

**NATIONAL DEVELOPMENT STRATEGY
(2001-2010)**

A POLICY FRAMEWORK

ERADICATING POVERTY AND UNIFYING GUYANA

A CIVIL SOCIETY DOCUMENT

ANNEX 13

FISHERIES

Date of Publication: November 2000

Date finalised by Sectoral Committee: May 2000

Equivalent Chapter in Core Document: 13

The Annexes to the National Development Strategy: An Explanatory Note

In June 2000, the National Development Strategy (NDS) of Guyana was formally presented to the President of Guyana and the Leader of the Opposition in the form of a core document, a 348 page distillation of the main elements of the analysis of the Guyana situation and the resulting strategy for action drawn from material prepared by 24 sectoral committees of the National Development Strategy Committee (NDSC). While Chapter 1 of the core document provides an outline of the origins of the NDS and the methodology of its preparation, the purpose of the present note is to explain the Annexes to the core document.

The Annexes are edited versions of the original drafts that the sectoral committees prepared, using a format that facilitated systematic thinking, though at the cost of some repetition. They are therefore longer than the corresponding Chapters of the core document, and also differ from them in other ways:

1. While the Annexes were individually edited in terms of their content, in the core document, disagreements or dissonances between Chapters were removed; for example, if the Chapter on the Private Sector proposed a strategy for Education that was in contradiction with a strategy proposed in the Chapter on Education, the two were rationalised.
2. While the core document was updated with the most recent data where possible, the Annexes generally retain their original data; for recent economic and social statistics, the attention of readers is particularly drawn to the recently completed *1999 Guyana Survey of Living Conditions*. In addition, again because of differences in when they were prepared, what was a Bill at the time of the original draft may have become an Act by the time the core document was being edited. This type of difference may be footnoted in the Annexes.
3. The treatment of the Annexes as historical documents occasionally produced another kind of difference, the main example of which is the Annex on Energy which was written before the privatisation of the Guyana Electricity Corporation, and whose strategy was largely preempted by that privatisation; while the edited Annex deliberately relied on the original material, new material was developed for the core document. These differences may also be footnoted.

It is worth noting that the updates found in the core document usually demonstrate the soundness and continued applicability of assessments made on the basis of earlier data or other information.

There are fewer Annexes than there are Chapters in the core document. For various reasons, some sectoral committee drafts were finalised in the same format as the Chapters of the core document, and there would therefore be little difference between the Chapter and the corresponding Annex. (Examples of this are the Macro-Economic Strategies and the Management of the economy; Sugar; Urban Development; Land; Housing; and The Family). The core document also includes Chapters for which there were no corresponding sectoral committee drafts; the first three Chapters of the core document (Origins and Methodology, National Objectives and Governance) are examples.

For those sectors where there are both separate Annexes and core document Chapters, the titles and numbering of the two correspond except in two cases: one, the corresponding Annex for the Chapter on Manufacturing is titled Manufacturing and Technology and includes material on Science and Technology that the core document had placed elsewhere; and two, the corresponding Annex for Chapter 4, Macro-Economic Policy, is Annex 4, Financial Sector Policy, because the material prepared for the Financial Sector Policy Annex was incorporated into the Chapter on Macro-Economic Policy.

The National Development Strategy was published in summarised form (the core document) for the practical reason that few people would have the time to read the over 700 pages represented by the Annexes. Yet the Annexes have a clear value. They include background information and assessments that were too detailed for inclusion in the core document, but which trace the process that shaped the strategy. Above all, they preserve for us and for posterity the earlier thinking, and the full range of thinking, of the women and men whose work provided the foundation of the NDS. In doing so, they honour the labour which the sectoral committees put into distilling their own work and life experience and the views of the public they consulted in the process. It is this foundational material that is now being published, making the National Development Strategy of Guyana available in both summary and extended forms.

TABLE OF CONTENTS

	Page
LIST OF ACRONYMS	13-iii
LIST OF TABLES.....	13-iv
LIST OF FIGURES	13-iv
I. Basic Features of the Sector.....	13-1
A. Fisheries and the National Economy	13-1
1. Food Supply	13-1
2. Contribution to the Guyana Economy	13-1
3. Contributions to Export Earnings	13-2
4. Contribution of Employment and Incomes.....	13-3
5. Government Revenues Derived from Fisheries.....	13-3
6. Contribution to the Guyana Economy.....	13-3
B. Description of the Fisheries.....	13-4
1. Marine Fishery	13-4
2. Inland Fisheries.....	13-9
3. Aquaculture.....	13-11
4. Processing and Marketing.....	13-12
5. Artisanal Fisheries Infrastructure Complexes.....	13-14
II. Policies of the Sector	13-15
A. Past Evolution of Policies	13-15
B. Description of Current Policies	13-16
III. Issues and Constraints.....	13-19
A. Issues	13-19
1. Health of Fisheries Resources.....	13-19
2. The Potential of Aquaculture	13-21
3. The Management System (Institutional Capabilities).....	13-22
4. International Fisheries Management.....	13-22
5. Role of Cooperatives.....	13-23
6. Marketing and Post-harvest Processing.....	13-23
7. Training.....	13-23
B. Constraints.....	13-24
1. General Constraints.....	13-24
2. Specific Constraints for Aquaculture.....	13-24
IV. Sectoral Objectives.....	13-25

V. The Strategy	13-26
A. Achieving Sustainable Production Levels.....	13-26
1. Industrial Fishery	13-26
2. Artisanal Fishery.....	13-28
3. Monitoring and Surveillance.....	13-29
4. Post-harvest Management (Processing and Marketing)	13-30
5. Inland Fishery	13-31
6. Aquaculture.....	13-32
7. Institutional Strengthening.....	13-33
8. Public Sector Holdings in Fisheries.....	13-35
9. Other Policies.....	13-35
VII. Legislative Changes	13-36

LIST OF ACRONYMS

AFIP	Artisanal Fisheries Infrastructure Project
CARICOM	Caribbean Community
CIDA	Canadian International Development Agency
COPESCAL	Commission for Inland Fisheries of Latin America and the Caribbean
EEC	European Economic Community
EEZ	Exclusive Economic Zone
EU	European Union
FAO	Food and Agricultural Organisation
GDP	Gross Domestic Product
GFL	Guyana Fisheries Limited
GGFCSL	Greater Georgetown Fishermen's Cooperative Society
GNCB	Guyana National Cooperative Bank
HAACP	Hazard Analysis Critical Control Point
ICCAT	International Commission for Conservation of Atlantic Tuna
IPED	Institute of Private Enterprise Development
QC	Quality Control
TED	Turtle Excluding Devices
UNCLOS	United Nations Convention of the Law of the Sea
WECAFC	Western Central Atlantic Fisheries Commission

LIST OF TABLES

	Page
Table 13-1 Total Value of Guyana Fish Products, 1993	13-2
Table 13-2 Guyana Exports of Marine Products, 1989-1997	13-3
Table 13-3 Resources and Production Levels in the Fisheries Sector, 1993	13-6
Table 13-4 Major Inland Fish Species	13-10
Table 13-5 Summary of Marine Resource Potential Maximum Sustainable Yield Calculated (mt)	13-20

LIST OF FIGURES

	Page
Figure 13-1 Guyana Fishery Zone	13-5

ANNEX 13

FISHERIES¹

I. Basic Features of the Sector

A. Fisheries and the National Economy

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

1. Food Supply

Fish is the major source of animal protein in Guyana. It is estimated that per capita annual consumption rose from 9 to 27 kilograms between 1980 and 1988, and was nearly 45 kilograms in 1991, more than three times the world average of 14 kilograms per year. In 1996, it had climbed further to 59.8 kg.

2. Contribution to the Guyana Economy

The Guyana Bureau of Statistics estimates that the primary sector of fisheries contributed G\$5.5 billion to the total Gross Domestic Product (GDP) or value added in 1997. The contribution of fisheries at 6.2 percent was greater than that of bauxite at 3.7 percent and forestry at 3.5 percent.

Table 13-1

¹This Annex draws extensively on three previous studies and updated (1997) data from the Fisheries Department. These studies are:

- Guyana Department of Fisheries and GTA Consultants, Inc., in association with Agrodev Canada, Inc., *National Fisheries Management and Development Plan*, draft, Georgetown, March, 1995.
- Ministry of Agriculture, *The National Fisheries Policy of the Government of Guyana*, Georgetown, March, 1995.
- Terrence C. Phillips, "The Fisheries Sub-Sector of Guyana," ch. 5 in *Review of the Agricultural Sector of Guyana: Volume 2, Technical Presentations*, Ministry of Agriculture and IICA, Georgetown, December, 1993.

	1989	1990	1991	1992	1993	1994	1997
Prawns	1,892	1,665	1,922	1,526	1,630	1,483	1,107
Seabob and whitebelly	719	669	1,073	1,238	1,239	1,408	4,417
Finfish and by-products	943	1,521	2,367	3,151	3,080	3,485	3,627
Crabmeat	4	2	10	16	11	9	13
Total exports	3,558	3,857	2	5,372	5,960	6,385	9,164

Source: Fisheries Department Statistics

Note: The data series of the Bank of Guyana shows total shrimp exports of 3,525 tonnes in 1994.

Given that only 13 percent of total finfish landings were exported in 1994, there is potential for continued expansion of this trade. Up to 1994, the volume of exports of shrimp (prawns, whitebelly, and seabob) seems to have stabilised and future growth in shrimp exports was expected to come only from development in the aquaculture sector. However, increased seabob landings from 1995 to 1997 resulted in increased exports of shrimp (Table 13-2).

