CONTRIBUTION 10.8

National Report on the Status of Fisheries and Aquaculture in GUYANA

EXECUTIVE SUMMARY

Guyana is a relatively small producer of fish and seafood when compared to global volume, however in the Caribbean region, Guyana has historically led all producing nations. Guyana exports a significant portion of its production, by value. In recent years many of the resources that underpin the industry have shown the effects of excessive human and environmental impacts, both targeted and accidental. As Guyana experiences its rapid industrial development the demand for fish and fish products increases along with the negative effects on local fish population.

This summary report serves to provide the Member States of the Caribbean Regional Fisheries Mechanism with a work progress during the year 2022 related to agreed CRFM objectives, plans and the provisions. The document highlights implementation of agreed policy and management instruments, as well as country-level efforts to enhance the management of the sector in a way to ensure participants benefit from the available resource, thus ensuring economic and social stability.

Description of the fisheries sector in Guyana

The fisheries subsector is divided into three components, as detailed below.

Table1. fisheries sector by its components

Marine Fishery	Aquaculture	Inland Fishery
• The Offshore Industrial (shrimp Trawl) Fishery	• Brackish-water Culture	• Subsistence Fishery
• The Semi-industrial Fishery	• Fresh-water Culture	• Ornamental Fishery
• The Inshore Artisanal Fishery		
• Tuna longline fishery		

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INDUSTRIAL FISHERY

The industrial fishery is well developed. This fishery contributes significantly to the national economy by providing employment, foreign exchange, and export earnings. It comprises the seabob and prawn's fishery.

The Offshore Industrial fishery consists of ninety nine (99) trawlers vessels. Six (6) trawlers (did not operate) directed at exploiting mainly penaeid shrimp with finfish and small amounts of squid and lobster as by-catch, while eighty-nine (89) mainly exploit seabob (70 operational) and various fin-fish species with small quantities of penaeid shrimp as by-catch. The Turtle Excluder Devices (TED's) and the Bycatch Reduction Device (BRDs) are mandatory for the entire shrimp trawl fleet. Ice and freezing facilities servicing this fishery are owned and operated by people within the fishery sub-sector. Trawlers measure about 21 m in length, use double outrigger shrimp trawl nets, and operate in waters 14 to 91 m in depth over the seabed of mud, gravel or sand. The penaeid shrimp vessels would spend an average of 30 days at sea and make approximately 10 -12 trips per year. The Seabob trawlers spend 5 - 9 days at sea, but an average trip lasts 7 days. A typical Seabob vessel makes 2 - 3 trips per month, and an average of 30 trips per annum (Hackett & Maison, 2001).

The seabob fishery is the most economically viable fishery in Guyana. In the late 1950s, foreign companies established bases in Guyana and its neighboring countries and commenced exploitation of four species of prawn (*Penaeus spp*.) found on the continental shelf, (Ehrhardt & Shepard, 2001). This fishery expanded rapidly until 1975 (Ehrhardt & Shepard, 2001). In 1977 with the adoption of the EEZs the shrimp fishery became a national fishery and the local landings dropped along with the fishing effort. The late 1980s saw a reduction in catch rates and the total catch of these species (*Penaeus spp*.). This forced some companies to close operations and to sell their vessels to local entities. Many of these vessels' owners later converted the trawlers to catch Seabob (*Xiphopenaeus kroyeri*).

The trawl fishery for Seabob started in 1984 and experienced rapid and impressive growth as indicated by vessel numbers, total catch, the number of processing plants and other infrastructure, peaking in 2000. It was the dominant activity of the industrial fishery during that period, (DF/CRFM), 2007). Resource management and sustainable exploitation, climate change impacts together with rising fuel costs, are currently the major concerns for this fishery. Participants in the industrial fishery have formed the Guyana Association of Trawler Owners and Seafood Processors (GATOSP). Its membership includes all three processing plants owners, who also own trawlers, and all other trawler owners (D. Maison, 2012).

The seabob fishery through its association GATOSP, continues to work assiduously with the Fisheries Department to maintain certification and improve its score in all areas since it initially obtained Marine Stewardship Council certification. It is a major stakeholder in the development and execution of the management plan developed by the Fisheries Department.

Inshore Artisanal Fishery

This fishery consists of 1315 vessels ranging from 6 – 18 meters propelled by outboard or inboard engines. All boats are manufactured locally. The fishing gears in use includes Chinese seine/fyke.

Table 2. Vessels in the artisanal fishery by gear type and location

Location	C/S	GNN 2-4"	cc 5-6"	inb 7-8"	Cat guts	Anchor Seine	Tie Seine	P/S	Cad	Circle Seine	Total
Region 1	10	10	8	0	0	0	0	0	0	0	**28**
Region 2	22	53	31	24	6	3	1	3	7	0	**150**
Region 3	70	44	45	5	0	36	0	4	37	0	**241**
Region 4	97	118	69	19	0	0	0	1	9	0	**313**
Region 5	64	130	6	1	33	3	0	2	4	0	**243**
Region 6	42	103	170	0	0	0	0	11	0	14	**340**
Total	**305**	**458**	**329**	**49**	**39**	**42**	**1**	**21**	**57**	**14**	**1315**

The Inshore Artisanal Fishery is mainly demersal. Some of the main species caught in this fishery include Seabob and Whitebelly shrimp, Gillbacker, Bangamary, Sea Trout, Grey Snapper butterfish, shark, king fish and catfish.

