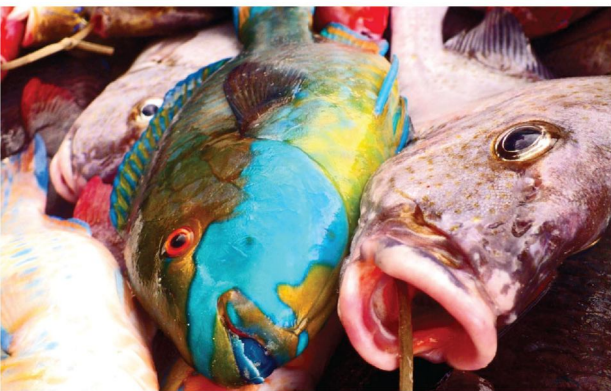




Seychelles Fishing Authority



2012 Annual Report

Responsible Fishing for Sustainability



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The Government of Seychelles,
Ministry of Natural Resources and Industry



Seychelles Fishing Authority

Annual Report

2012

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Acronyms

AFIA	Agricultural and Fisheries Incentives Act (2005)
AMESD	African Monitoring of Environment for Sustainable Development
AMPED	Aires Marines Protégées pour Espèces qui se Déplacent beaucoup
ASCLME	Agulhas-Somali Current Large Marine Ecosystem
BSFC	British/Seychelles Fisheries Commission
CANAL	Changes in the Biochemical Composition of Tropical Tunas and its Effects on Meat Quality
CAS	Catch Assessment Survey
CBS	Central Bank of Seychelles
CCA	Concessionary Credit Agency
COFI	Committee on Fisheries
CPUE	Catch Per Unit of Effort
DBS	Development Bank Seychelles
DoE	Department of Environment
EAF	Ecosystem Approach to Fisheries
EC	European Commission
EDF	European Development Fund
EEZ	Exclusive Economic Zone
EMOTION	Estimation of Maternal Effects on the Sustainability of Large Pelagic Populations
ESA	Eastern and Southern Africa
EU	European Union
FADs	Fish Aggregating Devices
FDF	Fisheries Development Fund
FMC	Fisheries Monitoring Centre
GEF	Global Environment Facility

GST	Goods and Services Tax
ICCAT	International Commission for the Conservation of Atlantic Tunas
IFREMER	Institut Français de Recherche pour l'Exploitation de la Mer
IOC	Indian Ocean Commission
IOT	Indian Ocean Tuna
IOTC	Indian Ocean Tuna Commission
IUU	Illegal, Unreported and Unregulated
LMEs	Large Marine Ecosystems
MADE	<u>Mitigating ADverse Ecological</u> impacts of open ocean pelagic fisheries
MASMA	Marine Science for Management
MCS	Monitoring, Control and Surveillance
MCSS	Marine Conservation Society Seychelles
MENR	Ministry of Environment and Natural Resources
MNRI	Ministry of Natural Resources and Industry
MSA	Maritime Safety Administration
NODC	National Oceanographic Data Centres
NSB	National Statistics Bureau
NDEA	National Drug Enforcement Agency
ODINAFRICA	Ocean Data and Information Network for AFRICA
OFCF	Overseas Fisheries Cooperation Foundation
PSM	Port State Measure
PV	Patrol Vessel
RFSP	Regional Fisheries Surveillance Project
SADC	Southern African Development Community
SCG	Seychelles Coast Guard
SEnPA	Small Enterprise Promotion Agency
SEYPEC	Seychelles Petroleum Company
SFA	Seychelles Fishing Authority
SLA	Seychelles Licensing Authority

SNPA	Seychelles National Park Authority
SPDF	Seychelles People Defence Force
SOTN	Seychelles Ocean Temperature Network
SWIOFP	South West Indian Ocean Fisheries Project
VMS	Vessel Monitoring System
WIOMSA	Western Indian Ocean Marine Sciences Association
YES	Youth Enterprise Scheme

Foreword

In November 2011, the President appointed a new Board of Directors of which I became Chairman. This Board, composed of 5 members, represents the artisanal sector, the semi-industrial fishery, the business community and the Government. It faced serious challenges and great expectations, as fisheries, together with tourism, are the main pillars of the Seychellois economy that, as the Blue Economy concept reminds us, remains inextricably linked to its marine environment.

The Board adopted the guiding principles of good governance, transparency and accountability for its actions and embraced the mission of building a Seychelles Fishing Authority that is an effective custodian of the marine resources of Seychelles, by strengthening the ability of the institution to deliver the services needed. As we approach the end of the second year of our work, it is a good opportunity to reflect upon the achievements and the challenges still ahead.

The new Fisheries Act, several years in the making and now nearing its completion, will bring new elements and tools to improve the management of our fisheries, including an ecosystem approach to fisheries, and a stronger participation of all stakeholders. This will require the strengthening and re-focusing of the SFA efforts towards better understanding of the status of our resources, and the formulation of management plans that will provide for rational sustainable utilization on the basis of our best knowledge.

The vision of the Board is that the Seychelles Fishing Authority continues to work at the service of the people to ensure that the contribution of the fisheries sector to our Blue Economy and to the well being of the Seychelles is enhanced, while maintaining a sustainable utilization and an equitable distribution of the benefits in the society.

As the main tuna fishing port, SFA is working towards the development of the infrastructure that we need to fully utilize the potential of our Blue Gold, by delivering the essential services needed to create business opportunities for the



By Mr Philippe Michaud,
Chairman of the Board of
Directors

private sector, working on the support of the tuna fleets operating from Victoria. The sectoral funds made available through the Fishing Partnership Agreement signed with the European Union, have allowed developing a number of projects that reinforce the fishing sector.

These projects such as the tuna quay and fish processing facilities should be completed by the end of 2013, and will contribute towards maximizing the economic benefits of the fisheries. It is not only necessary that Port Victoria remains the most important tuna port in the Indian Ocean as far as tonnage and transshipments of tuna are concerned, but it is essential that it continues to provide critical services for the tuna fleet and that more tuna is being landed and processed. SFA will play a bigger role in ensuring that this objective is met with the development of Zone 14 at Ile du Port.

Supporting the artisanal sector, the SFA continues to implement capital projects that will also expand the facilities for our fishing community, such as the projects in Providence and support in infrastructure for various fishing landing sites, (Bel Ombre, Praslin, etc.) to facilitate the work and the safety of our fishermen.

Resources at sea are not inexhaustible, and we have to realize that a rational utilization is the best defense against the dissipation of the rent brought about by open access. The formulation and implementation of the management plans will bring an opportunity for the participation of all stakeholders, in line with policy of the government to move towards a participatory management. The future management of resources in Seychelles will require a partnership between the various users of the resource to share not only the benefits, but also the responsibility of ensuring that regulations are effectively implemented, and that action is effective when necessary to defend the sustainability of our resources.

The recently approved initiatives for the co-management of the Praslin fisheries, and the agreement with the Association of Members of the Seychelles Sea-Cucumber Industry (AAMSI) to work cooperatively with stakeholders for a better management of the sea cucumber fishery are sure steps towards a participatory experience in the management of our domestic fisheries.

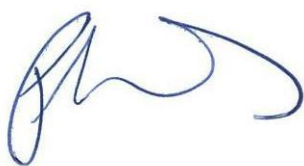
SFA is in the process of creating a Special Economic Unit that will work with other government offices towards a comprehensive economic valuation of the fishery and its contribution to the Blue Economy and understanding how changes in fisheries policy affect the benefits derived from the sector and their distribution throughout

society. The importance of the fisheries sector is often underestimated, in particular, the wide-ranging direct and indirect linkages with most sectors of the economy.

The SFA continues to strengthen its research capabilities, by reinforcing the capacity of its staff and by entering into partnerships with other institutions around the world, executing projects that align with the priorities of Seychelles. The SFA needs the contribution of young Seychellois who are willing to pursue a career full of satisfaction, both professionally and personally, and I would like to invite you to find out more about the opportunities for future exciting careers on fisheries management and conservation.

This Annual Report, now in your hands, documents the solid steps that SFA has been taking towards fulfilling its mission, and aims at sharing with the general public some of the milestones reached during 2012. I trust that you will find the information provided in this Report useful in understanding the contribution of SFA to our society. In order to improve for the future, our doors are open to your constructive comments and suggestions, as always.

Finally my recognition goes to the Members of the Board, the Management and the staff of SFA for their hard work, devotion and support in making SFA the great organization it is today.



Philippe Michaud

Chapter 1 - Structure and Functions

The SFA was incorporated on the 31st August 1984 by the Seychelles Fishing Authority (Establishment) Act, although it had physically been in existence since September 1983 when the Seychelles Industrial Fishing Authority (SIFA) was formed. The first Chief Executive of SFA was Mr Maxime Fayon. The Authority was established at a time of intense fisheries development, especially in foreign industrial tuna fishing. It was created to develop the fishing industry to its fullest potential and to safeguard the resource base for sustainable development. It absorbed personnel from the defunct Fisheries Division and the Fishing Development Company (FIDECO) and became the executive arm of the Government in the field of fisheries.

SFA works closely with the Ministry of Natural Resources and Industry (MNRI), which replaced the Ministry of Environment and Natural Resources (MENR) in 2010. The functions of the SFA as defined in article (5) of the Seychelles Fishing Authority (Establishment) Act are:

- To promote, organise and develop fishing, fishing industries and fishing resources in Seychelles.
- To assist in the formulation of national policy with respect to fishing, fishing industries and fishing resources and in the implementation of that policy.
- To conduct negotiations, engage in meetings, seminars or discussions, with regard to fishing or fisheries and the establishment or operation of fishing industries, whether at a national or international level, on behalf of the Republic.
- To identify the manpower training requirements of Seychelles with regard to fishing and fishing industries.

Subject to this Act, the Authority has the power to do all things necessary or convenient in connection with, or incidental to, the performance of its functions and, in particular the Authority may:

1. Own, lease or dispose of movables or immovables.

2. Form companies under the Companies Act.
3. Enter into partnership or joint-ventures.
4. Act as agent for the purpose of the management of any business or enterprise, or for any other purpose.
5. Hold shares in, or debentures of any company.
6. Carry on any business or enterprise for or in connection with:
 - a. fishing or fisheries
 - b. processing, transporting, handling, marketing or distributing fish or fish products
 - c. exporting fish or fish products
 - d. the sale of equipment or apparatus to be used for fishing, or
 - e. Any other matter relating to its functions where, in the opinion of the Authority, the carrying out of such a business or enterprise is in the best interest of the Republic.
7. Conduct surveillance operations, in conjunction with the Department of Defence, in relation to fishing operations in the Exclusive Economic Zone (EEZ) or in waters adjacent to the continental shelf.
8. Monitor the catch of all fishing vessels, and
9. Carry out scientific and development research

SFA is unique in that it is an organization with management, planning, development, scientific and training functions. SFA is a parastatal organisation whose Board of Directors is appointed by the President.

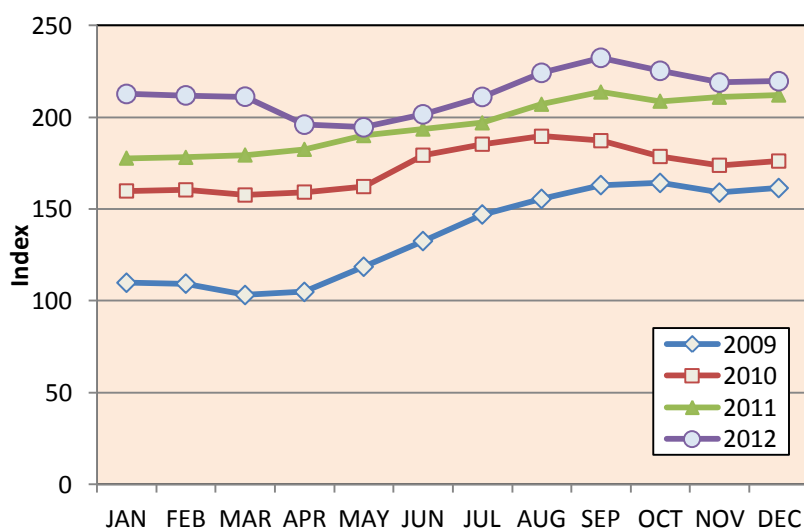
Chapter 2 - Economic Contribution of the Fisheries Sector

2.1 General Observation

Mixed results were observed in the fisheries sector for the year 2012. Whilst total domestic production declined, there was an increase in the total volume of fish and fish products exported. A decrease was recorded in revenue generated from the industrial tuna fishing activity, namely revenue from vessel expenditure, whereas the value of exports increased slightly. Nevertheless, there was an overall increase in gross revenue generated by the fisheries sector and related activities.

The artisanal catch in 2012 decreased by 13.0% over the previous year compared to an increase of 10.79% in 2011. This indicates a decrease in the amount of fish available for domestic consumption and export, which was reflected in the significant decrease of quantity of fish exported and the rise in the price index of fish in 2012, as illustrated in the diagram below.

Figure 2.1 Monthly price index of fish 2009-2012



The semi-industrial sector improved its performance over the previous year, showing an increase in catch landed by 13.9% in 2012.

Concerning trade, both export receipts and import expenditure increased in 2012 compared to the previous year. However, in terms of volume, exports increased slightly whereas imports decreased. Nonetheless, the fisheries sector retained its position as the main foreign exchange earner for the country.

2.2 Employment

Direct and indirect employment in fisheries and related sectors was estimated to be between 5,000 – 6,000 people in 2012, representing around 10% of total formal employment in the country.

The Indian Ocean Tuna (IOT) canning factory was by far the largest single employer in the country with a workforce of over 2,500 workers. The number of full and part-time commercial fishers varied between 1,300 and 1,400 primarily due to the seasonal mobility associated with this sector. In 2011, 150 people were employed in the sea cucumber fishing industry and the Seychelles Fishing Authority as a parastatal, employed 119 people. During the year, a maximum of 48 Seychellois seamen made at least one trip on board purse seiners. Employment in the fisheries sector also includes people employed in fish processing, export activities, net repairs and ship chandelling.

2.3 Production of Fish and Fish Products

In 2012, total domestic production of fish and fish products, excluding the production of fish meal and fish oil, showed an increase of 2.6% over 2011 to reach 34,268 MT in 2012 (Table 2.1).

The artisanal catch, which started recovering slightly in 2011, dropped by 13.0% in 2012 to reach 2,502 MT, a figure lower than that recorded in 2010 when piracy activities were at its peak. One possible explanation for this is the lack of human resource available therefore there has been a lack of complete coverage of fish landing sites. It is worth noting that in 2012, the Seychelles Fishing Authority initiated a process to have all its economic databases reviewed for future updating to improve the statistics it publishes.

Table 2.1 Total production of fish and fish products 2009-2012(MT)

(MT)	2009	2010	2011	2012	% change (2011/2012)
Artisanal Catch	3,019	2,595	2,875	2,502	-13.0%
Semi-Industrial Catch	329	295	238	271	13.9%
Canned Tuna	30,824	30,338	30,152	31,400	4.1%
Smoked Fish	28	30	29	28	-5.8%
Prawns	50	-	-	-	-
Others	60	70	110	68	-38.2%
Total Domestic Production	34,311	33,328	33,404	34,268	2.6%
Purse Seine Catch*	68,339	75,787	63,212	50,938	-19.4%
Longliner Catch*	8,323	6,659	7,566	12,164	60.8%
Subtotal (2)	76,663	82,446	70,777	63,102	-10.8%
Fish Meal	5,168	7,663	6,986	6,597	-5.6%
Fish Oil	826	915	767	871	13.6%
Subtotal (3)	5,994	8,578	7,753	7,468	-3.7%
Grand Total	116,967	124,351	111,935	104,838	-6.3%

*Seychelles flag vessels

Following relatively high landings in 2009, output from the semi-industrial fishery has been on the decline since, and in 2011, a decrease of 19.4% was registered. This was due to the fact that there were only four semi-industrial fishing vessels active conducting 55 long line trips in 2011, compared to nine vessels in 2010 (see section 3.3). However, in 2012, the semi-industrial fishery showed signs of improvement, with an increase of 13.9% recorded, with seven active vessels, conducting 63 long line trips, and landing 271 MT of catch. The first long liner to be bought through a loan from the Fisheries Development Fund joined the fishery in 2012. It is expected that in 2013, there will be a significant increase in semi-industrial catch due to additional long liners joining this sector financed by the Fisheries Development Fund.

As in previous years, canned tuna remained the dominant commodity produced, accounting for 92% of total domestic production of fish and fish products in 2012. Other productions, which includes dried sea cucumber and shark fins, decreased by 38% to reach 68 MT in 2012, compared to a record 110 MT in 2011.

During 2012, eight Seychelles registered purse seiners landed a total catch of 50,938 MT of tuna, which represents a 19.4% decrease from the 63,212 MT caught by the seven Seychelles registered purse seiners in 2011. This translates to an average catch of 6,367 MT per purse seiner in 2012, compared to 9,030 in 2011. On the other hand, the catch from Seychelles registered long liners increased by 60.8% to 12,164 MT in 2012, compared to the 7,566 MT caught in 2011. This is a result of the increase in the number of Seychelles flagged long-line vessels, from 15 in 2011 to 28 in 2012.

Fishmeal is a by-product produced from the tuna factory trimmings, and fish oil is obtained during the reduction process by which fishmeal is produced. Production of fishmeal decreased by 5.6% to reach 6,597 MT in 2012 compared to 6,986 MT in 2011. On the other hand, production of fish oil increased from 767 MT in 2011 to 871 MT in 2012.

Figure 2.2 Trends in the production of fish and fish products 1990-2012

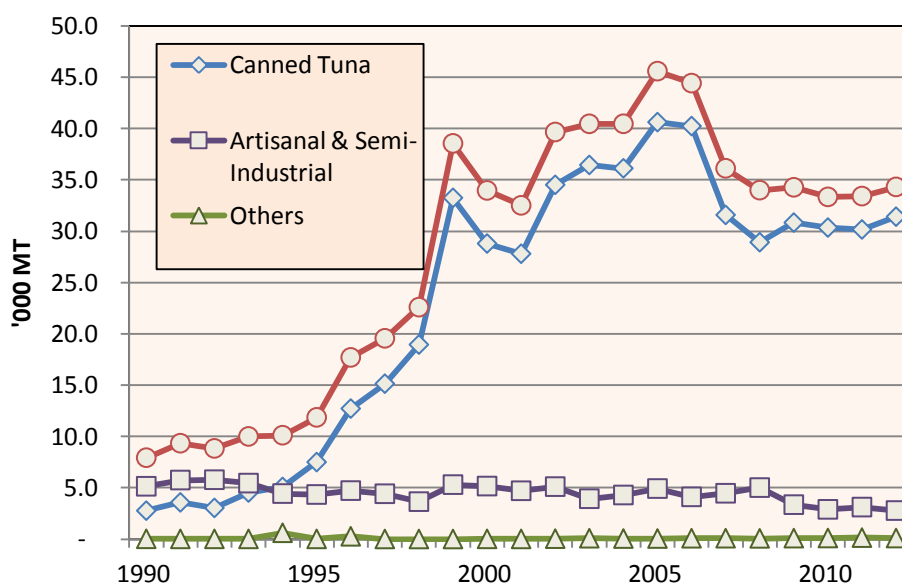


Figure 2.2 illustrates the trend in the domestic output of fish and fish products over the last two decades, revealing a high correlation between total output and canned tuna. For the past three years, total output has remained fairly constant, with no significant fluctuations in the production of canned tuna. The production of dried sea cucumber, shark fins and smoked fish remained relatively insignificant in contrast to their economic importance. Moreover, since 2009, the artisanal and semi-industrial catch decreased but has remained stable for the last three years (i.e. 2010, 2011 and 2012).

