

OVERVIEW OF SOME MARINE COASTAL FISHERIES IN MADAGASCAR

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INTRODUCTION

- According to the ministry of fisheries and halieutics resources (2012), the turnover of the sector of marine fisheries in 2010 would be about 91.1 million Euros, and the wealth created annually would be about 64.4 million Euros. Industrial fishing, artisanal and traditional fishing are 32.4 %, 0.3 % and 67.3 % of the total production volume respectively. The current role of marine fisheries in the national economy can also be enjoyed through the numbers and indicators:
- Domestic consumption of products of sea fishing, including the share of production that is about 42 700t/an , which reported to the public, gives a consumer products of sea fishing (excluding imports) of 2.14 kg / year / per capita.
- The share of maritime fishing in exports is around 7 % in value. In terms of currency flows, sea fishing contributes about 3 % to the balance of trade balance.
- The direct jobs created by marine fisheries are around 100,000 per year (including nearly 2,300 in the industrial fishing). Taking into account the indirect jobs and the low level of development of many coastal villages, we can consider that sea fishing provides livelihood to nearly a million people.

MAIN FISHERIES IDENTIFIED FOR SEA FISHING

- Of the twelve (12) main fisheries identified for sea fishing (MPRH , 2012) , tuna fishing in Madagascar is one of the most important currently as large foreign exchange earner . However, the system for collecting statistics on fisheries other than foreign industrial tuna fishing is deficient or non-existent.
- Now mud crab (*Scylla serrata*) and demersal fish become important fisheries since two or three years.

MARINE FISHERIES POTENTIAL

- With 5,697 km of coastline, Madagascar has a important potential fishery resources as a source of income for the country. Twelve main "fisheries" or more, whose definition is based on criteria "resource", can be distinguished today (Tab. 1).

Marine fisheries potential

Resource	Potential average (Ton/an)	
	(Ralison, 1990)	(MPRH, 2012)
Coastal Penaeid shrimp	7 000	12 000
Deep sea Penaeid shrimp	1000	-
Deep demersal resources (shrimps, crab,...)	-	(7 000) ?
Mud crab (<i>Scylla serrata</i>)	7 500	7 500
Lobsters from the continental shelf	200	1 000
Demersal fish, West coast	30 000	45 000
Demersal fish, East coast	13 000	
Cephalopods (octopus and squid	?	>1 500
Small coastal pelagic and neritic	50 000 - 110 000	+/- 100 000
Tunas major	1 600	52 000
Tunas and related species	50 000	
Red algae	750	3 600
Trepangs (sea cucumber)	140	>1000
Sensitive species (sharks / fins, Conger / swim bladder)	?	?
Total	200 000	230 600

DIFFERENT TYPES OF MARINE FISHERY

- **Traditional maritime fishing**

It is practiced on foot or from non-motorized canoes, driven sailing on the west coast or just paddling on the eastern part of Madagascar. It should be noted that the supposed noble products from this fishery such as prawns, lobsters, crabs, sea cucumber, first class fish (including tuna) , algae, etc ..., are collected by formal manifolds (grouped in the GEXPROMER) in the majority of cases to be sold on the domestic market or in part for export

The artisanal marine fisheries

It uses powerboats inboard or outboard less than 50 hp. With its shallow draft, this type of craft, especially for shrimp fishing, comes to approaching the coast as fronts or inter-distributary mangroves. In general, fishing areas are located further away from the coast with autonomy at sea not exceeding 10 days. This corresponds to the maximum duration of storage of the ice.

Artisanal fisheries of demersal fish existed for many years in Madagascar but has primarily focused on sharks. In recent years, she began to focus on the demersal fish species of high commercial value such as ***Serranidae*** , ***Lutjanidae*** , ***Lethrinidae*** Twenty artisanal boats, for the demersal fish fishery has been identified between 2010 and 2011.

The fishing industry

- Ship is considered industrial type, whose engine power is greater than 50 Hp. Industrial fishing can be divided into two categories:
 - i) national industrial fishing generally operator shrimp on the West Coast and in the Bay Antongil on the East Coast and some vessels operating further offshore but particularly targeting demersal fish and which is part pelagic tuna,
 - ii) foreign industrial fishing with fishing gear as seine or longline and target especially highly migratory species like tunas .
- The exploitation of demersal fishes of the continental shelf by means of industrial trawl vessels without pole or perch trawl was flourishing between 2001 and 2004. Indeed, the ministry had to stop operating because of the damage generated by the type of fishing on benthic fauna in all areas of operation.