Inland and Ornamental fishery

The Inland Subsistence Fishery involves the catching of fish in rivers, lakes, canals, flood plains, etc., by subsistence or part time fishermen for their own consumption or for sale. The activity tends to be influenced by the season and in some areas by the down periods for agricultural and other activities. For example in the sugar estate areas the intensity of activity varies with the sowing and harvesting of the sugar cane. Small flat bottomed long type vessels and cast nets, seine or handlines are used in the exploitation of the fish (FAO 2007).

This fishery is important to the well-being of the hinterland population which is about 10% of the population of Guyana. A number of Amerindian communities usually get their main source of protein from the rivers and creeks in their communities. They also depend on the fish for their livelihood. Fish is caught and dried and sold to miners and foresters in their area and in other communities.

There is also a small but active inland fishery for ornamental fish. Live fish are caught in the upper reaches of the rivers by collectors, these fish are sold to several exporters of ornamental fish. These fish are exported mainly to the U.S.A. and the fishery is managed mainly by the Guyana Wildlife Authority.

The government with the help of FAO has prepared a development plan for the inland fisheries management. This is presently with the minister responsible for fisheries.

Aquaculture

Aquaculture development is spearheaded by the Satyadeow Sawh Aquaculture Station (SSAS) of the Fisheries Department. The facility is used to execute research activities, train farmers, and produce fingerlings. The SSAS also provides extension services and free technical advice to farmers. The Satyadeow Sawh Aquaculture Station was constructed with funding provided by the Government of Guyana, the Food and Agriculture Organization of the United Nations (FAO) and the Canadian International Development Agency (CIDA). The station provides information on site selection, pond preparation and farm management. Technology transfer and training are offered to the local farmer. The facility is also involved in the production of fingerlings of various species, and conducts trials on feeding, growth rates, and other parameters for species with aquaculture potential. The Department of Fisheries continues to maintain and upgrade the Satyadeow Sawh Aquaculture Station and its extension services.

Although aquaculture activities first started in Guyana in the 1950s, to date the development of the industry has been slow but steady. Development has been impeded by lack of investment capital, technical skills, appropriate technologies, equipment and inputs, and research and training. Some amount foreign investment has been injected into the industry since investment prospects generally have been better elsewhere in the region (D. Maison 2012).

Two forms of aquaculture are practiced in Guyana the brackish water culture, and freshwater pond culture. Brackish water farms operate as extensive poly-culture systems utilizing the existing sluices and dams from the sea defense structures to control water exchange at high tide. The sluices, when opened, bring tide water and a mixture of eggs, fish fry and shrimp larvae into the impoldered swamps. In the impoldered 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, tambaqui, 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. There are over 2000 hectares under cultivation in about sixty farms. In 2021, through government intervention approximately USD$3,000,000 was invested in brackish water aquaculture development and cage culture.

The freshwater farms are spearheaded by the SSAS which supplies the farms with seedlings. There are over 200 acres of farms under cultivation in Guyana.

The project TCP/RLA/3003 (D) entitled “Introduction of aquaculture and other integrated production management practices to rice farmers,” has been designed to demonstrate the aquaculture potential of tilapias in rice-based farming systems through on-farm demonstration. Other projects were pursued by the government of Guyana to give aquaculture a boost.

These include:

The FAO technical cooperation

An FAO Consultant assisted the brackish water Shrimp farmers in Region #6 in improving their shrimp yield. Mr. De Aliza prepared a manual on "Shrimp Farming in Brackish Water Ponds" He also provided support to the rehabilitation of the Onverwagt Fish Station as a multi-purpose facility.

Japan International Cooperation Agency (JICA Technical Cooperation)

The JICA consultant was attached to the Guyana School of Agriculture but conducted the research on "Three Different Feeding Regimes for Tilapia Grow Out" at SSAS. He also reviewed the Basic Aquaculture Training Manual.

Brazil Technical Cooperation Agreement

The Ministry of Agriculture has signed an agreement with Agencia Brasileira de Coopercao (ABC), "Technique Transfer to Contribute towards the Development of the Aquaculture Sector in Guyana". This is to strengthen the SSAS technical capabilities

Social Investment

In 2022, fishers were faced with many challenges which impeded their ability to feed the nation and Caribbean as a whole, such as, climate change, low catches, illness, loss of life at sea, and global inflation. Through partnerships and government intervention, the following programmes were implemented to alleviate these burdens on fishers:

1. Guyana Online Academy for Learning (GOAL) Online scholarship – fishermen are encouraged to utilize the national programme to enhance their knowledge and skill in other areas from fishery.
2. US$750 gash grant - help members of the fishing industry recover from the effects of the COVID-19 pandemic as well as cushion the rise in cost of living
3. The TCP/SLC/3807 (E) Emergency Response and Early Recovery Support to Smallholder Fishers Affected by the 2021 Floods in Guyana and Suriname, to bring relief to 150 fishers in Regions 2, 3, 4, 5 and 6.
4. Fisheries Enhancement Project– 70 landing sites were selected to be enhanced with sanitary facilities, sheds, revetment, solar lights and wharfs.

