ASSESSMENT OF THE STATUS OF DATA COLLECTION AND REPORTING OF ARTISANAL FISHERIES IN MOZAMBIQUE

Case study of two coastal provinces, Cabo Delgado and Nampula

Rui MUTOMBENE[1], Isabel CHAUCA and Osvaldo CHACATE

Instituto Nacional de Investigação Pesqueira, Av. Mao Tsé Tung 389, Maputo, Mozambique

[1]Email: ruimutombene@gmail.com

July 2015

ABSTRACT

Mozambique exhibits a consolidated data collection system for the artisanal fishery (SNAPA). Data collected include gear, effort, species and length of same of dominant species. However, because of the complexity of its artisanal fishing sector, the country, as many other IOTC coastal states, continues to face challenges regarding collection and reporting artisanal tuna fisheries statistics, as requested by IOTC.

In the framework to improve the quality of data collected and reported to the IOTC for full compliance with the resolution 10/02, we conducted, in 2015, a pilot assessment of SNAPA, in two provinces (Cabo Delgado and Nampula) where artisanal fisheries shows significant catches of tuna species and billfishes.

With this assessment, it was concluded that the National Sampling System for Artisanal Fisheries (SNAPA) is suitable to be the primary source of data required by IOTC under the resolution 10/02 da IOTC. However, to guarantee full compliance with IOTC requirements regarding data collection and reporting for artisanal fisheries some arrangements needs to be implemented.

The problems raised during the assessment were, low level of sampling coverage on active gears and catches; week capacity of enumerators to discriminate correctly IOTC species at species level (tuna and billfishes) and none sampling of size data of IOTC species.

Based on the above findings, we proposed recommendations and an action plan to improve the level of data collection and reporting to IOTC regarding the artisanal fisheries in these two provinces, on the view to expand the same initiative to other coastal provinces.

1. INTRODUTION

The Artisanal fishery

The artisanal fishing sector in Mozambique has a particular importance for the country´s food security. Total catch of this sector is around 133,000 tons/year, and represents around 90% of the country catch (IIP 2014, Chacate and Mutombene 2014). The number of artisanal fishers is around 300,000 including fishers without conventional gears (45%) and conventional gear users (beach-seines, hand-lines, gillnets, small purse seines, longlines, traps and spearfishing) (55%) (IDPPE 2012). Operations takes place from the beach or on-board of a mixed fleet of vessels less than 10 m in length, generally within 3 nautical miles (Chacate and Mutombene 2013). Aside from purse-seiners, the majority of the fleet are small non-motorized boats. Usually, vessels conduct daily fishing trips using one type of gear, but in some cases multiple gears are employed simultaneously (Chacate and Mutombene 2013). Catches are highly diverse in terms of species reflecting the rich biodiversity of the costal ecosystems where fishing mainly takes place, including estuaries, seagrass beds and coral reefs (Chauca *et al* 2013). Commonly, in all coastal provinces, caches are mostly composed by of small pelagic fishes and small demersal species, with Beach-seines being responsible for most of the catches, around 38% of the total catch. Although the artisanal catch of tuna is very small, the northern coast of the country seem to exhibit some targeting on tuna specie. This parcel of the country (Cabo-Delgado and Nampula provinces) possess more than 70% of purse-seines, which aside from small pelagics used to encircle neritic tunas (IDPPE 2012, Chauca *et. al.*, 2013). This area also possess about 60% of handlines, which aside from small demersal fish used to catch seerfishes and coastal billfishes (IDPPE, 2012).

The Artisanal Fishery Data Collection System

With mandate to ensure sustainable exploitation of fishing resources, the Ministry of Fisheries, thought the National Fisheries Research Institute (IIP), developed in 1997 a pilot system for collection of artisanal fisheries data. Initially on experimental basis and of gradual implementation, the system was expanded and became adopted as the official source of artisanal fisheries statistics of Mozambique (SNAPA). For exemple, in Nampula Province, in 1997 the system was implemented in Angoche and Moma Districts, in 1998 in Mongicual, in 2001 in Memba and in 2007 expanded to all costal districts (Mossuril, Nacala Velha, Nacala Porto e Ilha de Mozambique). In Cabo Delgado province the system was established from 2005-2008 in coastal districts (Pemba, Ibo, Mocímboa da Praia, Quissanga, Macomia e Palma). The system is actually covers all costal districts and the main inland water bodies.