4. Contribution of Employment and Incomes

The fishing industry employs some 4,800 people in harvesting and 5,800 in processing and marketing. In addition to the more than 10,000 jobs which depend directly on fishery, many more people benefit indirectly from fishing-related occupations such as boat building - supply, and - repair. A high proportion of workers in processing, distribution and retail are women, and they are active in harvesting. Region 4 has a particularly high concentration of women in all activities of the sector. A total of about 1,000 women work in the sector. In 1997, a new processing plant in Region 5 increased the participation of women in processing in that Region.

5. Government Revenues Derived from Fisheries

The fisheries sector is a significant net contributor to Government revenues in Guyana, through export taxes, licence fees and consumption taxes on imported fuel for boats. Export taxes of 10 percent on the value of shrimp, 5 percent on the value of ornamental fish, and 1.5 percent on the value of finfish generate substantial revenues for the Government. Taxes on shrimp and finfish were removed in 1996. Licence fees for fishing vessels are an additional source of revenue. It is estimated that the sector contributed G\$433 million in revenues to the Government in 1994, and in contrast, accounted for only G\$5 million in Government expenditures.

B. Description of the Fisheries

The fisheries subsector of Guyana is made up of three primary components, with further subdivisions, as follows:

1. Marine fishery, including industrial trawl fishery and small-scale artisanal fishery.
 2. Inland fishery, comprising subsistence fishery (for food), and the ornamental fish industry.
 3. Aquaculture, which involves brackish water culture, and fresh water culture.
1. Marine Fishery
 - a. Fishing zones and resources

The Marine Boundaries Act of 1977 established a fishery zone beyond and adjacent to the territorial sea (12 miles) and bounded on its seaward side by the line, every point of which is two hundred (200) miles from the nearest point of the baseline of the territorial sea. On February 23, 1991, the zone became recognised 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, acting under the provision of Section 15 of the Maritime Boundaries Act, 1977. See Figure 13-1.

Guyana has a coastline of 432 km. and a continental shelf area of 48,665 sq. km. The average width of the continental shelf is 112.6 km. The area of the EEZ is 138,240 sq. km.

Most of Guyana's fishing occurs in the relatively shallow waters of the continental shelf. The marine resources exploited within the EEZ are mainly the demersal fishery resources and, to a much more limited extent, the pelagic fish resources found both over the continental shelf and toward the continental slope. Some of the demersal species, particular prawns and sharks, are showing clear signs that they are being exploited at an unsustainable rate. On the other hand, some deep slope demersal species and pelagic species are underexploited in spite of their greater potential. From a commercial viewpoint, the most important stocks may be the cross-boundary species. Harvesting these stocks and ensuring that they are exploited in a sustainable manner will require joint initiatives with Suriname, French Guiana and Brazil.

Figure 13-1
Guyana Fishery Zone

Data on the sector are for the most part estimates which are not especially consistent; however, Table 13-3 summarises the most recent information available on the stocks of marine resources and production levels.

Table 13-3
Resources and Production Levels in the Fisheries Sector, 1993

Item	Amount
Resources	
Pelagic fish biomass	300,000 mt
Demersal fish biomass	69,000 mt
Shark biomass	3,000 mt
Squid biomass	2,000 mt
Total estimated biomass	374,000 mt
Production	
Industrial fisheries	10,160 mt
Artisanal fisheries	37,121 mt
Inland fisheries	800 mt
All fisheries	48,681 mt

Source: National Fisheries Management and Development Plan, op. cit.

Note: Estimated production from inland fisheries has been constant at 800 mt/yr. for many years, so that the figure appears to be less reliable than the others in the table.

Since all of the production from artisanal fisheries and a good portion of the industrial production would be reaped from the demersal stocks, the pressure on those stocks is immediately evident from the Table. In contrast, the pelagic species are little touched except by poachers from other nations. These data immediately suggest the need for better management of demersal stocks and at the same time, the desirability of an expansion of fishing seaward to deeper waters.

In terms of markets, the industrial fishery dominate the export market, which is concentrated on shrimp, whereas the artisanal and inland fisheries are almost entirely oriented toward the domestic market.

b. Industrial fishery

The industrial fishery consists of 125 trawlers, 5 fish/shrimp processing plants, and many wharves and dry docking facilities. Ice and freezing facilities servicing this fishery are owned and operated by participants within and outside the fishery subsector. The trawlers are 54 percent foreign-owned. Foreign trawlers mainly exploit prawns (*Penaeus* species) with finfish as by-catch, while locally-owned trawlers mainly exploit a smaller shrimp called seabob, and finfish. These trawlers measure about 21 meters in length, use double outrigger shrimp trawl nets, and operate in waters 14 to 34 meters in depth over the seabed of mud, gravel, or sand.

There are also 6 stern trawlers measuring about 16 meters in length, which fish for finfish in depths ranging from 14 to 30 meters. The total number of trawlers has fallen by about 20 percent since the early 1980s, reflecting the apparent decline in the prawn population and the enforcement of a management decision not to increase the level of the trawling fleet.

In keeping with the Fisheries Act of 1958 and the Maritime Boundaries Act of 1977, trawlers are registered and licensed based on their ownership (foreign or local), length, and base of operation. Fishermen are also licensed. Vessels in the trawler fleet are also demarcated and licensed in terms of their operations (prawns, seabob/finfish, finfish).

The prawn vessels operate as a limited-entry fleet with the upper limit being at 80 vessels, while the seabob/finfishing fleet has an upper limit set at 30 vessels. This latter limit is lower not only because of the paucity of information on the seabob resource, but also because seabob/finfish vessels operate within the breeding and nursery grounds of the marine fishery. Local trawler owners/operators have all moved into seabob/finfish, thus ignoring the upper limit for seabob trawlers. The Fisheries Department is reviewing catch data and is in discussion with the industry to change the limits to 75 vessels for prawns and 45 for seabob.

Trawlers catching prawns take finfish on board as by-catch, and the prawn trawlers are required to land 15 mt of by-catch each year. However, dumping of by-catch at sea is still a widespread practice. This is especially damaging to the stocks when the by-catch includes a significant portion of juvenile fish.

Transshipment at sea is prohibited by law, although it is widely suspected to occur on a significant scale.

Some trawlers, especially those configured for seabob, target finfish when seabob is not in abundance. While the stress on the prawn resource has been evident for a number of years, seabobs, too, are now being more fully exploited, and several new seabob processing plants have been opened. The seabob/finfish trawlers have been operating increasingly close to shore, and this has produced a greater incidence of conflict between the industrial and artisanal fisheries.

At present, the mesh size of nets is not regulated in practice for either the industrial or the artisanal fishery. Greater enforcement of the existing law for avoiding the entrapment of turtles in the nets, through the use of turtle-excluding devices is also required, in order to maintain access to the U.S. market for shrimp.

c. The deep slope fishery

In addition to the trawlers, fishing boats known as handliners, measuring up to 18 m in length and fishing at depths between 120 m and the edge of the continental shelf, target snapper and grouper. Each vessel is normally equipped with 8 polyethylene handlines, each line carrying 16 hooks. Up to 1994, fewer than 5 vessels were involved in snapper/grouper fishing; inefficient gear and comparatively high operating costs hampered them and caused the activity to decline. It was recognized that there was room for limited expansion of this fishery in view of its potential sustainable yield, with production oriented toward export and the developing tourist market, and improvements coming through technology transfer. In 1997/98, expansion occurred

through an agreement that licensed 10 foreign vessels, and a movement by local fishermen to the use of traps and conversion of the larger artisanal vessels to fishing for snapper. There is now a need to control the mesh size of the traps and to deal with the important issue of poaching by foreign vessels in the snapper/grouper areas. Negotiations are taking place to permit Trinidad and Tobago to exploit these resources.

d. Small-scale fishery

Small-scale or artisanal fishery is an important source of food in both rural and urban areas, and is also increasingly important as a source of employment, income and export earnings. It experienced rapid growth, both in numbers of participants and volume of landings, up to 1992 but since then production appears to have levelled off. Beside the frictions 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. 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 sharks are harvested.

The artisanal or small-scale fishery consists of approximately 1,300 vessels ranging in size from 6 to 18 meters, propelled by sails and outboard or inboard engines, and using gear that includes Chinese seine (a fyke net), pin seine (beach seine), Cadell lines and handlines, drift seine, gill nets and circle seine. Gill nets are the most widely used gear. Gear such as the pin seine, the Chinese seine and the nearshore nylon gill net does substantial damage to the resource by catching juvenile fish and crustaceans.

The larger vessels have ice boxes and go on fishing trips that last as long as 18 days, while smaller vessels have no ice boxes and their operations are either tidal or diurnal. Except for the large handliners and drift seine that may or may not be decked, most artisanal vessels are of the flat-bottomed dory type with little draft, which affords great manoeuvrability over shallow muddy and sandy bottoms.

There are about 4,500 small-scale fishers. Of these about 1,000 are boat owners. Sixty to 70 percent of the boat owners are members of fishermen's cooperatives (13 in all) which acquire and sell fishing requisites to their members. Activity in the inshore artisanal fishery is pursued exclusively by Guyanese. Guyanese artisanal fishermen from the Corentyne have been experiencing difficulties in obtaining fishing licences to fish in the waters at the mouths of the Corentyne River and off the Suriname Coast.

