

Some results for tropical tuna based on catch data in Mozambique

Barbara Palha de Sousa

Instituto Nacional de Investigação Pesqueira
Av. Mao Tse Tung, 389, Maputo
Mozambique
e-mail: bsousa2@gmail.com

ABSTRACT

Mozambique has no national fleet for tuna and tuna like species so tropical tuna (Thunnus albacares, Thunnus obesus and Katswonus pelamis are caught by foreign fleet. However during some months of 2010 four longliners fished in Mozambican coast and results are presented. Also has there two different sources of information, data production and logbooks both of them are mentioned.

Table of contents

1. INTRODUCTION	3
1.1. Background	3
2. Catch and effort.....	3
3. Recommendations	14
4. References	14

1. INTRODUCTION

Purse seine and long line are the two main fishing techniques used in Mozambique in the tuna fishery. This activity is carried out by distant water fishing fleets, which operate in the EEZ as from 12 nautical miles off shore from January to December.

Purse seine fishing occurs mainly between the parallels 10° 32' and 20° S. Long line fishing occurs between 20° and 26° 52' S, mainly below parallel 25° S.

Over the last 10 years, the total catch in Mozambique waters ranges from 948 T to 17.470 T per year (Lichucha *et al.*, 2004) The number of long line vessels operating in Mozambique EEZ has declined substantially since 2007. In 2010, a total of 31 fishing companies were authorized to fish large pelagic species.

The composition of catch in the purse seine fleet is about two thirds of the catch for skipjack (SKJ), and a little less than one third for yellow-fin tuna (YFT). The composition of longline catch, expressed in number of fish is 65% for yellowfin tuna (YFT), 14% albacore, 13% bigeye (BET), and 3% swordfish (SWO) (Source IOTC Database 1983-2006).

In 2010, four Chinese long liners fished in Mozambican coast as national fleet, from 15° 30' to 25° 60'.

An attempt was carried out in order to present different sources of available information on tropical tuna in the country and analyzed them.

1.1. Background

Mozambique is located in south-east Africa and fishery plays an important role in the Mozambican economy, for sustenance, income and food security of fishing communities. There are three main fishing sectors: industrial, semi-industrial and artisanal. But tuna is mainly caught by industrial sector.

Apart these four vessels which operated during 2010 the remained fleet is foreigner and landings are undertaken outside the country mainly in Seychelles, Madagascar, Mauritius and South Africa. At the moment, there is no sampling on landings and no observer program. It is planned in SWIOFP project component 4 (pelagics) to start an observer program to get information on species composition and biological characteristics of the main tuna species. However there is a constraint due to catch landings outside the country.

2. Catch and effort

There are two different sources of information, the first given by the Fisheries Administration through the data production by vessel and day, and the logbooks. Unfortunately the