STATISTICS, RESEARCH, CONSERVATION, AND MANAGEMENT PERFORMANCE OF THE MARINE FISHERIES

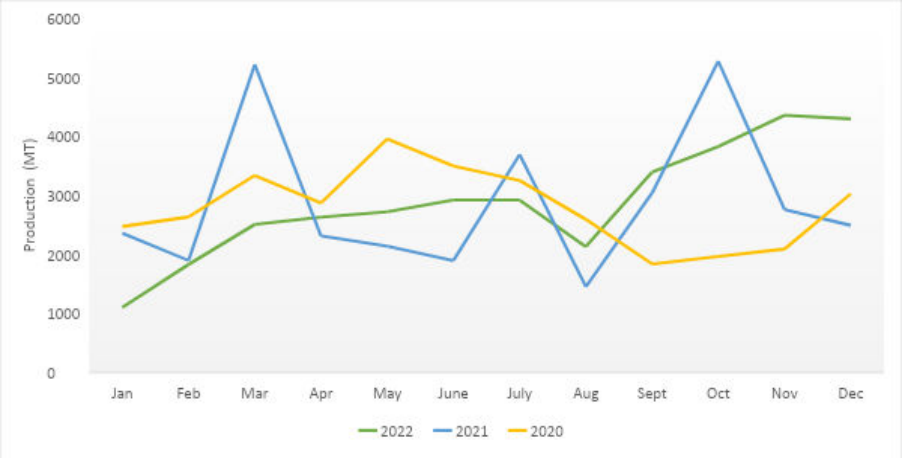

Figure 1. Marine production 2020-2022

Marine production has shown fluctuating patterns of production landings throughout 2020 and 2022. The marine capture fishery produced an estimated landing of 33,536mt in 2020, 34,538mt in 2021 and 34,647mt in 2022. There was an increase of 0.31% from 2021 – 2022, with a positive trending line projection for both years. However, a negative trend was noted for 2020.

In 2020 marine fisheries experienced its highest production landings in May and its lowest landings in August. Further, there was a gradual decrease in landings from May to September for the same period. It is important to note, that the seabob trawl fishery was closed for 10 weeks from September 1st, 2020, to November 9th, 2022. This closure has contributed significantly to the low catch observed during that period.

Significant rainfall occurred in May – June 2021 resulting in large amounts of fresh water entering the ocean. There was a reduction in marine production, with several fishing villages being affected by flooding. Marine fisheries experienced its highest landings in March with seafood production totaling 5,216 mt. This was the largest landing observed for both 2020 and 2021. For the remaining period, both high and low production landings were experienced.

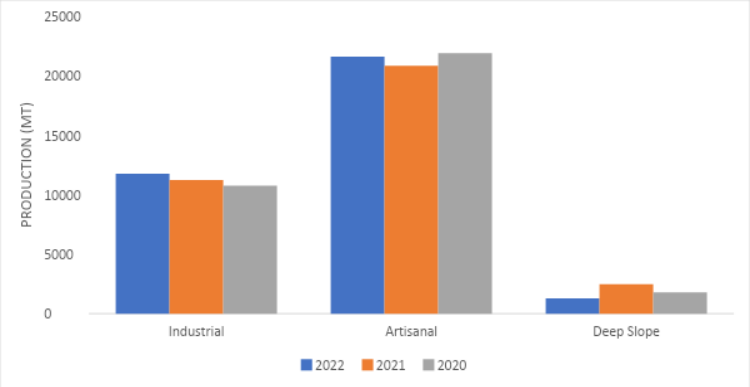

Figure2. Production landing by fishery

Production in the artisanal sector continues to be the largest producing fishery for Guyana in 2020, 2021 and 2022 compared to the other marine fisheries. The importance of small-scale fisheries to Guyana's food security is paramount. Furthermore, there was a slight decrease in artisanal production landing from the previous year. Both the industrial and deep slope attained an increase from the previous year.

Industrial CPUE 2021 and 2022

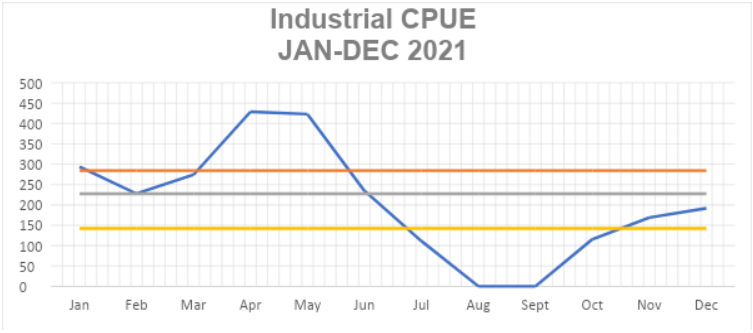

Figure 3. The Industrial Seabob Catch per Unit Effort (CPUE) in 2021

For the year of 2021 the Industrial Seabob Companies recorded an annual CPUE rate of 276 kg/ndas. The month of April recorded the highest CPUE for 2021 which was 429 kg/ndas. The lowest monthly CPUE was observed in the month of November with 169 kg/ndas (i.e the closed season period not included 27th July -3rd October). The Industrial Seabob companies collectively had an averaged CPUE of 206 kg/ndas per month in 2021.