The development of onshore infrastructure (wharves, ramps, workshops, fuel depots, requisite shops, ice machines, and fish storage bins) at eight sites along the coast, financed by the Government with assistance from CIDA and the EEC, has been completed. Five of these complexes have been leased to the fishermen's cooperatives within whose boundaries they fall for management and operations. Poor management, narrow vision, and lack of capital hinder the operations of most of them. Joint-venture arrangements are proposed for the remaining three complexes.

An increased number of artisanal boats means a higher demand for ice, which the Georgetown area has not been able to meet. This limiting factor on production in the artisanal fishery is currently being addressed with a substantial private sector input.

2. Inland Fisheries

a. 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 level of freshwater fishing tends to be influenced by the levels of activity in agriculture and in other economic areas. For example, in the estate communities the intensity of fishing varies with the harvesting of sugar cane and rice. Freshwater fishing is carried out with small, flat-bottomed, dory-type vessels and cast nets, seine or handlines.

The limited data available indicate that most inland fishing is carried out by Amerindians, although non-Amerindians fish in inland waters near the coast and in the vicinity of logging and mining communities situated in the interior of the country. At present, the effort is largely directed at subsistence fishing, although a few fishermen participate in small-scale commercial fisheries based on inland waters.

The country's flowing waters are the "blackwaters" typical of rain forest regions. They are characterised by a reddish-brown stain of humus compounds, an acid or very acid reaction and a low level of dissolved minerals. Their level of biological production is low unless the waters are retained in lakes or canals, where nutrient status and productivity tend to rise. Many of these waters do, however, support a diverse population of fish, often reaching large sizes. This apparent anomaly between an environment low in productivity and a relative abundance of catchable fish could be due to the very low level of exploitation to which the fish in these waters have been subjected until recently. Indeed, the steady increase in fishing pressure has already brought about a decline in the sizes of some of the fish caught. These effects are undocumented but generally reported. The implication is that the resource cannot sustainably support a yield much above that which meets subsistence requirements.

Areas that seasonally alternate between dry savannah grasslands and a shallow floodplain caused by a heavy rainfall and rivers overlapping their banks usually have a high level of fish production. This results from the abundance of nutrient materials absorbed into the water from the dry lands when the flooding occurs. There are some forty or fifty thousand square kilometers of these seasonally inundated floodplains in the southwestern areas of the country, especially in the Rupununi, and a potential harvest of up to 100 tonnes per square kilometer may be achievable.

There is also 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 sherga (*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.²

The major species of freshwater fish caught in Guyana are listed in Table 13-4.

Table 13-4
Major Inland Fish Species

Local Name	Scientific Name
Lukanani	<i>Cichla ocellaris</i>
Houri	<i>Hoplias malabaricus</i>
Wabri	<i>Metynnis shreitmuelleri</i>
Patwa	<i>Cichlasoma bimaculatum</i>
Tiger Fish	<i>Surubim spp.</i>
Hassar	<i>Hoplosternum littorale</i>
Piranha	<i>Serrasalmos niger</i>
Tilapia	<i>Oreochromus mossambica</i>
Yarrow	<i>Hoplerythrinus unitaeniatus</i>
Sunfish	<i>Crenicichla saxatilis</i>

Source: National Fisheries Management and Development Plan, op. cit.

In some areas of the country, observers report that some species are becoming less available as a consequence of the intensifying fishing pressure. In many cases, however, the subsistence fisherman will respond to declines in the stocks of fish by reducing his fishing effort. An exception to this kind of flexible and responsive exploitation occurs when fish poisons and explosives, which can be totally destructive of the fish over limited areas, are used. Those who fish inland waters for commercial gain may also not curtail their effort in response to declining stocks.

There are many informal reports and a limited amount of systematic data to support the contention that water pollution and habitat degradation, particularly from mining and forestry activities on the river systems of the interior, are having a negative impact on the spawning and growth of many freshwater species.

b. Ornamental fish industry

There is a small but active trade in ornamental fish. Live fish are caught in the upper reaches of the rivers by collectors and brought and sold on the coast to six exporters of ornamental fish. The fish are exported mainly to the U.S.A. and to a much lesser extent, Canada and Europe. In 1997, over five million of these fish were exported, with a value of G\$36 million. The El Nino phenomena affected this trade.

²Agrodev Canada Inc., *Preliminary Report on the Fisheries and Aquaculture Potential of Region 2, Guyana*, prepared for IICA/Guyana, November, 1994.

Collectors catch ornamental fish mainly in riverain areas, utilising craft powered by outboard engines and varying types of fishing gear (dragnets/seines, dipnets, pin-seines). Mortality rates of the fish are very high. At present, most of the ornamental fish caught and exported come from the Canje River, the Berbice River, the Abary River, the Mahaicony Creek, the Mahaica River, the Upper Demerara River, the North West Area (vicinity of Morawhanna), and the Essequibo River.

Some of the more valuable species are now being cultured in the U.S., and that development may have a long-term impact on the demand for ornamental fish from countries like Guyana. Furthermore, some consumers in overseas markets are demanding that strict environmental standards be followed in the harvesting of ornamental fish.

Prices received for ornamental fish by Guyanese exporters are only a tiny fraction of international prices. Export data from the Bureau of Statistics for 1993 show that the average export value of live ornamental fish from Guyana was about US\$2.50/kg., compared to the average international price quoted in INFOFISH International (issue 44/94) of US\$300/kg. This discrepancy may be due in part to under-reporting, but is no doubt also due to quality considerations (health and mortality rates, or the dull colour of most local species).

Significant opportunities for ornamental fish producers exist in improving quality, moving into pond production, and exporting directly to Japan and the EEC. It is thought that some of the present exports to the U.S. are re-exported to those countries.

3. Aquaculture

Although aquaculture activities first started in Guyana in the 1950s, the development of the industry has been slow, retarded by a lack of investment capital, technical skills, appropriate technologies, equipment and inputs, and research and training. Very little foreign investment has been injected into the industry since investment prospects generally have been better elsewhere in the region.

Two forms of aquaculture are basically practised in the country: traditional extensive brackish water culture, and freshwater pond culture. Brackish water farms operate as extensive polyculture systems utilising the existing sluices and dams from the sea defence structures which 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 schmitti*, *P. aztecus* and *P. braziliensis*.

Brackish water culture occurs mainly in the swamps along the Atlantic Coast in Corentyne, Berbice. Sixty-four farms, including two registered fish culture cooperatives, use approximately 670 hectares of coastal lowlands in what can be described as controlled exploitation of coastal swamps for a variety of finfish and shrimp species. The average size of a farm is eleven hectares.

In freshwater ponds, *Tilapia mossambica*, *Tilapia nilotica* and, to a limited extent, *Hoplosternum littoral* (catfish), are the main species cultured in Guyana. This type of culture produced an estimated 34 mt of fish in 1987 from about 115 hectares of ponds. The major producer is the Guyana Sugar Corporation Limited, with about 40 hectares of production ponds. Some schools and individual subsistence farmers are also involved.

The Botanic Garden Fish Culture Station, established by Government to conduct research and pilot-scale demonstrations and to supply fingerlings to fish farmers, has been closed down.

4. Processing and Marketing

The industrial and artisanal fisheries have largely distinct processing and marketing channels, though both could benefit from closer linkages for these purposes. In the sector as a whole, there is a wide range of processing technologies and quality standards. The greatest opportunities for increasing volumes and values of fish processed appear to be in the area of finfish.

Four licensed industrial processors operate in Guyana, namely, Georgetown Seafoods & Trading Co. Ltd., B.E.V. Enterprises Limited, Marine Food Products Limited, and Noble House Seafoods Ltd. These industrial processors account for most prawn and seabob production and slightly under 20 percent of finfish production. They are export-oriented. 95 percent of the prawns are exported, with only minor amounts sold domestically to restaurants, and 91 percent of the seabob is also exported. Industrial finfish production is split more evenly between export (64 percent) and domestic (36 percent) markets. In total, about 77 percent of the industrial production is exported.

Prawns are produced and exported in a variety of forms but the dominant product form is frozen shell-on tails. This product is sold mostly to the U.S., with Japan providing the second most important market and a minor amount going to CARICOM countries. Seabob shrimp are almost entirely exported to the U.S., in peeled form, with the domestic market absorbing the remaining, small quantities. Guyana producers supply a relatively small proportion of the U.S. market for both products.

Finfish landed by industrial processors is primarily a by-catch of shrimp operations. Declines in prawn production in the late 1980s and early 1990s, combined with increasing prices for finfish, resulted in increasing interest by some industrial companies in processing the latter.

It is estimated that in 1993 industrial processors produced roughly 5,500 mt of frozen finfish products. Of this total, 1,200 mt were marketed domestically and 3,500 mt were exported. Finfish exports go mainly to CARICOM countries, the U.S. and Venezuela. A significant proportion of domestically marketed finfish is purchased by cottage processors. The landed quality of this catch reportedly is poor due to the lack of compression on board and of the ice needed for long periods at sea.

The interest in finfish on the part of industrial processors is confined to species with high prices and ready export markets. These species include grey snapper, gillbacker and bangamary.

Large quantities of finfish by-catch of species that do not command high prices are still discarded at sea.

About 80 percent of the finfish landed by the inshore artisanal fishery is sold fresh or fresh on ice, while of the remaining 20 percent, 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 percent is sold fresh to consumers. Of the remaining 50 percent, 47 percent is sold to cottage processors and 3 percent 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 and fish glue. In 1997 there were 1231 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 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 therefore could contribute to employment generation in rural areas.