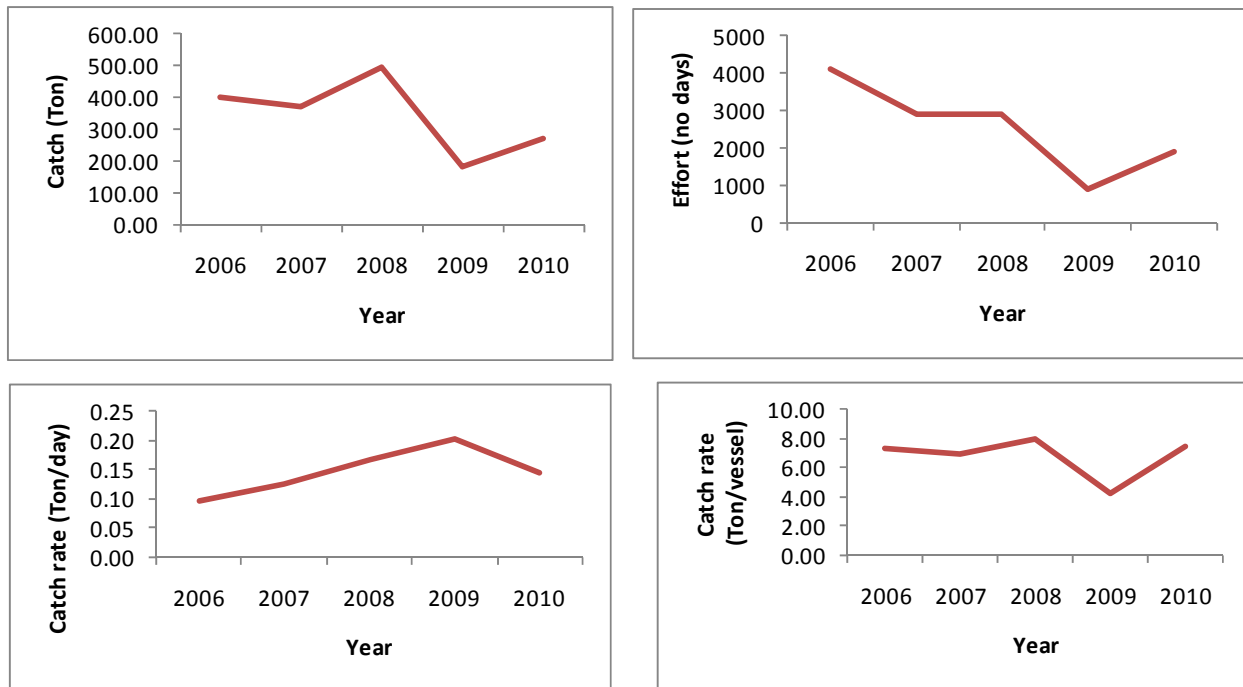
percentage of log books filled are quite small and the data production does not give in most of the cases catch by species. For example for tuna fishery catch by species is only available from 2007 (Table 1).

Table 1 Number of fishing vessels and annual catch per primary species, from 2004 to 2010 (ADNAP annual reports)

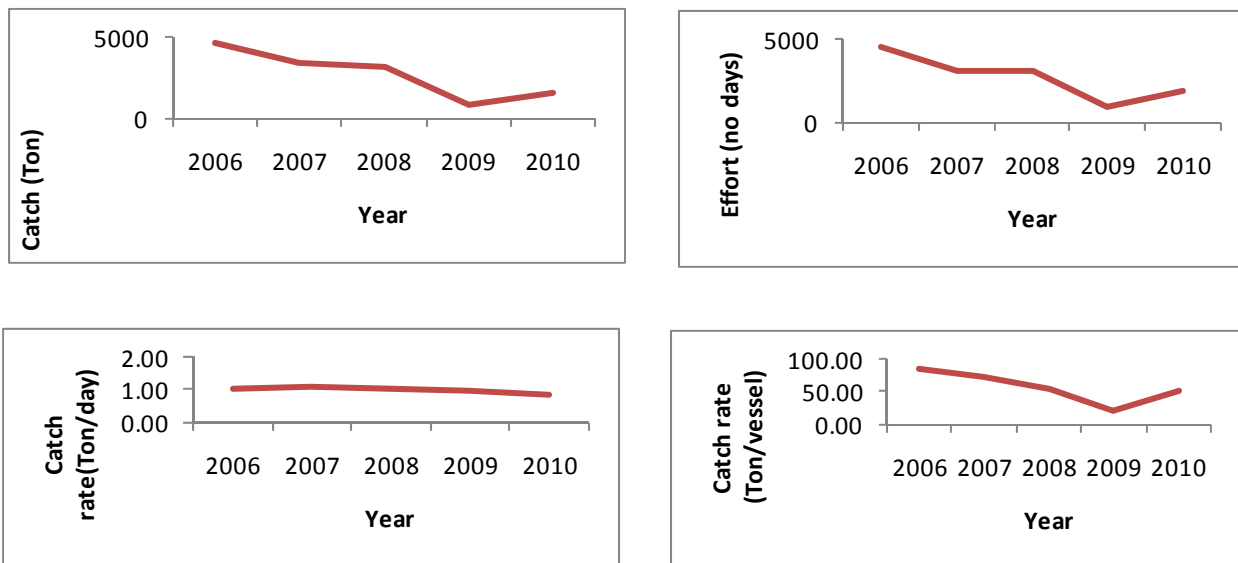
Years	YFT	BET	ALB	SKJ	BLM	SWO	TUN	No vessels	TOT
2007	3402	350	541	641	1	218	428	161	5581
2008	2647	322	341	2550	9	209	471	122	6549
2009	824	173	106	1942	9	721	538	111	4313
2010	1267	166	99	764	27	600	603	71	3811

The bulk of the catch (30%) is composed by yellow fin tuna, followed by skipjack (29%) and tuna(10%).