TWO MAIN MARINE FISHERIES OF MADAGASCAR

1 - Mangrove crabs

Cash and fishing

Madagascar has a large stock of mangrove crab (*Scylla serrata*). Production areas are located in mangrove on the west coast of Madagascar. As for the distribution of *Scylla serrata* in different habitats associated with mangroves, it was found that *Scylla serrata* is essentially a subtidal species and the large fraction of the adult population is constantly immersed in the areas.

TWO MAIN MARINE FISHERIES TO BE ASSESSED

1 - Mangrove crabs

Production and Potentiality

The potential remains unclear. The mangrove area is about 300,000 ha.

Based on this figure and assuming a theoretical yield of 25 kg / ha / year , the SME is estimated to be around 7,500 t.

1 - Mangrove crabs

- **Fishing technique**

In Madagascar, fishermen catch not only crab but with other seafood (shrimp, fish , shark ...). Agriculture is practiced in parallel. Two major types of fishing techniques have been identified, fishing and feet that made a boat. Fishing practice feet at low tide on the intertidal flats or discoveries along the channels in low places and immersed in mangrove forests .

Crabs are often found in burrows filled with water and they are extracted using a hook. When crabs move into shallow water where they are visible by transparency or when they are on the ground, they are captured using a racket. Fishing boat requires different equipment such as line, hook and balance.

1 - Mangrove crabs

- **Management measures**

Biostatistics studies crab *Scylla serrata* are rarely carried out in Madagascar and this every 15 years. The first took place in 1974/75, the second in 1989 /90 and the last in late 2005 and early 2006. Results and conclusions, including those related to biology, are very cautious.

The latest study in 2006 set the objective of sustainable exploitation of the fishery for crab and validates the relevant management measures. Outline the measures taken and implemented from January 1, 2007 include:

- The minimum size of crabs allowed to be harvested and marketed at 100 mm LC
 - The prohibition of fishing and marketing of female ovate throughout the year ;
 - The prohibition of fishing and marketing of soft-shell crabs .

However, no closure of the fishery is still considered

2 - Demersal fish

- Cash and fishing

The crest of the continental slope in the range of approximately 60 to 250 m and throughout the tropics of the world, contains mainly composed of demersal species of high commercial value in high demand on the world market: *Lutjanidae* (snappers), *Serranidae* (groupers) and *Sparidae* (toothed, spares and snapper). These resources support very active fisheries in many developing countries.

2 - Demersal fish

Production and Potentiality

Investigations conducted by the native R / V Dr Fridtjof Nansen of 16 to 28 June 1983 for demersal and pelagic fish provided estimates of the provisional biomass waters in southeast of Madagascar. The results can be divided into two zones:

- Subarea south, off the coast and south of 25 ° S and,
- The east coast ranging between 25 ° S and 17 ° S.

When estimating biomass, the values shown in Table of the trawl efficiency was taken to 50 percent ($q = 0.5$) and 100 percent ($q = 1.0$) .

2 - Demersal fish

Zone	Number of stations	Mean catch	Density (kg/km ²)	Area (km ²)	Biomass (tonnes)	
					(q = 0.5)	(q = 1)
West Coast	15	127,6	1 640	18 000	29 520	14 760
East coast	17	78,7	1 012	8 000	8 093	4 047
TOTAL					37 613	18 807

From these data , the author was able to estimate MSY area using the equations of Garcia et al. (1987) with $SME = BM^2/2M - (CY / B)$ (based on the Schaefer model)

$MSY = M_0 \exp ((Y/MB) - 1)$ (based on the Fox model).

2 - Demersal fish

Fishing technique

Both fishery, traditional and artisanal are most active in the exploitation of demersal fish . Industrial fishing , flourishing in the early 2000s, no longer exists. Twenty boats of artisanal , for the groundfish fishery , was identified in 2011 and thousands of traditional fishermen . Several types of fishing gear were used for the exploitation of demersal fish . However, their use varies fishing categories (traditional and artisanal), fishing areas and target species.

2 - Demersal fish

Management measures

Madagascar has no management of the demersal fishery level. Previously, the Malagasy Government priority is the development of operations products such as shrimp, lobster, ...

No marine fish is affected by any development plan.

CONCLUSION

In recent years, the exploitation of these fisheries sectors (mud crabs and demersal fish) showed significant productions, but the supporting statistical data, to assess the stocks are not available, so we propose to take priority to develop management these two fisheries.

THANK YOU

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