Timeline and story of the Spanish purse seiner fishery targeting on tropical tuna from Indian Ocean: a historical review

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Abstract

The aim of the present study is to describe the main milestones of the Spanish purse seine fishery targeting on tropical tunas in the Indian Ocean, since the first fishing prospecting survey in the 1980s to the present. We also review the scientific effort that has been done for this period to obtain reliable scientific fishing estimations. Finally, the current situation of this fleet is described, after the economic crisis of this last decade. All these milestones are important to understand some peak and down in the historical data series from Spanish tropical tuna catches, and scientific estimations.

Introduction

The Spanish purse seine freezer fleet operating in the Indian Ocean is one of the most important in the world. It consists of a total of 14 fishing boats (15 boats during 2014) supported by vessels not equipped with a fishing gear, mainly managing the floating objects stock (deployment, detection, tuna school estimation, etc.). During 2014, together caught the 1.74% of the tunas of the world (2.18% of the skipjack and 3.95% of the yellowfin tuna tonnes landed in the world) (data deduced from Báez et al., 2017).

Start of the fishery

The diplomatic relations of Spain and Seychelles have always been good since the independence of Seychelles in 1976 (for example Spain attended the independence of Seychelles ceremony to see BOE 1976, 1990).

On the other hand, the establishment in 1982 in the United Nations Convention on the Law of the Sea (UNCLOS), the Exclusive Economic Zone in 200 nautical miles pushed the Spanish fleet to look for new fishing grounds. Moreover, the fisheries yield for the Spanish Atlantic purse seine fleet was very low in this period. For these reasons, the

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government of Spain financed several fishing prospecting surveys between 1981 and 1984 in Seychelles.

On October 28th, 1983, the governments of Seychelles and Spain signed in Mahé a fisheries agreement, by which 15 fishing vessels could catch tunas within the EEZ of Seychelles.

Evolution of the operational fleet from purse seiners from Indian Ocean

The first 4 PS began their activities in March 1984 and gradually the fleet was increased to 16 (one with the flag of Panama) in December 1984 (Cort, 1985).

The average number of boats in the Indian Ocean between 1984-2017 has been 17 vessels per year, with a maximum of 23 vessels in 1997. The fleet has been aging over time with an aging maximum of 18 years old currently (see **figure 1**). The carrying capacity (CC) has been increasing over time, reaching its highest capacity since 2011. The vessels with highest CC (i.e. CC > 2300 m^3) appear in 2011.

Evolution on fishing on anchored and drifting objects

From the origin of the fishery in 1984 the Spanish fleet used anchored FADs (AFADs) (or payaos). In addition, according to Cort (1985) in the inter-monsoon period, the Spanish fleet fished on natural objects in waters off Somalia. However, due to the increase in measures to avoid non-dolphin bycatch in purse seiners mainly from Pacific Ocean in early 90s (including a The U.S. attempt to reduce foreign dolphin kills through the use of embargoes and labeling requirements) (Hampton, 1999), had a significant impact on behavior of Spanish fleet forcing it to improve the development of new fishing techniques, like the development of drifting FADs (DFADs). According to many authors in the decade of the 90s, the use of DFADs was intensified (Davies et al., 2014).

Recently the policy of the IOTC is aimed at reducing the number of DFADs (for example IOTC resolutions 16/01 and 17/08); while resolution 16/07 on the use of artificial lights to attract fish ended with the use of AFADs.

Supplies trend

According to Pallares et al. (2002) the use of supplies in the Ocean began in 1994. The average number of supplies with Spanish flag has been 5 boats, with a maximum in 2016, and currently in decline (**figure 2**).

Correction of catch composition

Fonteneau (1976) discussed about the difficulty for some skippers to correctly identify the retained catch composition. Consequently, a correction procedure was designed for the logbook catch records by species, based on the implementation of a multi-species sampling system, which had been developed since 1980 in the Atlantic Ocean (Pallarés & Petit, 1998) and from 1984 in the Indian Ocean in the major unloading ports for EU fleet.

Since the beginning of the activities of the PS in the western Indian Ocean, the samplings were stratified, according to the commercial categories of the fish. Extensive surveys on the rate of mixing of the main tuna species were carried out. The mixing rate values found were applied to the various geographic strata (5° x 5° areas) and these values were weighted to the catch (Cort, 1985).

In 1998, a new sampling strategy was implemented (Pallarés & Petit, 1998, Pianet et al., 2000).

We show in Figure 3 the Spanish purse seine fleet trend of catches of tropical tuna corrected with the system explained in Pallares & Petit (1998) and Pianet et al. (2000) per CC.