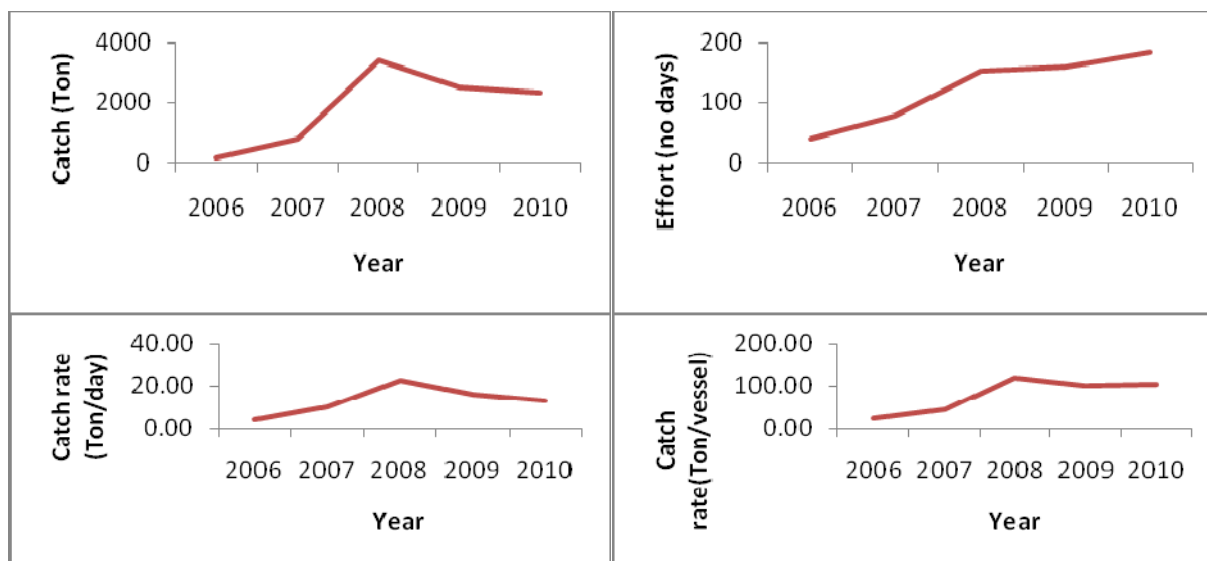
The coverage and the quality of data are also not good. Based on data production by vessel and day some graphs were produced.



Figures 1, 2, 3 and 4 Catch, effort, catch rate per day and vessel for bigeye tuna.



Figures 5,6, 7 and 8 Catch, effort, catch rate per day and vessel for yellowfin tuna.