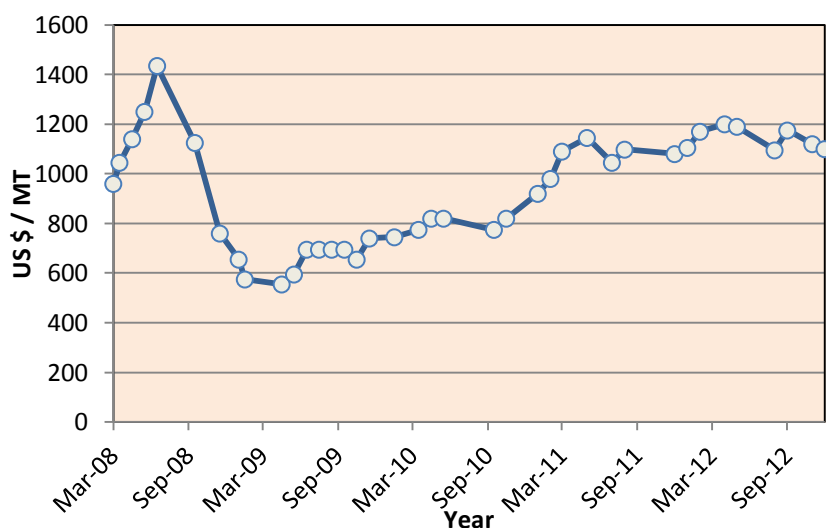
2.4 Revenue from the Industrial Tuna Fishery

Industrial tuna fishing activity remains of the most significant source of foreign exchange earnings in the economy. Gross income from this sector is derived mainly from foreign fishing vessels' expenditure on goods and services in Port Victoria, as well as through payments for licences and financial compensation. In 2012, gross expenditure reached SR1.265 billion, a 13% decrease from the expenditure of SR1.457 billion earned in 2011.

Table 2.2 Main sources of revenue from the industrial tuna fishing activity 2009-2012 (SR million)

	2009	2010	2011	2012	% change
Vessel Expenditure	1,157	1,145	1,290	1,054	-18%
Company Expenditure	12	20	20	18	-8%
Seamen Compensation	0.54	0.51	0.58	0.84	45%
Licence Fees, Excess Catch, EU Compensation	229	132	146	192	31%
Total	1,399	1,297	1,457	1,265	-13%

Spending by vessels remained the most important source of revenue from industrial tuna fishing activity, accounting for approximately 83% of all revenue from this sub-sector in 2012. During the year 2012, vessel expenditure decreased by 18% from the previous year to reach SR1.054 billion. It is worth noting that this is an approximate figure, the majority comprising of expenditure by purse seiners as data for long liner expenditure has as at 2012 not yet been made available to SFA by the agents. The number of port calls by vessels in Port Victoria, which is a major determinant of expenditure decreased to reach 407 calls in 2012 compared to 783 calls in 2011.

Figure 2.3 Price of fuel quoted by SEYPEC Mar 2008 –Nov 2012

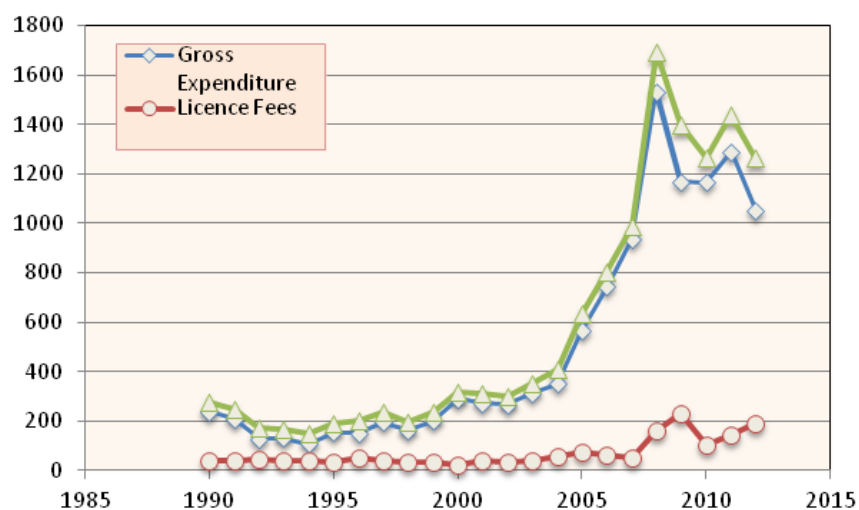
Note: These figures do not take into account various discounts offered by SEYPEC on fuel purchase by vessel-owners.

In 2012 data received from Seychelles Petroleum Company (SEYPEC) indicate that an approximate value of SR1.1 billion worth of fuel were purchased by purse seiners, reefers, longliners and supply vessels. As seen in Figure 2.3 above, there has been a continuous increase in the price of fuel as of January 2009, but prices have remained fairly constant over 2011 and 2012.

A decrease of 8% was registered in spending by foreign fishing companies based in Port Victoria. However, there was a significant rise in seamen compensation, increasing by 45%. Seamen compensation is a fee which ship-owners are obliged to pay under the Seychelles/EU protocol when a tuna purse seiner fails to take at least two Seychelles seamen on board when fishing in Seychelles' waters. The fee is calculated using a flat rate per day multiplied by the amount of days that the fleet operated in Seychelles' waters.

Figure 2.4 shows the trend observed in total revenue since the 1990s. Up until 2009, there was a general upward trend in total revenue earned from the industrial tuna fishing activities. Due to the piracy threat, activity in that sector decreased in 2009 and 2010 but has since shown signs of recovery as revenue increased slightly in 2011. However, in 2012, figures dropped to reach similar levels to 2010. A fall in gross expenditure, namely vessel expenditure, accounted for this decrease in total revenue in 2012.

Figure 2.4 Revenue from industrial tuna fishing activity



2.5 Trade in Fish and Fish Products

2.5.1 Exports of fish and fish products

Exports of fish and fish products constitute an important source of foreign exchange earnings for the country. In addition, processing of fish into exportable products generates a significant amount of employment and income. The volume of products exported increased by 0.34% in 2012, whilst the value of exports increased by 12.5%. This translates to 39,154 MT with a corresponding value of SR 3.6 billion exported in 2012 as compared to 39,023 MT valued at SR3.2 billion exported in 2011.

Dried shark fins and **sea cucumber** exports decreased by 38.4% with its value also decreasing by 22.7%. Due to the limited number of countries supplying the global market with this product, there has been a continuous rise in prices paid for sea cucumber over the years, which has positively impacted on its export price. However, there are currently management measures in place, e.g. a closed season, to prevent over exploitation of this resource.

In 2012, a slight decrease of 0.5% was recorded in the volume of **canned tuna** exported, bringing volume of canned tuna exported to 31,105 MT in 2012 as compared to 31,283 MT in 2011. However, the value of canned tuna exports increased, from SR 3.001 billion in 2011 to R 3.411 billion in 2012. This translates into a 14% increase in the price per tonne, from SR 95,939 per MT in 2011 to SR109,663

per MT in 2012. The piracy threat has caused the supply of tuna to the canning factory to decrease as purse seiners shifted their operations from the Indian Ocean to the Atlantic Ocean. This in turn caused an increase in the price of canned tuna on the EU market which is Seychelles main destination for canned tuna exports.

In 2012, the volume of **fish meal** exported increased by 4.3% from 6,645 MT in 2011 to 6,931 MT, On the other hand the value of export of fish meal decreased by 9.3% from SR 91.302 million in 2011 to SR 82.842 million in 2012. Regarding export of fish oil both quantity and value increased by 13.5% and 23.6% respectively.

In 2012, the value of exports of consumable fish and fish products constituted 93% of the total value of domestic exports. This illustrates the importance of marine product exports for foreign exchange earnings. Europe remained Seychelles' primary market for fish and fish products, with canned tuna being the dominant commodity. Other than exporting to the EU, Seychelles also exported to Reunion, Mauritius, U.S.A and the Middle East. South-east Asian markets such as China, Japan and Singapore also constituted an important market for Seychelles', particularly for dried sea cucumber and shark fins.

Table 2.3 Volume and value of fish and fish products exported, 2011-2012

	2011		2012		% change	
	MT	SR '000	MT	SR '000	MT	SR '000
Fresh and Frozen Fish	203	18,788	180	24,303	-11.2%	29.4%
Fish Fillet	15	1,422	0.03	2	-99.8%	-99.8%
Canned Tuna	31,283	3,001,272	31,105	3,411,050	-0.5%	13.7%
Other Processed Fish (Tuna Loins)	0		166	13,743	-	-
Dried Shark Fins & Sea Cucumber	110	53,902	68	41,681	-38.4%	-22.7%
Total	31,611	3,075,384	31,353	3,477,034	-0.8%	13.1%
Total Domestic Exports		3,284,052		3,723,503	-	-
% of Domestic Exports		94%		93%	-	-
Fish Meal	6,645	91,302	6,931	82,842	4.3%	-9.3%
Fish Oil	767	32,379	871	40,016	13.5%	23.6%
Grand Total	39,023	3,199,065	39,154	3,599,892	0.34%	12.5%

2.5.2 Imports of fish and fish products

During 2012, although there was a decrease in the volume of fish and fish products imported, an increase in the value of these exports was registered. The main product, frozen tuna was destined for the IOT canning factory for canning and fish-meal production. The other commodities imported were supplies for the hotel and local market and bait for the domestic fishing industry.

The volume of fish and fish products imported decreased slightly by 1.9% to reach 67,443 MT in 2012. For that same year, total expenditure on imports to the country increased by 36.3%, from SR1.6 billion in 2011 to a record SR2.2 billion. This was due to an increase in the prices of all fish and fish products imported during 2012, fuelled by demand from hotels and restaurants around the country and a general decrease in domestic availability of fish and fish products.

Table 2.4 Volume and value of fish and fish products imported, 2011-2012

	2011		2012		% change	
	MT	SR '000	MT	SR '000	MT	SR '000
Fish, Fresh or Chilled	3.9	587	9.3	1,007	139.7	71.6
Fish, Frozen	68,440	1,578,862	66,663	2,146,649	-2.6	36.0
Fish, Fillets, and other fish meat	3.7	523	8.5	984	127.6	88.2
Fish, dried, salted	17.8	2,121	35.4	4,455	98.5	110.1
Molluscs and Crustaceans	218.3	28,886	705.2	42,392	223.0	46.8
Fish prepared and preserved	16.5	1,725	14.34	2,187	-13.1	26.8
Molluscs and Crustaceans preserved	8.8	980	7.3	1,091	-17.0	11.3
Total	68,709	1,613,684	67,443	2,198,765	-1.9	36.3

Frozen fish, namely tuna, the main raw material for the canning factory remained the dominant import commodity, accounting for over 99% of total fish imports and fish products in terms of volume and approximately 98% in terms of value. In 2012, frozen tuna imports amounted to 66,663 MT, a 2.60% decrease from 2011. As piracy still remains a threat in the Seychelles' waters, many of the purse seiners that had moved to the Atlantic Ocean have still not returned to the Indian Ocean, resulting in a reduction of raw material available locally for production.

To conclude, in 2012, there was a general increase in the prices of imports in the country, especially the price of frozen tuna for the canning factory, which implied

that although the volume of exports fell slightly, the total expenditure on imports made by Seychelles in 2012 increased significantly.

2.6 Foreign Currency Flows

Trade in fish and fish products and other related activities constitute an important growth and income generating activity for the national economy. These activities have a major influence on the country's balance of payment as a substantial portion of the country's current inflow of foreign exchange is derived from fish trading activities.

In 2012, the volume of consumable domestic production of fish reached 34,268 MT, increasing by 2.6% over 2011. The volume of exports of fish and fish related products increased by 0.34% to reach 39,154 MT, whereas volume of imports decreased by 1.9% to reach 67,443 MT.

In terms of value, gross value of exports in 2012 was SR3.6 billion, corresponding to a 12.5% increase from 2011. The gross value of imports also increased but by a much larger margin of 36.3% to reach SR2.2 billion. This translates in a gross balance of trade surplus in fish and fish products of SR1.4 billion for 2012. However, it should be noted that this balance of trade figure only takes into account fish and fish products imported and not other inputs required by the fishing industry which would imply a much lower net currency inflow.

As observed in Table 2.5 below, the gross inflow from fisheries made up 31.5% of current account receipts in 2012 down from 33% in 2011. This was due to the fact that although gross inflow from fisheries improved by 4.49% in 2012, current account receipts increased by a larger margin of 45.25%.

Table 2.5 The gross inflow of foreign exchange generated by the fisheries sector, 2010-2012

Foreign Currency Flows (SR '000)	2010	2011	2012	% change (2012/2011)
Visible Exports	2,571,765	3,199,065	3,599,892	12.53%
Revenue from Industrial Tuna Fishing	1,297,210	1,456,550	1,264,799	-13.16%
Gross Inflow from fisheries (a)	3,868,975	4,655,615	4,864,691	4.49%
Current Account Receipts (b)	10,627,800	14,126,000	15,959,800	12.98%
(a) as a % of (b)	36%	33%	31.5%	

Official figures from the Central Bank Annual Report indicate that in 2012, tourism earnings amounted to SR4.247 billion or 27% of current account receipts whilst the earning from fisheries and related activities accounted for 31% of current account receipts. This essentially highlights the economic importance of the fisheries sector and shows that it could in fact be the number one pillar of our economy. The importance of the fisheries sector in the development of the country is highlighted, and, there is a potential in the future to further develop the sector through value addition and the development of the semi-industrial fishing industry.

Chapter 3 - Industrial and Semi Industrial Tuna Fishing Activities

3.1 The Purse Seine Fishery

3.1.1 Catches, fishing effort, catch rates and species composition

The total catch in the Western Indian Ocean by purse seiners holding Seychelles licenses to fish inside the Seychelles EEZ for 2012 was estimated at 231,477 MT compared to 258,361 MT in 2011. This represents a decrease of 10% in the total reported catch over that of the previous year.

The fishing effort in 2012 was estimated to be 9,696 fishing days, only 1% higher than the 9,558 fishing days reported in 2011. The overall monthly catch rates in 2012 ranged from 15.14 to 37.53 MT/fishing day. The average catch rate was 23.87 MT/fishing day, slightly lower than the 27.03 MT/fishing day for 2011.

Yellowfin and skipjack tuna accounted for 57% and 35% of the total catch respectively. The catch of skipjack dropped by 35% whilst the catch of yellowfin increased by 19%. (Table 3.1).

Table 3.1 Tuna catch statistics for the last ten years

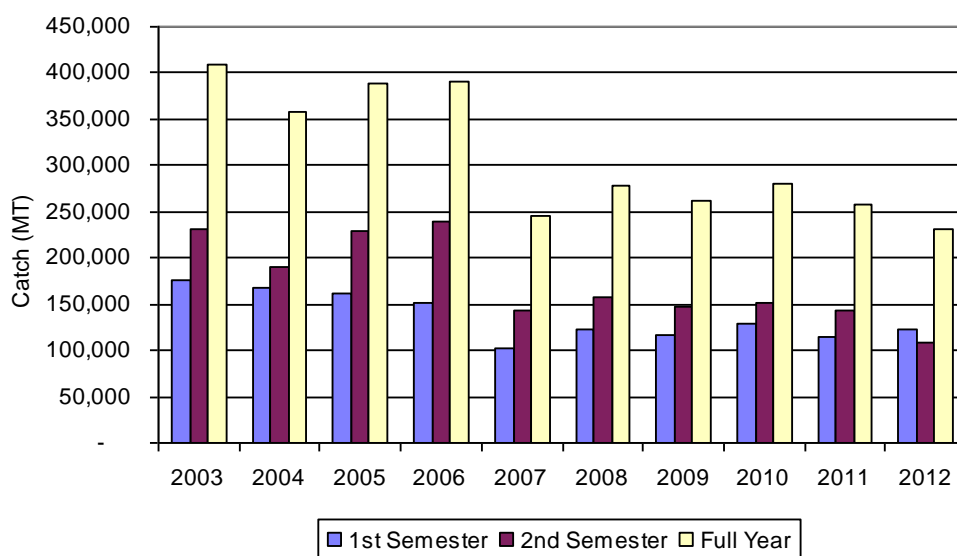
Year	Total Catch (MT)	Catch Rate MT/Day	Yellowfin		Skipjack		Others	
			Catch	%	Catch	%	Catch	%
2003	408,366	34.87	197,782	48	189,566	46	21,018	5
2004	358,258	30.03	201,727	56	137,103	38	19,428	5
2005	389,256	29.16	176,322	45	190,053	49	22,882	6
2006	389,935	26.8	145,596	37	224,065	57	20,274	5
2007	245,670	16.45	92,034	37	132,238	54	21,399	9
2008	278,956	21.1	112,724	40	137,330	49	28,903	10
2009	262,719	24.02	84,821	32	150,420	57	27,478	10
2010	279,244	29.97	103,127	37	153,782	55	22,334	8
2011	258,361	27.03	110,574	43	127,150	49	20,637	8
2012	231,477	23.87	131,057	57	82,163	35	18,257	8

Table 3.2 Tuna catch statistics by country of registration for 2011 to 2012

Country	2011			2012		
	Catch (MT)	Effort	CPUE	Catch (MT)	Effort	CPUE
Spain	126,009	3,839	32.83	111,644	4,112	27.15
France	42,530	2,108	20.17	37,155	1,944	19.11
Seychelles	63,212	2,347	26.94	50,938	2,133	23.88
Others*	26,610	1,264	21.06	31,740	1,506	21.08
Total	258,361	9,558	27.03	231,477	9,696	23.87

* Others represent other countries and include Korea (2012) and Mayotte (2011-2012)

In term of catches by countries, Spanish, France and Seychelles fleet all recorded a decrease of 11%, 13% and 19% in their total catch respectively. The catch of Spanish fleet decreased from 126,009 MT in 2011 to 111,644 MT in 2012, Seychelles catch decreased from 63,212 MT in 2011 to 50,938 MT in 2012 and France fleet decreased from 42,530 MT to 37,155 MT during the period under review. (Table 3.2)

Figure 3.1 Total catch reported by purse seiners licensed to fish in the Seychelles waters, from 2003 – 2012

Since the year 2003 an increasing trend has been observed in purse seine fishing effort whilst the CPUE has been on the decrease. The trends then reverse for both

CPUE and fishing effort from 2007 to 2010. The CPUE then decrease from 29.97 Mt/Fishing days in 2010 to 23.87 Mt/Fishing days in 2012 whilst the fishing effort increase slightly from 9,318 fishing days in 2010 to 9,696 fishing days in 2012 (Figure 3.2).