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

- a. Vendors purchasing from boat owners for sale by cart or bicycle to a given community.
- b. Vendors purchasing from boat owners for sale in municipal markets or at roadside markets, especially on paydays at sugar estates.
- c. Sale of fish and shrimp at outlets and supermarkets in Georgetown.
- d. Middlemen purchasing large quantities of fish from vessel owners in outlying areas and transporting them to processing plants.
- e. Processing plants sending out trucks to purchase fish or shrimp.
- f. Sale of salted, smoked and dried products of cottage industries by vendors in markets, at outlets and supermarkets, and by middlemen in hinterland areas.

Within the industrial fishery sub-sector, a great deal of attention is paid to quality control, especially as it relates to products for export; any lapses tend to occur with the by-catch sold as "mixed fish" to cottage processors. In the artisanal fishery sub-sector, on the other hand, little care is given to quality control, either with fresh fish or with salted, smoked and dried fish. This is perhaps due to the fact that most of the fish is sold locally though at fairly high prices and for the most part, the local consumer seemingly overlooks quality considerations.

The need to improve the quality of fish and fish products on the local market, as well as to maintain the quality of fish and fish products being exported, is recognised. This is especially important in the light of recent laws and regulations in importing countries such as the U.S., Canada and the EU regarding the quality of imports of marine products.

A report prepared by J. Bentink in March 1993, entitled "Draft Proposal for the Establishment of a National Export Quality Control System," presents a clear picture of quality issues in Guyana's fisheries and proposals for a new quality assurance system. Some of its main findings include the following:

"A few processing establishments attempt to have in place some measure of quality control and a QC supervisor, in others it is practically non-existent. Also, in the majority of cases a greater percentage of those factory workers are unaware of their role in maintaining or preserving quality of the product and observing good hygienic practices.

"Not to mention the mediocre laboratory facilities available for sampling and analysis, and the fact that inspections are usually conducted in an ad hoc manner, with scant reference to reliable product standards or according to any inspection manual. Also there is little or no control over sanitation or hygienic practices on sea, at landing sites or markets.

"Therefore, the quality of fishery products leaving Guyana is highly questionable, and the manufacturer would be subjected to undue pressure to prove his operations and resulting product capable of meeting the stipulated requirements of the importing country" (pp. 11-12).

5. Artisanal Fisheries Infrastructure Complexes

The Artisanal Fisheries Infrastructure Project (AFIP) was implemented from 1984 to 1993 with assistance from CIDA and the EEC. The EEC and the Government of Guyana funded the establishment of the inshore fishport complex at Meadowbank in Georgetown in 1987, while CIDA and the Government funded inshore fishport complexes at #66 and #43 villages on the Corentyne, and at Rosignol, Parika, Lima, Charity and Morawhanna. Of the eight complexes constructed, six have been leased to Fishermen's Cooperative Societies for management and operations; by far the largest is the Greater Georgetown Fishermen's Cooperative Society Limited (GGFCSL).

The objectives of the AFIP were to:

- a. Reduce post-harvest losses and thereby increase the supply of fish to the local market and for export.
- b. Increase the productivity and incomes of artisanal fishermen.
- c. Move the existing Fishermen's Cooperatives towards local organising of producers and marketers.

The Cooperatives= complexes have made varying degrees of progress toward achieving objectives (a) and (b), but unfortunately, none has made any headway toward objective (c).³ The Societies have remained uninvolved in the marketing of their members= catch. Their main roles are to supply their members with ice and equipment at cost. Except for GGFCSL, they also suffer from an insufficient number of skilled and experienced management personnel and a lack of working capital. A main limitation on their involvement in marketing is that the complexes do not have cold storage and freezing facilities. Among other things, this results in lower prices for fish in the outlying coastal areas, because of the difficulty of storing the fish and transporting it to Georgetown.

II. Policies of the Sector

A. Past Evolution of Policies

Early policies for the fisheries subsector were first outlined in the Fisheries Act of 1957 that set out to organise the industry. Administrative and other arrangements provided modifications and additions to that policy, e.g., in the early sixties, duty free fuel for the industry to promote growth; in the seventies, obligatory landing of by-catch to prevent waste of resource and to provide more protein for the country, the ban on importation of fish and fish products to promote growth of the industry and develop self-sufficiency, and the development of fisheries cooperatives.

Given the lack of updated legislation and of a comprehensive fisheries policy document, fisheries policy in Guyana has been set and updated in development plans that include the National Development Plan (1972-1976), the Fisheries Development Plan (1979-1983), and the Draft Fisheries Development Plan (1989-1993), which followed the Agriculture Development Plan (1987-1990). The Draft Plan was updated in a Fisheries Subsector Policy and Planning Document and submitted to the Government for consideration in May 1994, and a revised policy draft dated March 1995, prepared.

In the past, clear enunciation and implementation of policy have been inhibited by severe institutional weaknesses. Lack of sufficient funding, and therefore of adequate staffing, has seriously hampered the operations of the Department of Fisheries. As of December 1994, only 17 out of 42 positions in the Department, and only one out of eleven senior technical and administrative positions were filled. Data collection and studies, and policy-making, implementation and monitoring have all suffered.

At the end of the 1970s and the beginning of the 1980s, policy attempted to forge a greater role for the State in the fisheries sector, creating two State enterprises for that purpose, Guyana Fisheries Limited (GFL) and the Guyana Libya Fishing Company. Both experienced operating problems, and GFL's 21 trawlers were sold in the early 1990s and its facilities rented

³ This conclusion is reached in I. Nwike, "Assessment of the Effects of the Artisanal Fisheries Programme," Report Prepared for the Monitoring and Evaluation Section, Planning Division, Ministry of Agriculture, 1993.

out. Of the ten trawlers of the Guyana Libya Fishing Company, fewer than three are operational now.

At the same time, the private fishing sector suffered from lack of capitalisation in vessels, processing facilities, and storage and marketing facilities, and lack of appropriate technology in many cases. For inshore fisheries, little attention was paid to questions of sustainable yield and how to regulate the industry so that its harvests were consistent with the rate of reproduction of the species, perhaps in the belief that the point of exhaustion of stocks would never be reached. Throughout the world, the reality of declining fish stocks has emerged abruptly in recent years, undermining that comfortable assumption.

In effect, albeit not by design, a laissez-faire approach characterised past policies toward the private fisheries. The sector was viewed as a source of tax revenues, and little public expenditure was made on it, outside of that mandated by the attempts to establish State fishing industries. Economic concerns and declining fisheries resources for some species are now forcing a fundamental re-evaluation of policy toward the sector.

B. Description of Current Policies

The general objectives, strategies, and global targets for agricultural development set out in the Draft Agricultural Development Plan (1987-1990), in which fisheries was identified as one of the subsectors for special attention at a national level, were used as a guide to develop the major objectives in the Draft Fisheries Management and Development Plan (1989-1993).

The six major objectives adopted for the Draft Fisheries Management and Development Plan (1989-1993), were:

1. A rapid increase in aggregate output and productivity to impact significantly on the growth of the national economy significantly.
2. The achievement of nutritional self-sufficiency and food security.
3. The maintenance in good working order and the optimal utilisation, of assets related to production.
4. The generation of increased employment and income in the sector.
5. The intensive utilisation of the country=s flora and fauna to meet non-food basic and cultural needs, such as those related to energy, clothing, home construction and furnishing, and arts and crafts.
6. An increase in net foreign exchange earnings.

The overall strategy was to provide services and pursue policies supportive of improved technology and cultural practices in order to promote the growth of fisheries production; to diversify fisheries production and processing, and to achieve the necessary cost efficiency for competitiveness.

In striving to implement this strategy, it was agreed that emphasis should be placed on the following:

1. Making optimum use of the existing production capacities before seeking to establish additional capacity.
2. The allocation of resources where they could obtain optimal use and would yield the greatest foreign exchange benefits.
3. Development of new products and by-products of traditionally produced items by using appropriate techniques.
4. The promotion of regional self-sufficiency in food and other items including those for daily use, thereby reducing the hinterland's dependence on the coast for the supply of important basic commodities.
5. Provision of direct and indirect incentives, including:
 - a. the adoption of producer-oriented policies, especially in the areas of pricing, marketing, supply of essential inputs, and import concessions;
 - b. improvement of service delivery systems relating to the provision of technical training and advice, credit and input distribution, and statistical and resource capability information for planning and marketing purposes, and
 - c. in all regions, maintenance and expansion of production award systems in areas of activity consistent with those emphasised in the Plan.

The overall strategy recognised the dualistic character of the fisheries subsector, that is, an export-oriented sector of large-scale commercial production of shrimp (prawns), and an equally important domestically oriented small-scale/artisanal production (of finfish). However, the increasing scarcity of some species, and therefore the need to husband those stocks, was not duly recognised, nor was the need to withdraw the State from production activities while strengthening its regulatory role.

The following additional factors have influenced current fisheries policies in practice:

1. The establishment of the 200 miles fishery zone and exclusive economic zone by most countries (Guyana, 1977), and the global agreement on conditions arising from this development as set out in UNCLOS III (United Nations, 1983). The clauses of significance are: "The Convention of the Law of the Sea gives coastal States *sovereign rights over the resources of the exclusion economic zone* (article 56), [...and . . .] it is the sole prerogative of the coastal State both *to determine the allowable catch* of the living resource in the EEZ (article 611), and *to determine its own capacity* to harvest those resources (article 62).

