in the interior of the country, other groups exploit the freshwater resource. At present, the effort is largely directed at subsistence fishing, although a few fishermen participate in small-scale commercial fisheries.

The Ornamental Fishery

The ornamental fish industry for the aquarium fish export trade to the United States of America and Europe is being conducted by four licensed exporters, who have collectors obtaining fish in the upper reaches of the rivers and transporting them live to farms near to the airport, where they are prepared for export by air.

Aquaculture

Although aquaculture activities first started in Guyana in the 1950s, to date the development of the industry has been slow. Development has been retarded by lack of investment capital, technical skills, appropriated technologies, equipment, inputs, and research and training. Very little foreign investment has been injected into the industry.

At present, there are basically two forms of aquaculture: traditional, extensive brackish-water culture, and freshwater pond culture. Brackish-water farms operate as extensive polyculture systems, utilizing the existing sluices and dams from the sea defence structures to control water exchange at high tide. The sluices, when opened, bring tide water and a mix of eggs, fish fry and shrimp larvae into the empoldered swamps. In the empoldered areas, farmers often construct their own dikes and sluices to control water flow and exchange within individual ponds. In most cases, the trapped fish and shrimp grow to marketable size without any additional inputs. Fish and shrimp species grown in the ponds include queriman, snook, croaker, bashaw, tilapia, tarpon and indigenous shrimp such as Penaeus (Litopenaeus) schmitti, *P. aztecus* and *P. brasiliensis* and the swamp shrimp (*Misopenaeus tropicales*).

Brackish-water culture occurs mainly in the swamps along the Atlantic Coast in Corentyne, Berbice, where there are 64 farms, including two registered fish culture cooperatives, using approximately 670 ha of coastal lowlands. The average size of a farm is 11 ha.

In the freshwater ponds, *Tilapia (Oreochromis mossambicus), T. nilotica* and, to a limited extent, *Hoplosternum littorale* (atipa catfish), are the main species cultured in Guyana. Two commercial farms were recently established − a 6.25-ha farm producing fresh water prawn (*Macrobracium rosebergi*), using imported seed and feed, is struggling, mainly because of praedial larceny, and a 40-ha tilapia farm is developing satisfactorily.

In 2001, the government established the Mon Repos Freshwater Aquaculture Demonstration Farm and Training Centre, with assistance from FAO and the Canadian International Development Agency (CIDA), with the aim of stimulating and promoting the

development of aquaculture through the training of farmers, the provision of start-up seed and technical assistance to farmers, and to conduct adaptive and applied research.

Utilization of the Catch

Industrial processors account for most prawn and seabob production, and slightly under 4% of finfish production. They are export oriented. Most prawn (95%) is exported, with only minor amounts sold domestically to restaurants. Most seabob is also exported. Industrial finfish production is split more evenly between export and domestic markets.

Prawn are produced and exported in a variety of forms, but predominantly as frozen shell-on tails. This product is sold to the United States of America, Japan and CARICOM countries. Seabob shrimp are almost entirely exported to the United States of America, in peeled form, a small quantity of cooked shrimp goes to the EU and the remaining small quantities are absorbed by the domestic market.

The interest in finfish on the part of industrial processors was confined to species with high prices and ready export markets. These species include grey snapper, gillbacker and bangamary. However, the range of species has now expanded to meet the demand of new export markets. Large quantities of finfish by-catch of species that do not command high prices are still discarded at sea.

About 70% of the finfish landed by the inshore artisanal fishery is sold fresh or fresh on ice, while of the remaining 30%, three-quarters is converted into frozen products by industrial processing plants. The remainder is processed into dried or smoked products by cottage industries.

Of the shrimp landed by artisanal fishermen, about 50% is sold fresh to consumers. Of the remaining 50%, 47% is sold to cottage processors and 3% to industrial processing plants for processing into frozen peeled shrimp.

Some cottage industry processors, as well as some individuals, export frozen, salted and smoked finfish, dried shrimp and other by-products such as fish bladders, shark fins, crabmeat, and fish glue. In 2004, there were 1 260 shipments of finfish by small-scale exporters. They trade primarily with CARICOM countries and West Indian communities in North America.

The cottage industry for salted, smoked and dried fish and shrimp has the potential to process and preserve larger quantities of product, which that could be exported or sold in hinterland areas and mining camps, where cold storage facilities are not so readily available. It is a labour-intensive industry and could therefore contribute to employment generation in rural areas.