Figure 3.2. Total effort (fishing days) and catch rates (MT/fishing day) reported by purse seiners licensed to fish in the Seychelles waters, from 2003 – 2012

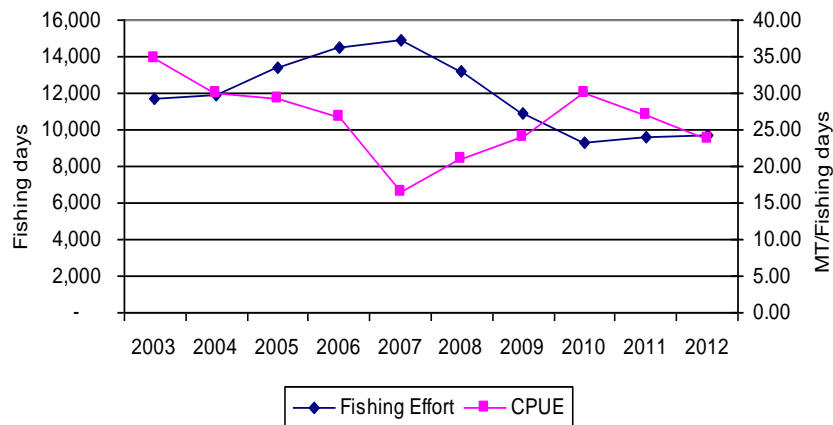
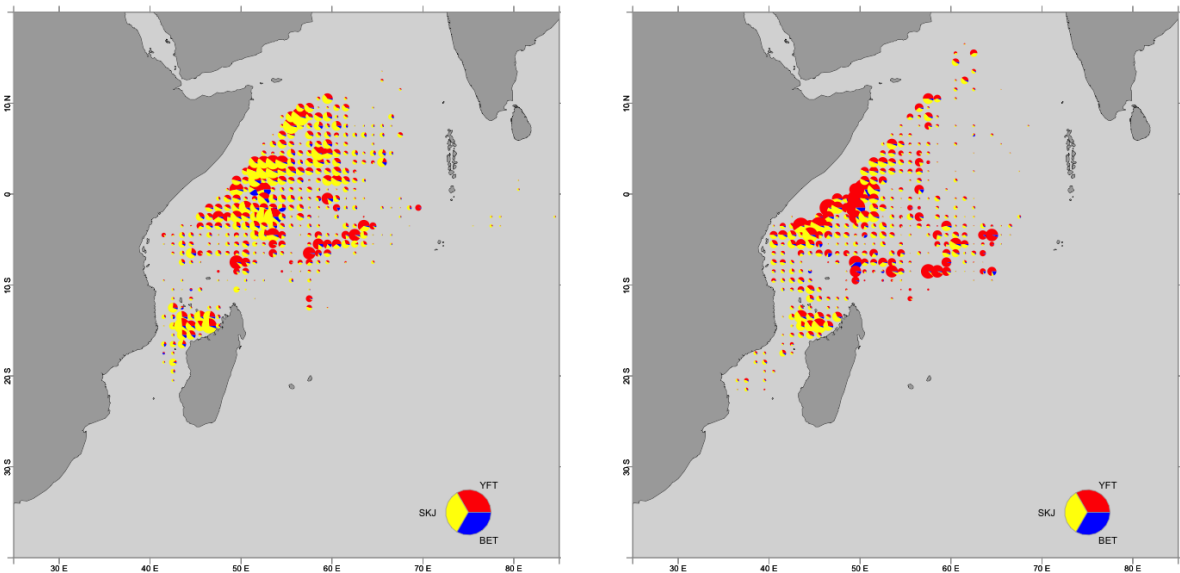


Figure 3.3 Purse Seine total catch by 1^o square, 2011 (left panel) and 2012 (right panel)



3.1.2 Fishing grounds exploited

Figures 3.3a and 3.3b show the distribution of catches reported by purse seiners (holding licenses to operate in Seychelles waters) in the Western Indian Ocean by 1^o square, for 2011 and 2012 respectively.

3.1.3 Transshipment and landings in Port Victoria

A total of 189,656 MT of tuna was transhipped / landed in Port Victoria in 2012, representing 82 % of the total tuna caught during that year (Table 3.3). Overall, a decrease of 11% in the total tuna transshipment / landings was recorded during 2012 when compared to the 213,338 MT transhipped or landed during the previous year.

In comparison to other ports used by purse seiners for transshipping in the region, 19,412 MT and 19,126 MT were transhipped/landed in Diego Suarez and Port-Louis (Mauritius) respectively whilst 3,283 MT was transhipped/landed in Mombasa.

Table 3.3. Transshipment and landings in Port Victoria by nationality, for 2011 and 2012

Country	Transshipment/ Landings	2011	Transshipment/ Landings	2012
		% Of Catch*		% Of Catch*
Spain	113,497	90	98,922	89
France	34,669	82	28,833	78
Mayotte	9,351	35	16,017	55
Seychelles	55,821	88	43,160	85
Korea			2,725	100
Total	213,338	83	189,656	82

*Total tuna transhipped/ landed in Port Victoria by country as percentage of their total catch

Table 3.4 Transshipment and landings by ports for 2009 and 2012

Port	2009	2010	2011	2012
Diego Suarez	34,157	27,370	21,753	19,412
Maurice	11,214	11,339	21,311	19,126
Mombasa	3,327	4,832	1,959	3,283
Seychelles	211,594	235,206	213,338	189,656
Others	2,426	498	-	-

3.2 The Longline Fishery

This section summarises the activities of longliners licensed to operate inside the Seychelles EEZ for the years 2003 to 2012. Figures presented here for the years 2003 to 2012 may be different to previously published figures as the data have been revised as more logbooks have been received by SFA for these years.

It must be noted that prior to 2003, the number of logbooks returned to SFA was very low (<50%). There has been a remarkable increase in logbooks return since 2003 (Table 3. 5).

3.2.1 Fishing effort, catch, catch rates and species composition

In 2012, the total catch reported by industrial longliners licensed to fish inside the Seychelles EEZ was estimated at 18,995 MT obtain from a fishing effort of 27.5 million hooks, thus giving a mean catch rate of 0.69 MT/1000 hooks (Table 3.5). This represents an increase of 130% in total catch corresponding to an increase of 55% in fishing effort when compared to the previous year. The increase in catch relates to an increase of 162% in the number of industrial longliners active from 53 vessels in 2011 to 139 vessels active in 2012.

Table 3.5 Catch statistics reported to the SFA for the last ten years

Year	Log %	Catch	Effort	Catch Rate	Yellowfin		Bigeye		Others	
					Catch	%	Catch	%	Catch	%
2003	56	18,661	34	0.55	7,642	41	7,519	40	3,500	19
2004	71	24,432	46.6	0.52	9,451	39	11,695	48	3,286	13
2005	75	29,301	60	0.49	13,706	47	12,391	42	3,205	11
2006	82	18,096	45.1	0.4	6,562	36	8,614	48	2,920	16
2007	84	16,601	40.8	0.41	4,145	25	8,933	54	3,523	21
2008	84	11,806	30.3	0.39	1,833	16	6,832	58	3,141	27
2009	81	10,221	25.2	0.4	881	9	5,112	50	4,228	41
2010	84	8,603	22.2	0.39	845	10	4,604	54	3,150	37
2011	86	8,257	17.7	0.47	1,366	17	4,473	54	2,418	29
2012	73	18,995	27.5	0.69	1,874	10	12,824	68	4,297	23

Others: other species, which include mainly swordfish and other billfish (Marlins, Sailfish), and Sharks

Log %: Percentage of logbooks returned

Catch: Total catch in t

Effort: Fishing effort in million of hooks

Catch rate: in t per thousand hooks

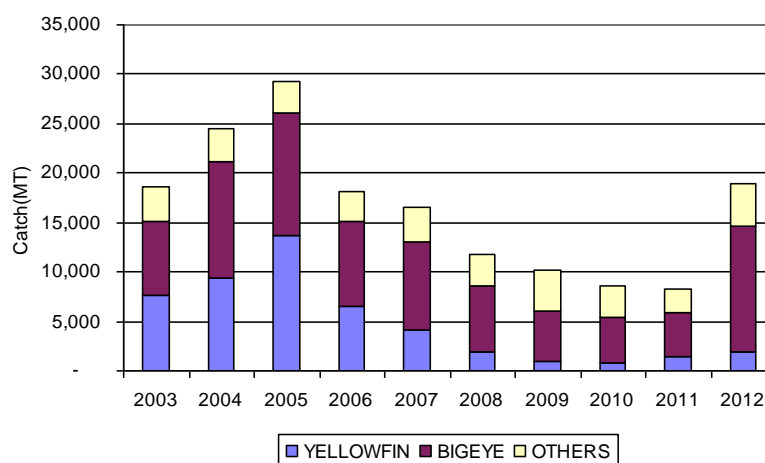
Table 3.6 Catch statistics reported by country for 2011 and 2012. Fishing effort in millions of hooks, catch in metric tons, catch rate in mt/1000 hooks

Country	2011			2012		
	Fishing Effort	Catch	Catch Rate	Fishing Effort	Catch	Catch Rate
China				0.34	143	0.42
Japan				0.53	399	0.75
Oman	0.09	33	0.38	0.13	71	0.56
Philippines	0.02	8	0.46	0.45	272	0.61
Seychelles	16.33	7,566	0.46	15.99	12,164	0.76
Taiwan (ROC)	1.28	650	0.51	10.02	5,946	0.59
Total/Average	17.72	8,257	0.47	27.46	18,995	0.69

In term of species composition, bigeye tuna remain the dominant species caught by industrial longliners accounting for 68% of the total catch, whilst yellowfin made up only 10% of the total catch for 2012.

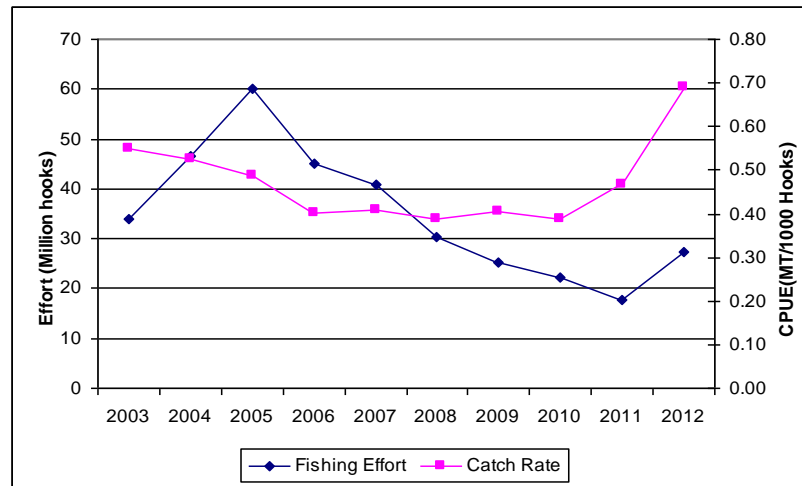
During 2012, the catch for Seychelles fleet increased by 61%, from 7,566 MT during the previous year to 12,164 MT. Taiwanese fleet also recorded an increase from 650 MT in 2011 to 5,946 MT in 2012, (Table 3.6).

Figure 3.4 Total catch reported by Longliners licensed to fish in the Seychelles waters, from 2003 – 2012



Since 2003 the CPUE of longliners operating in the Seychelles waters has been on a decreasing trend whilst the fishing effort was on the increase but has however decreased sharply from 60 million hooks in 2005 to 17 million hooks in 2011. In 2012, the fishing effort increased to 27 million hooks (Figure 3.5). The CPUE remained more or less constant between 0.41 MT/1000 hooks to 0.39 MT/1000 hooks, during the period 2007 to 2010 then increased to reach 0.69 MT/1000 hooks in 2012.

Figure 3.5. Total effort (fishing days) and catch rates (MT/1000 hooks) reported by longliners licensed to fish in the Seychelles waters, from 2003 – 2012



3.2.2 Fishing Grounds Exploited

Figures 3.6 and 3.7 show the distribution of catches reported by longliners (holding licenses to operate in Seychelles waters) in the Western Indian Ocean by 1° square, for 2011 and 2012 respectively

Figure 3.6 Distribution of catches reported by industrial longliners by 1° square, 2011

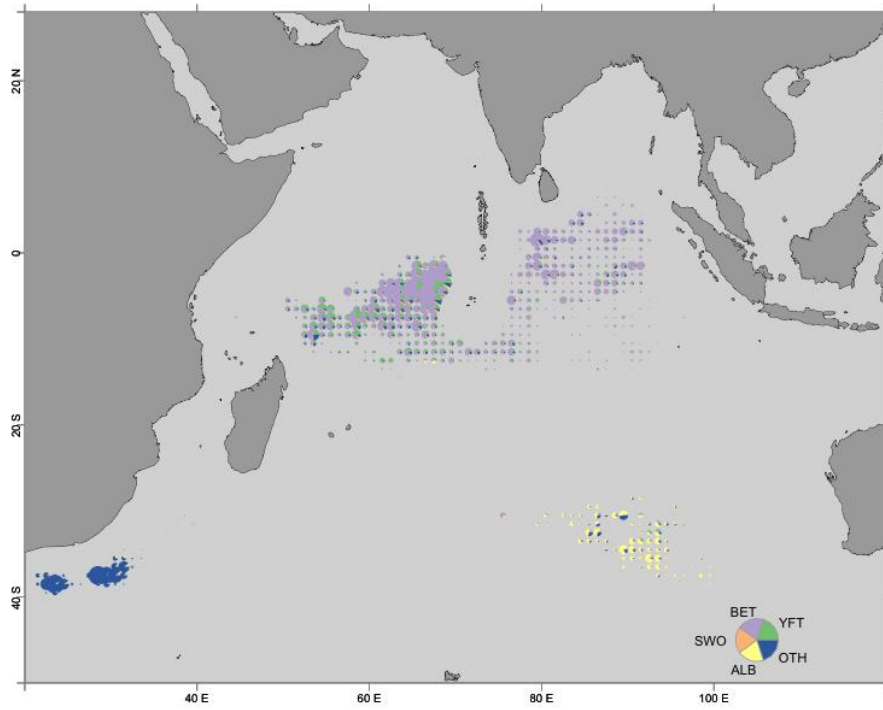
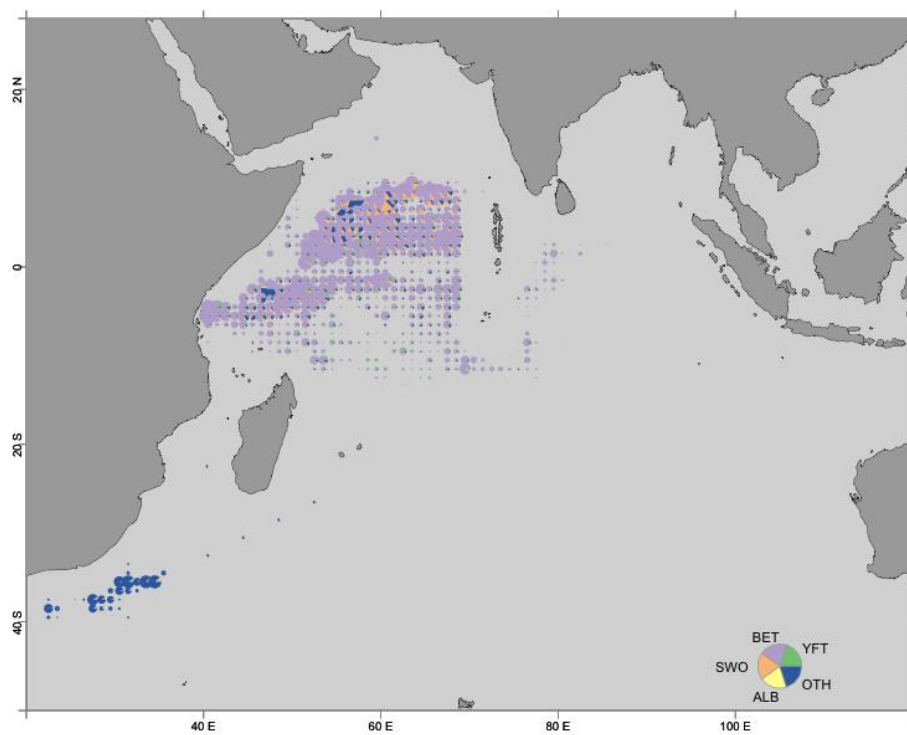


Figure 3.7 Distribution of catches reported by industrial longliners by 1° square, 2012



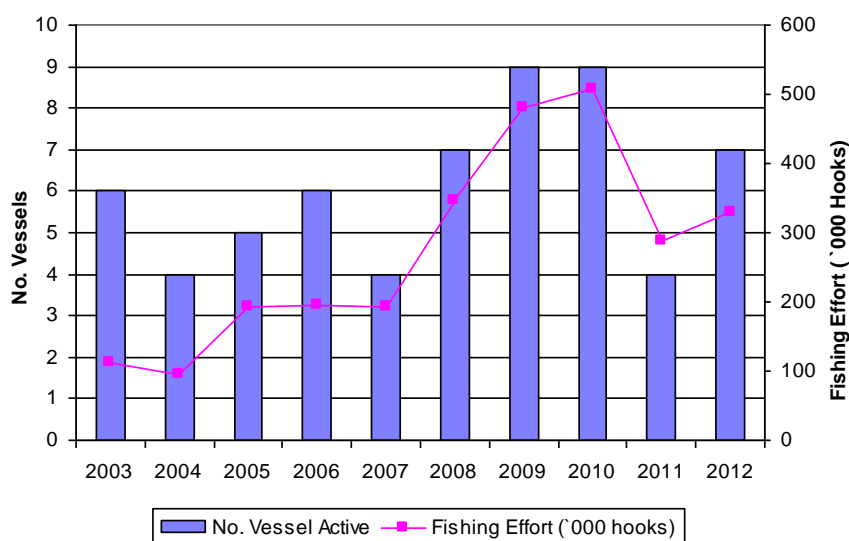
3.3 The Semi-industrial Fishery

3.3.1 Vessels active and fishing effort

In 2012, 7 semi-industrial vessels conducted a total of 63 longline fishing trips (for tuna and swordfish) compared with 55 trips conducted by 4 local vessels in 2011. This represents a 15% increase in the number of fishing trips targeting tuna and swordfish.