"One of the main duties of the coastal State is to ensure that >the maintenance of the living resources in the exclusive economic zone is *not endangered by over exploitation*= . Towards that end the coastal State has *to adopt proper conservation and management measures* (article 61).

"Where the coastal State does not have the capacity to harvest the entire allowable catch, it has the duty to give other States *access to the surplus of the allowable catch*.

"The convention provides for States to take measures in order to coordinate and ensure the conservation and development of stocks where >the same *stock or stocks of associated species occur within the exclusive economic zones of two or more coastal States*= [. . .] States may utilise appropriate subregional or regional organisations in seeking to agree upon measures to be taken.

"The coastal State and other States whose nationals fish for *high migratory species* both within and beyond the exclusive economic zone, are under a *duty to cooperate* to ensure conservation and promote the objective of optimum utilisation of such species."

2. Changing economic circumstances and policies in Guyana, demanding the removal of subsidies to the industry.

3. The current international accord of the "Code of Conduct for Responsible Fishing" (FAO), 1995, which outlines principles for States in relation to fisheries management, fisheries operations, aquaculture development, integration of fisheries into coastal area management, post harvest practices and trade, fisheries research, compliance with other international accords.

4. The HACCP requirement for quality control in fisheries being introduced by the major importing countries such as the United States, Canada, and the EEC.

As a consequence of these factors and the evolution of thinking about fisheries management, the major operational objectives of current policy, *de facto*, could be characterised as follows:

- improved management of renewable natural resources to achieve long-term stability and sustainability;
- expansion of export earnings;
- restructuring of government services to reduce problems of inadequate staffing levels due to fiscal constraints;
- development of new cost recovery mechanisms for extension and other services to industry;
- development of effective education and training programmes;

- expanded production from aquaculture through private investment and/or joint venture arrangements;
- expanded harvesting of underutilised marine fish species through private investment and/or joint venture arrangements;
- upgrading of seafood product quality and food health standards to protect and promote export markets;
- improved legislation and regulations, and expanded surveillance and enforcement capabilities, to protect Guyana's marine resources within the EEZ;
- development of new structures to promote industry and producer participation in resource management and regulatory activities;
- development of new strategies to reduce poverty, to protect food supplies, and to promote socioeconomic development in coastal and inland communities, and specifically via the participation of women in the industry.

III. Issues and Constraints

A. Issues

1. Health of Fisheries Resources

a. The need for more precise information

As mentioned in an earlier section, Guyana's fishing activities are concentrated on the continental shelf and to a minimal level on the continental slope, while there is no activity in the far offshore area and the potential of the coastal and oceanic pelagics is not known. As fishing pressure increases on our traditional inshore fisheries the commercial potential of the offshore resources needs to be explored. Various estimates of the magnitude of Guyana's marine resources and their potential yields have been attempted. Table 13-5 provides some of these estimates.

Table 13-5
 Summary of Marine Resource Potential
 Maximum Sustainable Yield Calculated (mt)

Survey or Scientist				
Type	Gullan (1971)	Jones and Dragovich (1975)	Kilma (1976)	FAO/NORAD Survey (1988)
Finfish				
Demersal finfish	45,000	-	75,000	45,000
Snappers and groupers	-	-	1,500	-
Pelagic finfish	65,000	75,000	-	-
Shrimp				
Prawn	-	800	-	-
Seabob	-	-	-	-
Whitebelly	-	-	-	-
Others				
Squid	-	2,000	-	-

b. Sustainability

The key to development in any fishery is long-term sustainability. If exploitation rates are not controlled, the contribution of fisheries to GDP, exports, employment, and nutrition, will be significantly reduced.

Conservation and management measures to control harvesting levels and protect stocks are therefore the highest priorities in the preparation of the National Fisheries Management and Development Plan and this statement of policy in the National Development Strategy.

Another basic area of concern, which has become a bottleneck for the development of the artisanal fishery, is the adequacy of facilities for processing and cold storage, and the existing deficiencies in quality assurance.

c. Inland fisheries

The most pressing issues in this sector are the need to protect the waterways from environmentally destructive practices associated with the expansion of mining and forestry

operations, and the development of potential inland fisheries and aquaculture.

Pollution from mining activities and the use of chemicals and pesticides threaten these resources. Further, while fresh water stocks are relatively abundant in many areas, indications are that their reproductive capabilities are limited. No efforts should therefore be made to expand harvesting levels significantly without more data. There is also a need to examine current and potential fisheries activities in hinterland communities, and to identify appropriate development options, possibly including fish stocking and aquaculture initiatives. In addition, with six months of rain and six months of drought in inland areas, there is a need to improve methods for preserving fish to stretch the food supply through the year.

There is pressure to expand the harvesting of certain ornamental fish from the interior water systems. Concerns about stock conservation and a lack of in-depth knowledge of the market dynamics for ornamental species call for a cautious approach. With proper research and development work, there may be potential to produce ornamental fish by means of aquacultural methods.

2. The Potential of Aquaculture

Despite serious development efforts in the past, the aquaculture industry is still in its infancy. It has significant growth potential, both for the production of low cost food supplies on a subsistence or artisanal basis, and for production for processing and export.

Aquaculture has been increasing at an amazing rate on a worldwide scale. Many species of fish, shellfish, and aquatic plants have been successfully cultured. The cultivation of shrimp has exceeded that of all other fish or shellfish and is the largest contributor to aquacultural production.

The cultivation of fish and shrimp lends itself to countries which are situated in tropical climates, and which have coastal access and underdeveloped lands. The development of shrimp farming industries has been shown to provide employment and foreign investment opportunities, increase export product range and foreign exchange, add to local incomes, improve standards of living, and offer additional protein sources for the country.

Although in some coastal areas the soils are acid-sulphate and thus inappropriate for aquaculture, many natural conditions required to raise shrimp and fish successfully already exist in Guyana. The existence of a natural marine shrimp industry to supply post-larval shrimp to the ponds is an important requirement. As the industry grows, the demand will increase for post-larval shrimp and the construction of hatcheries becomes feasible. The infrastructure already exists for the processing facilities and marketing system for handling shrimp and fish.

An in-depth investigation is required to determine the overall economic potential for fish and shrimp culture, and to decide the extent and location of areas that may be suitable.

Development options include the more intensive use of creeks, canals and polder lands for food production for local markets, the introduction of new species (particularly shrimp), and the use of aquaculture techniques to produce ornamental fish for export. To avoid interspecies

problems, the production potential of indigenous species should be examined before exotic varieties are considered for introduction.

The keys to development in the aquaculture sector are expansion of applied research and development, attraction of adequate levels of investment and modern technology, and effective training and extension work with industry. There is an urgent need for a comprehensive aquaculture development policy and a regulatory framework that take adequate account of environmental constraints, particularly in the foreshore areas.

3. The Management System (Institutional Capabilities)

The compelling paradox of the Guyana fisheries is that during a period of strong industry growth, the Government's capacity to regulate and manage the industry were sharply reduced. Due to wider economic constraints, the Government of Guyana has not been able to offer salary levels that are competitive with the private sector. As a result, qualified personnel currently occupy only 9 of 32 professional and technical positions in the Department of Fisheries.

This situation calls for new strategies and approaches. With rapid industry expansion and the resulting danger of over-exploitation of the stocks, it is imperative that the Government's ability to manage the fishery and to plan and control its development be enhanced.

The Department of Fisheries must have the budget and staff to carry out assessments and other data collection, regulate and monitor the domestic fisheries, promote aquaculture and other development options, provide adequate extension support to the fishermen's cooperative societies, offer the training that the industry needs, and enforce Guyana's sovereignty within its own territorial waters. There is pressing need for international efforts to protect and manage cross-boundary stocks, particularly in the shrimp fishery.

New ways to attract and hold qualified staff and new sources of revenue, including innovative ways to tax the growth of the industry, will need to be explored.

4. International Fisheries Management

Current stock assessments suggest that the most important commercial fish stocks in Guyana's Exclusive Economic Zone are cross-boundary stocks. Effective management and stock conservation will therefore require cooperative initiatives with the governments of Suriname, Cayenne, Brazil, Venezuela, and Trinidad and Tobago.

There are problems with illegal foreign fishing and over-the-side sales within Guyana's EEZ. Also, Guyana's fishermen regularly penetrate the zones of neighboring countries in pursuit of fishing opportunities. The expansion of surveillance and enforcement activities should be carried out on a regional basis, with close cooperation and communication among the governments involved.

5. Role of Cooperatives

Fishermen's cooperative societies have played a crucial role in the mobilisation of artisanal fishermen, in education and training, and in the maintenance and management of fish landing sites. Through the landing sites and a line of credit to purchase fisheries equipment, both supported by the Canadian International Development Agency (CIDA), the cooperatives have contributed significantly to the growth of finfish exports.

The cooperatives could provide more services to their members and their communities through marketing and processing activities, and through fisheries management and conservation initiatives. They need to develop their capacities to finance their own expansion, possibly through joint ventures with other investors, to improve their organisational and management practices, and to identify and correct their weaknesses. To accomplish these goals they will need strong support from extension workers from the Department of Fisheries and the Cooperatives Department.

To play a role in the improvement of marketing, both for export and for domestic sales, it is essential that they obtain cold storage equipment.

6. Marketing and Post-harvest Processing

Currency devaluation, competitive wage levels and a well-developed processing infrastructure have all contributed to the growth in sales of processed fish products. With declining prawn landings, the main prospect for export growth is now finfish from artisanal harvesters. There may also be potential for development of new pelagic fish products. Quality improvement will be one of the keys to growth.