Milestones

1984. Start of the fishery.

1985. Opening of the Spanish fishing office in Victoria (Seychelles)

1990. First dFADs

1994. First supply vessels

1997. Maximum number of Spanish purse seiners in the area.

1998. New sampling strategy.

2005. Intensification of Somali piracy.

2008. Kidnapping Playa de Bakio

2009. Kidnapping Alakrana

2012. Private security on ships

2013. Closure of the fishing office

2017. YFT TAC

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Figure Captions

Figure 1. Trend of the Carrying Capacity (m3) of the Spanish purse seiner fleet from Indian Ocean.

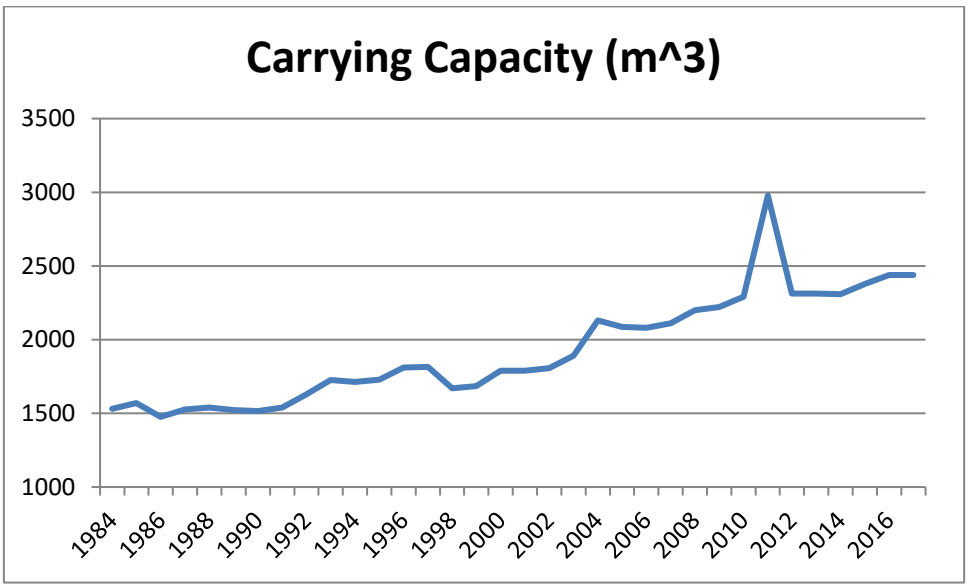

Figure 2. Trend of the Spanish supplies from Indian Ocean.

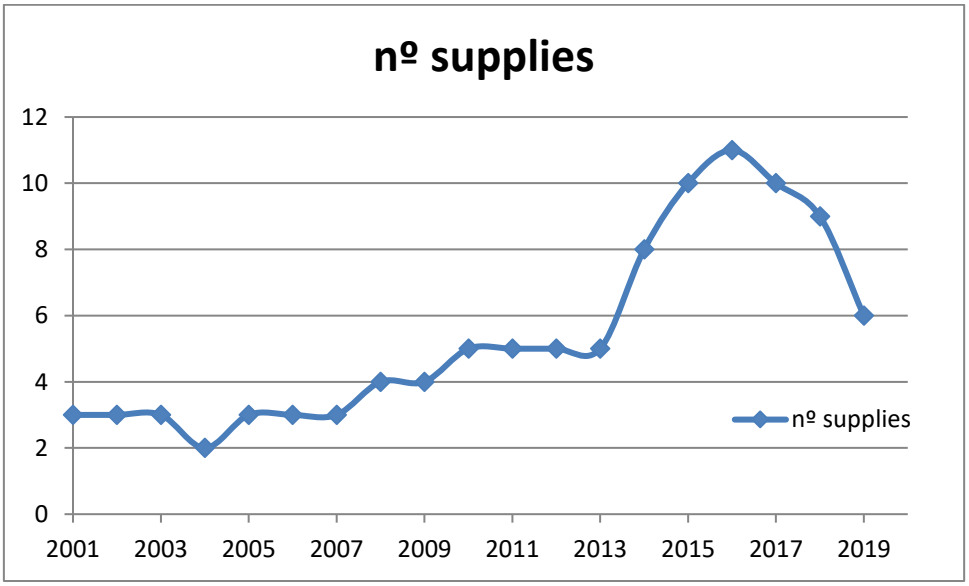

Figure 3. The Spanish purse seine fleet trend of catches of tropical tuna corrected with the system explained in Pallares & Petit (1998) and Pianet et al. (2000) per CC.