The fishing effort (number of hooks) also increased by 15 %, from 289,540 hooks in 2011 to 330,466 hooks in 2012 (Figure 3.8)

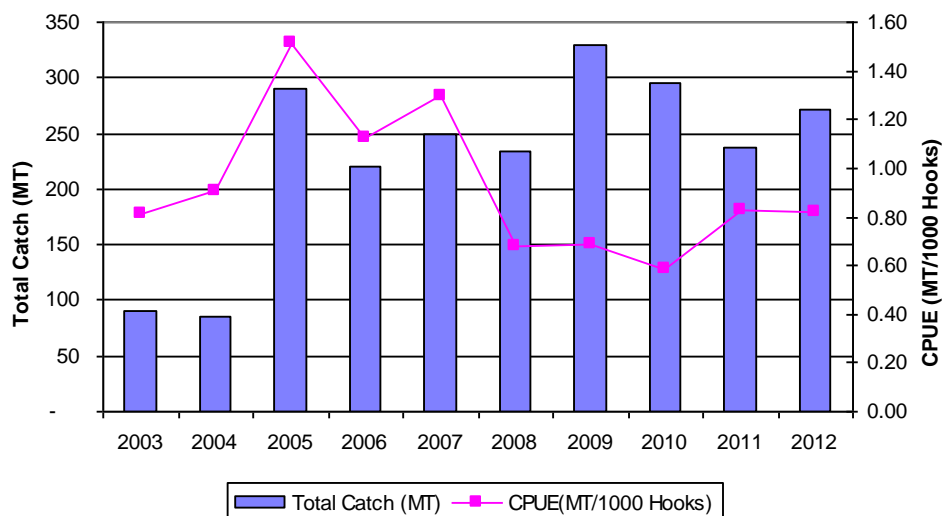
Figure 3.8 Trend in number of vessels and fishing effort from 2003 – 2012



3.3.2 Total catch and catch rates

The total catch by the local semi-industrial fleet for 2012 was estimated at 270.8 MT compared to 237.7 MT in 2011 (Table 3.7), representing an increase of 14% from the previous year.

The catch rate for 2012 was estimated at 0.82 MT/1000 hooks compared to 0.83 MT/1000 hooks for 2011 (Figure 3.9). The swordfish and yellowfin CPUE decreased slightly from 0.49 MT/1000 hooks and 0.16 MT/1000 hooks in 2011 to 0.48 MT/1000 hooks and 0.14 MT/1000 hooks respectively in 2012. The CPUE of bigeye tuna increased from 0.08 MT/1000 hooks to 0.12 MT/1000 hooks.

Figure 3.9 Total landed catch and catch rates reported between 2003 to 2012

3.3.3 Species composition

The species composition reported for the period 2003 to 2012 is given below in table 3.7. In 2012, swordfish remained the dominant species caught in the semi-industrial fishery, accounting for 59% of the total catch whilst tuna (yellowfin & bigeye) consist of 31% of the total catch.

Table 3.7 Species composition of the total catch reported from 2003 to 2012

Year	Swordfish	Yellowfin	Bigeye	Sailfish	Marlin	Shark	Others	Total
2003	65.5	13.1	11.4	0.4	0.3	0.1	0	90.9
2004	71.1	7.4	7.2	0.7	0.4	3.2	0.2	90.2
2005	168.0	49.8	55.8	5.1	2.0	11.7	1.8	294.2
2006	107.9	40.1	47.7	3.3	2.3	31.1	0.4	232.8
2007	111.1	70.2	55.5	2.6	1.9	4.6	2.7	248.5
2008	97.9	43.7	58.6	7.2	3.2	22.2	0.6	233.3
2009	169.9	67.7	59.2	14.5	5.3	11.6	0.7	329.0
2010	185.7	57.9	26.1	4.9	11.8	6.3	2.1	294.8
2011	140.7	46.5	23.1	4.8	6.9	15.0	0.8	237.7
2012	159.1	46.5	38.3	2.8	9.2	14.0	1.0	270.8

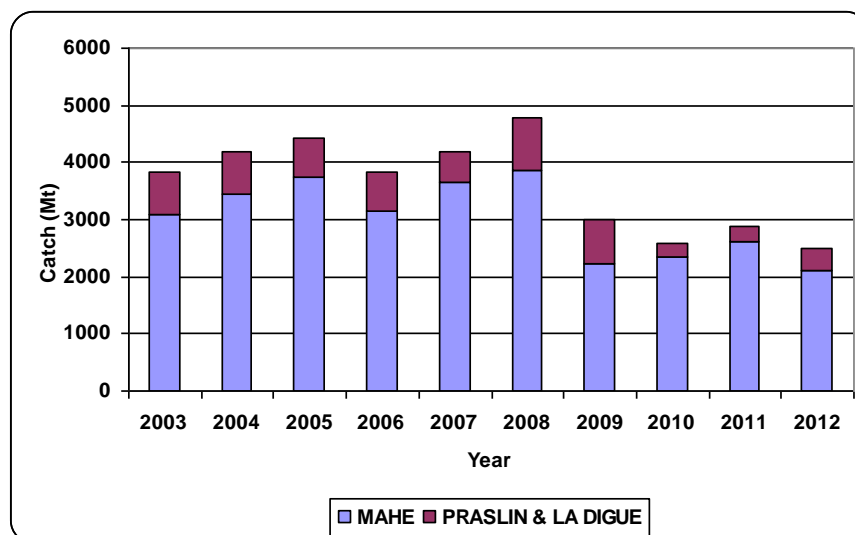
Chapter 4 - Artisanal Fishery

4.1 Catch Assessment Survey (CAS)

Based upon output from the CAS, which has been implemented since 1985, this section of the report reviews the performance of the major artisanal fisheries for 2012 and summarizes major trends.

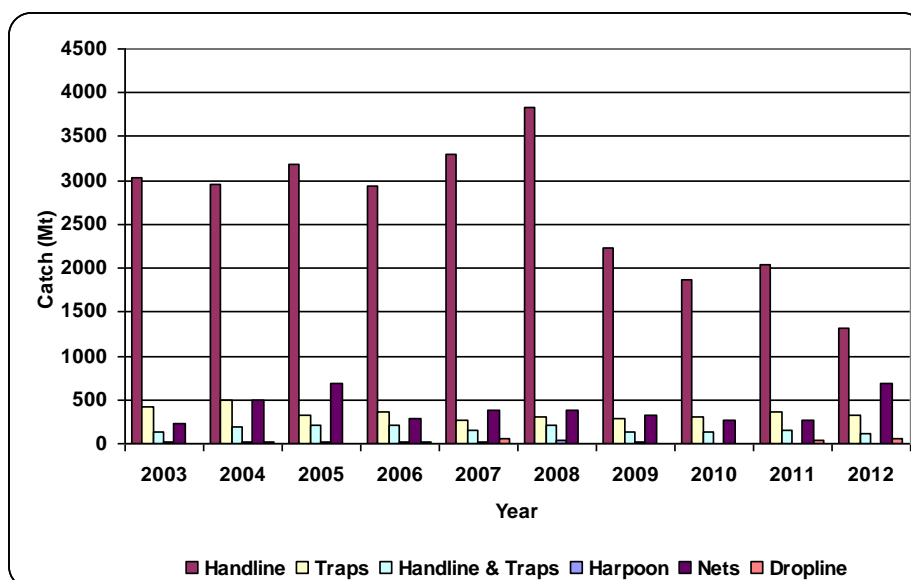
The total artisanal catch for 2012 was estimated at 2,502.1 Mt. This represents a decrease of 13% over the 2,875.0 MT landed in 2011 (Figure 4.1). Compared to 2011, landings on Mahe decreased by 520 MT (20%), whereas landings on Praslin increased by 147 MT (59%). The decline in catch during the past four years was partly due to decline in fishing effort (Figure 4.3). From 2008 to 2012, in terms of fishing effort, harpoon, handline and trap fishery recorded a decrease of 71%, 49% and 5% respectively.

Figure 4.1 Artisanal catch (t) for Mahé and Praslin/La Digue: 2003 to 2012



In terms of catch by gear categories, handline fishery, handline & trap fishery and the trap fishery decreased by 35%, 29% and 12% respectively whilst net fishery, dropline and harpoon fishery recorded increases of 157%, 21% and 3% respectively (Figure 4.2).

Figure 4.2 Catch (MT) by gear category for 2003 to 2012



The composition of the total artisanal catch by vessel category was dominated by outboard (50.7%), followed by whalers (30.8%) Table 4.1.

Table 4.1 Percentage of annual catch landed by major vessel types, including foot fishermen: 2003–2012

Boat Type	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Pirogue	1.1	1.3	1.6	2.1	0.6	0.6	0.8	0.6	0.4	1.0
Outboard	27.4	34.3	36.2	28.3	25	25.4	37.6	33.9	33	50.7
Whalers	64.1	54.2	50.4	56.9	63.3	64.2	47.6	47.8	51.7	30.8
Schooners	6.8	9	11.1	11.5	9.3	8.9	13.3	17.1	12.9	15.0
Foot Fishers	0.6	0.9	0.7	0.6	0.4	0.8	0.5	0.6	0.4	0.5
Dropline	0	0.3	0	0.6	1.4	0.1	0.2	0	1.5	2.1

Table 4.2 Maximum monthly fishing vessels in operation: 2008 to 2012

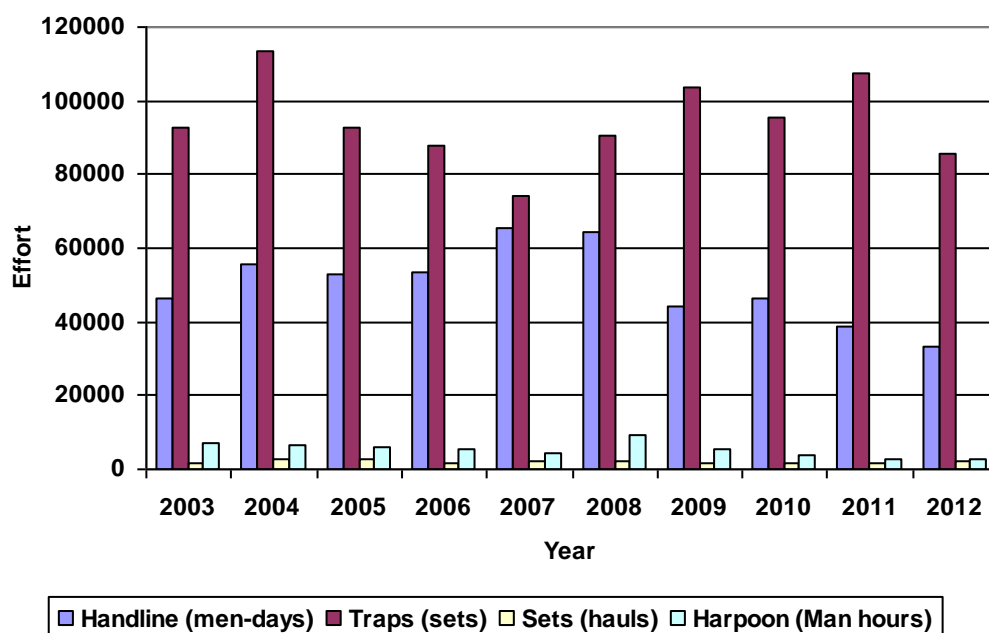
Vessel Type	2008	2009	2010	2011	2012
Pirogue*	19	19	16	15	15
Outboard*	293	324	316	294	296
Whaler	107	113	105	106	106
Schooner	22	27	27	32	28
Sport	**	**	**	**	**
Dropline	3	2	1	5	2

*Includes part time fishing vessels. ** Data not available due to poor logbook returns

4.1.1 Effort

As determined from monthly mean estimates of the number of vessels in operation, whereby the maximum value is used as an indicator of fleet activity for the year, the fishing activities of outboard vessels increased in 2012 compared to 2011, whilst those of pirogues and whalers have remained the same. The logbook returns from the sport fishery continued to be poor, precluding estimation of the number of vessels engaged in that fishery (Table 4.2).

In terms of fishing effort, trap, handline and harpoon fisheries recorded decreases of 20%,14% and 2% respectively, whilst net fishery recorded an increase of 34% in 2012 compared to 2011 (Figure 4.3).

Figure 4.3 Fishing effort for the major gear types for 2003-2012

4.2 Species Composition

In terms of species composition, trevally (*Carangoides* and *Caranx spp.*) and mackerel (*Rastrelliger sp.*) were the two main species dominating the catch for 2012. Catches of mackerel increased from 219 MT in 2011 to 469 MT in 2012 whereas catches for trevally decreased from 833 MT to 552 MT. Catches of job-fish, red snapper, rabbit fish and groupers all recorded decreases of 51%, 47%, 27% and 21% respectively compared to the previous year (Table 4.3).

Table 4.3 Percentage species/species-group composition of artisanal catch for the period 2008-2012

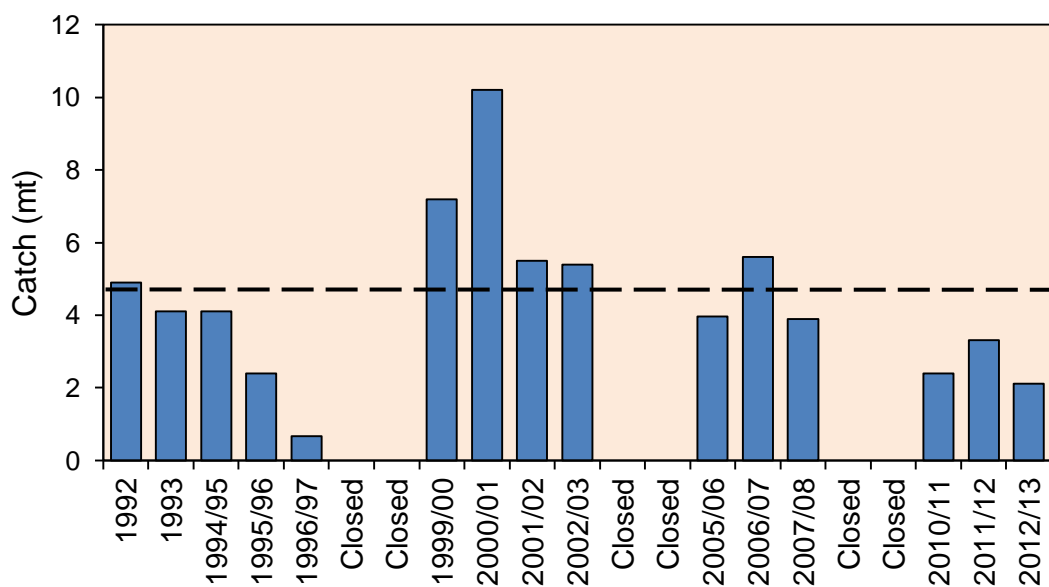
English/Scientific	Species Group Kreol	Percentage (%) of total annual catch				
		2008	2009	2010	2011	2012
Trevally (<i>Carangoides</i> spp.)	Karang	25.8	17.9	26.2	28.9	22.1
Red snapper (<i>Lutjanus</i> spp.)	Bourzwa,	22	20.4	21.6	17.6	10.6
	Bordomar					
Jobfish (<i>Aprion virescens</i>)	Zob gri	15.8	16.9	13.6	14.0	7.9
Emperors (<i>Lethrinus</i> spp.)	Kaptenn	7.2	7.2	3.7	5.3	5.7
Bonito (<i>Euthynnus affinis</i>)	Bonit	3.1	5	1.8	3.0	2.8
Groupers (<i>Epinephelus</i> spp.)	Vyey	3.2	2.7	3	3.5	3.2
Rabbitfish (<i>Siganus</i> spp.)	Kordonnyen	4	7.3	9.8	8.6	7.3
Mackerel (<i>Rastrelliger</i> sp.)	Makro dou	6.1	2.9	6.7	7.6	18.7
Others		12.8	19.7	13.6	11.5	21.7
Total annual catch (MT)		4,777	3,019	2,595	2,870	2,502

4.3 Lobster fishery

The 2012/2013 lobster season was opened for a period of three months from 1st December 2012 to 28th February 2013. The species targeted were Pronghorn spiny lobster (*Panulirus penicillatus*) Long-legged spiny lobster (*P. longipes*) Painted spiny lobster (*P. versicolor*) and Ornate spiny lobster (*P. ornatus*). The total catch recorded for the 2012/2013 season was 2.11 t compared to 3.30 t recorded for the 2011/2012 season (Figure 1). The most common techniques used to catch lobsters were

snorkelling and skin diving. A total of 208 trips were undertaken during the 2012/2013 season which gave a CPUE of 10.14 kg per trip. The effort remained stable compared to the 2011/2012 season where 206 trips were undertaken. The most abundant species caught for this season was *P. penicillatus* with 1370 kg recorded followed by *P. longipeds* with 710kg. An assessment of stock indicators over the last 3 fishing seasons has led to the conclusion that overfishing may have occurred. Significant declines in the total catch CPUE for the snorkelling gear and CPUE by fishing location were observed over the last 2 fishing seasons. From these observations it was recommended that the lobster fishery remain closed for a period of one to two years to allow the stock time to recover and for fisheries independent surveys to be carried out to monitor changes in the state of the stock.

Figure 4.4. Historical seasonal catch (metric tonnes, t) of spiny lobsters. Dashed line indicates mean seasonal catch since monitoring began in 1992



4.4 Sea Cucumber Fishery

In 2012, the total catch of sea cucumber was 620,100 pieces, representing a slight decrease of 3% from the 642,404 pieces recorded in 2011 (Table 4.4). Decreases were observed across all species groups except for Pentard where an increase of 17% was observed.