In addition to sales to cottage processors, the fish and shrimp landed by artisanal fishermen are marketed by various means, which include:

- vendors purchasing from boat owners for sale from cart or bicycle to a given community;
- vendors purchasing from boat owners for sale in municipal markets or through roadside markets, especially on pay-days at sugar estates;
- sale of fish and shrimp at outlets and supermarkets in Georgetown;
- middlemen purchasing large quantities of fish from vessel owners in outlying areas and transporting them to processing plants;

- processing plants sending out trucks to purchase fish or shrimp; and
- sale of salted, smoked and dried cottage industries products by vendors in markets; at outlets and supermarkets, and by middlemen in hinterland areas.

Within the industrial fishery subsector, a great deal of effort goes into quality control, especially for products for export. Lapses tend to occur with by-catch sold as "mixed fish" to cottage processors. In the artisanal fishery subsector, there is growing attention to quality control, both with fresh fish and salted, smoked and dried fish.

FISHERIES AND THE NATIONAL ECONOMY

The fishery sector is of critical importance to the economy and to social well-being in Guyana. Indeed, the economic contribution of fisheries has grown dramatically in recent years, and its importance is evident in five areas.

Food Supplies

Fish is the major source of animal protein in Guyana. It is estimated that per caput annual consumption of fish rose from 9 to 27 kg between 1980 and 1988, and was about 45 kg in 2003.

Contribution to Guyana's Economy

The Guyana Bureau of Statistics estimated that the primary sector of fisheries contributed G$ 157 million to total GDP (at 1988 prices) in 2004, more than 2% of the total. The contribution of fisheries (2.8%) was greater than that of rice (2.6%).

From Table 3, it can be seen that finfish for the domestic market is the largest component of the industry, followed by shellfish for export, with finfish for export increasing annually. The finfish catch has increased significantly since 1989, as has seabob for export, whereas volumes of prawn exported have declined. The total (available) estimated value of fish products in Guyana in 2004 was G$ 26 653 million. Domestic sales, aquaculture products and ornamental fish exports also contribute to the value of the fisheries. In addition, significant quantities of fish are harvested for local consumption from inland rivers, lakes and flood plains. The inland fisheries are an important source of nutrition, particularly for hinterland communities.

Table 3. Total value of Guyana fish products (2004; G$ '000s)

Category	Domestic market	Exports	Total
Shellfish	N/A	6 763 768	6 763 768
Finfish	14 034 108	5 853 047	19 887 155
Non-edible	N/A	2 470	2 470
Total	14 034 108	12 619 285	26 653 393

Source: Fisheries Department Statistics.

Contribution to Export Earnings

Guyana's export earnings from fisheries in 2000 were approximately G$ 7 200 million (≈US

$ 36 million). In 2004, it was G$ 12 600 million (≈US$ 63.1 million) (Table 5). Exports of finfish were 6 607 t in 1998, falling to 5 268 t in 2000, but growing again to 11 995 t in 2004, while total shrimp exports (prawn, seabob and whitebelly) rose from 4 869 t in 1998, to 8 275 t in 2000 and to 9 741 t in 2004 (Table 4).

Table 4. Exports of various marine products from Guyana (1998 to 2004; tonnes)

Year	1998	1999	2000	2001	2002	2003	2004
Prawn	1 137	1 280	1 076	924	682	518	648
Seabob and whitebelly	3 732	4 902	7 199	10 923	9 071	11 534	9 093
Finfish and by-products	6 607	4 870	5 268	6 768	9 339	9 834	11 995
Crabmeat	36	25	3.33	3	24	15	21
Total exports	11 512	11 077	13 546	18 618	19 116	21 901	21 757

Source: Fisheries Department of Guyana statistics.

Table 5. Earnings from exports of marine products from Guyana, 1998–2004

Year	Amount (tonnes)	Value (G$)
1998	11 627	6 500 million
1999	11 170	9 000 million
2000	13 547	7 200 million
2001	18 340	11 000 million
2002	19 322	11 500 million
2003	21 901	11 200 million
2004	21 757	12 600 million

Source: Fisheries Department of Guyana statistics.

Expansion in finfish trade and the growth of seabob production (despite a fall in production in 2004) account for the increase in exports.

