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Title: Fishery in Iran and a review on billfish by-catches of Industrial gillnet Fishery

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Abstract:

Fishery for tuna and tuna-like species is a major component in large pelagic fisheries in Iran and one of the most important activities in the Persian Gulf, Oman Sea and offshore waters. There are 4 coastal provinces in those areas and more than 11 thousands vessels consist of fishing boat, dhows and vessels which are engaged in fishing in the coastal and offshore waters. There are three fishing methods targeting tuna and tuna-like species in the IOTC area which include gillnet and purse seine and also some of small boats use trolling in coastal fisheries. Gillnet is the dominant fishing gear in the IOTC area, Majority of the production comes from the Gillnet vessels operating within EEZ as well as offshore fishery. More Billfish's are caught as incidental catch in offshore waters targeting other species. In terms of area, more Billfish is caught in northwestern areas.

The total production of large pelagic fishes during 2015 was 271000 Mt of which 232000 Mt belongs to tuna and tuna-like fishes in the Indian Ocean areas. Those catches with76.3% (182456Mt) of Tunas, 12.6% (30040 Mt) of Seerfish, 3% (7135 Mt) different species of shark and the third largest group of fish is the billfish with almost 19531Mt which is around 7.2% the total large pelagic landings in Iran. The Sailfish were the majority with 9745 Mt recorded, followed by black marlin about 5958 Mt while only 839 Mt Striped marlin and Swordfish1174 Mt and others 1816 Mt were reported. Although billfish are not normally targeted species, they are considered as by-catch species but according our regulation for Tuna species fishing, no part of billfish catch will be discarded by vessels.

1. Introduction:

There are three categories of fisheries activities in Iran consist of the southern fishery, the northern fishery (the Caspian Sea) and inland fishery and aquaculture. Figure 1.1 shows Historical Catch & production in the country and the annual production in Iran was about 983300Mt in 2015, which can be distributed as 56% (549700 Mt) of the total catch and production contributed to the country fishing activities in the Persian Gulf, Oman Sea and offshore waters, about 3%(32600 Mt) of production from northern water (Caspian Sea) and 41%(401000 Mt) through inland water and aquaculture.

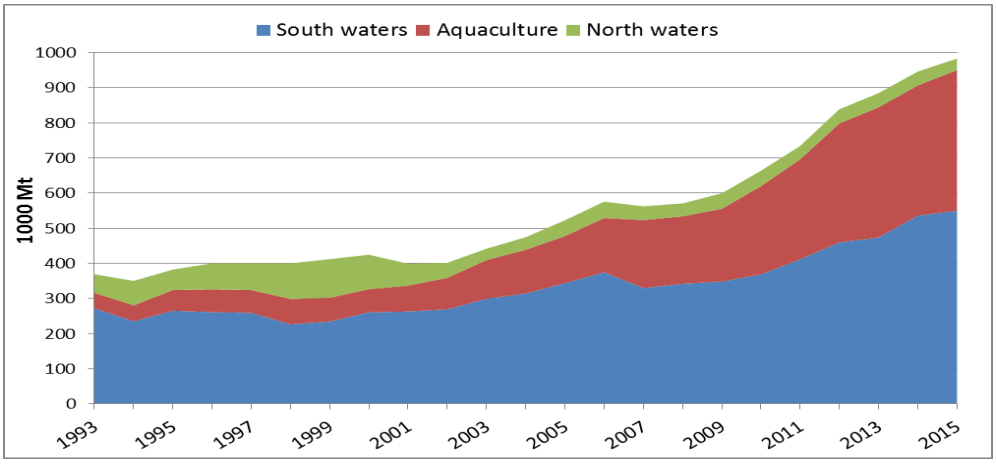


Figure.1 Historical Catch & production in the country

The main fishing grounds for large pelagic species in southern of the country are located in the coastal sectors of Persian Gulf and Oman Sea and total volume of production in the coastal and offshore waters in 2015 around 549700 Mt, which include large pelagic, small pelagic, demersal, shrimp and lantern fishes. Major catch is allocated to large pelagic with 271000 Mt (49.3 % of total catch) in the coastal and offshore. Figure1.2 shows the catches quantity of different aquatic species group in the southern waters of Iran.