Table 4.4 Reported number of sea cucumbers caught between January to December 2007 to 2012

Year	Black teat	Sandfish	White teat	Prickly red	Pentard	Others	Total
2007	7,883	433	57,837	19,693	181,670	63,499	331,015
2008	5,687	1,842	57,084	21,272	155,674	24,650	266,209
2009	6,230	303	134,978	44,885	290,285	13,950	490,631
2010	31,434	1,639	125,472	35,480	306,725	30,452	531,202
2011	10,764	2,018	117,791	82,710	348,431	80,690	642,404
2012	6,854	1,806	83,517	69,366	409,326	49,231	620,100

Chapter 5 - Aquaculture

5.1 Aquaculture Development

Aquaculture is defined as “the cultivation, propagation or farming at sea or on land of fish from eggs, spawn, spat, fingerling or seed; and includes the rearing and ranching of fish taken from the wild or imported into Seychelles”. Aquaculture implies some form of intervention in the rearing process to enhance production, such as regular stocking, feeding and protection from predators.

Seychelles has a relatively long history of prawn farming, which was established on Coetivy Island in 1989 by the Islands Development Company Ltd and the Seychelles Marketing Board and later taken over and managed by the latter. The farm comprised of two hatcheries and around 200 ponds and occupied an area of around 96 ha, and when in black tiger prawn (*Penaeus monodon*) peaked at 1200 tonnes in 2004. On the other hand, Pearl (oyster) farming in Seychelles was started in 1995 and continues on Praslin in the Curieuse Marine National Park where the sea concession of the farm covers an area of around 19ha. Black lipped oyster (*Pinctada margaritifera*), and the winged Oyster (*Pteria penguin*) are produced. Round pearls are mainly produced through Black lipped Oyster, while half pearls are produced by winged oyster. The Black Pearl farm on Praslin ceased commercial production of giant clams (*Tridacna maxima*) for export since 2011 as it was not viable any longer. While pearl farming remains fairly constant in production with around 5,000 pearl oyster that were implanted in late 2011. The expected time until harvest is around 2-3 years. Harvesting size of the round pearls vary from 8 to 12mm.

There is a need to meet national socio-economic and food security objectives, particularly in view of the vulnerability of the fisheries and tourism sectors. With declining trends in capture fisheries worldwide and locally, aquaculture is seen as one of the potential activities that could keep up with the rapid increase in fish demand. Seychelles has the environment, the species and the basic infrastructure, services and some of the raw material to develop a sizeable aquaculture industry. As a

consequence the government has decided to develop the “Seychelles Mariculture Master Plan” which will ensure;

- the orderly and environmentally sustainable development of the sector;
- the efficient use of the country’s resources;
- that the legislative and regulatory framework, support services and human capacity needs are developed harmoniously; and
- that the development of the sector leads to positive social and economic benefits, while adverse effects are either negated or minimized.

The goal of the Aquaculture sector is to create a sustainable sector that is integrated into the country’s economic planning vision, coastal zone and off-shore management strategies and that is environmentally responsible and sustainable.

Phase 2 of the Seychelles Mariculture Master Plan is expected to be completed in December 2013, when there will be a call for investment in the sector.

Chapter 6 - Research Projects

6.1 From Behavioural Ecology, to Spatial Management for the Conservation of Sharks in the Seychelles (SEYSHA)

The SEYSHA project, which started in early 2010, used acoustic telemetry (acoustic receivers and tags) to study the distribution and migration of coastal sharks around the inner granitic islands. A network of 39 acoustic listening stations (Vemco VR2) was deployed at various sites around the inner granitic islands of the Seychelles. The sites were chosen after interviewing fishermen and dive operators to collect empirical knowledge on potential key habitats. The initial strategy of the project was to tag several species as to reflect the multispecies component of the shark community in these waters, such as grey reef sharks (*Carcharhinus amblyrhynchos*), Tiger Shark (*Galeocerdo cuvier*), Bull sharks (*Carcharhinus leucas*) and Hammerhead sharks (*Sphyrnidae* sp.). Most of the tagged sharks were in the average of 1m total length, with the biggest being a 3.6m tiger shark. A poster presenting the programme and the preliminary data collected was presented at the 2011 WIOMSA symposium in Mombasa.

Preliminary analysis of the data from 2011 showed that of 5 grey reef sharks tagged 3 of these were picked up on receivers situated at 3 sites with 6 receivers in total and showing fairly large movements of about 12 km apart. Although this data showed the movements between these sites, there was a lack of data in between detections. In order to try and get better fine scale movement data the objectives of the project were redefined and focused on examining the activity patterns and area use of juvenile sickle fin lemon sharks, *Negaprion acutidens*, in a small marine protected area. The smaller study area allowed for a greater coverage using acoustic receivers, therefore the number of detections improved.

In recent years the understanding of the movement of exploited marine species has began playing an important role in the design of spatial management measures such as marine protected areas (MPAs). In Seychelles, juvenile reef sharks are often observed in shallow areas where they are often targeted by recreational fishermen. To better understand the movements and habitat use of these sharks a total of 19

individuals were successfully tagged and data showing rhythmic movements over a very restricted habitat was collected. Analysis of the data showed that juvenile sharks show high fidelity to the marine protected area studied and were only occupying the site for a period of several weeks up to 5 months before leaving the area. This suggests that the MPA is an important nursery site for this species. The knowledge gathered from this study could be used to implement partial closures to fishing in other nursery sites that could help protect these vulnerable species without having to create full time fishing closures that may affect the livelihood of artisanal fishermen that often use these areas for fishing activities.

6.2 South West Indian Ocean Fisheries Project (SWIOFP)

The process of winding up the South West Indian Ocean Fisheries Project started in 2012 whereby all field activities and data analysis had to be completed in time for the drafting and formulation of a Transboundary Diagnostic Analysis (TDA) and the Strategic Action Programme (SAP) for the Western Indian Ocean in partnership with the ASCLME project. The pelagic component which was being coordinated by the Seychelles completed a total of 11 sea going surveys (5 acoustic/pelagic trawl surveys for small pelagic, 6 Instrumented longline/tagging surveys for large pelagics) and deployed anchored FADs in 7 member countries (Seychelles, Tanzania, Mozambique, Mauritius, Comoros, Madagascar and Kenya).

The sea-going research contributed to the SWIOFP's objective of studying exploitable offshore fish stocks within the South West Indian Ocean, determining existing fishing pressure on these stocks and investigating the role of environmental influences on the life histories, seasonal variability and health of stocks as well as enhancing the technical expertise within the region through capacity building.

A total of 14 swordfish were tagged (11 off South Africa and 3 off Reunion Island) using Pop Up Satellite Tag (PSAT). However due to tag retention problems, only 5 tagged fish were followed for a period between 60 to 90 days. All of the tagged fish stayed in the Mozambique Channel including the one tagged off Reunion Island which moved there, suggesting the existence of a bounded home range for swordfish in the Mozambique Channel. Two of those swordfish crossed over into the Atlantic Ocean, which suggest a need to revisit stock delineation between the 2 oceans.

The deployment of anchored FADs in member countries suffered from considerable delays due to lengthy procurement procedures and delays from supplier. The materials arrived in June 2011 and by December of the same year, FADs had been

deployed in Seychelles, Comoros, Madagascar, Kenya and Tanzania. Unfortunately for Kenya and Tanzania, the FADs were vandalized within days of deployment, possibly due to inadequate sensitization of the fishing community.

In Seychelles a total of 6 shallow water FADs (max depth 50m) were deployed on the Mahe plateau (within 2 km from shores). Acoustic tagging surveys to look at residency and movement of fish around FADs was initiated in May 2012 on 2 of the 4 remaining FADs. A total of 15 medium pelagic fishes (4 wahoos, 4 bonitos, 6 Dorado and 1 sailfish) were tagged and release around FAD's. Unfortunately, data could not be retrieved from those FADs since one month later both FADs were lost together with the listening stations. Vandalisms and the quality of the materials are two issues which would need careful consideration for any future FAD's fishery development programme.

The SWIOFP made a substantial contribution towards improving the quality of data available for regional fisheries management, and laid the groundwork for future endeavors to establish national and regional observer programmes. Although the initiative was severely hampered by an escalation in piracy, good progress was made with establishing the infrastructure necessary for such programmes. Four observers from Seychelles received training funded by SWIOFP and also benefited from materials developed for the collection and recording of observer data.

Key outcomes of the SWIOFP included strengthening of institutional and human capacity, fostering a regional identity, development of regional protocols and standards (e.g. for cruises management plans, observer programme), and establishing regional networks which were not present before the project started. The Trans Diagnosis Analysis and Stragic Action Plan are expected to be ready in 2013.

6.3 Mitigating ADverse Ecological Impacts of Open Ocean Pelagic Fisheries (MADE)

Activities under the MADE project began in 2008 with a kick-off meeting in Genoa, Italy. This international project involves 13 research institutes from 8 countries of the Mediterranean Sea and Atlantic and Indian Oceans. Funded by the European Commission Seventh Framework Programme, the main goal of the project is threefold: to gain appropriate knowledge of the biology and ecology of by-catch species; to investigate spatial and technical management measures to reduce the by-catch of fisheries targeting large pelagic fish in the open ocean (purse seiners using

FADs and longliners); and to assess the effects of FADs on behaviour and ecology of pelagic fish.

The majority of field studies were completed in 2011 and the data collected were analysed during 2012. A manual entitled “Good practises to reduce the mortality of sharks and rays caught incidentally by tropical tuna purse seiners” was produced in 2012. The manual, which illustrates a set of voluntary and nonbinding guidelines, was prepared with the assistance of French skippers and crews who shared their experiences and knowledge.

A final international symposium was organised in October 2012 to provide scientists with the opportunity to present their most recent findings and provide a platform to exchange ideas and investigate optimal approaches to mitigate impacts and ensure sustainability of tuna fisheries. At the end of the symposium, the International Seafood Sustainability Foundation (ISSF) hosted a 1 day workshop where purse seine fleet owners, skippers and scientist had the opportunity to interact and discuss by-catch reduction methods in the tuna purse seine fishery. The methods discussed included: the monitoring of fishing activities (e.g. FADs for purse seiners), the control of fishing efforts (e.g. numbers of hooks per sets, numbers of sets, numbers of FADs or FAD sets, etc.), the development of economic incentives or market driven measures (e.g. use of non sensitive by-catch species, regulate price of undersized target fish, promote eco-labelling, etc.), the improvement of fishing practices such as methods to release bycatch or use of particular gears (e.g. promote the use of ecological FADs, ban light-sticks or wire leaders for longliners, promote the use of artificial baits, etc.).

Although the MADE project has ended, research investigating by-catch issues continues under the ISSF By-catch Project. This new project has similar objectives to the MADE project and aims to reduce by-catch associated with purse seine vessels, particularly those that utilise FADs.

6.4 WIOMSA MASMA Project: Incorporating Reef Fish Spawning Aggregations into Optimal Designs for no-take Fishery Reserves

SFA has been very successful in obtaining competitive research grants from the Western Indian Ocean Marine Science Association (WIOMSA). The first research grant SFA obtained from the Marine Science for Management (MASMA) Programme of WIOMSA was to support research on spawning aggregation-based fisheries in Seychelles between 2003 and 2006. In 2008, SFA was successful in obtaining a further

MASMA grant (US\$200,000), this time to lead a team of institutions from Kenya and Zanzibar in research focused on providing the necessary data and tools for the assessment and management of spawning aggregation-based fisheries in the region. Field work for the project was carried out in all of the three countries in 2009, 2010 and 2011 with monitoring of *Siganus sutor* ('kordonnyen blan'), *Epinephelus fuscoguttatus* ('vyey goni') and *Epinephelus polyphekadion* ('vyey masata') spawning aggregations, using acoustic technology and underwater visual census. The project was successfully completed in 2012 when the last acoustic receivers were removed from the study site at Farquhar atoll, southern Seychelles. All work carried out under the project, results and synthesis will be presented in a book which is expected to be published by the end of 2013. The book will form part of the MASMA Science series. The objectives of the book are to: i) disseminate results, findings, etc. to a wide audience beyond scientists; ii) promote understanding and uptake by fisheries and conservation managers and policy makers, iii) Facilitate a more rapid dissemination to scientific audiences in lieu of more time consuming scientific peer-reviewed publications and iv) facilitate scientific peer-reviewed publication process by setting early deadline and allowing cross-cutting issues and findings to emerge.

6.5 Piloting Participatory Research in a Fisheries Co-Management Set-up: The Case of the Praslin Rabbitfish Spawning Aggregation Fishery

The Seychelles Fishing Authority (SFA) was a partner with the Praslin Fishers Association (PFA) in the implementation of this project which was completed in early 2012. The project's general objective was to strengthen the management of the shoemaker spine foot rabbit fish spawning aggregation fishery around the island of Praslin. It had 2 specific objectives which were to:

- (i) carry out participatory research to address key management-orientated questions on the dynamic of the of shoemaker spine foot rabbit fish spawning aggregation, and
- (ii) empower the members of the PFA so that they can effectively participate in decision making process in the fishery co-management set-up which is currently being piloted.

Part of the scientific results of the project dealing with residence time, site fidelity and spawning aggregation turn-over studied using acoustic telemetry has already been published. The second component of scientific results, which investigated

movement of conventionally tagged fish away from spawning aggregation site, is being completed and will soon be submitted for publication. Another manuscript on the effect of full and new moon periods in structuring coral reef fish communities at spawning aggregation site is also being finalised.

6.6 Spatio-Temporal Use of Near-shore Coastal Areas by Large Bull and Tiger Sharks

This is an on-going project that was launched in 2011 after 2 tourists were fatally attacked by sharks while swimming at a touristic beach on the island of Praslin. The aim of the project is to study the spatial and temporal use of near-shore coastal areas by large (>2.5 m) individuals of the 2 species (Bull shark: *Carcharhinus leucas* and Tiger shark: *Galeocerdo cuvier*) which were suspected to have been involved in the attack. The project involves tagging of large sharks with satellite (mini-PAT, SPOT) and acoustic tags (Vemco V13 and V16) tags to study temporal patterns in the use of near-shore areas and to identify hot spots preferred by these large sharks. The project is being implemented in collaboration with the Shark Fishermen Association. So far 3 bull sharks and 4 tiger sharks have been tagged. There are plans to tag an additional 9 sharks in August 2013.

6.7 African Monitoring of Environment for Sustainable Development (AMESD)

AMESD is a project that has the objective of helping African countries improve the management of their natural resources by providing remote sensing equipment and data. For the countries of the Indian Ocean, the theme is 'Coastal and Marine Resource Management. This implies that environmental data (e.g. sea surface temperature, ocean colour) monitored by satellite will be freely disseminated through installed Satellite Dish in participating countries. SFA was nominated as the key Institution for the initiative and in 2011 the Satellite Dish was installed on SFA grounds and early 2012 the operating system for the Satellite Dish was updated. SFA is currently receiving daily near real time data (ocean temperature and ocean colour) which are available to potential users. AMESD project has provided training in the management of the system and data component - to use and process the data.

6.8 Ocean Data and Information Network for AFRICA (ODINAFRICA)

The ODINAFRICA project has the objective of promoting the sustainable management of marine and coastal resources through information, data and product sharing and is currently in its fourth phase. The objectives of this phase are to strengthen the National Oceanographic Data Centres (NODC) and marine related institutions. To contribute to this project, SFA aims to develop an electronic National Marine Atlas and an E-Repository. The Marine Atlas is a tool that will enable users to create their own specific maps according to their needs. The Atlas captures both the metadata and data aspects, with most of the core components already completed. E-Repository provides online access to related publications, reports and books. The E-Repository can currently only be accessed through SFA's Network and has about 1056 records. The aim is to have both systems available online.

6.9 Seychelles Ocean Temperature Network (SOTN)

The Seychelles Ocean Temperature Network was an initiative under the Seychelles Second National Communication to the United Nations Framework Convention on Climate Change aimed to establish a collaboration network between public, private and NGOs in Seychelles for monitoring and sharing of ocean temperature data. The network had 16 members by 2010 and had deployed over 49 temperature loggers within Seychelles since 2007; 37 around the Inner Islands, ten in the Amirantes and two at the Farquhar Atoll. The temperature data will be used to provide information for studies of coral reef ecology and monitor and predict possible bleaching. In March 2012, a Research cruise was undertaken to download data from most of temperature loggers within the Inner islands.

6.10 Pangaea Project

Pangaea is a long-term (2013 – 2018) marine research program that is being promoted by the South African Institute for Aquatic Biodiversity (SAIAB) with a geographical focus on the Seychelles. The project has secured the services of a 60m motorized vessel (M/V *Pangaea*) from *Teach Green Charitable Foundation* and *Outpost Expedition Pacific* for 4-months per annum for a five year period. SAIAB is seeking the partnership of the Seychelles Fishing Authority (SFA), Island Conservation Society (ICS) and Seychelles Island Foundation (SIF) in this project and is offering the use of the research vessel for these organizations to undertake projects in remote areas of Seychelles as per their research priorities. A number of projects are being proposed including: i) baseline evaluation of unexploited and lightly exploited stocks

of targeted demersal fishes, ii) assessment of requirements for future marine protected areas for demersal fish species, iii) identification of fish spawning aggregation sites; iv) development of best practice protocol for handling caught fish and to reduce catching and post-release mortality; v) efficiency and selectivity of fish traps, and vi) environmental effects of fisheries and climate change. The project has a capacity building component that includes bursaries for a post-doc and MSc. Students to be registered at the University of Rhodes in South Africa.

6.11 Estimation of Maternal Effects on the Sustainability of Large Pelagic Populations (EMOTION)

EMOTION is a research project led by Institute of Research and Development (IRD, France) in collaboration with the Seychelles Fishing Authority (SFA, Seychelles), AZTI Technalia (Spain), Institut Français de Recherche pour l'Exploitation de la mer (Ifremer, France) and AgroCampus Ouest (France) which aims at testing and quantifying maternal effect on large pelagic species. It will address several interrelated questions about growth, body condition and reproduction. The study is targeting females of 3 main exploited tuna species from the Indian Ocean i.e. the yellowfin (*Thunnus albacores*), the skipjack (*Katsuwonus pelamis*) and the bigeye (*Thunnus obesus*). The project started in March 2012 and its duration is for three years.

The first objective is to estimate age and individual growth using sclerochronological methods. This will be achieved using otolith reading. Growth models will also be developed using dataset of the Indian Ocean Tuna Tagging Programme (IOTTP). The second objective is to investigate the body condition, lipid and fatty acid dynamics during the reproductive cycle of the three targeted species. Biometric measurements including total weight, fork length, predorsal distance and thorax girth along with samples of white and red muscle, liver and gonads are collected. Tissue samples are tested for bioenergetics tracers such as total lipid content, lipid class composition and fatty acid profiles. In addition histological analyses on gonads will allow the determination of maturity stage and fecundity potential for each female. The result will bring valuable information on the maturity cycle, length at first maturity and spawning area location for the 3 species. Then the results from the lipid and fatty acid analysis will give information on the lipid dynamic and the energy that is allocated to offspring during reproductive cycle. The main activity for 2013 will focus on bigeye tuna, as analyses have already been performed on yellowfin and skipjack. SFA staffs

will do histological and fecundity analyses while IRD will be in charge of the lipid class and fatty acids analysis.