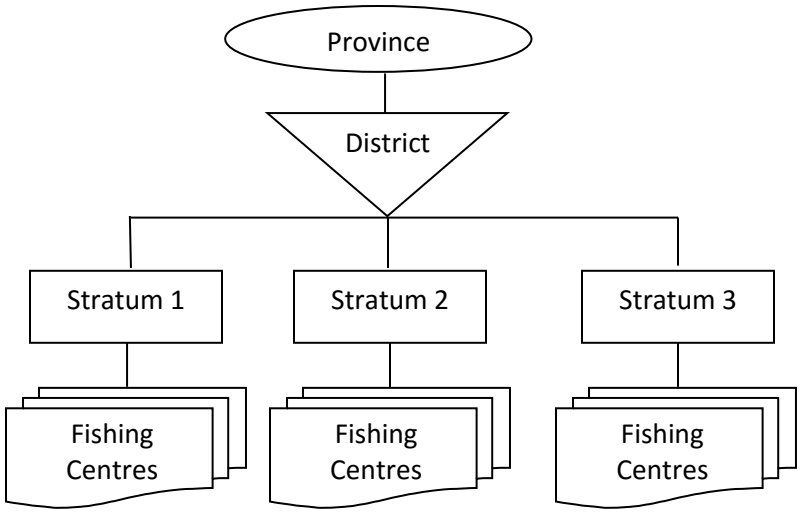

Figure 1. Mozambique artisanal fishing data collection system.

The system is based on a random-stratified sampling at landing sites defined as *fishing centres* (Figure 1) (Balói *et al*., 2007). Data collected include gear, effort, species composition and length of dominant species. Not all fishing centres are sampled. At Nampula province the system covers about 46% of a total of 180 fishing centres (Mualeque *et. al*., 2011) while in Cabo Delgado the system covers about 37% of a total of 136 fishing centres (Pires *et. al*., 2011). To fix this problem, fishing centres with similar type of ecosystems were grouped to form a *fishing stratum* including sampled and non-sampled centres (Figure 1). Information of sampled locations, at the end, is raised to non-sampled fishing centres based on the number of gears. The number of gears available in non-sampled centres is assessed on a five year basis through a national census of the artisanal fishing (IDPPE 2007, IDPPE 2012).
Collected data is stored and processed in Access database (PescArt 3.5) implemented since 1997 with revisions along the years.

2. RATIONALE

With the recent adhesion to IOTC in 2012, Mozambique, as all coastal states, has been faced with the challenge of collecting and reporting data of all fisheries that impact on IOTC species (listed in appendix 1) according with the established standards (see the pilot project Pilot project to improve data collection for tuna, sharks and billfish from artisanal fisheries in the Indian Ocean; The resolution 10/02 of IOTC and also the IOTC guidelines for data collection) (Moreno 2012, IOTC 2014a, IOTC 2014b). In fact, despite exhibiting a sampling system for artisanal fisheries the country has been assessed by IOTC as partially compliant regarding reporting of artisanal tuna fisheries statistics. The geographical extension and complexity of the artisanal sector, which primarily do not target on IOTC species, associated with logistical (financial)

limitations for implementation of the sampling system have been argued to be the primary causes affecting the effectiveness of data collection and reporting.

In the framework to improve the quality of data collected and reported to the IOTC for full compliance with the resolution 10/02, we conducted, in 2015, this pilot assessment of SNAPA, in Cabo Delgado and Nampula Provinces, where artisanal fisheries shows significant catches of tuna and billfishes.

3. STUDY AREA

Cabo Delgado and Nampula are the northernmost coastal provinces of Mozambique (Figure 2). Each province possess 8 costal districts, namely Palma Mocímboa da Praia, Macomia, Ibo, Quissanga, Pemba-Metunge, Pemba and Mecufi at Cabo Delgado province, Memba, Ilha de Mozambique, Nacala Velha, Nacala Porto, Mossuril, Mongicual, Angoche and Moma at Nampula Province (Figure 2). All district are enclosed in one of the three distinct costal zones of the country (zona A), with exception of two southernmost districts of Nampula (Angoche and Moma) that belongs to Sofala Bank (Zona-B). The Northern coast is characterized by a very narrow platform with presence of coralline and rocky bottom substrates. Artisanal fishing sector is the only sector operating in this area.