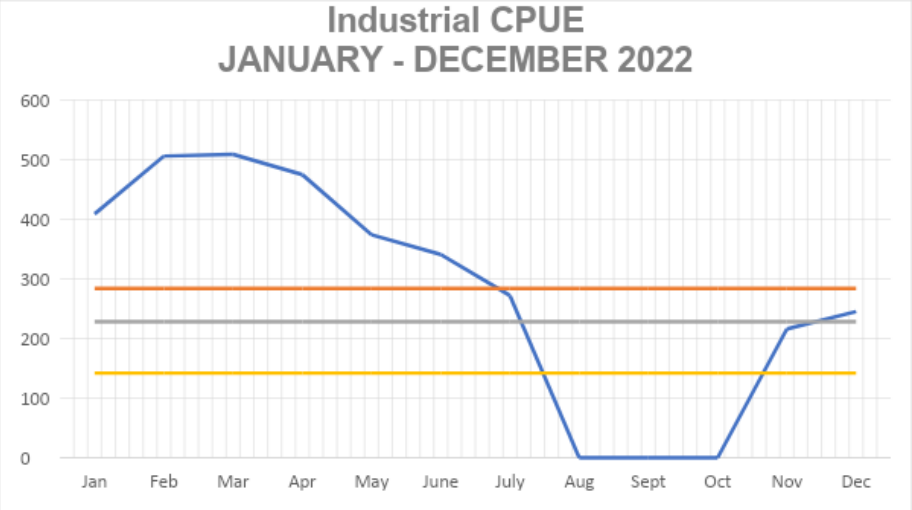

Figure 4. The Industrial Seabob Catch per Unit Effort (CPUE) in 2022.

For the year 2022, the Industrial Seabob Companies recorded an annual CPUE rate of 354 kg/ndas, an increase of 28% from 2021. The month of March recorded the highest CPUE for 2022, with 509 kg/ndas. The lowest monthly CPUE was observed in the month of December with 245 kg/ndas (i.e the closed season period not included 31st August – 7th November). The Industrial Seabob companies collectively had an averaged CPUE of 279 kg/ndas per month in 2022.

Licencing and permit

Artisanal Licence and Permits

One thousand five hundred and thirty (1530) artisanal vessels were licensed representing a 171.2% increase when compared to 2021 (564).

Commercial Fishers

There were three thousand one hundred and four (3,104) Commercial fishers permits (workmen) were issued for the year of 2022, representing a 47% increase from 2021.

Fish Pen/Pin Seine

A total of nine hundred and forty-nine (949) fish pen permits were issued for 2022, representing 208% from 2021.

Registrations

Two hundred and nine (564) new persons were registered for the year of 2022. This number represents an achievement of 170 % from 202.

Industrial vessels

Ninety-nine (99) trawlers, of which eighty-nine (89) targeting seabob/finfish and nine (6) targeting Penaeid (prawns) were licenced in 2022.

Semi-Industrial

One hundred and Twenty-nine (129) Red Snapper vessels were licenced for 2022, an increase of 40% from 2021. Eighty-nine (84) local trap red snapper vessels were registered for 2022, while sixty-two (62) Venezuelan longline vessels were licenced to operate for a period of three (3) months at the following companies.

Processing Plants and Storage Facilities

Twelve (12) processing plants were inspected and licensed for fish and shrimp. Small and cottage processing establishments.

Twenty-five (25) small seafood processing establishments were registered, inspected, and licenced in 2022.

Individual Export and Import Licences

Six hundred and thirty-nine (639) individual export licenses were issued in 2022 representing a 1.8% decrease when compared to 2021; while, one hundred and fifty-three (153) individual import licenses were issued for 2022.

Aquaculture

Table 3. Aquaculture production 2013-2022

Unit		Kilograms								
Year	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
Production	220,163	373,330	417,610	474,515	696,267	310,666	243,919	237,626	141,863	1,003,372

Aquaculture fisheries production for the period 2013 to 2022 produced a total production of 3,115,959. There was a steady rise in production landings from 2013 to 2016, and in 2017 production peaked at 696,267.

Aquaculture production 2020-2021

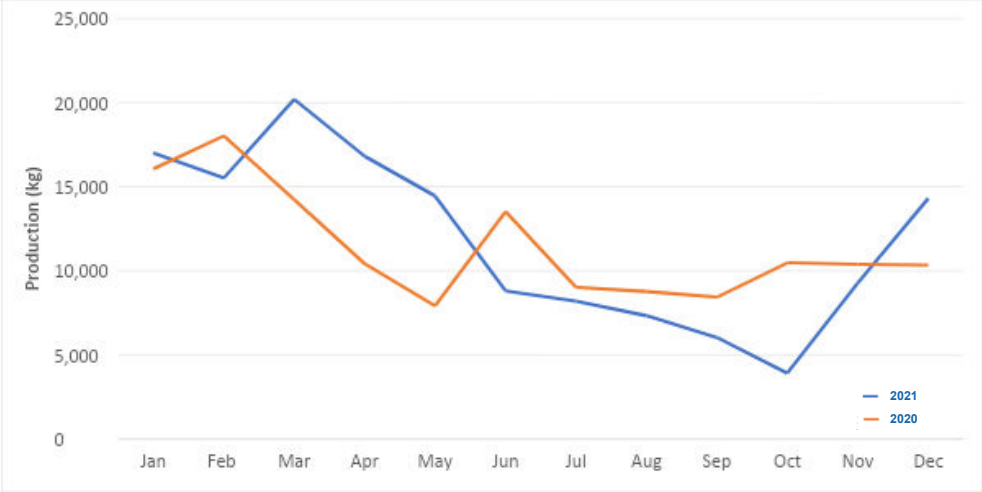

Figure 5. Aquaculture production 2020-2021

Aquaculture production landings have shown fluctuating patterns of production landings throughout 2020 and 2021. The marine capture fishery produced an estimated landing of 33,536 mt in 2020 and 34,538 mt in 2021.