6.12 Changes in the Biochemical Composition of Tropical Tunas and its Effects on Meat Quality (CANAL)

Alongside the EMOTION project is the CANAL project which aims to find out why tropical tunas collected from March to June in the Mozambique Channel and processed by the Indian Ocean Tuna cannery (IOT) have meat with lower quality compare to tunas fished during the rest of the year. It is a project sponsored by MW Brands led by IRD and SFA. The sampling protocol is the same as for EMOTION except that it will be targeting immature and mature (male and female) tunas. In order to understand the spatio-temporal variability of tuna meat quality, biochemical composition of the tunas will be performed including total proteins, total fat, lipid class composition, and fatty and amino acids profiles. In addition information regarding tuna reproduction and diet will be obtained through histological and stable isotope analyses. The result will bring benefits to both the IOT factory and the Seychelles economically as well as giving information on the nutritional quality of these tunas which are consumed by the population. The project duration is three years.

Chapter 7 - Fisheries Development

7.1 Credit Facilities to the Fisheries Sector

Table 7.1 below summarises the number of loans and their values, for years 2011 and 2012, approved for investment in the fisheries sector. The table only provides information of loans from the Concessionary Credit Agency (CCA) and the Development Bank of Seychelles (DBS) as no information could be obtained for loans granted by the commercial banks.

In line with the Development Bank of Seychelles' decision to put all lending activities on hold in February 2012, due to difficulties to raise finances to meet demand, no loans were approved by DBS in 2012.

The CCA grants soft loans of up to SR 300,000 for the purchasing of new as well as second hand boats and engines, fishing gears and for the refurbishment of fishing vessels. In 2012, CCA continued to issue loans throughout the year, with a total of 21 loans approved, compared to 36 in the previous year.

In 2012 both the number and value of loans approved decreased compared to 2011, the former fell by 42%, whilst the latter registered a lesser decrease of 17%. Reasons for this could be an increase in demand for higher value loans in 2012 as fishermen and entrepreneurs' confidence in the fisheries sector is slowly being restored with ongoing efforts to eliminate piracy.

Table 7.1 Number and value of loans approved by CCA and DBS 2011-2012

	2011			2012		
	CCA	DBS	Total	CCA	DBS	Total
Number of loans approved	36	25	61	21	0	21
Values of loans approved (SR,000)	2,485	4,898	7,383	2,063	0	2,063

7.2 Fisheries Incentives

7.2.1 GST and trade tax concessions

As observed in Table 7.2, 190 applications with a CIF value of SR 11.3, million were received under the Agricultural and Fisheries Incentive Act (AFIA) in 2012 for GST and Trades Tax concessions on imported materials. These included various items such as engines, commercial vehicles, equipment and spare parts. Applications were received from fishermen, boat owners (individuals as well companies) and companies processing and exporting fish and other fish related products.

Table 7.2 Applications and CIF value for concessions under AFIA

	2011	2012
No. of Applications	239	190
Est. Value (SR M)	18.8	11.3

7.2.2 Registration

In 2012, the total numbers of new registrations and renewals with SFA were as follows; 92 fishermen, 84 fishermen/boat owner, and 13 companies including processors.

There are various incentives for registering with SFA including the “Sickness Benefit Scheme” for fishermen, which compensates full time fishermen if they fall sick or are unable to work, and the fuel incentive scheme for boat owners. Registered fishing companies, including processors/exporters, benefit from GST, and Trades Tax exemption on imported goods, Business Tax concessions as well as GOP exemptions for foreign workers employed.

7.2.3 Fisheries Development Fund

The Fisheries Development fund (FDF) was launched in July 2009 and has an allocation of Euro 2.7 million. It is funded by the European Union’s sectorial support to Seychelles, under the EU/Seychelles Fisheries Partnership Agreement. This fund aims to boost investment in fisheries value addition and processing, purchasing of new long-line vessels, as well as upgrading existing long-line vessels.

The fund is a collaboration between the Seychelles Fishing Authority (SFA) and the Development Bank of Seychelles (DBS). Investors wanting to apply for a loan under the FDF must first submit a project memorandum to SFA for approval. This is then forwarded to DBS that has responsibility for the administrative aspect of the loan. It is worth noting that the guarantee and security for the loans is as per DBS requirements.

Loans under this fund are charged at a 3% rate of interest annually with a period of repayment that should not exceed 10 years and are available exclusively to Seychellois investors or joint partnerships where the majority shareholder is Seychellois. Investors are asked to contribute a minimum of 5% of the total project cost.

This fund has been set up at a crucial time where much importance is being placed on developing the fisheries sector to its full potential and to extract maximum economic benefits from its natural resources. Presently, the semi-industrial industry is producing approximately 300 tonnes of catches per year; but with the launching of this fund expected catches will increase to approximately 1,500 tonnes in the next two years.

Certain amendments have been made to the conditions of the loans such as amount of personal contribution which decreased from 15% to 5%, the grace period increased from 9 months to 12 months and changes in the guarantee and securities required for the loan.

Two loans for a total value of SR 9.1 million were approved in 2011 under the FDF and in 2012, an additional 11 loans for a total value of SR 40.2 million was approved. By the end of 2012, seven loans with a value of SR 22.5 million had been disbursed.

7.3 Fisheries Development Facilities

7.3.1 Ile du Port Zone 14

The agreement to construct the Tuna Quay to service the industrial fishing fleet was signed in the third quarter of the year. The project consists of a 120 meters long quay with 9.5 meters draft at average chart datum. The tuna quay when completed in around one year time is costing a little over SR50 millions. The contractor for the project is Vijay Construction and the consultant Charles Pool Associates. When completed the quay facility will allow the existing and the new generation of

industrial purse seiners to berth for services such as net working, fuel and fresh water bunkering and also for ships' victuals etc. No doubt such facility will help in alleviating congestion during peak fishing period, improve ships turnabout time thus making Port Victoria more competitive regionally. The project is funded under the EU Sectoral programs under the EU/Seychelles Fisheries Partnership Agreement

7.3.2 Providence Fishing Port Zone 6

Zone 6 quay facility: The quay length which measures 100 meters serviced 47 fishing boats on average weekly for loading ice, unloading catch and boat moorings. The fleet that were serviced make up of 4 longliners, 36 schooners and seven whalers.

Fuel Bunker Facility: Construction work on the new fuel bunker facility was completed in the fourth quarter of the year. Completion work was delayed by almost one year due to the uplifting of the fuel tank concrete chamber. At the facility when commissioned diesel and kerosene will be sold to fishermen. In other word fishermen from south east and south Mahe will be able to purchase their fuel supplies at the station. This will inevitably assist those fishermen using the pump to cut transportation costs, important fishing times and less hardship. The operating hours will be communicated at a later stage. With the provision of this fuel station the Seychelles Fishing Authority will manage and operate two such facilities, one at Zone 6 and the other one at one Victoria.

Processing Building Facility: The principal aim of the project will be to provide processing facility to aspiring fish processors to add value to fish products. When completed the facility will provide three main building components consisting of nine units. Each unit measures 400 meter squares meters. Commissioning of the facility is planned for early 2014. And again the project is funded under the EU fisheries sectoral Programmes under the EU/Seychelles Fisheries Partnership Agreement.

Land Sub Division Zone 6: Survey works to sub divide several plots of land at Zone 6 were undertaken during the year. The task when completed and approved by the Planning Authority will allow the Seychelles Fishing Authority to lease land to serious fishing companies/processors to further develop the fisheries sector.

7.3.3 Bel Ombre Fisheries Development Project

The second phase of the fisheries development project for Bel Ombre comprising of two processing buildings, one fishermen gear stores and one fuel bunkering facility was submitted to Planning Authority for approval. The processing building will be leased out to fish processors. The gear stores will be used to secure fishing gears and tackles for fishermen while the bunker facility for fuel and water supplies. Should everything go to plan we will soon see the start of the construction work. When completed no doubt these developments will be a boost for the artisanal and semi industrial fishing sector for the Mahe Northern Region.

7.3.4 Victoria Quay Facility

The overall length of the quay is 350 meters with water draft alongside 3.5 meters. The facility stretches from Oceana Fisheries to SMB boundary wall. During the course of the year on coverage 152 fishing boats used the facility weekly for loading of ice, unloading fish and mooring. Fishing boats that used the service included longliners, schooners and whalers.

7.4 Ice Plants

In 2012 the Seychelles Fishing Authority managed and operated five ice plants in total. Their daily production capacities are as follows; Baie St Anne Praslin 4 tons, Anse a La Mouche 2 tons, Anse Royale 5 tons and Zone 6 10 tons. The cost of utilities to produce one kilo of ice is one rupee and fishermen paid only 60 cents for a kilo. Below is a table indicating demand and sales of ice over the last four years Table 7.3.

Table 7.3 Sale of ice for 2008-2012 (in thousands of SR)

	2008	2009	2010	2011	2012	TOTAL
Anse a La Mouche	58	82	208	196	195	738
Anse Royale	168	66	-	355	284	872
Baie Ste Anne	-	149	-	272	281	703
Bel Ombre	-	-	101	276	392	769
Providence			163	1,050	1,247	2,480
Total	226	297	472	2,169	2,399	5,562

7.5 Navigation Aids

Leading lights that are installed in dangerous passes outside Port Victoria were serviced and maintained in the second quarter of the year. These lights which are fitted on floating buoys are placed in dangerous access channels supported by heavy concrete sinkers which act as moorings. Their principal aim is to guide fishermen to negotiate safer access to and from fishing grounds.

7.6 The Seafood Value Addition

Since 2007 SFA has been involved in the expansion of the industrial seafood processing sector. A Development and Evaluation section has been created within the SFA, which is responsible for promoting seafood value addition by providing the conditions and expertise necessary to guide and assist potential investors venturing in fish processing.

The research and development laboratory funded by the OFCF is competent in value addition of seafood products through the creation of new products and in the development of innovative processes. Until now ten new products suitable for the local market have been developed and tested.

Warehouses of international food standards, able to accommodate 9 semi-industrial fish processing activities are under construction at the Providence industrial zone. The Development and Evaluation section is also competent in assisting and advising potential investors in the areas of business development, industrialization and food hygiene.

Chapter 8 - Monitoring Control and Surveillance

The Monitoring Control and surveillance (MCS) Section is comprised of two sub-units.: the Monitoring and Control Unit and the Enforcement Unit. The Monitoring and Control Unit is composed of the Fisheries Monitoring Centre (FMC) and the Fisheries Control Unit.

The Fisheries Monitoring Centre (FMC) deals with the compliance of all fishing vessels reporting requirements, Vessel Monitoring System (VMS), validation of statistical documents for ICCAT, IOTC, EU and Non-EU catch certificates. The Fisheries Control Unit is responsible for the processing of fishing licences. The Enforcement Unit carries out all inspectorate duties with regards to port state inspection, land inspection, sea and air surveillance duties pertaining to national and regional requirements.

The main objectives of MCS Section include:

- To ensure compliance to the fisheries Act and regulations, Fisheries agreement and protocols;
- To provide supports to local partners such as the Seychelles Coastguard (SCG) and the National Drug Enforcement Agency (NDEA);
- To work with countries of the region to improve MCS implementation in a regional effort to eliminate IUU fishing activities;
- To ensure compliance to the Licensing Act and Regulations;
- To ensure compliance to international legal framework plus the IOTC resolutions that has been endorsed by the Seychelles.

8.1 Fisheries Monitoring Centre (FMC)

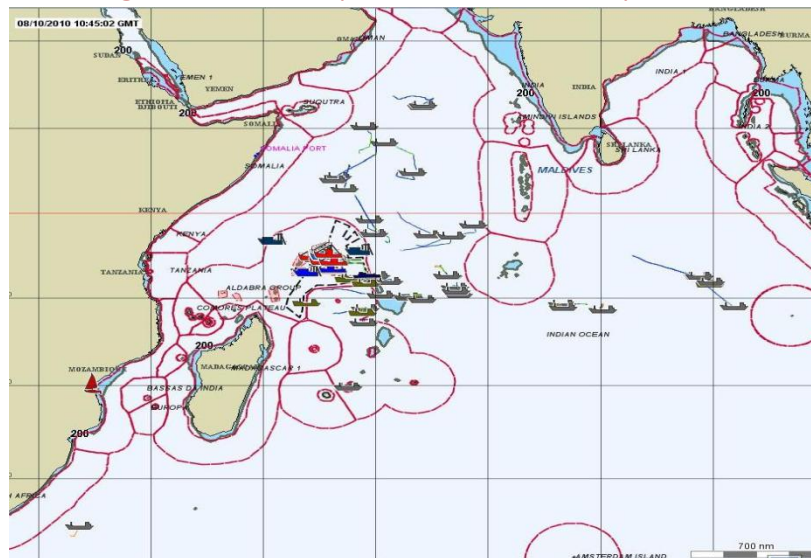
8.1.1 Vessel Monitoring System (VMS)

With the integration of our new VMS software (Themis), SFA VMS data transfer operation became fully compatible to send and receive data through HTTPS and SMTP protocol. The Themis platform was installed in 2009 and further upgrades has

been done since then to improve the operation of the server. The software has enabled the FMC to be able to monitor licence fishing vessels on a larger scale.

A technical team of the FMC ensures the operation of the FMC servers on a daily basis, plus the installation and maintenance of VMS mobiles on local fleets and the inspection of VMS mobiles on Seychelles and foreign flagged fishing vessels.

Figure 8.1 Screen capture of Themis viewer platform



The Vision software, develop by CLS that was temporarily installed at the Seychelles Coastguard was replaced by the Themis software in December 2012. The Themis software operates on a vector map which will assist the SCG during their Patrolling operation within Seychelles EEZ.

The total VMS data transmission continued to increase over the years and Table 8.1 below illustrates data transmission records for different fleets which took licences to fish in Seychelles waters in addition to Seychelles' flagged vessels during 2012.

The increase of data reporting is due to the increase of vessel applying for a fishing licence.

Table 8.1 VMS data transmission records per vessels flags

Vessels Flag	2005	2006	2007	2008	2009	2010	2011	2012
France	90,800	109,969	130,466	106,417	55,498	99,557	89,981	75,136
China	20,368	3,864	4,913	9,163	6,484	55	897	12,825
Japan	179,207	159,815	125,248	108,799	5,788	384	0	8,781
Seychelles								
Artisanal	140,024	174,100	250,895	242,972	326,684	296,895	327,297	563,154
Mayotte	0	1,965	7,240	7,206	23,724	23,408	20,799	31,626
Seychelles								
Industrial	249,566	301,662	338,297	399,348	388,695	548,902	563,362	579,012
Spain	56,635	73,974	76,431	58,915	49,618	51,262	45,864	52,710
Taiwan	403,472	202,566	161,572	125,712	172,683	189,070	159,433	354,624
Panama	0	0	0	0	0	0	0	0
Oman	0	314	0	0	8,118	2,545	2,233	10,797
Netherland	2,755	3,993	0	0	0	0	0	0
Belize	151	1,517	0	1,388	0	0	0	0
Philippines	1,533	567	0	0	77	0	732	2,123
Italy	2,724	3,157	2,523	0	0	0	0	0
Korea	22,079	26,376	629	1,532	4,049	0	0	15,804
Thailand	0	0	0	3,564	20,197	5,548	0	0
Total	1,171,319	1,065,845	1,100,221	1,067,024	1,494,319	1,238,580	1,210,598	1,716,592

8.1.2 VMS on local fishing fleet

The number of local vessel installed with Inmarsat-C transceivers in 2010 was 190 and thirty five vessels were equipped with VMS. in 2011. By end 2012 only 206 vessels were equipped with VMS and 12 out of the 35 vessels which were marked as active vessels in 2011 were marked as inactive fishing vessels. Maintenance of the VMS terminals on the local fishing vessels still remain one of the main challenges to the centre.

Table 8.2 below also shows the number of maritime distress alerts received by the Seychelles Coast Guard.

Table 8.2 Breakdowns and maritime distress alerts received by the Coast Guard for 2010 - 2012

	2010	2011	2012
Breakdowns	13	1	9
Distress	19	20	11

8.1.3 Longliner transshipment

All Seychelles longliners that carry out transshipment at sea or in foreign port have to seek prior authorisation from SFA in line with IOTC resolution 09/03. A total of 112 transshipment were carried out in 2011 and 130 in 2012.

Table 8.3 Total number of transshipments carried out at sea 2011 – 2012

Year	2011	2012
Total No. of Transshipments	112	130
Total No. of kg Transhipped	6,985	36,727

8.1.4 Statistical document

Since 2002, Seychelles has been validating statistical document for ICCAT and IOTC. As of the 1st January 2010 when COUNCIL REGULATION (EC) No 1005/2008 came into force SFA successfully implemented the catch certificates as per article 12 of the regulation. During 2010-2011 there was continuous improvement in the EU/IUU regulations, especially from processing products whereby partial certificates were introduced for partial processing of products from the industrial tuna fishery.

In 2012 a total of 2,348 catch certificates and statistical documents were validated for export.

Figure 8.2 Graphical illustrations of validated Catch Certificates for the period 2009-2012

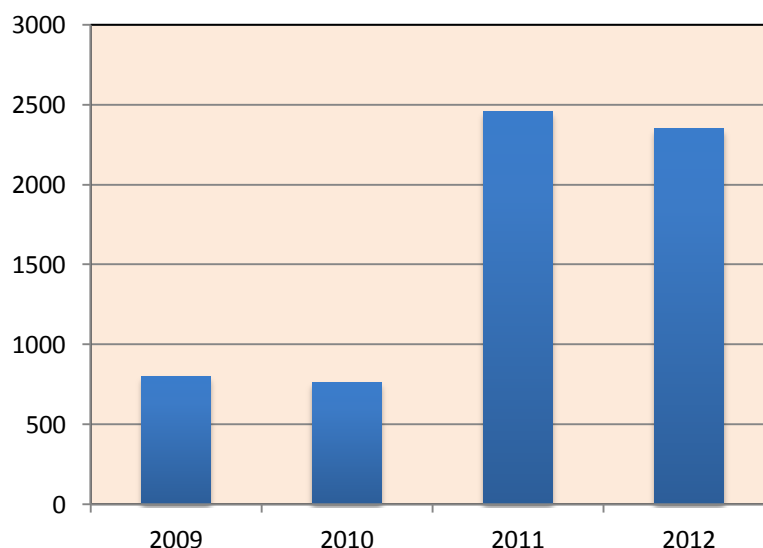


Table 8.4 shows the total number of fish exported in 2011 by country as per validated catch certificates.