Contribution to Employment and Incomes

The fishing industry employs some 6 500 people in harvesting and 6 000 in processing and marketing, so more that 12 000 livelihoods depend directly on fishery, and many more benefit indirectly from fishing-related occupations, such as boat building, gear supply and

repair. In addition, significant numbers work in processing, distributing and selling fish and fish products in domestic markets. A high proportion of workers in processing, distribution and retail are women, and they are active in harvesting as well. Region 4 has a particularly high concentration of women in all activities of the sector. More than 1 500 women in total work in the sector. A new processing plant (1997) in Region 5, one in Georgetown (in 2003) and two in Region 3 (in 2004) have increased the participation of women in processing in those Regions.

Government Revenues Derived from Fisheries

Fishery is a significant net contributor to government revenues in Guyana, through export taxes, licence fees and consumption taxes on imported fuel.

FISHERY SECTOR INSTITUTIONS

The Department of Fisheries

The Department of Fisheries (DOF) has as its mandate the management, regulation and promotion of the exploitation and development of Guyana's fisheries resources. The department's authority was originally contained in the Fisheries Act of 1957, and redefined by the Fisheries Act, 2002. It reports to the Minister of Agriculture through the Permanent Secretary, and is organized under four sub-programmes: Programme Administration; Legal and Inspectorate; Research and Development; and Extension. A ten-year analysis of DOF staffing shows a high percentage of vacancies. The full staff complement would be about 50 employees, but on average over half the posts have remained unfilled. As at the end of 2003, the three most senior administrative positions were vacant. The acting Chief Fisheries Officer also served as Chief Administrator, Head of Operations and Budget Coordinator. Senior technical positions were only half of them staffed.

DOF is in dire need of additional human resources to accomplish its mandate. It urgently requires scientific, operational and enforcement personnel. Reasons cited for the problem of finding staff included difficulties in finding suitably qualified candidates, and the government's inability to offer attractive remuneration packages to the few potential qualified candidates. It raises doubts about the department's capability to undertake its regular functions and services, especially in the areas of licensing and the collection and inputting of data. The paucity of resources hampers its ability to monitor and enforce regulations.

Veterinary Public Health Unit

The Veterinary Public Health Unit of the Ministry of Health is the "Competent Authority" to enforce Regulation No 7 of 2003, which is the Fishery Products Regulations under the Fisheries Act, 2002. These regulations deal with all aspects of quality control, inspection and certification of plant and animal products. This unit reports to the Minister of Health through the Permanent Secretary, but maintains an excellent working relationship with the Ministry of Fisheries.

Stakeholder Organizations

Stakeholder organizations include the Guyana Association of Trawler Owners and Seafood Processors (GATOSP) and thirteen fishermen's cooperative societies. The sector does not have a unified organization. GATOSP does not include ten small seafood processing plants, nor the smaller cottage industry processors and the storage facilities. Only 80% of boat owners are in the artisanal co-op societies. There is no organization representing domestic vendors.

LEGAL FRAMEWORK

The Marine Boundaries Act of 1977 established a fishery zone beyond and adjacent to territorial waters (i.e. beyond 12 n.mi.) and extending out to 200 n.mi. from land. On 23 February 1991, the zone became recognized as an Exclusive Economic Zone (EEZ) when the President of Guyana promulgated an order known as the Exclusive Economic Zone (Designation of Area) Order, 1991, as provided for in Section 15 of the Maritime Boundaries Act, 1997.

The Fisheries Act of 1957 was redefined and adapted to be more relevant to current national and international requirements by the Fisheries Act, 2002.

Regulation No. 7 of 2003, Fisheries Products Regulations, was set under the Fisheries Act, 2002.

DEVELOPMENT PROSPECTS

The overall strategy is to increase landings and production by developing the fisheries of underexploited stocks, such as the deep slope and pelagic species, and expand aquaculture, while simultaneously improving management of the fisheries currently being exploited, to achieve sustainable levels of production, productivity and real incomes for fishery products and producers other groups involved in the delivery of products to domestic and export markets, thereby contributing to national production, income and welfare.

A Government of Guyana study produced a National Fisheries Management and Development Plan (NFMDP). It was formulated in 1995 after a comprehensive situational analysis that identified critical constraints to management and development. It examined opportunities for future development of the fisheries sector in Guyana and devised innovative plans to promote sustainable fisheries development. The plan was prepared based on a ten-year horizon to match the current planning cycle of the government.