Aquaculture production 2020-2022

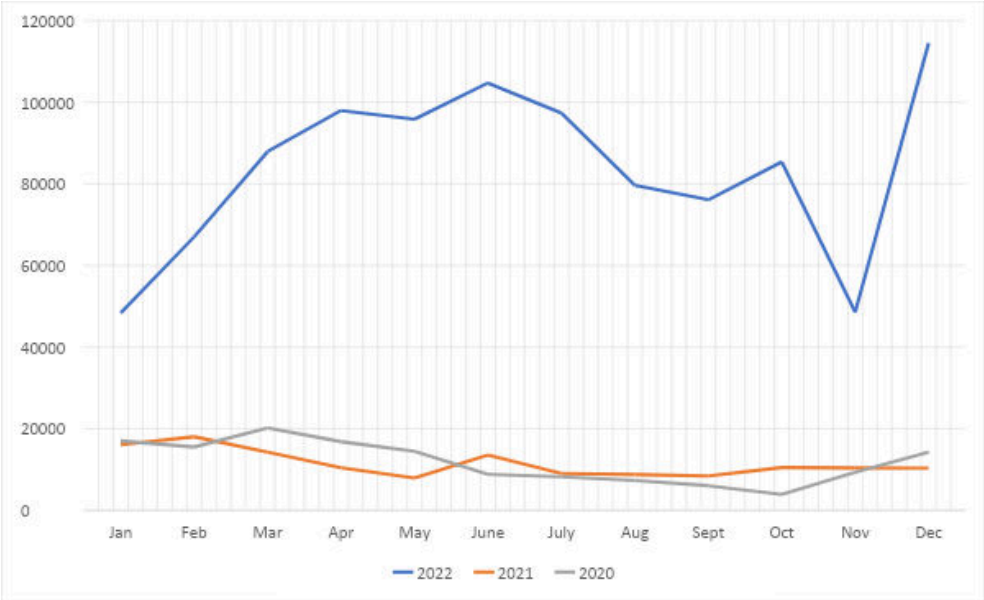

Figure 6. Aquaculture production 2020-2022

Aquaculture development has been accelerated through government intervention from 2021 with approximately USD$3,000, 000 being invested in brackish water development and cage culture. There is currently high interest from foreign investment in aquaculture as a result of government investments, with exceptional success in the production of brackish water species.

Table 5. Aquaculture production by species 2020-2022

Species	2020 (Kg)	2021 (Kg)	2022 (Kg)
Tilapia	12,089	257	13,637
Black shrimp	111,999	105,919	623,630
Tambaqui	5730	9851	307
Hassar	12,295	21599	11,930
Snook	0	0	42,775
Queriman	0	0	106,930
Mullet	0	0	123,262
Crab	0	0	52,465
Basha	0	0	35,885
Total	192,113	137,626	1,003,372

STATUS OF THE MARINE FISHERY RESOURCE

Prawns Resources

Preliminary assessments of the three shrimp *Penaeus spp*. (*P. brasiliensis*, *P. subtilis* and *P. notialis)* resources have shown that they are either fully or over exploited, with the need to reduce effort to rebuild the stocks. These assessments were carried out between 1996 and 1999 and were done on three of the four species of shrimp that are harvested by the trawl fleet. Data was insufficient for the assessment of the other species *Penaeus schimitti*. The stock assessment analysis showed that the decrease in shrimp abundance is in part due to an excess of exploitation in addition to some environmental factors (Ehrhardt & Shepard, 2001). For Example, total rainfall in Georgetown decreased by about 77% between 1967 and 1997, which may have influenced recruitment success.

Several management measures were recommended for the resource such as regulation of the effort through reduction of the number of vessels and enforcement of a closed season to protect the juvenile shrimp at the peak of their abundance to allow them to grow to maturity (D. Maison 2012)

The results from the Kilma survey in 1976 showed that the resource was estimated at 800 metric tons. This meant that harvesting levels should have only been about 50% of the resource for the resource to be sustainable for a number of years. However, harvesting levels were as much as five times the estimated total resource base. In 2007 there were 45 vessels harvesting the resource as compared with 100 that were exploiting the resource from 1983 to 2001. Since 2000 no other assessment has been done on the resources.