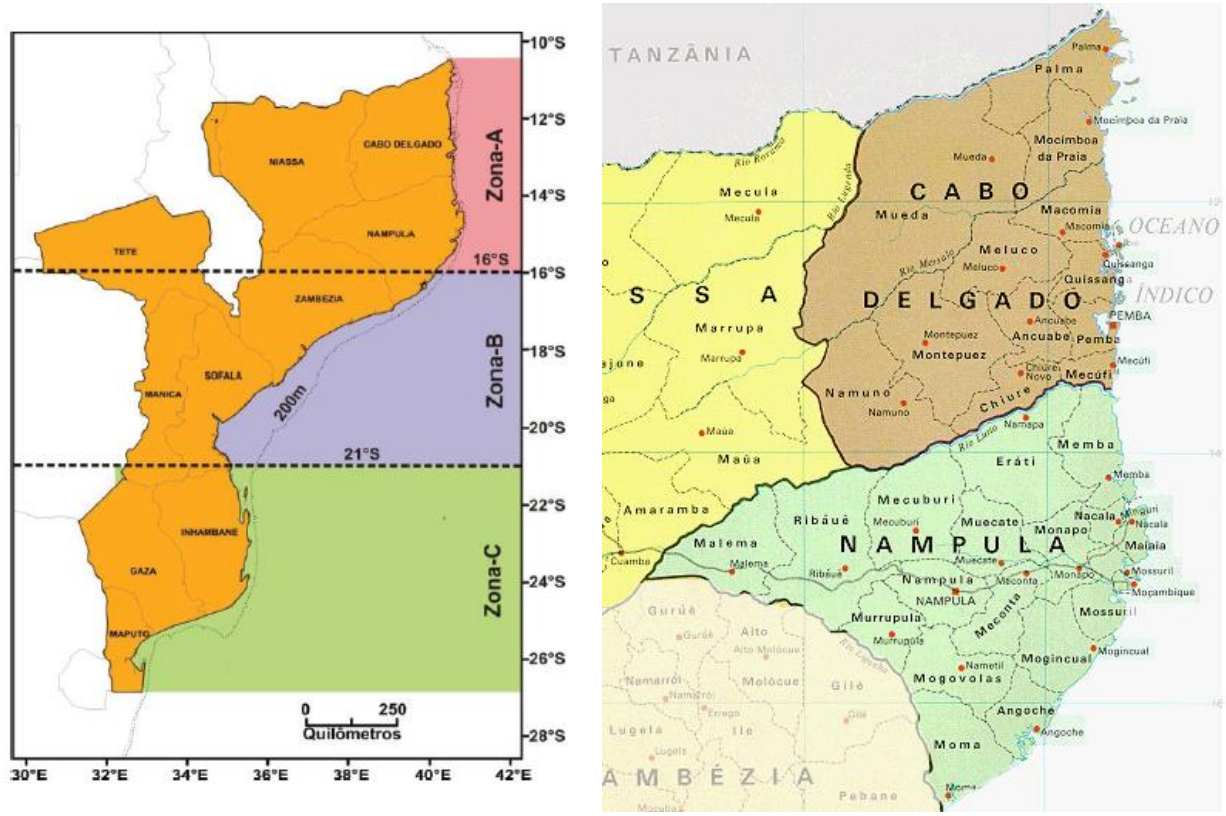

Figure 2. Mozambique coastal zones with focus on the Northern section, Nampula and Cabo Delgado Provinces.

4. METHODOLOGY

The study was based on literature review and a field mission to Cabo Delgado and Nampula provinces.

Key literature related with monitoring of Mozambique artisanal fisheries (Baloi *et al.* 2007, Chauca *et al.* 2009, Mualeque *et al.* 2011, Pires *et al.* 2011, IDPPE 2012) and the IOTC requirements for data collection and reporting (Moreno 2012, IOTC 2014a, IOTC 2014b), were revised.

A Field trip mission to Cabo Delgado and Nampula provinces (Figure 1) was performed from 28 June to 08 July, 2015. The travel itinerary of this mission is presented in the appendix II.

i. Presentation of the IOTC process, and Mozambique obligations concerning tuna fisheries data collection and reporting to IIP staff responsible for SNAPA at province level.
ii. Visits to fishing centres to follow in real time, the dynamic of artisanal fisheries disembarkation and data collection undertaken by the local enumerators in the framework of SNAPA (together with local supervisors) (Table 1).
iii. Detection of gaps on SNAPA that makes the system not compliant regarding resolution 10/02 of IOTC.
iv. Discussions with local IIP staff responsible for SNAPA, on how to address the gaps detected on SNAPA to improve the data collection under the light of resolution 10/02 of IOTC.
i. Reflexion about local initiatives in terms of scientific research related of tuna and other IOTC species.