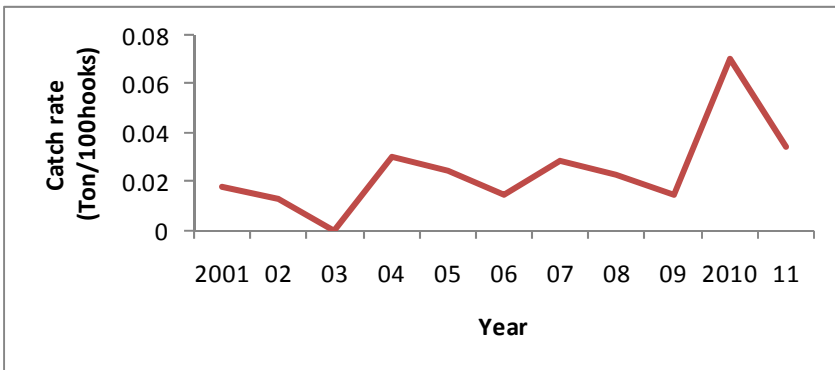
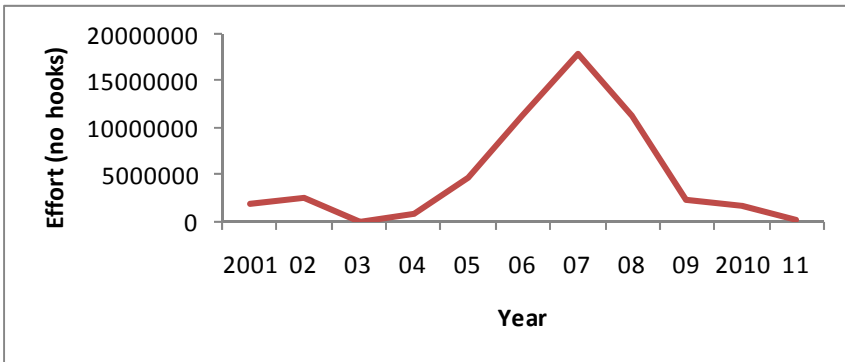
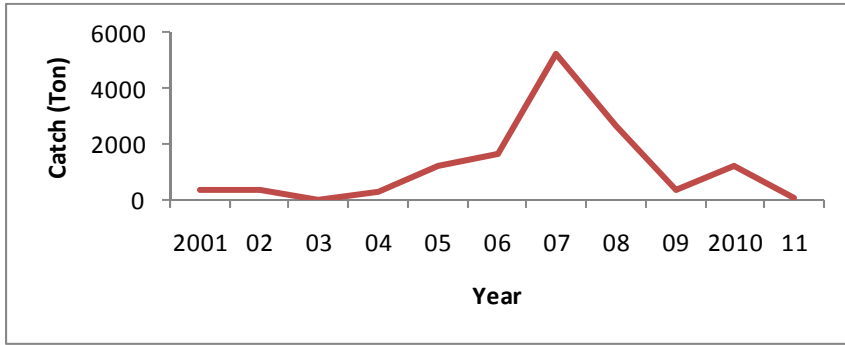
Figures 9,10,11 and 12 Catch, effort, catch rate by day and vessel for skipjack.

Bigeye tuna catch and effort has decreased from 2006 to 2009 with a catch peak in 2008 (Figs 1 and 2). During 2010 there was again an increase of catch and effort. Catch rate by day increase until 2009 followed by a sharp decrease.(Fig.3) Catch rate by vessel is constant until 2008 and in 2009 decreased (Fig4).

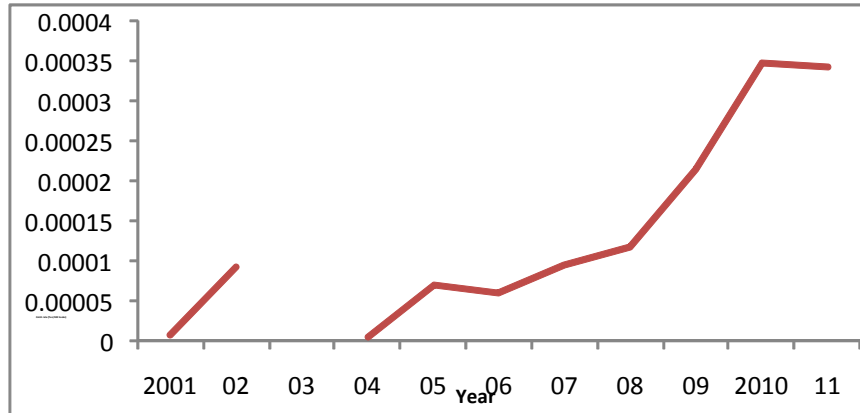
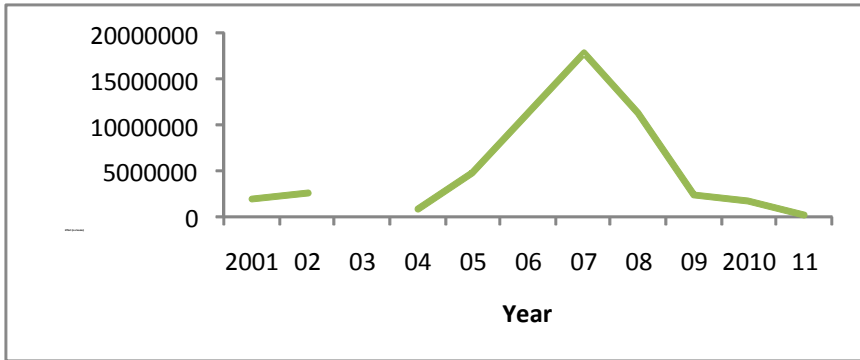
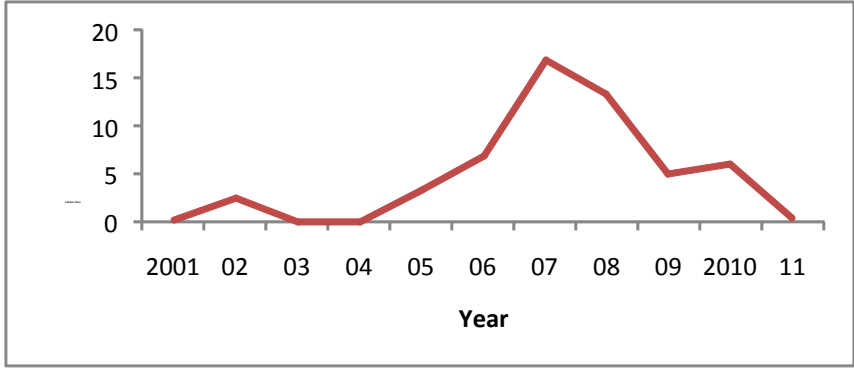
Yellowfin tuna catch and effort has decreased from 2006 to 2009 and slightly increase in 2010. (Figs 5 and 6) Catch rate by day is almost constant during the period while the catch rate by vessel has the same trend of catch and effort (Figs 7 and 8)