Seabob fishery

Seabob (*Xiphopenaeus kroyeri*) exploitation is the dominant activity in the industrial shrimp trawl fishery. As recently as 2017, the seabob fishery has been showing signs of overexploitation. Seabob trawlers were staying longer at sea and the average size of the shrimp appears to be declining. Production statistics for the last 5 years have shown that annual shrimp production has been experiencing a steady fall. (Fisheries dept annual report 2017-2021). Seabob landings have declined from 21,659 mt in 2017 to 8,002 mt in 2021, a reduction of 63% in five years. In 2020 industrial seabob landings produced an average 9698 mt and in 2021, 8003 mt a decrease of 17.5% from the previous year. However, in 2022 8,764.4 mt of seabob was harvested from both the artisanal and industrial fishery, a 9% increase from 2021.

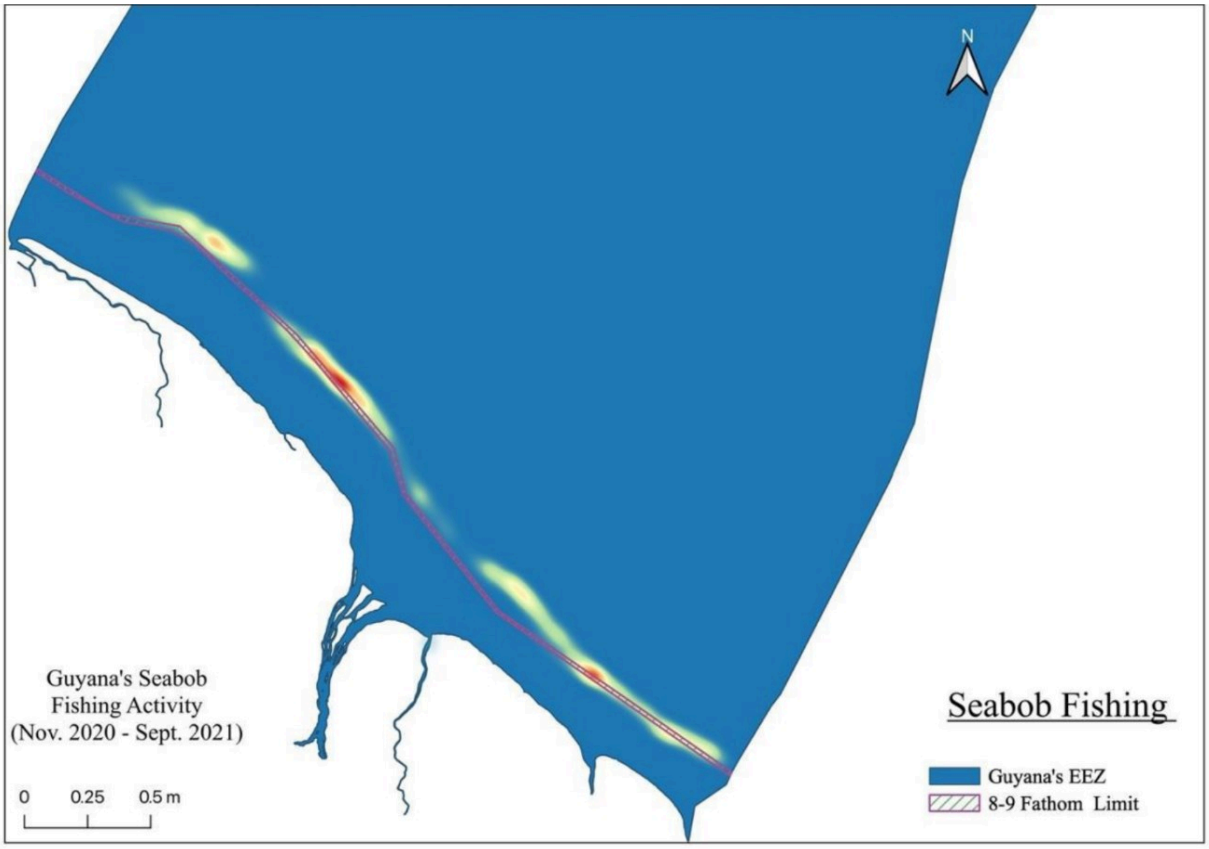

Figure 7. Seabob fishery activity within the Guyana EEZ

The seabob fishery underwent its Marine Stewardship Council (MSC) certification annual audit in 2022. A summary of the conditions progress is in figure 8, below:

2.1.1 Summary of Conditions

Table 6 Summary of conditions for Guyana Seabob fishery (SA = Surveillance Audit; OT = 'On Target'; BT = Behind Target; C = Closed). For conditions 3, 4 and 5, under Derogation 6, there is no requirement to formally evaluate progress against this condition.