Table 1. Visited fishing centres in Cabo-Delgado and Nampula Provinces.

Province	**District**	**Visited fishing centres**
Cabo Delgado	Pemba	(1) Ruela, (2) Kifungo, (3) Wimbe.
Nampula	Nacala	(1) Rocha, (2) Mahelene.
	Ilha de Moçambique	(1) Quissanga, (2) Passo Mar.
	Memba	(1) Mecuta

Based on finds and recommendations of the mission we produced a draft action plan that may drive improvements on Mozambique artisanal fisheries data collection and reporting, under the resolution 10/02 of the IOTC.

5. FINDS

The main finding of this assessment is that the National Sampling System for Artisanal Fisheries (SNAPA) is suitable to be the primary source of data required by IOTC under the resolution 10/02 da IOTC. However, to guarantee full compliance with IOTC requirements regarding data collection and reporting for artisanal fisheries some arrangements needs to be developed.

5.1. Gaps or weakness detected on data collection

a) *Low level of sampling coverage on active gears and catches;*
Causes: Due logistical limitation not all sites are sampled and in those where sampling takes place, the real sampling coverage is low. There are in Cabo Delgado and Nampula a total of 167 and 188 fishing centres respectively. In Cabo Delgado only 37% of centres are sampled while in Nampula the coverage is about 46%. Additionally, there is *per* fishing stratum (composed with 4-6 fishing centre) only one enumerator designated to take samples covering at the end of the week, all gears. By other side, artisanal fleets' disembarkation is synchronized with tide levels, taking one to two hours. Thus, the enumerator is only able to sample one fishing centre (landing site) per day, being practically impossible to satisfy 5% of coverage of the active fishing gears. Another issue, is that IOTC species are impacted by many artisanal gears, including small purse seines, handlines, gillnets and spearfishing.
Some gears like purse seiners has ability to encircle large quantities of fishes and when it happens, like in many cases, the requisite of covering 5% of the total catch is also practically impossible to be achieved by the enumerator who has to take samples of other different fishing gears.

b) Week capacity of field enumerators to discriminate correctly IOTC species (tuna and billfishes) at species level.
Causes: Artisanal catch is composed by a great diversity of species. As such species misidentification and aggregation into higher taxa levels is a common problem. Tuna species as well billfishes exhibits many morphological similarities. It was found, during the mission, difficulties of enumerators to differentiate correctly the species of gender *Auxis* sp., to differentiate *bigeye* from *yellowfin*, to distinguish billfishes. With the recent adhesion of Mozambique to IOTC, the enumerators needs to be trained on correct identification of IOTC primary species (Table 1 of Appendix I) and main pelagic Sharks (Table 2 of Appendix I).

c) *Non-sampling of biological data of IOTC species particularly size data*.
Causes: The National Sampling System for Artisanal Fisheries (SNAPA) collects size frequency of same of the most abundant species defined as "priority species" for each type of fishery. Basically these species are composed by shrimps, small pelagic (Clupeids,) and demersal fishes (Siganids). Under the *SNAPA* framework IOTC species (tuna, billfishes and also sharks) are not stated as priority species so biological data including size frequency is not collected, apart from the narrow bared spanish mackerel (important linefish species).

6. RECOMMENDATIONS

6.1. Recommendations regarding data collection process:

a) *To improve the level of data collection*

- Increase the sample size always if catch is very high to ensure that at least 5% of the catch is sampled. The table below shows a relationship between total catch of a fishing unit and sample size, which could be conventionally adopted with a view to inducing sampling coverage levels not below of 5% of total catch, as required by IOTC.

Table 2. Sample size based on total catch.

Total catch of a fishing unit	Sample size above:
100 Kg	5 Kg
200 Kg	10 Kg
500 Kg	25 Kg
1000kg	50 Kg

In term of sampling strategy, if total catch of a fishing unit is relatively high and composed by mixed sizes it is recommended to split the sampling in two categories of large and small individuals and sample 5% of each category. IOTC species will be in the large size category.