Limited cold storage and processing capabilities in the artisanal sector make it difficult for finfish exporters to expand their markets. A lack of information and expertise related to international fish markets also inhibits the development of cottage industry exports.

In the industrial sector, there is an excess of processing capacity because of reduced landings of prawns. The larger companies have diversified into finfish in recent years.

Over-capacity in the industrial sector and under-capacity in the cottage industry processors are important issues to be addressed. There is also a need for improvements in market intelligence and quality control.

7. Training

In addition to the action which the sector needs to take to address the critical shortage of qualified personnel in the Government agencies responsible for fisheries administration/management, a comprehensive training and extension system is required to upgrade knowledge and skills in technical fields such as engine mechanics, vessel and gear repair, fishing techniques, navigation, seamanship and safety at sea. Only minimal fisheries-related training is available in training institutions in Guyana.

B. Constraints

1. General Constraints

- a. Some major commercial stocks are being exploited near or above maximum sustainable yields.
- b. No arrangements are in place to manage or protect trans-boundary stocks.
- c. The fisheries management system is inadequate; specifically, there is a lack of enforcement, a paucity of data on the fishery and fishers, no stock assessment, very weak extension system and incomplete licensing of vessels.
- d. There are resource constraints in the Department of Fisheries and the Guyana Coast Guard. Neither agency has an adequate surveillance vessel.
- e. Fishing gear is inappropriate, leading to excessive amounts of by-catch and the destruction of stocks of juvenile fish.
- f. Over-the-side sales at sea and foreign poaching continue.
- g. The mangrove habitat is being destroyed, reducing breeding grounds for shrimp and other species.
- h. Post-harvest infrastructures are undeveloped: quality is uneven, and there is no product diversity.
- i. The cost of operations for industrial fishermen is high owing to their use of outmoded technologies.
- j. There is a lack of good market information in the artisanal sector, and a lack of management skills necessary for self-sustaining business.
- k. The ownership of many vessels operating in the artisanal fishery by non-fishers may, as in other countries, lead to resource conservation and management becoming eroded or of secondary concern.

l. Cold storage and processing facilities in rural coastal areas are limited.

m. Inland waterways are being damaged by environmentally destructive practices.

2. Specific Constraints for Aquaculture

- a. There is no access to freehold land or to secure leases of very long duration.
- b. There is no aquacultural policy for long-term development, limited investment and a lack of policy to promote investment in the sector.

- c. Initial capital costs are relatively high, and returns on investment are uncertain.
- d. There is a lack of infrastructure and of the qualified human resources necessary to facilitate research, development and extension activities by the Department of Fisheries.
- e. Aquacultural development is weak in relation to its potential.

IV. Sectoral Objectives

The fisheries sector is well-placed to contribute importantly to the achievement of both of the broad national goals of this Strategy: promoting *rapid economic growth* and ensuring that *its benefits are as widely distributed as possible*. In spite of limitations on some aspects of the fisheries resources, there are significant possibilities for continued growth in the sector, mainly through more effective exploitation of the deep slope and pelagic resources, improvements in the quality of post-harvest handling of artisanal finfish, to permit access to wider export markets as well as better supplies to the domestic market, and more investment and improved technology in aquaculture activities.

The fact that artisanal fisheries are mostly located in rural coastal areas implies that improvements in this sub-sector would have beneficial effects on rural populations and would contribute to poverty alleviation. The important role of women in these fisheries means that they also would share the benefits of expansion.

It should not be overlooked that the widespread availability of fish products provides a vital buffer against the threat of malnutrition in the lower-income stratum of the population. The inland fisheries, as well as some on the North West coast, provide an important complementary source of income and nutrition for Amerindians as well as other population groups.

At the same time, to ensure the viability of the sector it is essential that its development pattern contribute to the national policy condition of *environmental sustainability* of the growth path. Without better management of the industry, some important stocks would continue their decline to the point of effective depletion. The consequences of such an occurrence for rural employment and incomes would be grave, making it an urgent necessity to reach agreement with fishing communities and enterprises on measures to regulate the exploitation of some species. Fisheries, except aquaculture, are a common property resource, and avoiding their overexploitation therefore requires agreement on joint actions and restraint by all involved parties. To achieve this, the Government will have to provide the initiative through appropriate policies and monitoring, always acting in full concert with the affected parties.

With these considerations as a context, the sectoral objectives may be summarised as follows:

1. Ensure that the nutritional, social, and economic benefits from current fishery operations are maintained and improved.

2. Give special priority to the preservation of artisanal fisheries and the improvement of incomes of artisanal fishermen, in particular through better integration of their production activities with processing and marketing.

3. Put the sector on a more sustainable basis, environmentally, by improving our knowledge of marine eco-systems and stocks, taking measures to reduce incidental catch and waste of non-targeted species, assuring that the fishing effort is commensurate with the sustainable productive capacity of the resources, and introducing other environmentally sound practices.

V. The Strategy

This Annex establishes specific policies to accomplish the fishery sector's objectives. Accompanying recommendations of a more detailed nature are found in the National Fisheries Management and Development Plan. The fundamental orientation of the policies is to promote a gradual shift in emphasis in the sector, so that the areas with greatest potential are encouraged to expand at the same time that safeguards are put in place to ensure that, so as not to deprive our fishermen of a source of livelihood, important species are not overexploited and exhausted.

A. Achieving Sustainable Production Levels

1. Industrial Fishery

The industrial fishery needs to be encouraged to orient its capacities more toward finfish, particularly those of deeper waters. Marine prawn harvesting needs to be stabilised urgently at lower levels than the present ones, to avoid depleting the resource. Seabob production also needs to be stabilised. It is expected that large increments in shrimp production in the future would arise from expansion of aquaculture activities, propelled by adequate amounts of investment and modern technology and management methods.

The two most important components of policy for abating the current overexploitation of the marine shrimp resources are limitations on trawler operations and regulation of gear for all types of vessels. Trawlers have driven fish stocks to the point of non-recovery, or have threatened to do so, in many countries in what is now recognised as a world crisis of fisheries resources. Some countries, e.g., Indonesia, have decided to ban trawlers entirely owing to their devastating effects on the regenerative capability of many species. Others have imposed increasingly strict limitations on their operations, with priority given to preventing them from trawling inshore waters where many species have their primary reproductive areas.

In light of these concerns, Guyana's policy orientations for fisheries are clearly established in this document. Their implementation would be progressive, evolving as more precise information on the health of the stocks becomes available over time. However, enough information is now available to allow the nature of some urgently required measures to be clear. They will be put into effect as soon as is practicable. They include the following:

a. Shrimp and finfish trawling in waters shallower than 18 fathoms will be prohibited so as to reduce the damage to juveniles, increase the total sustainable yield, and

minimise conflicts with artisanal fishermen.

b. Regulations on turtle-excluding devices (TEDs) in all trawlers will be enforced, to safeguard Guyana's seafood exports to the U.S. and protect diminishing turtle populations.

c. A programme of seasonal closures of the prawn fishery will be instituted during the approximately three months of most intensive recruitment of the species; this will initially be for selected locations so that the effects of the programme can be studied and properly evaluated.

d. The present monitoring system (vessel logbook and plant logbooks) for seabob and prawns, will be improved and implemented to provide accurate information on catch. This information will be used for making management decisions for this fishery, including the issues of by-catch.

e. A regional approach to management of the prawn resource will be encouraged and promoted. Guyana will pursue the fullest possible participation in the activities of the proposed Western Central Atlantic Fisheries Commission (WECAFC) Scientific and Advisory Committee for the Management of the Shrimp Fisheries of the Guyana-Brazil Management Area on Shrimp.

f. A study to determine the areas of high adult abundance and the level of seasonality of the seabob resource will be undertaken. This will be done with a view to reducing conflicts with artisanal fishermen and damage to nurseries and juveniles, and to determine whether a closed season is needed for seabob.

g. Annual fees for trawler licences will be significantly increased to reflect the true value of the resources and discourage their over-exploitation. The licences will be made fully tradeable among boat owners, and will become the primary source of revenue from the sector.

h. In consonance with the measure outlined at (g), consideration will be given to a tax per voyage of industrial ships. This would be easier to enforce than a tax per ton of product landed. The vessel licensing fees in effect represent the price of entry into the common-resource industry, and the fees per voyage represent a tax on the level of fishing effort *per se*. If this measure is introduced, the fees will be adjusted annually on the basis of information on the health of stocks of the main species. Recent experience in Australia has shown that these two fiscal measures together constitute an effective approach to controlling the level of exploitation of the species.

i. The prawn trawler fleet will be rationalised by reducing the number of prawn trawler licences from the present level of 100 to 80, and studies of the resource base will be conducted at intervals of three years to determine if further reductions are needed. In years when the number of authorised licences is to be lowered, the reduced number will be allowed by means of an auction, in which the highest bidders will receive licences subject to their payment of the fee in addition to the amount bid at the auction.

j. After reviewing existing information to determine the appropriate size of the trawler fleet for demersal finfish vis-à-vis the stocks of the resource, a similar limited-entry approach will be introduced.

k. Mesh size and gear regulations for finfish trawling will be introduced in order to reduce the catch of juveniles.

l. A study will be conducted to better utilise the shrimp by-catch, and its results will be published for the benefit and encouragement of investors in the industry.

m. An economic study of the industrial fishery will be undertaken to facilitate the establishment of an economic data base for use in bio-economic modelling and the ongoing determination of suitable licence and voyage fees.

n. For large pelagic fisheries, joint ventures will be facilitated to encourage commercial investment, particularly for the deep slope fishery, in order to promote technology transfer to local fishermen. However, the model based on factory ships ("mother ships") will not be pursued, because experience has shown that it does not bring significant benefits to the host country but to the country of origin of the large ships, and that it diminishes the amount of exploitable resource left available to local fishermen.

o. Given the highly migratory nature of the larger tunas and related species, management linkages with international regulatory bodies such as ICCAT will be developed, in order to access vital information to manage the fishery properly.

p. New regulations (licences, data requirements, restrictions on gear and mesh sizes, etc.) will be introduced for the pelagic fishery.