Skipjack catch, catch per day and catch per vessel (Figs 9, 11 and 12) increased from 2006 to 2008 and maintains constant in the following years, because as mentioned before is a target species in foreign fleet. Effort follows the same trend.

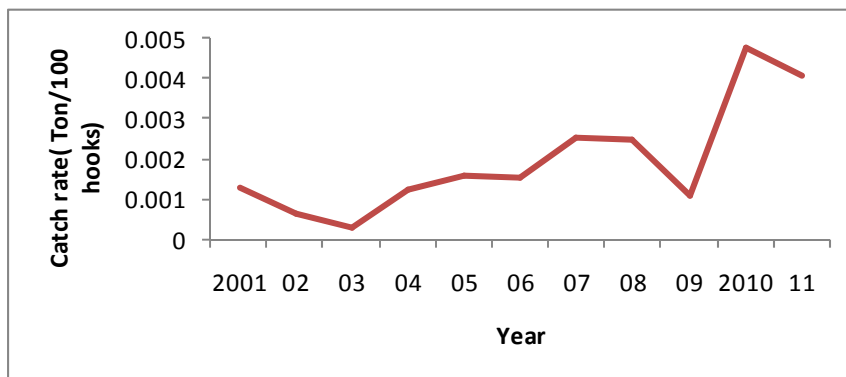
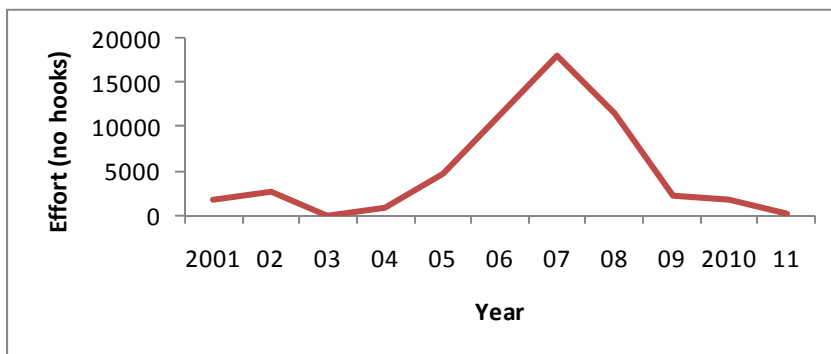
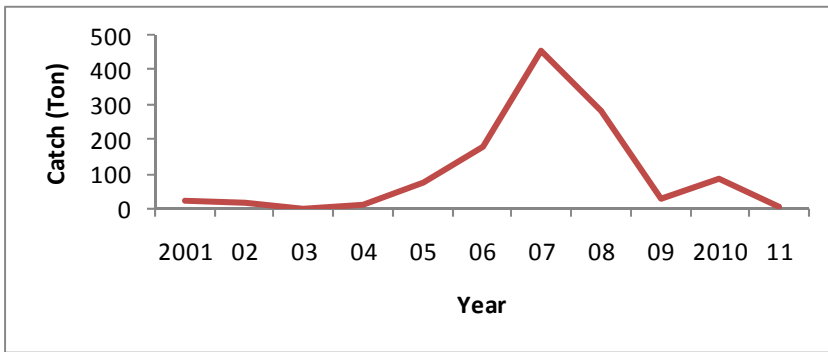
As it was mentioned above the other source of information are the logbooks. Based on information obtained from longliners logbooks some graphs were produced for yellowfin tuna, skipjack and bigeye tuna from 2001 to 2011. Only some months of 2011 were considered. Generally, the trends were high catches and effort in 2007 and catch rates were constant with a peak in 2010.