- Increase the sampling frequency at fishing centres with majority of fishing gears and production in order to induce at least 5% of coverage in active gears. For example, if enumerator covers a stratum with three fishing centres (A, B e C), where fishing centre *C* has 50% of active gears and produce about 70% of total landings of the stratum then its recommended that 50% of sampling effort of the enumerator to be invested in this fishing

centre. In other words, it means that the monthly sampling plan needs to be adjusted to the proportion of fishing activity of the fishing centres in the previous month.

Table 3. Map of fishing effort and production per gear by fishing centre.

Month	Distrit	Stratum	Fishing Centre	Fishery (gear)	Effort (gear*day)	Catch (kg)	% Tuna, billfish and serrefish	% of IOTC Sharks
Jan	Pemba	Paquite	Ruela	Handline	600	3000	13	4
Jan								
Feb								

- Recognising the existing logistical limitations for full implementation of SNAPA (enumerators, budget and logistical means) it is recommended to conduct parallel sampling campaigns, of one week per month, in the fishing centres and districts of major productivity to increase the levels of coverage. In these centres focus on sampling needs to be addressed to gear with high production, not well covered by SNAPA. It is also important to analyse the aspects of seasonality of IOTC Species and concentrate more efforts (people involved in those campaigns) during high catches season.

b) *Actions to improve the capacity of enumerators to identify correctly the IOTC primary species and main IOTC sharks.*

- It will be necessary to train all enumerators on correct identification of IOTC species (Tuna, billfish and sharks) and provide them with IOTC species identification manuals. Portuguese versions of the manuals (IOTC primary species and Sharks) needs to be provided to Mozambique by IOTC.

c) *Actions to guarantee that size frequency data of IOTC primary species and main IOTC sharks will be collected.*

- Include all IOTC species (Tuna, billfish and sharks) occurring in the province, on the list of species subjected to biological sampling and instruct enumerators to also collect size frequency of those species by routine SNAPA data collection. In some fisheries catches per fishing unit is very low (eg, spearfishing, handlines) and in other catches are considerably high (beach-seine, purse-seine). In order to standardize the sampling procedures and taking into account that IOTC resolution 10/02 recommends, per species, 1 individual sampled per metric ton landed, it is recommended to take size measurements of all priority species in the sample not exceeding five individual per species in all gears.

6.2. Recommendations for data reporting according IOTC Standards:

It is recommended that catch and effort data (including by species) still being processed in PESCARTE followed by rising sampling to include non-covered areas, under the framework of SNAPA. Final processed data aggregated in a monthly basis needs to be sent quarterly to IIP headquarters in Maputo (Department of Fish Assessment) which will congregate data of all provinces. Reporting needs to be in excel matrixes as presented in table 4 (catch and effort).

Table 4. Matrix for reporting catch and effort data by gear, species and month in each province.

Fishery (Gear)	**Month**	**Species**	**Catch (kg)**	**Effort** (Active gears.days)
Purse seine	Jan	Euthynnus affinis	7066	2640
Handline	Jan	Istiophorus platypterus	12000	2640

Length data collect in logbooks needs to be filled directly in excel matrixes as proposed in table 5.

Table 5. Matrix for reporting size frequency data of IOTC species, by gear, species and month in each province

Fishery (gear)	**Month**	**Species**	**TL (cm)**
Handline	Jan	Euthynnus affinis	56
Handline	Jan	Euthynnus affinis	44
Handline	Jan	Euthynnus affinis	44
Handline	Jan	Auxis thazard	36
Handline	Jan	Auxis thazard	25
Handline	Feb	Euthynnus affinis	60
Handline	Feb	Auxis thazard	19
Handline	Feb	Auxis thazard	19

Purse seine	Jan	Euthynnus affinis	56
Purse seine	Jan	Euthynnus affinis	39

TL= Total Length

Until 30 March each province needs to send final data (catch and effort and size frequency) of the previous year (Tables 4 and 5) to IIP-headquarters.

6.3. PROPOSED ACTION PLAN

The recommendations of this report were translated in a plan of action which may guide the work that needs to be done to improve collection and reporting of data of artisanal fisheries with impact n IOTC species in Nampula and Cabo Delgado Provinces (Table 6). While catches of tuna and billfishes by artisanal sector are generally low and confined to Cabo-Delgado and Nampula provinces, significant catches of seerfish do occur in all coastal provinces of the country. It is also suspected that a considerable number of sharks may be caught although not targeted, mainly in the Sofala Bank area (Zone B) which include Zambézia and Sofala Provinces. The perspective is to expand the same initiative to other coastal provinces.