2. Artisanal Fishery

Artisanal fisheries also need to address the reality that their catches of some species are declining due to over-exploitation. At the same time, they must improve the quality of their product so that they can command higher prices and penetrate wider export markets. This is an open-entry industry, as it is in most other countries, so the required controls on levels of harvesting need to be achieved by consensus with the fishing communities and implemented through mechanisms such as regulations on gear and closed seasons, rather than through limits on the number of vessels. Training of captains and crews is also required. It should be fully explained to artisanal fishermen that any short-term sacrifices arising from controls on gear will be compensated for over the medium term by higher yields, and that they would substantially benefit from the restrictions placed on trawlers' movements.

Quality improvements can best be attained by increasing the capacity for production of ice and installing cold storage facilities in the fishports, and by training crews and processors in appropriate handling of fish. Linkages with industrial processors can be improved. These initiatives are discussed below in the subsection on processing and marketing.

The main policies for the artisanal sub-sector are the following:

a. The registration and licensing of vessels will be made comprehensive, and gear will also be registered, by type. These actions can be carried out largely through collaboration with the fishermen's cooperatives.

b. The GNCCB will be urged to open credit lines for fishermen who are not owners of their boats and wish to purchase them. Discussions will be held with the micro-enterprise programmes of Scotia Bank and IPED toward the same aim.

c. Controls will be established over Chinese seines, which are the most damaging nets to juveniles, by registering all of them and phasing down the number that are permitted. Concomitantly, closed grounds and seasons will be established for Chinese seines.

d. Minimum mesh sizes will be established and enforced for pin seines, drift nets, and nearshore nylon gill nets. The use of such nets will be restricted to specified fishing grounds, perhaps on a rotating basis, after adequate study of the options. The hook sizes of Cadell lines will be regulated to ensure that only larger sizes of fish are targeted. Depending on the results of scientific studies, over the medium term measures may also be instituted to reduce the number of pin seines.

e. Strengthened mechanisms will be established for dialogue with artisanal fishermen on sustainable management issues, emphasising the role of the fishermen's cooperatives in such a dialogue.

f. Limits will be placed on landings of shark and possibly mackerel, their levels to be established as a result of scientific studies of the resource.

g. A mangrove protection and management plan will be reviewed with the concerned coastal communities, modified as necessary, and implemented with their cooperation.

3. Monitoring and Surveillance

The artisanal fishermen are legitimately concerned about the hijacking of engines, fuel and catch at sea, while for the industrial fishermen the main problem of this nature is the unauthorised and illegal sale of catch over the side, at sea.

Integrated systems for monitoring, control, and surveillance in the Fishery Zone will be developed. A clear separation of fisheries management and development functions from surveillance and enforcement will encourage more positive and constructive relations between the industry and fisheries' managers.

The Coast Guard currently has experienced and qualified personnel able to undertake marine and shore-based surveillance and enforcement operations, given some specialised training, improved equipment and expanded operating budgets. In contrast, the Department of Fisheries has no fleet, no operational personnel in this area, and no budgetary resources to provide this service.

Given all these factors, the following actions will be taken:

a. Steps will be taken to implement the Coast Guard's Development Plan for provision of adequate staff, equipment and other support for supplying services in the offshore, inshore and inland fishing zones.

b. A Fisheries Surveillance and Enforcement Coordinating Committee will be established with suitable representatives of the Department of Fisheries, the Coast Guard, the Guyana Defence Force, the Ministry of Foreign Affairs, the Customs and Excise Department, and the Marine Police. This Committee will plan, supervise and evaluate surveillance and enforcement operations, plan and coordinate the development of required legislation and regulations, and oversee the generation of adequate operational budgets for fisheries surveillance and enforcement operations through inter-departmental cooperation and sharing of resources.

4. Post-harvest Management (Processing and Marketing)

As discussed in earlier sections of this Annex, improvements in processing and marketing will be the most effective means of unlocking the sector's growth potential. The following measures will be undertaken as matters of priority:

a. The recommendations for quality control and improvement of the Bentink Report will be implemented. The Department of Fisheries will establish a timetable for that purpose and monitor progress.

b. A feasibility study of fish meal processing and marketing, both domestically and internationally, will be carried out and its results made available to the interested public. If such an operation proves economically feasible, this would be one important way to reduce the waste of by-catch.

c. Investment in cold storage facilities and ice-making capacity for the operating fishport complexes and fishermen's cooperatives will be assured, if necessary, by approaches to international donors for this purpose.

d. Access to freehold land for cottage processing facilities will be improved in Regions 2, 3, 4, 5 and 6.

e. Procedures for approvals and licensing of processing plants will be simplified and speeded up.

d. A national export quality control system will be established with effective mechanisms for inspection and enforcement.

e. Rules and procedures for export of fish products will be simplified.

f. Market intelligence services for the fishing industry will be expanded.

i. Consideration will be given to reducing spoilage by prescribing a maximum allowable number of fishing days at sea; factors to be taken into account include monitoring and delays in fishing caused by currents and breakdowns.

j. Training in proper handling of fish for quality control will be provided to crews, onshore handlers, cottage processors, and marketing agents.

k. Trade missions will be undertaken to selected export markets, including for ornamental fish.

5. Inland Fishery

This fishery needs basic measures in respect of simple methods of processing, more sustainable harvesting techniques, and protection of habitats from degradation. The main concerns are to increase the quality and value of the fishery product extracted, ensure that harvests are sustainable, and tap into new potential in the areas of sports fishery activities and breeding ornamental fish for export.

a. Methods of preservation such as salting and smoking will be demonstrated in the rural floodplain and hinterland areas, to preserve fish during a glut for the leaner periods, with priority given to Amerindian communities.

b. Mechanisms of dialogue will be developed with principal fishing communities in the hinterland, so that they can participate in the development of operational plans for eliminating the use of explosives and poisons in fish harvesting, and for enforcing regulations on minimum mesh sizes in nets. NGOs can assist in these efforts and the rural women=s networks will be utilised to the fullest in this undertaking.

c. A comprehensive assessment of inland fish resources and habitat will be carried out.

d. With the assistance of national and international NGOs and the Amerindian Studies Unit at the University of Guyana, a survey will be carried out of Amerindian involvement in fishing and of related problems and prospects.

e. A feasibility study for the development of a sport and recreational fishery in inland waters, linked to an overall development strategy for ecotourism, will be carried out.

f. A joint commission will be formed with representatives of the Department of Fisheries, the Guyana Geology and Mines Commission, Amerindian leaders, the Environmental Protection Agency, and concerned NGOs; this Commission will be tasked with developing recommendations for controlling and mitigating the impact of mining on inland fish habitats, with special but not exclusive emphasis on the effects of missile dredges and alumina wastes.

g. The Fisheries Department will seek to encourage exporters of ornamental fish to conduct research into breeding selected species of ornamental fish in captivity. This will be done by providing technical assistance through foreign agencies possessing such expertise.

6. Aquaculture

Aquaculture is the sub-sector of fisheries with the greatest potential for expansion of production, creation of employment and generation of foreign exchange earnings. Very significant potential exists in both freshwater and brackish water aquaculture activities.

As for freshwater aquaculture, tilapia was introduced to Guyana as early as the late 1940s, and the culture of the species went through a period of growth until 1990 but subsequently declined due to a lack of incentives and insufficient transfer of technology to sustain the production capacity of the cultured species. Introduction of the appropriate technology in Jamaica in 1977 took the tilapia culture industry from 16 tonnes in 1979 to 3,000 tonnes in 1989, valued at US\$8.4 million and produced in 160 ponds. The activity continues to grow. Guyana's climate is equally favourable for year-round production.

The few currently operating tilapia culture facilities in Guyana are producing only 20 tonnes from 20 ha of ponds and employ perhaps 20 Guyanese. With a transfer of technology, a propitious policy environment, and entrepreneurship, it is conceivable that by the year 2004 Guyana could have 500 ha of ponds producing 2,500 mt of freshwater finfish annually, for the local market. This would imply approximately 100 freshwater farms and employment of about 1,000 Guyanese.

The only brackish water aquaculture currently being undertaken in Guyana consists of the operations along the Corentyne Coast. Those operations are extensive in nature and rely on natural tidal flow and wild post larval shrimp and inputs of water and seed. The total area under production has increased from 400 hectares in 1987 to 840 ha in 1994; however, the production of shrimp from this area increased only marginally from 91 to 129 tonnes over that period. Yields obtained from the operations are low at only 0.2 mt per hectare per year.

Ecuador, Peru and Panama produced more than 80,000 mt of cultured shrimp in 1990 (of *P. vannamei*). Shrimp cultivation has developed more slowly in the Caribbean but the Dominican Republic produced 241 mt in 1988 and Cuba harvested 570 mt in that year, with a yield per hectare five times that of Guyana. The species used in Cuba is *P. schmitti*, the one that occurs along the Corentyne Coast. Belize and Venezuela have recently entered the marine shrimp culture industry.