Table 8.4 Destination of the 2012 catch
for the semi-industrial and artisanal
fishing vessels

Country of Export	Quantity (Kg)
United Kingdom	83,825
Reunion	22,753
Germany	11,394
France	4,404
Italy	408
Mauritius	41,791
Australia	3,606
U.A.E	11,750
USA	16,055
Pakistan	9,481
South Africa	14,772
Czech Republic	102

8.1.5 Data exchange

During 2012, data exchange between Seychelles and Reunion (CROSS REU) have continued to progress with weekly exchanges. Further to that, data exchange also took place during regional fisheries surveillance missions.

The SFA is also optimistic of further data exchanges under the SADC regional MCS program and the Smart Fish MCS component funded under the 10th EDF for ESA IO member states.

Stop illegal Fishing has launched a new initiative **Fish-I**. It is a regional partnership between the Southeast African countries to combat fisheries crimes. The initiative was launched in December 2012 in Seychelles.

8.2 Fisheries Control

In the past SFA's responsibility was limited to compliance verification and approval of the licences. To issue or revoke a fishing licence was the responsibility of the Seychelles Licensing Authority (SLA).

Since 25th September 2010, the SFA has been legally responsible for the issuance of fishing licences, but due to limited office space and human capacity constraints, the SFA was unable to discharge such responsibility.

8.2.1 Industrial sector

The number of licences issued by SFA in 2012 is reflected in Table 8.5. There has been a large increase in the number of licences issued in 2012 compared to 2011. In 2011 there was 103 licences issued and in 2012 there were 207 in total.

Concerning the type of vessels that applied for industrial fishing licences, the increase in the number of licences is largely reflected in the number of longliners from the Far East.

Table 8.5 Number of industrial fishing licensed issued per country and by types of Fishing Vessels in 2012

Country	Longliner	Purse Seiner	Supply vessel	Total
Spain	0	14	5	19
Belize	0	0	0	0
Iran	0	0	0	0
Oman	2	0	0	2
China	13	0	0	13
France	0	8	0	8
Italy	0	0	0	0
Korea	0	1	0	1
Japan	2	0	0	2
Mayotte	0	5	0	5
Philippines	7	0	0	7
Seychelles	29	9	3	41
Taiwan (ROC)	108	0	0	108
Tanzania	1	0	0	1
Thailand	0	0	0	0
Total	162	37	8	207

Table 8.6 Licence Fees

Type of vessel	Duration	Amount	Currency
Longliner			
Sey/Taiwan	1 Year	24,000	USD
	6 Month	17,500	USD
Purse Seiner			
Sey. Flagged	1 Year	90,000	USD
French/Spanish (EU Agreement)	1 Year	61,000	EURO
Private Agreement	1 Year	120,000	USD
Supply Vessel	1 Year	5,000	USD

8.2.2 Local fishing licences

In 2012 381 local fishing licences were issued, compared to 420 issued in 2011 and 501 local licenses issued in 2010. Open deck Mini Mahe still remains the dominant type of fishing vessels issued with licences over the last three years followed by whalers and schooners.

Table 8.7 Type of local licenses issued for 2009 – 2011

Boat Type	2010	2011	2012
Catamaran	3	2	2
Seadog	11	8	9
Longliner (Semi-industrial)	17	15	18
Lekonomi	29	26	16
Lavenir	32	24	20
Schooner	65	58	61
Whaler	54	37	36
Mini Mahe	290	250	219
Total	501	420	381

8.2.3 Sea cucumber licences

The number of sea cucumber licences has remained constant over the years whereby the number is capped at 25 licences. The total number of sea cucumber exported by processors for 2012 was 608,188.

8.2.4 Lobster licences

Lobster fishing season re-open in 2010/2012. A limit of 20 licences was given to the three main islands Mahe, Praslin and La Digue.

8.3 Fisheries Surveillance

This is an area that is lacking in both manpower and equipment but on the other hand there have been major improvements in terms of sea patrol and port state control. Land based monitoring and port state control remains an area that needs to be reviewed as well as the type of inspection.

In the framework of the regional fisheries surveillance programme, SFA inspectors have had training in the field of inspection at sea, radio telecommunication, and procedures for safety at sea. Compliance observer training and port state inspections are areas that have been targeted for future training.

8.3.1 Port state control

Port state control has been one of the strong points of Seychelles even before the creation of the MCS section. Despite this fact the overall approach to port state control was reviewed in 2009, concentrating on an investigative rather than an informative approach. The results have been positive since several infractions have since been detected and in one case resulted in the capturing of the Sri Lankan flag fishing vessel Lucky Too in 2012. The vessel was fined SCR 100,000.00.

Nevertheless, there is still a need to improve port state inspection so that it can be brought in line with the requirements of the FAO Port State Measures (PSM) and the IOTC PSM resolution.

8.3.2 Compliance inspection

Compliance inspection is carried out on all Seychelles flagged industrial fishing vessels to ensure compliance as per FAO requirement for port state responsibility. Given that most distant water longline fishing vessels does not use port Victoria as their base port, the inspection is carried out when the vessel is registered and prior to issuance of the Certificate of Authorisation to fish outside of Seychelles waters. Most of the inspections are carried out in foreign ports, particularly, Jurong in Singapore, Port Louis in Mauritius and Colombo in Sri Lanka. These inspections are repeated every two years to ensure continuous compliance for all Seychelles flagged vessels.

Table 8.8 Number of fishing vessels inspected in Port Victoria by country and type of vessel for 2012

Flag	Purse Seiner	Longliner	Supply Vessel	Others
China		3		
France	61			
Korea	6			
Seychelles	55	4	12	
Spain	104		17	
Taiwan		32		
Mayotte	4			
Phillipines		3		
Total	230	42	29	

Table 8.9 Seychelles' flagged fishing vessel Compliance inspection in foreign ports for 2012

Year	Purse seiner	Longliner	Supply vessel
2010	-	5	-
2011	-	6	-
2012	-	22	-

8.3.3 Land patrols

Land patrols targets mainly landing sites around the three main islands: Mahe, Praslin and La Digue. The main purpose of land patrols are:

- Inspections of boats upon licence application;
- Inspection with regards to fuel claims;
- Inspection of sea cucumber landing at authorised landing sites;
- Inspection at point of export of sea cucumber;
- Monitoring of the Lobster fishery;
- Investigation on report of illegal activities;
- Periodic inspection at beach landing sites.

8.3.4 Regional fisheries surveillance

The Regional Fisheries Surveillance Project (RFSP) financed by the EU and IOC member states was extended for another year in 2011. Another three year extension has also been proposed for the coming years.

Twenty nine regional patrols have been planned since November 2007 up to November 2011, covering all jurisdictions of the Indian Ocean Commission member states.

With the implementation of the RFSP and the allocation of a budget financed by the Seychelles Government for joint fisheries and piracy patrol, Seychelles has improved its efficiency in the surveillance of its EEZ, as illustrated in table 8.10. For 2012 there was no patrol conducted due patrol vessel and Aircraft unavailability. All fisheries patrols were postponed for 2013.

8.3.5 Patrol vessels

The Seychelles Coast Guard have two long range patrol vessels, the 'PV Andromache' and 'PV Topaz'. The two vessels were fully engaged in piracy patrols since February 2009. Hence, SFA was left with no other alternative but to lease a vessel for fisheries patrol so as to meet our national and regional obligations. The Patrol vessel that was leased was the "Maya Dugong", owned by Silhouette Cruise Com. Ltd.

8.3.6 Aircrafts

SFA has been utilising the Seychelles' People Defence Force (SPDF) aircrafts for aerial fisheries surveillance. Availability of the aircrafts was again limited, in particular during 2010-2012 because of aircrafts involvement in piracy surveillance. The arrival of a new Twin Otter plane for the SEYCHELLES AIR FORCE of the Seychelles People Defence Forces did not alleviate this problem.

Table 8.10 Records of patrol conducted between 2007 and 2011

	2007	2008	2009	2010	2011
Sea	7 days	38 days	107 days	110 days	91 days
Air	3.2 hrs	74.6 hrs	216. hrs	40 hrs	6hrs

8.3.7 Vessels apprehended

Table 8.11 Records of vessel apprehended since 2010 to date

Date	Vessel/ captain/owner	Nationality	Charge	Zone	Outcome
11 January 2012	Lucky Too	Sri-Lankan	Fishing inside Seychelles waters without a valid license	Sey EEZ Mahe plateau	Compounding SR. 100,000.

8.3.8 Piracy

With the increase in the threat of piracy since early 2009, the numbers of industrial fishing vessels taking licences have been drastically reduced. The number of industrial fishing vessel licences decreased from 140 licences in 2008, to 130 licences in 2009, to 89 licences in 2010 and slowly started to increase in 2011 to 100 licences. But in 2012 there was a large increase in licence application, the number rises to 207 licences.

8.3.9 Regional MCS effort

There are two main regional MCS ongoing initiatives that the SFA is actively participating in. The first one is the establishment of a SADC Regional MCS Centre, to be based in Maputo, Mozambique, although still not operational. The second initiative is the MCS activities, including training, conducted under the framework of the Project Smartfish (Integrated Regional Fisheries Strategy), co-implemented by the Commission de l'Océan Indien and FAO, and financed under the 10th European Development Fund.

Chapter 9 - International Co-Operation

9.1 EU/Seychelles Fisheries Partnership Agreement

The EU and Seychelles' co-operation under the framework of the Fisheries Partnership Agreement (FPA) between the two Parties continued as in previous years.

The Joint Committee met in Mahé, Seychelles in February to review the performance of the Protocol and the sectorial support for the prior year as has always been the case. Twenty two EU purse seiners comprising of fourteen Spanish and eight French vessels were licensed under the Protocol in 2012. The combined catch of the fleet were within the reference tonnage of 52,000 tonnes as set under the Protocol.

As an improvement on catch reporting requirement of the fleet, the Committee agreed to work towards the introduction of electronic logbooks as provided for under the existing Protocol. This is to have the added benefit of Seychelles being provided with daily catch reports of the EU vessels when they are operating in Seychelles waters.

The total budget of the sectorial support provided by the EU under the FPA for this budget year, which included accumulated funds from previous years brought forward, was Euro 8.4 million. Fisheries infrastructure development was top of the three priorities identified by Seychelles for a total value of Euro 5.6 million. This comprised of financing for artisanal infrastructure projects for the districts and facilities for processing and value addition, mainly from the semi-industrial sub-sector. Provision under the latter was for nine processing units at Providence Fisheries Facilities to be leased out to private entrepreneurs as well as for Bel Ombre.

The biggest project under this priority was for the construction of a 120m quay for purse seiners on Ile Du Port, which has been designated as the purse seine fishing port. Other facilities such as salt storage and net repair areas including other logistical support for the purse seine fleet are to be provided from Ile Du Port to ease the vessels operations when in port.

As it remained for this Protocol year the other two priorities were; improve fisheries management and industrial fisheries and capacity building.

Funds for the fisheries management objective were attributed to improving research, Monitoring Control and Surveillance (MCS), support for the fishermen associations, the National Parks Authority in relation to marine parks protection. Additional fund was also allocated to the revolving fund established in 2009 for fisheries development such as semi-industrial boat building or conversion, value addition projects etc.

With regards to supporting the capacity building needs of the sector, funds were allocated for human resource development including training of SFA personnel. Five SFA staff attending BSc and MSc courses in fisheries overseas were supported under this financing. Support was also given provided to the Fish Inspection Quality Control Unit as the Competent Authority of Seychelles Bureau of Standard (SBS). Also benefiting was the Maritime Training Centre for procurement of a training vessel to support with the formation of seafarers for the industry.

9.2 British/Seychelles Fisheries Commission (BSFC)

This Commission was established in 1995 to promote, facilitate and coordinate conservation and scientific research. As established by the Agreement the Commission met for its yearly meetings as scheduled, alternating from Seychelles to UK, London. This was the 17th meeting of the Commission that was preceded by the 24th meeting of the Scientific Sub-Committee (SSC).

Areas of focus of the SSC and Commission were on the status of the BIOT Marine Protected Area (MPA) and on-going research in the MPA and respectively same that was ongoing in Seychelles in the coastal and offshore fisheries.

The Commission also discussed on issues such as piracy and its effect on fisheries in the Western Indian Ocean including other aspects such as the displacement of fishing effort by purse seiners and longliners from the BIOT MPA.

Other points of exchange and collaboration discussed during the meetings were in relation to monitoring control and surveillance activities conducted by each Party and on illegal activities detected.

The Commission reaffirmed its commitments to continue working together in co-sponsoring proposals to the IOTC Commission meetings for the effective conservation and management measures of the tuna resources managed by IOTC. The parties also had discussions on the on-going debate within the IOTC on the allocation of catches within the IOTC, in particular with regards to Seychelles' proposal to the IOTC Technical meeting on Quota Allocation Criteria of which the UK renewed its support for it.

9.3 Indian Ocean Tuna Commission (IOTC)

Seychelles' participation in the IOTC has remained as active as ever. The main IOTC activity for this year started with the 9th Compliance Committee (CC) meeting followed back to back with the 16th Commission meeting in Freemantle Australia.

The CC meeting was preceded by a close session for coastal States of IOTC facilitated by Australia. This was an opportunity for those like-minded coastal States to go through the proposals for the Commissions' session and converge where possible.

As for the CC meeting, member States were required to explain their status of compliance in relation to specific resolutions of the Commission and also had to report on Illegal Unreported and Unregulated (IUU) activities that they had detected during the preceding year. On the latter Seychelles reported to the Committee on the apprehension of a Sri Lankan fishing vessel on suspicion of having conducted illegal fishing.

The main challenge for Seychelles in relation to compliance with the IOTC resolutions was that the resolutions adopted were not being transposed into national legislation. This was due to the amendments required to the national fisheries legislation to cater for same. Seychelles, therefore informed the CC on the stage it is at in updating its respective legislation in order that it can fulfil this obligations.

The Commission meeting reported on the progress of the Kobe Process, and on recommendations coming out of the 3rd joint meeting of the tuna Regional Fisheries Management Organisations (RFMOs). This process is an initiative to consolidate best practices amongst the different regional tuna RFMOs on all issues such as science, management, compliance and enforcement.

Also addressed at the Commission meeting was the report of the 14th Session of the Scientific Committee (SC) and management advice coming from same. The SC raised concern on the number of drifting FADs being deployed by purse seiners and took note of the implementation of a FAD closure period in the Western and Central Pacific Fisheries Commission since 2009. However it was generally felt that should such a closure be implemented in the Indian Ocean in future, it could possibly have an effect on the supply of raw material to the cannery as there are some fleet that are very dependent on FAD fishing.

Another concern raised was the low level of implementation of the Regional Observer Scheme since its entry into force in 2010. Seychelles is yet to implement the scheme but have started training its observers.

As for the stock status, the SC did not raise any major concern. It summarised that the major targeted stocks were healthy.

Following this the 15th Session of the SC was held in Seychelles in December. The SC reported on the different WP that had taken place during the year and on recommendations coming out of them. These were the 8th WP on Ecosystems and Bycatch and the 4th WP on Methods.

Again as per the SC management advice on the status of the major tuna stocks, bigeye, skipjack and yellowfin tunas were all reported to be within sustainable level. However, there were slight concerns for the albacore tuna and swordfish stocks.

9.4 South West Indian Ocean Fisheries Commission (SWIOFC)

The 6th session of the South West Indian Ocean Commission was held in Flic en Flac Mauritius. The Scientific Committee (SC) of the Commission presented its report to the Commissioners, centered on the state of fish stocks it reviewed at its last session. Proposals coming out from the SC were to improve the quality and timeliness of advice provided on stock status to the Commission. It was also agreed during the meeting to broaden the mandate of the working group on demersal fishery and also to reinforce the stock assessment working group to increase the level and qualities of the assessment done jointly using standardized methodology.

The Commissioners also deliberated on the performance review of the Commission and priority areas that should be considered for the future. This included amongst

other recommendations: the desire to relocate the Secretariat from Harare, Zimbabwe to a coastal member country, and Mozambique offered to host same.

The members also proposed options to render the Commission more effective and requested that they are presented with options for such on the transformation of the body.

The Commission also endorsed the establishment of a Working Party (WP) on tuna conservation and management collaboration and cooperation. The WP will be composed of Directors of Fisheries from all the member countries of the Commission and its structure and functioning would be that of a subsidiary body within SWIOFC whereby NGOs and the private sector will be invited to attend as observers.

Seychelles also accepted during the meeting to host a conference on sustainable fisheries development with the support of the Indian Ocean Commission, FAO and SmartFish in line with the Millennium Development Goals in 2013.

9.5 Southern African Development Community (SADC)

In July 2010, the SADC Ministers for Natural Resources approved the SADC Action Plan for combating IUU Fishing and provide for set up of a SADC Regional Fisheries Monitoring Control and Surveillance Co-ordination Center (MCSCC). In this context two regional workshops were organized with the aim of providing an opportunity to discuss various aspects of the process of implementation by Member States. Additionally the workshops provided a platform for assessing the sustainability aspects in relation to the establishment of the SADC Regional Fisheries MCSCC and to develop a proposal for a funding plan for the Centre

The first workshop was held in Windhoek, Namibia from 16th – 17th October. The aim of the workshop was to provide information on progress in the implementation of the Statement of Commitments On IUU fishing and also to give input on the sustainability of the SADC Regional Fisheries MCSCC. The workshop was attended by the MCS Manager.

The second workshop was held in Maputo, Mozambique from the 22nd – 23rd November. This was a validation workshop and was aimed at clearing the report prepared by the consultants on the implementation of the SADC Statement of Commitment to combat IUU fishing and draft sustainability Plan for the MCSCC.

9.6 African, Caribbean and Pacific Group of States Fish II Programme (ACP FISH II)

The ACP Fish II 3rd Regional Programme Monitoring Workshop and Training for Southern Africa was held at Le Preskil Beach Resort, Mahebourg, Mauritius from the 4th – 6th December 2012. The objectives of the meeting were;

1. To effectively monitor ongoing ACP Fish II projects in Southern Africa region and identify and implement corrective actions,
2. To describe the revised ACP Fish II monitoring and evaluation system, and complete Project Evaluation Grids (PEGs) and score indicators accordingly,
3. To expose participants to selected fisheries realities in Mauritius.