Table 6. Proposed Action Plan to improve data collection and reporting of artisanal fisheries with impact on IOTC species in Cabo Delgado e Nampula (resolution 10/02).

Objective	**Proposed action**	**Implementation body**	**Indicator (verification)**	**Expected Result /Impact**	**2016**				**2017**	
					1Q	**2Q**	**3Q**	**4Q**	**1Q**	**2Q**
1. Improvement of data collection in the light of the resolution 10/02.	i. Develop and implement the use of the table that defines the size of the sample depending on the amount of the total catch.	Provincial Delegation of IIP in Cabo Delgado and Nampula	% of enumerators using tables defining sampling size. Target is 100%	Sample size increased to at least 5% of the total catch of a fishing unit.	X					
	ii. When catches are composed by mixed sizes Split the sampling into two size categories (large and small fish).	Provincial Delegation of IIP in Cabo Delgado and Nampula	% of logbooks with record of sampling split into size categories. Target is 100% of sampling performed according size categories	Improvement on statistics estimates (qualitatively and quantitatively).	X					

	iii. Produce, in a quarterly basis, a map of catch and effort by fishing centre and gear, in order to identify the districts (and fishing centres) of higher fishing activity and production, and then adjust the sampling frequency (sampling plan) according to the proportion fishing activity.	Provincial Delegation of IIP in Cabo Delgado and Nampula	% of sampling plans adjusted on a quarterly basis taking into account the frequency of operations of the previous month. Target is a total of 4 quarterly sampling plans per year	Sampling coverage increased to at least 5% of active fishing gears (outings)	X	X	X	X		
	iv. Include all IOTC species that occur within each province, in the list of species subjected to biological monitoring and instruct enumerators to collect size frequency of IOTC species	Provincial Delegation of IIP in Cabo Delgado and Nampula	% of enumerators using the updated list of species to collect size frequencies (with IOTC species included). Target is 100%	Collection of size frequency data of IOTC species captured in artisanal fisheries	X					

	v. Translate the IOTC Species identification manuals to Portuguese and provide printed versions to Mozambique enumerators (priority are ID of IOTC primary species and Sharks)	IOTC	% of enumerators using the IOTC ID manuals. Target is 100%	Improvement on quality of reported data (species well discriminated and species aggregation minimized)	X	X	X			
	vi. Train the enumerators on correct identification of IOTC species and sampling procedures	Provincial Delegation of IIP in Cabo Delgado and Nampula/ Fish Department of IIP at central level	% of enumerators trained annually. Target is 100%	Improvement on quality of reported data (species well discriminated and species aggregation minimized). Improvement on statistics estimates (qualitatively and quantitatively)	X	X				

	vii. Undertake parallel sampling campaigns for fisheries data collection with emphasis at districts (and fishing centres) of higher fishing activity and production and during the season of high production of IOTC species. It is important to visit the non-covered fishing centres and take a picture of fishing effort	Provincial Delegation of IIP in Cabo Delgado and Nampula/ Department of fish assessment of IIP at central level.	% of sampling campaigns Target is 100% of planned campaigns covered to fill the gaps on Sampling coverage	Sampling coverage increased to at least 5% of active fishing gears (outings). Collection of biological data increased	X	X	X	X		
2. Report collected data according IOTC standards	viii. Process the data of catch and effort and size frequency as performed actually and aggregate them in excel files as recommended in this report (in a monthly	Provincial Delegation of IIP in Cabo Delgado and Nampula	Data filled in excel files.	Standardization of the information to be reported to the IOTC.	X	X	X	X		

	basis).									
	ix. Report quarterly the data collected to Department of fish assessment of IIP at central level.	Provincial Delegation of IIP in Cabo Delgado and Nampula	% fisheries, species and months reported. Target is 12 months reported	Globalization of the data collected in all provinces, other fishing sectors and programs; to be reported to IOTC secretariat	X	X	X	X	X	
	x. Report annually collected data of the previous year to IOTC	Department of fish assessment of IIP at central level.	% fisheries, species and months reported. Target is 12 months reported							X