No.	Condition	PI	PI original score	1st SA	2nd SA	3rd SA	4th SA
1	The assessment of stock status is subject to peer review.	1.2.4e.	75	C			
2	Main secondary species are highly likely to be above biologically based limits, or, if below biologically based limits, there is either evidence of recovery or a demonstrably effective partial strategy in place such that the UoA does not hinder recovery and rebuilding.	2.2.1a	75	OT	OT	BT	
3	Provide evidence that there is a strategy in place that can identify unacceptable impacts on ETP species.	2.3.2a	75	OT	OT	N/A Der. 6	
4	Accurate quantitative information that is adequate to measure trends and support a strategy to manage impacts on ETP species should be collected.	2.3.3 a&b	60	OT	OT	N/A Der. 6	
5	Evidence should be provided to demonstrate fishers comply with the management system under assessment.	3.2.3c	70	OT	OT	N/A Der. 6	
6	The fishery-specific management system should be subject to regular internal and occasional external review.	3.2.4b	70	C			
7	An MCS system has been implemented in the fishery and has demonstrated an ability to enforce relevant management measures, strategies and/or rules.	3.2.3a	70	n/a	OT	C	

Figure 8. Summary of MSC conditions progress after 3rd audit

STATUS OF FISH RESOURCES

a. Red snapper

Anecdotally, the fishermen report a decrease in CPUE since the early days of the fishery in the 1990s – but this is a logical pattern if the fishery was new. Grouper stocks taken as a bycatch also appear to be in decline. Currently, red snapper fishery have been showing fluctuating patterns of landing with an average annual production of 1600 mt. A preliminary assessment done by the CARICOM Fisheries Unit (2003) indicated that the status of the red snapper resource was unclear.

b. Other finfish

The main finfish stocks are targeted by the artisanal and trawl fishery The ground-fish assessment – citing various research surveys over the years indicated that some fish stocks were being exploited at or above sustainable levels. Stock assessments of Bangamary butterfish and seatrout indicated that the long-term sustainability of these stocks are under threat (CEFAS 2017).

In recent years finfish production has shown a steady increase. During 2020 and 2021 it was observed that artisanal fisherfolks were employing more gear and spending more days at sea to harvest the same amount and sometimes even less as previous years. The artisanal fishery is an

open access fishery and measures should be taken to restrict the effort if the fishery is to be managed on a sustainable basis.

POLICIES AND LEGISLATION

- Act and Regulations in Force: Fisheries Act 2002 (replaced the 1959 Fisheries Act and portions of the 1977 Marine Boundaries Act). The revised Fisheries Act, which was drafted with FAO assistance in 1983 and 1999, include a number of new provisions, such as: authorizing the Minister to promote the development and management of fisheries to ensure the optimum utilization of fisheries resources, mandating the Chief Fisheries Officer to prepare and keep under review a plan for the management and development of fisheries, including consultations with fishermen and others stakeholders, creation of a Fisheries Advisory Committee, procedures for licensing fish processing establishments; dispute settlement in fisheries and for foreign and local licensing, fishery Products Regulation 7, 2003, (DoF/CRFM), 2007).

Currently, through collaboration with FAO, the Act is in the process of being updated to include key fisheries management principles, such as the ecosystem based approach to fisheries management, addressing gaps in aquaculture management, combating IUU fishing through the Port State Measures and strengthening inland fishery management.

- In 2012 Guyana received technical assistance from FAO to develop the **policies for Inland** and **Aquaculture Fisheries**. The policy has been finalized and implemented later in the year.
- Established the Marine Regulations (2018) and preparing regulations for aquaculture it will be mandatory for all seabob vessels to be equipped with Vessel Monitor Surveillance (VMS), Fish Aggregating Devices (FAD) and By-catch Reduction Devices (BRD).
- **The Fisheries Management Plan (2022-2027)** was recently implemented in 2022 (supported by WWF).
- **The Seabob Management Plan (2022-2027)** was recently implemented in 2022 (supported by WWF).
- **The Artisanal Fishery Strategic Framework and Management plan (2019-2024)** This management plan, that **runs from 2019 to 2024**, allows Guyana to maintain its obligations towards upholding the United Nations Sustainable Development Goal #14 which seeks to conserve and sustainably use the oceans, seas, and marine resources (supported by WWF).
- **The Arapaima Management plan (2002)** - was designed through a series of participatory meetings between community fishermen governmental and non-governmental organizations. The objectives of the plan are to increase the local Arapaima population, improve local organization institutions and increase local fishers' income. The guiding philosophy of this management plan is that local social organization will be improved as local people work to conserve an economically important natural resource. Currently the plan is obsolete. A review and updating of the plan are required.
- **Maritime Zones Act (2010)**150 repealed the Marine Boundaries Act (1977)151 that first set up a fisheries zone beyond and adjacent to territorial waters (i.e., beyond 12 n.mi) and

extending out to 200 n.mi. from land. In 1991, the zone became recognized as an Exclusive Economic Zone (EEZ).

- **Fisheries (Exemption from Registration) Order (1957)**: which exempts from the provisions of section 3(1) of the Fisheries Act, all fishing boats not exceeding thirty-five feet in overall length measured from stern to stern, and all fishing boats in the interior, except fishing boats exceeding thirty-five feet in overall length used for transporting fish to the city of Georgetown.
- **Fisheries (Pin Seine) Regulations (1962)**: specifies the features and conditions for handling of pine seine and fish.
- **Fisheries (Aquatic Wildlife Control) Regulations (1966)**: provides conditions to capture collect, remove or slaughter any form of prescribed aquatic wildlife found in any waters in the country.
- **Fisheries Products Regulations (2003)**; provide conditions for exporting and marketing of fisheries products; and
- **Fisheries (Turtle Excluder Devices) (2006) Regulations (2006)**: provides the requirements for the protection of sea turtles.
- **Marine Mammals Protection Regulation (2022**) Prevent marine mammal species and stocks from diminishing to the point that they are no longer a significant functioning part of their ecosystems. Restore diminished species and stocks to their optimum sustainable populations.
- **Fisheries Products Regulation 2022:** Ensures high quality standards are applied in the production, exportation and importation of fishery products

Policy Instruments

The policy instruments used to manage the fisheries resources are licensing systems, closed fishery, closed season, contractual arrangements with foreign fleets and monitoring and enforcement.