Figures 13, 14 and 15 Catch, effort and catch rate for yellowfin tuna.



Figures 16, 17 and 18 Catch, effort, catch rate for skipjack.



Figures 19, 20 and 21 Catch, effort, catch rate for bigeye tuna

During some months of 2010, four Chinese longliners fished in Mozambican coast and logbooks were filled. These longliners covered fishing grounds from 15° 30' to 25° 60', mainly Sofala Bank, Bazaruto A and B and Boa Paz as shown in the map (Fig. 22). These vessels have 35 m total length, 274 t TAB and the bait was sardine.

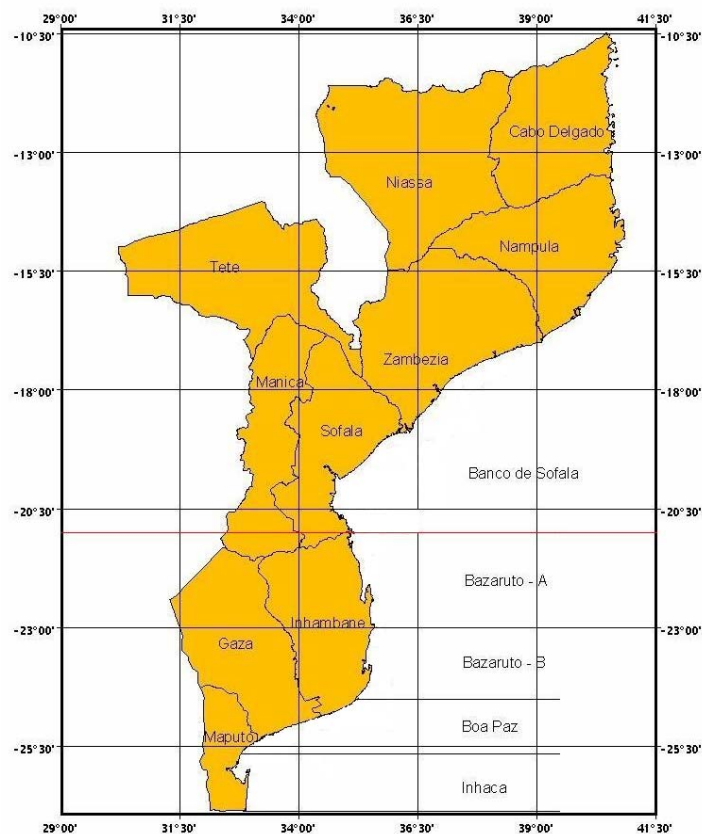


Fig. 22 Mozambique map with main fishing grounds.

Fishing operations took place from April to November and started in northern Mozambique. These vessels fished between 90 to 120 days per month. Total catches per month ranged from 6 to 54 tons and total effort per month from 48000 to 175000 hooks. The target species was bigeye, followed by sharks and yellowfin tuna. Effort was higher in April-May, September and November.

Only data on yellow fin and bigeye tuna are available because skipjack was almost not caught. It looks like the best catches were in May, September and November, but more data needs to be collected in the future in order to get consistent information. Unfortunately, these vessels are not fishing in 2011. Most of the fishing was undertaken around 19° and the best catches were between 17° and 19°.