A sustainable intensification of brackish water aquaculture in Guyana can only occur if the seed for the operations comes from a hatchery as opposed to a collection process from the wild. Of the 725 square miles of coastline surveyed in 1990 by the Department of Fisheries, 284 square miles were found to be suitable for brackish water aquaculture. If only a portion of this area is developed in a semi-intensive way, the potential for success is excellent. By the year 2004 it is conceivable that 2,000 hectares will be in semi-intensive operation, producing 4,000 mt of cultured shrimp from 200 farms and employing 2,000 Guyanese.

Among other benefits, expansion of freshwater and brackish water aquaculture will provide alternative sources of employment for artisanal and industrial fishermen who are affected by the decline in natural stocks of prawns and other species.

Policies to promote the fulfilment of these prospects include the following:

- a. A comprehensive sub-sectoral policy will be drafted, dealing with rights to land and foreshore resources, defining the role of the State and the private sector, and establishing regulations governing quality control and management of the environment.
- b. Joint ventures involving overseas and national firms will be encouraged, with foreign firms providing appropriate technology and access to overseas markets and local firms providing land, access to water and labour, capital to cover local costs, and access to local markets.
- c. Suitable areas of land for the conduct of aquaculture activities will be identified, and arrangements will be made for that land to be held in freehold or 99-year transferable leases.
- d. Guyana will seek to join the Commission for Inland Fisheries of Latin America and the Caribbean (COPESCAL). Membership in that body will put the country in a position to share in and benefit from the experiences of other countries in Latin America and the Caribbean.
- e. Two National Aquaculture Research Stations will be constructed, one a Freshwater culture Research Centre in Region 4, possibly at Mon Repos, and the other a Brackish Water Fish and Shrimp Research Centre on a site still to be identified.
- f. Demonstration farms for both freshwater and brackish water culture will be established, both to improve deficiencies in technology transfer and to enhance the capacity of the Department of Fisheries to provide extension services.
- g. Research will be undertaken, with priority given to system intensification, water quality management and fish diseases.
- h. The capacities of the extension services unit of the Department of Fisheries will be increased to include the delivery of fingerlings to interested parties as well as advise on various aspects of aquaculture. A special extension subunit will be created to work with Amerindian communities in both freshwater culture (in the hinterland) and brackish water culture (in the North West).

7. Institutional Strengthening

It is evident from the foregoing that the fisheries sector is of sufficient importance and future potential to require vastly strengthened public sector management. The restructuring that the sector will be undergoing reinforces this need. The principal functions that the public sector should carry out for adequate fisheries management include the following:

- policy development
- programme development
- coordination with public institutions and the private sector
- the building of public awareness and education
- programme implementation
- monitoring and surveillance
- execution of measures to ensure compliance
- information collection and management
- analysis of sector issues and developments
- liaison with counterpart bodies in other countries and international organisations
- quality control

At present, the Department of Fisheries not only has a large number of vacancies in key positions but it also has staff that is undertrained and underqualified for the duties they are asked to carry out, inadequate office space, and insufficient facilities for data management, libraries and laboratories; in addition, it lacks the necessary transportation for the staff to service the sector. In light of this:

a. To overcome these deficiencies and help the sector to fulfil its potential as envisaged in the National Development Strategy, the Department of Fisheries will be reorganised and reinstated as an autonomous Guyana National Fisheries Commission, which will be institutionally parallel to the Guyana Forestry Commission; the latter is now able to offer suitable benefits packages for professionals and is constrained only by revenue considerations.

One of the principal advantages of the Guyana National Fisheries Commission is that it will have more flexibility with respect to wages and salaries for staff and will be able to put in place incentive programmes tied to staff performance. It will also be authorised to receive grants from international agencies and to collect and utilise revenues arising from fines imposed for non-compliance with regulations in the sector, although it will not be authorised to directly receive other fees, which could lead to conflicts of interest. (To cite a hypothetical example of the latter, if the new Commission were given powers to utilise fees collected from the industry, it might promote increases in trawling activity to generate more revenues in the short run through fees, rather than restrict the activity to avoid depleting stocks).

b. The Board of Directors for the Commission will be a Fisheries Advisory Board, constituted approximately as follows:

- B A representative of the Minister of Agriculture responsible for Fisheries
- B The Permanent Secretary of Agriculture
- B A representative of the Minister of Finance
- B A representative of the Coast Guard
- B A representative of the Ministry of Health
- B A representative of the Environmental Protection Agency
- B Two representatives of Fishermen's Cooperatives
- B A representative of the industrial processors
- B A representative of the cottage producers

- B A representative of the small exporters
- B A representative of the Amerindian community
- B A representative of Foreign Affairs

The Chief Fisheries Officer will not be a member of the Board, precisely because the Board's role is to supervise the work of the Fisheries Commission.

c. Along with this measure, the Central Government will undertake to increase funding for the fisheries management institution by a factor of ten by the year 2000, which would still mean a net outlay of less than one-eighth of the governmental revenues generated by the sector.

Taken together, these measures will put in place institutional arrangements that are appropriate for guiding the future development of a dynamic and complex sector.

8. Public Sector Holdings in Fisheries

The problems associated with the public sector holdings in fisheries were described in an earlier section of this Annex. A decision was made to divest those holdings, and what remains is to deal with problems that arose in the divestment of one of these holdings and to proceed with the divestment of the other.

a. Some assets of Guyana Fisheries Limited were leased to Marine Food Product Limited, and the latter has not been making payments on the lease recently, arguing that the original agreement is flawed and should be renegotiated. If a reasonable agreement cannot be reached soon, then those assets will be put up for sale at a public auction.

b. The costs of rehabilitating the Houston Complex will be estimated. In the event that the present renters do not agree to increase the rent to cover those costs, plus continued maintenance, then this asset will also be put up for sale.

These assets play a marginal role in the sector and the Government perceives no gain from continuing to underwrite the financial losses associated with their continuance in the present form. Rather, it will focus its efforts and resources on strengthening the management of the sector in the ways outlined throughout this Annex.

9. Other Policies

a. The Government will promote initiatives with the Governments of Venezuela, Suriname, Cayenne (French Guiana), and Brazil to manage the fishing effort on transboundary stocks jointly.

b. A certificate programme in fisheries management and quality assurance will be initiated at the University of Guyana.

c. The Department of Fisheries will develop a programme, jointly with GNCCB, Scotia Bank and IPED in order to expand access to credit for women engaged in fisheries production and marketing.

d. The Department of Fisheries will develop a programme, and oversee its implementation, for the improvement of working conditions for women in fish processing plants and markets.

VII. Legislative Changes

To date, the fisheries policy and regulations of Guyana have been guided by the provisions of the Fisheries Act of 1957, the Fisheries Regulations of 1959, the Fisheries (Pin Seine) Regulations of 1962, the Fisheries (Aquatic Wild Life Control) Regulation of 1966, and the Maritime Boundaries Act of 1977. Neither the Fisheries Act nor the Fisheries Regulations have been updated since they were first passed by Parliament in the late 1950s. They contain no provision for dealing with key issues such as declining fish stocks, management of aquaculture fisheries, and new fishing technologies.

In 1986, the Government of Guyana, through the Department of Fisheries, sought the assistance of FAO to help in drafting a new Fisheries Act and Regulations, updating the existing provisions in line with the realities of fisheries in Guyana in the late twentieth century. FAO did provide some initial assistance with the first draft but it was never completed. On the request of the Government of Guyana, FAO is to implement in the very near future a project to complete the drafting of the Act and Regulations for consideration and approval by the Ministry of Agriculture and Parliament. The new Act and Regulations will provide the legal framework for the fisheries policies set out in the National Development Strategy.

This new legislation, which will encompass the entire fisheries subsector (marine, inland, and aquaculture), will deal with such areas as:

- Licensing and limiting trawlers
- Licensing and limiting gear and regulating mesh sizes
- Closed seasons and grounds
- Quality assurance procedures and controls
- Fisheries Management and Development Plan
- Fisheries Advisory Committee
- Establishment of the Guyana National Fisheries Commission
- Regional cooperation in fisheries
- Fisheries access agreements
- Foreign as well as local fishing licences
- Fisheries research
- Ornamental fish export
- Aquaculture
- Surveillance and monitoring
- Fines for failure to comply with regulations

Guyana has played a role in the development of fisheries worldwide as it was the sixtieth signatory to the 1983 U.N. Convention of the Law of the Sea (UNCLOS III) that brought the convention into force. However, Guyana has not capitalized on its rights and privileges under the Convention as it has lacked the institutional capability to provide the monitoring, control, and surveillance necessary and the resource assessment capability to protect diligently its marine resources from over-exploitation through proper conservation and management measures. Guyana does not currently have the data to determine its total allowable catch and thus should be extremely cautious about negotiating access by other States to fish the surplus (if any exists) until this is known.

Although Guyana has had joint fishery agreements in the past with foreign fishing fleets, including Cuba, Barbados, Jamaica, the USSR, the German Democratic Republic, and other countries, all are nonfunctional because they have expired or were never activated. Given the current lack of information on the resource and thus, Guyana's violation of the terms of UNCLOS, this is probably a blessing although data suggest that there is at the present time, active illegal fishing by several countries, most notably Venezuela and Suriname.

The new regulation will make provision for addressing the international accords of UNCLOS III, Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas, International Cooperation in the Conservation and Management of Straddling Fish and Highly Migratory Fish Stocks, and the Code of Conduct for Responsible Fishing.