Licences are used in the open access artisanal fishery; this however is just a way of gaining access to the fishery and is not used as a management tool. It is also a way for the government to extract funding for the management of the resource. There are approximately 1315 artisanal vessels and, in any year, approximately 84% of the fleet is licensed (Fisheries Department, 2021). License fees are also charged for the closed shrimp fishery which has 107 shrimp trawlers of which 87 are licensed to harvest seabob and 12 licensed to harvest prawns. The shrimp industry also has a closed season that is done in collaboration between the industry and supported by the government. This is done to protect the juvenile shrimp until it reaches maturity and to allow for recruitment for the next fishing season. There are consultations between the government and the industry as to when the closed season.

The licensing system is also used in the semi-industrial fleet for the red snapper fishery which has both a local and foreign fleet. A contractual arrangement of 1-year periods is offered to foreign fleet.

Other licenses issued are for export, processing plants and for storage facilities. In order to monitor the activities of individual export, licenses are issued per shipment with any amount of shipment within a month. The large processing plants are issued with annual licenses for export

and the processing plants. The fees charged are very marginal in relation to the value of the resource and the product being exported. Just about 60% of the production is exported, (Fisheries Department, 2005).

Monitoring and enforcement activities are carried out by the fisheries department with assistance from the Guyana Coast Guard and the Marine Police.

INSTITUTIONAL FRAMEWORKS WITHIN THE FISHERIES SECTOR

The Ministry of Agriculture is the lead governmental agency responsible for fisheries development and management. The fisheries management (administration) unit within the Ministry is the Department of Fisheries (DF). The following (Table 7) agencies are involved in the management of fisheries in Guyana.

Government Agencies

Table 5. Agencies involved in fisheries management

Agency	Responsibility
Guyana Coast Guard and Marine Police	Mandated to monitor and ensure compliance with regulations throughout the fishery zone.
Ministry of Foreign Affairs	Responsible for international access agreements with other nations' fishing vessels**.**
Ministry of Health	Units dealing with quality assurance and safety in fisheries are the Veterinary and Public Health Unit, Food and Drug Department and the Environmental Health Unit.
Central Planning and Housing Authority	Certification of processing plants.
Guyana Bureau of Standards	Processing/final product standards
Environmental Protection Agency	Habitat protection, coastal zone management, promoting the maintenance of biodiversity and environmental impact assessment
New Guyana Marketing Corporation	Provides market facilitation services to the private sector for the export of non-traditional agricultural produce which include facilitating local market development, developing and disseminating post-harvest technology and providing appropriate market research.
Customs Department of the Guyana Revenue Authority	Deals with the importation and exportation of seafood, registration of coastal vessels, collection of levies and granting concessions on materials and equipment imported.
Maritime Administration	Inspection and issuance of Sea Worthiness Certificates for Vessels, enforces safety regulations and licensing of captains
Hydrometeorological Service	Observing, archiving, and understanding Guyanese weather and climate, and providing meteorological, hydrological and oceanographic services in support of Guyana’s national needs and international obligations.

University of Guyana	Discovering, generating, disseminating, and applying knowledge of the highest standard for the service of the community, the nation and of all mankind within an atmosphere of academic freedom that allows for free and critical enquiry
Institute of Applied Science and Technology	Provides laboratory services in testing for heavy metals in fish and fish products.
Statistical Bureau	Conducting of censuses, the collection, compilation, analysis, and publication of certain statistical information and for other matters relating thereto.

Non-governmental Organizations:

Table 6. Non-governmental organizations involve in fisheries management

NGOs	Areas of Interest
International Centre for Rain Forest Conservation and Development (IWOKRAMA)	Has responsibility for fisheries issues within its area of operation. INLAND FISHERIES
World Wildlife Fund	Interest in the conservation of marine turtles and inland fisheries
Conservation International	Conservation of marine turtles
Guyana Marine Turtle Conservation Society	Conservation of turtles
National Aquaculture Association of Guyana	facilitates the sustainable development of aquaculture

Risk Management

The plans and strategy below comes under the umbrella of climate change adaptation and disaster Risk Management, however it is not specific to the fisheries sector

- National Oil Spill Contingency 2019.
- Coastal Zone Management
- Low Carbon Development Strategy 2030

Participation in CRFM

Guyana is an active participant on the continental shelf working group (CSWG). The Fisheries Department continues to participate in reviewing the status of implementation of the national fisheries management plans for the Atlantic Seabob fisheries of Suriname and Guyana through the CSWG. The seabob working groups of Guyana and Suriname were each expected to submit written progress reports and deliver verbal presentations on the implementation of the national fisheries management plans for their national Atlantic seabob fishery. The reports and/or presentations included, inter alia, information on:

a. Status of implementation of the research plan.
b. Status of implementation of the new HCR.
c. Status of addressing MSC conditions and recommendations.

The meeting reviewed and discussed the reports and presentations, and provide technical guidance on the way forward

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