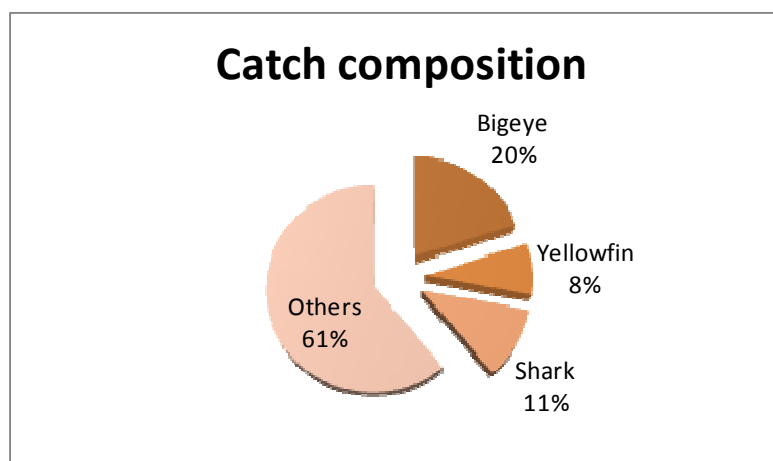


Fig. 23 Catch composition of Chinese longliners.

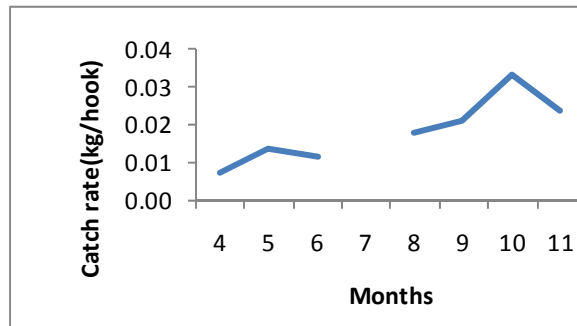
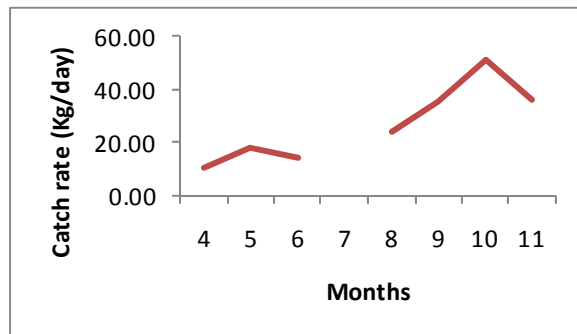
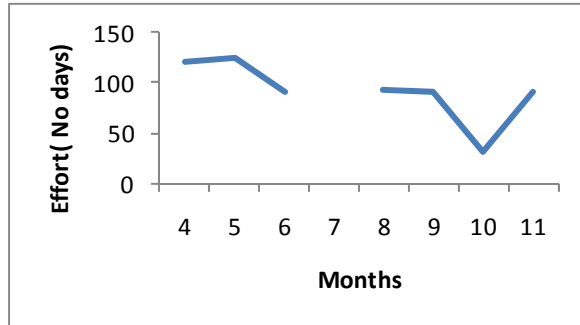
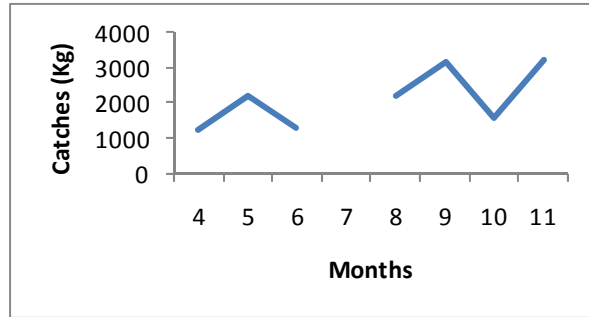
The catch composition for the whole period was bigeye (20%) followed by shark , (11%), yellowfin (8%) and the remain percentage by other species.

Catch rates (kg/ hook) for yellowfin tuna ranged from 0.01 and 0.03 and the best catch rates were in May and October(Fig 27). Catch rates (Kg/day) ranged from 10.38 in April to 51.23 in October and the best catch rates were found in September, October and November(Fig.26).