The workshop was followed by a training workshop on Evaluation and Monitoring of ACP Fish II projects. The training consisted theoretical sessions on M&E overall concepts and that would be used to follow up and evaluate ACP Fish II projects, including the use of M&E project indicators and Project Evaluation Grid (PEG) as set in the ACP Fish II M&E manual.

Focal points from the following countries were present; Angola, Botswana, Comoros, Lesotho, Malawi, Mauritius, Mozambique, Namibia, Swaziland, Zambia, and Zimbabwe. Due to flight complications the focal point from Seychelles was unable to attend.

Chapter 10 - Information and Technology Services

10.1 Documentation Services

10.1.1 Acquisitions

The number of documents/publications acquired by the Documentation Centre's holdings continued to increase in 2012. Fifty new publications were added to the collection. Most of the publications received are through exchange programmes. SFA is also receiving publications in electronic format.

10.1.2 Library management

In 2012, a total of 585 new records were catalogued in the InMagic library database, and, 160 documents were loaned to both SFA staff and external users. The total number of records in the InMagic database now stands at 6,778.

The new AgriOcean DSpace software which provides basic functionalities that are required by small libraries such as cataloguing was successfully installed and is operational within the SFA Network, and the aim is to make it available online to facilitate access to SFA publications and other reports related to marine resources of Seychelles. A total of 1,073 records were catalogued in the new library database.

10.1.3 Publications

AFONSO, P.; GRACA, G.; BERKE, G.; FONTES, J. (2012) First observations on seamount habitat use of blackspot seabream (*Pagellus bogaraveo*) using acoustic telemetry. ***In: Journal of Experimental Marine Biology and Ecology 436-437 p.1-10***

GUILLOTREAU, P.; CAMPLING, L.; ROBINSON, J. (2012) Vulnerability of small island fishery economies to climate and institutional changes. ***In: Current Opinion in Environmental Sustainability (4): p.287-291***

CHONG-SENG, K.M.; MANNERING, T.D.; PRATCHETT, M.S.; BELLWOOD, D.R. (2012) The influence of coral reef benthic condition on associated fish assemblages. ***In: PLoS One 7(8): e4216, 10 pp.***

- GOVINDEN, R.; JAUHARY, R.; FILMALTER, J.; FORGET, F.; SORIA, M.; ADAM, S.; DAGORN, L. (2012) Movement behaviour of skipjack (*Katsuwonus pelamis*) and yellowfin (*Thunnus albacares*) tuna at anchored fish aggregating devices (FADs) in the Maldives, investigated by acoustic telemetry. ***In: Aquatic Living Resources p.1-10***
- WILSON, K. GRAHAM, N.A.J.; FISHER, R.; ROBINSON, J.; NASH, K.; CHONG-SENG, K.; POLUNIN, N.V.C.; AUMEERUDDY, R.; QUATRE, R. (2012) Effect of macroalgal expansion and marine protected areas on coral recovery following a climatic disturbance. ***In Conservation Biology, p.1-10***
- SEYCHELLES FISHING AUTHORITY (2012) Summary of Activities of the Seychelles Industrial and Semi-Industrial Fisheries for the year 2011. ***In: Twenty Fourth Meeting of the British/Seychelles Fisheries Commission Scientific Sub-committee Meeting, Background Paper SFA 01)18 pp.***
- SEYCHELLES FISHING AUTHORITY (2012) Result of the Catch Assessment Survey (CAS) 2011 and Research Activities for Artisanal Fisheries. ***In: Twenty First Meeting of the Scientific Sub-committee of the British/Seychelles Fisheries Commission, (Background Paper SFA 02)7 pp.***
- SEYCHELLES FISHING AUTHORITY (2012) Overview of Research Projects. ***In: Twenty-Fourth Meeting of the British/Seychelles Fisheries Commission Scientific Sub-committee Meeting, (Background Paper SFA 03) 3 pp.***
- SEYCHELLES FISHING AUTHORITY (2012) Overview of Research Projects. ***In: Twenty-Fourth Meeting of the British/Seychelles Fisheries Commission Scientific Sub-committee Meeting, (Background Paper SFA 04) 7 pp.***
- SEYCHELLES FISHING AUTHORITY (2012) Seychelles Fishing Authority Annual Report 2007-2010, 96 pp.
- SEYCHELLES FISHING AUTHORITY (2012) Seychelles Fisheries Monthly Bulletin (January-December 2012)
- SEYCHELLES FISHING AUTHORITY (2012) Seychelles Fishing Authority: Tuna Bulletin, Year 2009, 38 pp.
- SEYCHELLES FISHING AUTHORITY (2012) Seychelles Fishing Authority: Tuna Bulletin, Year 2010, 38 pp.
- SEYCHELLES FISHING AUTHORITY (2012) Seychelles Fishing Authority: Tuna Bulletin, Year 2011, 37 pp.

10.2 Information Technology

As for the year 2012 there has not been any major change with the system except for replacement of computer exceeding their lifespan, plus some additional servers in order to shift the SFA domain from Server 2003 to Server 2008. Nevertheless,

Exchange still remains a key System for SFA, and, therefore, a third server was added to the group called a DAG in order to provide fault tolerance in case a server fails. The link to the Seychelles Coast Guard was upgraded to a Virtual Private Network so as to provide connection to Themis client. All additional work during 2012 was devoted to maintenance and support of the installed capability.

Chapter 11 - Finance

The Authority received Rs. 32,706,000 from Government of Seychelles as subsidy towards its recurrent and minor capital expenditure for the year ending 31st December 2012. This represented an increase of 38.6% in comparison with the previous year.

SFA's recurrent budget expenditure for 2012 was made up as follows:

- Personnel Emoluments: Rs. 16,191,554.00
- Administration costs: Rs. 13,592,200.00
- Transport & Travelling: Rs. 1,348,500.00
- Repairs & Maintenance: Rs. 1,573,746.00

The Authority continued to maintain its responsibility towards IOTC in terms of contribution in 2012.

The Seychelles Government through SFA paid a total of Rs. 20,928,540, under the Fuel Incentive Scheme for Fishermen, Table 11.1.

Table 11.1 Fuel Incentive Scheme

Month	Amount Paid Out
Jan & Feb 2012	2,308,485
Mar-12	2,177,006
Apr-12	2,024,179
May-12	2,103,222
Jun-12	1,310,889
Jul-12	1,438,357
Aug-12	2,121,186
Sep-12	2,364,290
Oct-12	800,460
Nov-12	1,913,240
Dec-12	2,367,227
Total	20,928,540

Chapter 12 - Staffing and Administration

12.1 SFA's New Structure

The SFA has a new structure and Schemes of Service that, although completed, still has to be amended to encompass all activities undertaken by the Authority.

Upon the restructuring exercise, all the job descriptions of scientific, technical and support service posts have been re-evaluated and upgraded in accordance to the weight of the duties the posts entails.

It is to be noted that the Research and Development Division has become the Fisheries Research Division, which deals mainly with fisheries research. The Fisheries Technicians are now based under the Fisheries Economic and Information Division as their activities are primarily to collect data. The post titles also have been changed to that of Fisheries Statistical Technicians.

As SFA's activities expand more staff are needed to cope with the workload as well as new activities.

12.2 Staff Movement

There have been promotions of 95% of the SFA staff following the job evaluation and upgrading of posts in addition to the implementation of the Scheme of Service.

Compared to the years 2010/2011 the staff turnover has declined as there were only two resignations during the year 2012.

The SFA also lost a member of its staff who passed away early during the year. There have been recruitments at all levels. Among those recruited were a Financial Controller, a Manager and a Senior Accountant.

The other areas of recruitments have been in the Fisheries Economic and Information Division, Corporate Services Unit, Port Administration Unit in the Project Section.

Table 12.1 Recruitment by Sections for 2012

Divisions/Sections/Units	2011	2012
Secretariat	3	5
Fisheries Management & Evaluation	0	1
Monitoring Control & Enforcement	0	1
ICT		0
Fisheries Economic & Information Management	0	0
Fisheries Research	8	5

12.3 Training and Development

The SFA continues to put emphasis on staff development and thus does its utmost to train staff in order to achieve the organizational objectives and goals. Training and workshops varies from local to international, short to long courses. Staff also attends in-house trainings and workshops.

The Training Policy has been completed and is being implemented. This training policy is to guide staff about training and development in general and it is implemented alongside the Training Plan.

We have introduced IDP files (Individual Development Plan) for each staff member whereby the stages of their development are followed.

There are presently 5 staff attending long term courses overseas; 10 staff attended local and 10 attended international short courses/workshops in-house as well as external venues during the 2012.

Emphasis will be made for more technical staff to be trained to attain higher qualifications. (BSc with Honors/Masters Degrees). Those not meeting requirements for entry to university will follow adhoc trainings available to meet university requirements.

12.4 Overseas Duty Trip

There has been an increase in fisheries activities and participation in meetings, forums and workshops. Junior Managers and Supervisors are being given the opportunities and exposures at international meetings and conferences.

Table 12.2 Overseas Training

Participants	Title /Country	Duration
Aubrey Lesperance	Aquaculture training in Tel Aviv, Israel	05 th to 29 th March 2012
Cindy Assan	Tuna Information System in Sete, France	12 th April to 14 th May 2012
Belinda Jean/Naddy Esparon	Integrated Coastal Management for Developing Country in China	6 th April to 3 rd May 2012
Karine Rassool	PhD (basic) Economics of Aquaculture in Portsmouth, UK	12 th to 22 nd April 2012
Cathrina Amelie	CDM DNA for African Region in Kenya	15 th to 20 th April 2012
Denise Mathiot	Introduction to Electronic Records Management, SWI in Kenya	7 th -10 th May 2012
Marie-Stella Savy/ Joan Didon	Coastal Region Economic Development for Developing countries in Xiamen, China	16 th May to 5 th June 2012
Bernadette Gill	OTA MIM - Preservation of Books and other Media, Ostende Belgium	21 st – 25 th May 2012
Aubrey Lesperance/Karine Rassool	Smart Fish Regional training on Marine Fisheries Governance/Value for Money for Fisheries Management Services in Mombasa, Kenya	11 th to 14 th June 2012
Wendy Perreau	Leadership course in Fisheries Resource Management in Japan	July to November 2012
Sabrina Lawrence	Coastal Fisheries Management in Japan	August to October 2012
Jude Gabriel	Dreamer Weaver Web Design and MTCITP Server Administrator in Singapore	September to October 2012
Slim Dogley/Cindy Assan	IT Professional training – Oracle Database/ Introduction to SQL Server in Malaysia	17 th - 25 th Sept 2012

Table 12.3 Duty Travel

Participants	Title/Country	Duration
Roy Clarisse/Manuel Stravens/ Dolor Ernesta/ Philippe Michaud	EU/SEY Joint Commission Mixed Meeting in Brussels	15 th to 16 th November 2012
Roddy Allisop	SADC Regional w/shop – Combating IUU Fishing in Namibia	16 th to 17 th October 2012
Vincent Lucas/Gregory Berke/Cindy Assan	(i) IOTC Tuna Tagging Symposium (ii) IOTC Working Party on Tropical Tuna Tagging Symposium in Mauritius	24 th Oct to 2 nd Nov. 2012
Cindy Assan/Belinda Jean	SWIOFP STATBASE working group and Pasgear Data Software in Mombasa, Kenya	18 th to 20 th October 2012
Finley Racombo	Fisheries Directors meeting of IOC Member States in Zanzibar, Tanzania	7 th to 9 th November 2012
Freddy Lesperance	29 ^{eme} Reunion de L'Unite de Co- rodination Regionale in Madagascar	9 th to 10 th October 2012
Minister Peter Sinon/Philippe Michaud/Beatty Hoarau	Impact of Piracy on Fisheries in the Indian Ocean in Brussels	30 th Sept. to 2 nd Oct 2012
Roy Clarisse/Vincent Lucas	- 5 th Session SWIOFP Budget & Policy Planning meeting - Joint ASCLME/SWIOFP Committee meeting	30 th Sept. To 6 th Oct. 2012
Khursen Gonsalves	Regional patrol mission in South West Indian Ocean	5 th – 26 th September 2012
Michel Marguerite	IOC/Smart fish- Regional Fisheries Strategies meeting in Mauritius	
Marie-Antoinette Saminadin	Fisheries Compliance Inspection in Mauritius	08 th to 11 th August 2012
Elisa Socrate	3 rd Workshop on working Party on Fisheries Data and Statistics in Mombasa, Kenya	22 nd to 26 th July 2012
Aubrey Lesperance/ Michel Marguerite	Value Chain Analysis ACP Fish II in Mauritius	23 rd to 27 th July 2012
Sonny Naiken Carmel Rene	Compliance Inspection in Singapore Inspection on Seychelles flagged vessels JIIN HORNG No. 106 in Mauritius	3 rd to 6 th July 2012 11 th to 13 th July 2012
Philippe Michaud	13 th Session of the Fisheries Committee in Rome, Italy	9 th to 13 th July 2012

Participants	Title/Country	Duration
Finley Racombo/Roddy	Smart Fish/PRSP Action Plan meeting	24 th to 26 th January
Allisop	for Joint Fisheries Patrol in Mauritius	2012
Michel	Smart Fish Program – IOC/IRFS	28 th Jan. to 2 nd Feb.
Marguerite/Karine	Program-	2012
Rassool/Philippe		
Michaud	EDF 10 in Antananarivo, Madagascar	
Roy Clarisse/Wendy	7 th International Forum on IUU	1 st to 5 th February 2012
Perreau	Fishing in London, UK	
Karine Rassool/Philippe	EU-ESA Economic Partnership	12 th to 17 th March 2012
Michaud	Agreement (EPA) Interim EPA	
	Implementation in Mauritius	
Sabrena Lawrence	5 th Meeting of the Scientific	26 th Feb. to 02 nd Mar
	Committee of SWIOFC in Cape Town,	2012
	South Africa	
Khurlsen Gonsalves	Compliance Inspection in Mauritius	28 th Feb to 03 rd March
		2012
Michel Marguerite	EPA Negotiation meeting in	05 th to 06 th March 2012
	Mauritius	
Michel Labrosse	Compliance Inspection in Mauritius	06 th to 10 th March 2012
Marie-Antoinette	Compliance Inspection in Colombo,	8 th to 13 th April 2012
Saminadin	Sri Lanka	
Finley Racombo/Elisa	COI Smart Fish Program in	14 th to 18 th April 2012
Socrate	Preparation for the IOTC meeting in	
	Mauritius	
Roy Clarisse/Elisa Socrate	Coastal States Meeting	16 th to 26 th April 2012
	IOTC Compliance meeting	
	16 th Session of the IOTC Commission	
	meeting in Perth Australia	
Vincent Lucas	Coastal States Meeting 16 th Session	18 th to 20 th April 2012
	of the IOTC Commission meeting in	
	Perth, Australia	
Carmel Rene	Compliance Inspection in Singapore	02 nd to 8 th May 2012
Khurlsen Gonsalves	Compliance Inspection in Mauritius	18 th to 23 rd May 2012
Calvin Gerry	Modeling Marine Ecosystem from	18 th to 29 th June 2012
	the Ocean to the Fish	
Michel Labrosse	Compliance Inspection in Singapore	27 th to 30 th May 2012
Michel Marguerite	Capacity Strengthen for Negotiation	07 th to 09 th June 2012
	of Equitable Fisheries Access in	
	Abidjan, Ivory Coast	
Sabrena Lawrence	Regional Workshop on MPA's as a	08 th to 13 th June 2012
	Sustainable Management Tool for	
	Sustainable Fisheries in the SW	
	Indian Ocean in Mauritius	
Sonny Naiken	Compliance Inspection in Singapore	09 th to 13 th June 2012

Participants	Title/Country	Duration
Finley Racombo/Freddy Lesperance	28 th Session of the Regional Coordinating Unit and First Meeting of the Fisheries Directors in St. Denis, Reunion	25 th to 29 th June 2012
Marie-Antoinette Saminadin	Compliance Inspection in Singapore	19 th to 22 nd June 2012
Karine Rassool	Forum Economique des Iles de L'Ocean Indien in Reunion	6 th to 25 th September 2012
Khurlsen Gonsalves	31 st Patrol surveillance mission boarding in Mauritius	06 th to 25 th September 2012
Sabrena Lawrence/Rodney Govinden	SWIOFP Database Observer Induction W/shop in Mombasa, Kenya	24 th to 30 th September 2012
Denise Mathiot	(i) Marine Information Management Workshop	24 th to 29 th September 2012
	(ii) Websites Development W/shop in Nairobi, Kenya	01 st to 3 rd October 2012
Calvin Gerry	(i) 4 th ORDINAFRICA Coastal Marine Atlases W/shop	24 th to 29 th September 2012
	(ii) Websites Development W/shop in Nairobi, Kenya	01 st to 3 rd October 2012
Carmel Rene	Vessel inspection on in Mauritius	27 th to 28 th September 2012
Rodney Govinden	MDAE Scientific Symposium in Mont Pellier, France	15 th to 19 th October 2012
Rodney Govinden	IWMC- African Fisheries Nations w/shop- Impact of CITES Decision on Conservation of Marine Species & Safeguard of Livelihood in Johannesburg, S. Africa	20 th to 22 nd November 2012
Michel Marguerite	Implementation of SADC Commitment to combat IUU Fishing in Maputo in Mozambique	20 th to 25 th November 2012
Finley Racombo	Smart Fish Focal Point Meeting in Mauritius	21 st Nov. to 25 th Dec. 2012
Michel Marguerite	Think Tank meeting on Formulation of Fisheries Policies Framework in Doula, Cameroun	29 th Nov. to 1 st Dec. 2012
Michel Marguerite	3 rd ACP Fish II Meeting in Mauritius	04 th to 6 th December 2012

12.5 Employees with 15 to 25 years Continuous Service

In 2012 SFA awarded the following staff who have been in continuous service for the past 10 to 25 years Table 12.4

Table 12.4. Long Serving Staff

10 years in service	15 years in service	20 years in service	25 years in service
Mr. Justin Faure - Security Guard	Mr. Allain Gabriel - Fuel Attendant	Ms. Cecile Botsoie- Senior Fisheries Statistical Technician	Ms. Antoinette Marie- Therese - License Administrator
Mr. Antoine Pierre - Handyman	Ms. Naddy Esparon - Senior Fisheries Statistical Technician	Mr. Michel Marguerite Chief Economist	Ms. Claire Pierre-Louis - Senior Fisheries Statistical Technician
Mr. Slim Dogley - Chief System Support Officer	Mrs. Belinda Jean - Senior Fisheries Statistical Technician		Ms. Denise Mathiot - Librarian
			Mr. Carmel Rene - Senior Enforcement Assistant