7. REFERENCES

- IOTC Secretariat (2014a). Compendium of Active Conservation and Management Measures for the Indian Ocean Tuna Commission. IOTC Secretariat, Mahé, Seychelles, October 2014. 193pp.
- IOTC Secretariat (2014b). Guidelines for the reporting of Fisheries Statistics to the IOTC. IOTC Secretariat, Mahé, Seychelles, January 2014. 70pp.
- Chacate, O and R. Mutombene (2014). Mozambique National Report to the Scientific Committee of the Indian Ocean Tuna Commission, 2014.
- IIP, 2014. Relatório Anual 2013. Instituto Nacional de Investigação Pesqueira. Maputo. 81pp.
- IDPPE (2013). Censo da Pesca Artesanal 2012: Principais Resultados. Ministério das Pescas - Instituto Nacional de Desenvolvimento da Pesca de Pequena Escala. Moçambique. 124pp.
- Chaúca, I., P. Limited, T. Pereira, O. Chacate, D. Mualeque, R. Mutombene, A. Simango, E. Morais, C. Maúnde, A. Thuzine, A. Wetimane, Z. Masquine, A. Inácio, E. Leong, K. Samucidine e R. Álvaro (2013). O Estado de Exploração dos Recursos Acessíveis à pesca Artesanal em Moçambique-2010. Instituto Nacional de Investigação Pesqueira, 47pp.
- Moreno G (2012). Pilot project to improve data collection for tuna, sharks and billfish from artisanal fisheries in the Indian Ocean. IOTC Secretariat, Mahé, Seychelles. 93pp.
- Mualeque D., R. Mutombene, A. Simango (2011). Estado de Exploração dos Recursos Acessíveis a Pesca Artesanal na Província de Nampula. Relatório Interno de Investigação pesqueira nº9. IIP.84 pp.
- Pires P., R. Álvaro, T. Pereira e O. chacate (2011). Estado de Exploração dos Recursos Acessíveis a Pesca Artesanal marinha na Província de Cabo Delgado. Relatório Interno de Investigação pesqueira nº8. IIP.70 pp.
- Baloi P., Santana-Afonso, P., Premegi N e Volstad, J.H., 2007. Metodologia e processamento de dados de captura e esforço de pesca em Moçambique. Revista de Investigação Pesqueira Nº. 27. Instituto de Investigação Pesqueira, Moçambique.

APPENDIX I

Tabela1. List of 16 IOTC primary species (tuna, billfish and seerfish).

Species Code	Portuguese Name	English Name	Scientific Name
YFT	Albacora	Yellowfin tuna	*Thunnus albacores*
BET	Patudo	Bigeye tuna	*Thunnus obesus*
SKJ	Gaiado	Skipjack tuna	*Katsuwonus pelamis*
ALB	Voador	Albacore	*Thunnus alalunga*
SBF	Atum do Sul	Southern bluefin tuna	*Thunnus maccoyii*
SWO	Espadarte	Swordfish	*Xiphias gladius*
BLM	Espadim negro	Black Marlin	*Makaira indica*
BUM	Espadim azul	Blue Marlin	*Makaira nigrican*[T1]
MLS	Espadim raiado	Striped marlin	*Tetrapturus audax*
SFA	Veleiro	Indo-Pacific sailfish	*Istiophorus platypterus*
LOT	Bonito-oriental	Longtail tuna	*Thunnus tonggol*
KAW	Merma	Kawakawa	*Euthynnus affinis*
FRI	Judeu	Frigate tuna	*Auxis thazard*
BLT	Judeu melveira	Bullet tuna	*Auxis rochei*
COM	Serra	Narrow-barred Spanish mackerel	*Scomberomorus commerson*
GUT	Serra-canadi	Indo-Pacific king mackerel	*Scomberomorus plurilineatus*

T1 - Makaira mazara

Besides the above primary species, the IOTC identified species of pelagic sharks for which CPC's and other parties having fisheries for IOTC species are requested to report statistics. These sharks make an important bycatch of IOTC fisheries.

Para além das 16 espécies listadas a IOTC é igualmente responsável pela gestão das espécies impactadas pelas pescarias dirigidas para a captura de tunídeos, principalmente espécies de tubarão e Raias (mantas e diabos) (Tabela) e algumas espécies carismáticas capturadas acidentalmente (tartarugas e mamíferos marinhos).

Table 2. List of shark species and rays that represent an important bycatch of IOTC fisheries.