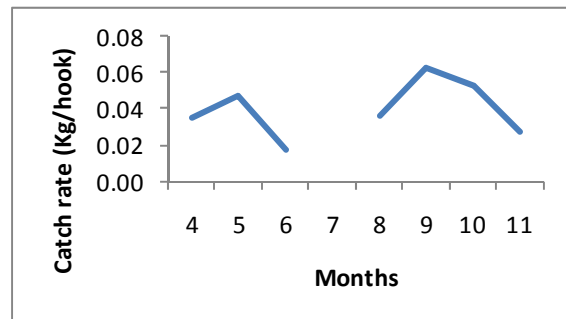
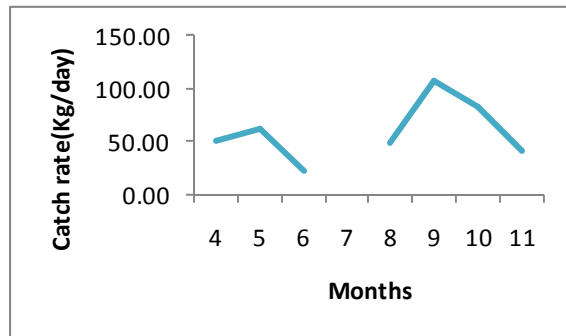
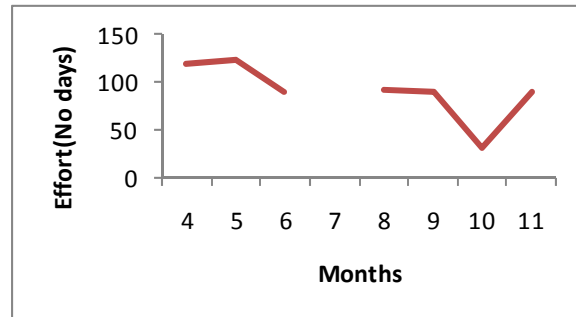
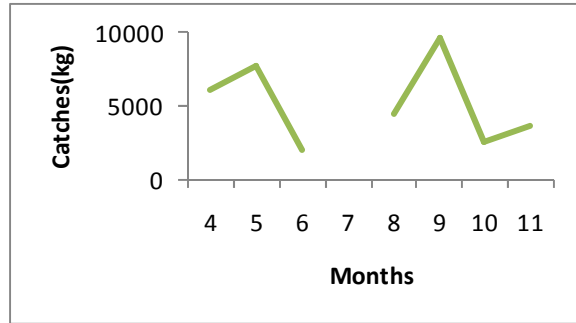
Catch rates (Kg/hook) for bigeye tuna ranged from 0.02 to 0.06 and the best catch rates were in May, September and October(Fig 31). Catch rates (kg/day) ranged from 21 in June and 107 in September and the best catch rates were in September and October(Fig 30). Table 2, summarizes all the information available.

Table 2 Catches (min and max), total effort (no days) and catch rates per day (min and max).

Months	Vessels	Min Catch	Max Catch	Tot Effort (No days)	Min C.rate (Kg/day)	MaxC.rate (Kg/day)
April-Nov	Fu Yuan Yu 065	2113	5655	91	117.39	471.25
April-Nov	Fu Yuan Yu 095	1398	10578	76	116.5	881.50
April-Nov	Fu Yuan Yu 835	1659	8410	74	139.08	546.92
April-Nov	Fu Yuan Yu 837	850	8336	86	71.66	541.23



Figures 24, 25, 26 and 27 Catch, effort and catch rate by day and hook for yellowfin tuna.



Figures 28, 29, 30 and 31 Catch, effort and catch rate by day and hook for bigeye tuna.

In 2009 , yellowfin tuna was the species most caught in the sport fishing followed by skipjack (Anon, 2009).

3. Recommendations

- An observer program should start in order to collect information on species composition and biological characteristics which is one of the big gap.
- Enforcement to fill logbooks should be carried out to get better quality of data on catch and effort.

4. References

Anon, 2009. Relatório anual 2009. Instituto Nacional de Investigação Pesqueira. 70pp.

IOTC Database 1983-2006

Lichucha, I., Ana Maria Luís & Kim A. Stobberup (2004) Profile of the Fisheries Sector in Mozambique: with emphasis on tuna fisheries. Country report prepared for the Indian Ocean Tuna Commission.