The NFMPD estimated investment requirements for government (through grant aid) and from the private sector of US$ 10.6 million, and direct government expenditure of US $ 62 million that was to be recovered through fees, taxes, etc., for necessary improvements in enforcement, organization, training, research and infrastructure.

The investment requirement was probably exceeded, due primarily to the aggressiveness of the private sector, which built new and modernized existing seabob and fish processing plants, installed increased ice-making capacities and established enterprises. The Private Sector Commission estimated that US$ 1.2 million was invested in aquaculture in 2002. Worsening returns on investment from 2003 in the industrial fishery, and the more recent high fuel costs that have affected all fisheries, slowed down the rate of investment. Government invested in patrol vessels for the Guyana Coast Guard, and collaborated with bilateral and multilateral agencies to provide training opportunities for the stakeholders in the sector.

RESEARCH

In 1988, FAO/NORAD, using R/V Dr Fridtjof Nansen, conducted a survey of the fish resources in the shelf areas between Suriname and Guyana.

Guyana is a participating country in the CARICOM Fisheries Resource Assessment and Management Programme (CFRAMP), jointly funded by CIDA and contributions from participating countries. One of the four activities of CFRAMP is resource assessment, and work is being done in this area in Guyana in relation to shrimp, ground-fish and deep slope

fisheries resources.

Workshops facilitated by CFRAMP, FAO and other agencies have examined available data, recommended data requirements and conducted assessment of shrimp and ground-fish species in 1998, 2000 and 2002, and included snappers in 2003.

AID

During the past 25 years, a number of donor agencies have made contributions to fisheries development in Guyana. In the late 1970s, CIDA set the stage for such help by financing the study for, and then producing, a National Fisheries Development Plan (1979-1983). The European Community financed a study to determine aquaculture potential, enhance the data collection system and estimate the level of the by-catch of the shrimp industry.

In the early 1980s, the industrial sector, through an IDB loan of US$ 12.7 million, expanded the trawling fleet by twenty vessels and modernized a processing plant. Simultaneously, through grant aid from the Government of Japan, a wharf, cold storage facilities and refrigerated trucks were obtained for Guyana Fisheries Limited. IDRC of Canada sponsored research on shrimp by-catch determination, utilization and product development.

The artisanal sector also benefited during this period. Loans from the European Community (1979) and from IDB (1980) to the Greater Georgetown Fishermen Cooperative Society provided for the purchase of fishing requisites to on-sell to small-scale fishers. Grant aid from CIDA through a Fisheries Line of Credit (1981) and Fisheries Equipment Facility (1984) also provided requisites for the small-scale fishers through their Cooperative Societies. Development projects in this period commenced in 1984, when the Government of Guyana in cooperation with the Government of Canada (through CIDA) constructed seven fish port complexes, and one with the European Community, for the artisanal small-scale fishers at important landing sites along the coast of Guyana. These complexes provided ice, docking facilities, fuel depots, market areas, chandleries for the sale of fishing requisites, etc.

The 1990s saw a move to Technical Assistance rather than development projects. CIDA financed a Fisheries Technical Assistance Project (1993−1995) that produced a Fisheries Background Report (1994) and a National Fisheries Management and Development Plan (1995). This assistance also provided training for staff of the Fisheries Department. FAO provided training and attachment studies through its TCDC programme to DOF technicians, advised and facilitated the drafting of new National Fisheries Regulations through its Law Advisory Programme, and has been − through its Technical Cooperation Programme − assisting in the design and construction of a Freshwater Aquaculture Demonstration Farm and Training Centre, the first phase of which was completed in July, 2001 and is in operation. Technicians were trained in aquaculture through bilateral programmes with countries in India and the Far East, and in Fisheries Statistics and Fisheries Extension through FAO′s TCDC Programme, and also through a Japanese Programme for CARICOM countries. At present, an FAO-sponsored activity has two aquaculture experts from the Far East conducting rice+fish culture trials with local rice farmers.

In the private sector, GATOSP has signed a Non-Reimbursable Technical Cooperation Agreement with the Inter-American Development Bank, which aims to increase net useable yields in the fisheries sector by finding commercial uses for waste created when processing seabob.