Species Code	Portuguese Name	English Name	Scientific Name
BSH	Guelha azul	Blue shark	*Prionace glauca*
POR		Porbeagle	*Lamna nasus*
OCS	Marracho oceanico	Oceanic whitetip shark	*Carcharhinus longimanus*
PSK	Tubarão crocodile	Crocodile shark	*Pseudocarcharias kamoharai*
TIG	Marracho tigre	Tiger shark	*Galeocerdo cuvier*
WSH	Tubarão branco	Great White shark	*Carcharodon carcharias*
FAL	Marracho sedoso	Silky shark	*Carcharhinus falciformis*
DUS	Marracho areneiro	Dusky shark	*Carcharhinus obscurus*
RHN	Tubarão baleia	Whale shark	*Rhincodon typus*
LMA		Longfin mako	*Isurus paucus*
SMA	Anequim barbatana curta	Shortfin mako	*Isurus oxyrinchus*
MAK	Anequins	Mako sharks nei	*Isurus spp.*
SPL	Tubarão martelo comum	Scalloped hammerhead	*Sphyrna lewini*
SPZ	Tubarão martelo liso	Smooth hammerhead	*Sphyrna zygaena*
SPN	Tubarões martelo	Hammerhead sharks nei	*Sphyrna spp.*
ALV	Zorro cauda longa	Thresher Shark	*Alopias vulpinus*
BTH	Zorro olho grande	Bigeye thresher	*Alopias superciliosus*
PTH	Zorro pelagic	Pelagic Thresher Shark	*Alopias pelagicus*
THR	Zorros	Thresher sharks nei	*Alopias spp.*
RME	Diabo	Longhorned mobula	*Mobula eregoodootenkee*
RMJ	Diabo	Spinetail mobula	*Mobula japanica*
RMO	Diabo	Smoothtail mobula	*Mobula thurstoni*
RMB	Manta gigante	Giant manta	*Manta birostris*
PSL		Pelagic stingray	*Pteroplatytrygon violacea*
MAN	Mantas e raias diabos	Mantas and devil rays nei	*Mobulidae*

APPENDIX II

Table 1. The travel itinerary of this mission to Cabo Delgado and Nampula provinces.

Activity	**Technical people involved**	**Date**
Presentation of IOTC process and the necessity of Mozambique collect and report fisheries statistics at Provincial Delegation of IIP, Cabo Delgado.	Rui Mutombene, Arone Salença, Sérgio José e Afonso Mudunzi.	29/06
Visit the fishing centre of Kifungo, Ruelas and Wimbe, in Pemba district.	Rui Mutombene, Isabel Chaúca, Arone Salença e Sérgio José.	29/06
Sampling at fishing centre of Ruelas	Rui Mutombene, Isabel Chaúca, Arone Salença, Sérgio José e Wanassah Domingos.	30/06
Discussions with local IIP staff responsible for SNAPA, on how to address the gaps detected on SNAPA to improve the data collection under the light of resolution 10/02 of IOTC.	Rui Mutombene, Arone Salença, Sérgio José e Afonso Mudunzi.	01/07
Trip to Nampula.	Rui Mutombene e Isabel Chaúca.	01/07
Sampling at fishing centre of *Rocha* in Nacala district	Rui Mutombene, Isabel Chaúca, Neto Borges, Edmundo Maurício e Mamudo Chale.	03/07
Sampling at fishing centre of *Mahelene* in Nacala district	Rui Mutombene, Isabel Chaúca, Neto Borges, Edmundo Maurício, Mamudo Chale e Hando Pilal.	04/07
Sampling at fishing centre of *Quissanga and Passos Mar* in Ilha de Moçambique district	Rui Mutombene, Isabel Chaúca, Edmundo Maurício e Nazário Cancala.	05/7
Sampling at fishing centre of *Mecuta* in Memba district	Rui Mutombene, Isabel Chaúca, Edmundo Maurício e Muireque Variano.	06/07

Discussions with local IIP staff responsible for SNAPA, on how to address the gaps detected on SNAPA to improve the data collection under the light of resolution 10/02 of IOTC.	Rui Mutombene, Isabel Chaúca, Edmundo Maurício e Neto Borges.	07/07

Cover Photo: Rui Mutombene (researcher), Mamudo Chale (local enumerator) and Isabel Chauca (researcher) at a fishing centre (Mahelene) of Nacala district, in Nampula province, with a handline catch (Sailfish).