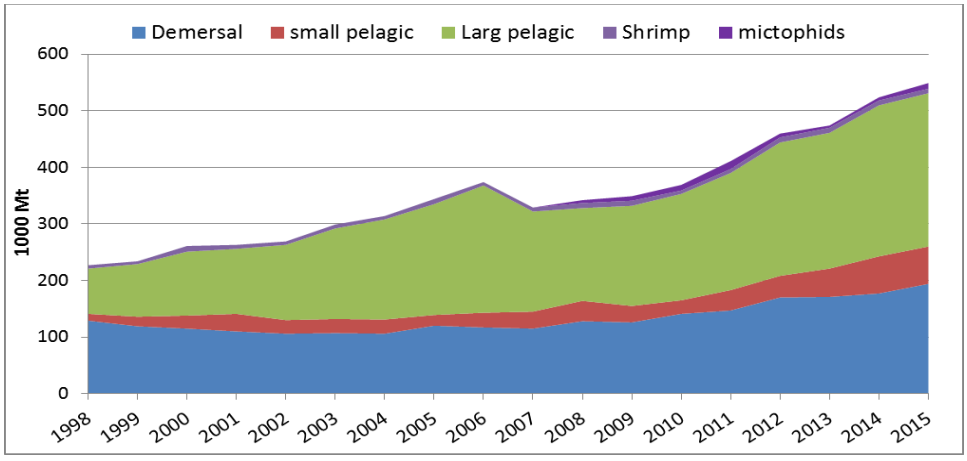


Figure.1.2 Historical catch quantity of different aquatic species group in the southern waters

2. Fleet structure:

Iran industrial and semi-industrial fishing fleets owned by private enterprises carry out almost all fisheries in the coastal and offshore water. Iran fisheries and exploitation of aquatic animals in the southern water is carried out by a fishing fleet around 11000 vessels of which about 7767 crafts are engaged large pelagic species activities in 2015. Of this total volume of vessels, about 1200 are active in Tuna and Tuna like fishing in the outside of EEZ and the rest are operated only in the coastal fishery. Those fishing crafts consist of industrial purse- seiners, fishing boats and artisanal vessels (Dhows) and GT of purse seiners is up to1000 t and GT of gillnetters ranges from less than 3t to more than 100 t. Gillnet and purse seine are two main fishing gear for catching tuna and tuna-like Species in the IOTC area and also some of small boats used trolling in coastal fisheries. Figure 2.1shows that the highest gillnet fishing pressure occurs within the Islamic Republic of Iran's EEZ.

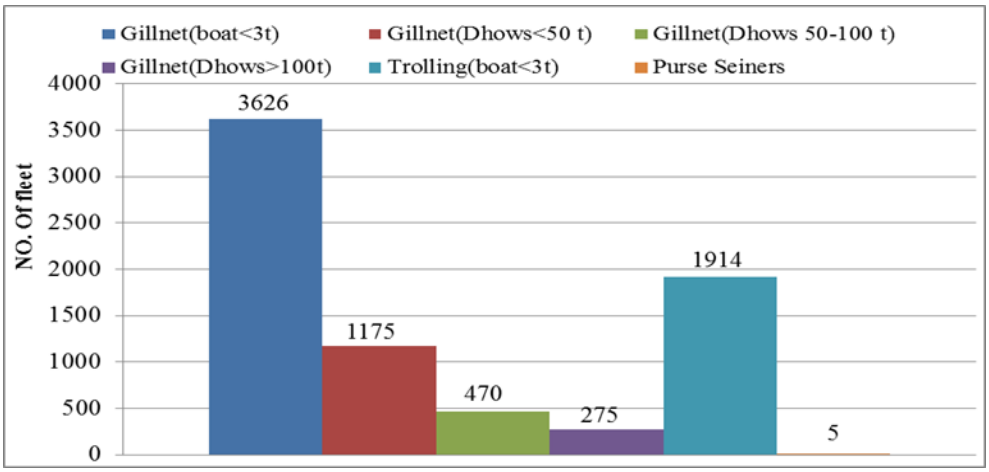


Figure 2.1: Iranian fishing active vessels in Southern waters by gear type and size in 2015

Figure 2.2 shows types of fishing vessels in Iran operate for tuna and tuna like Species: (a) Small boat (b) Dhows and (c) Purse seiners,

(a) *Small boat*

(b) *Artisanal vessel (Dhow)*

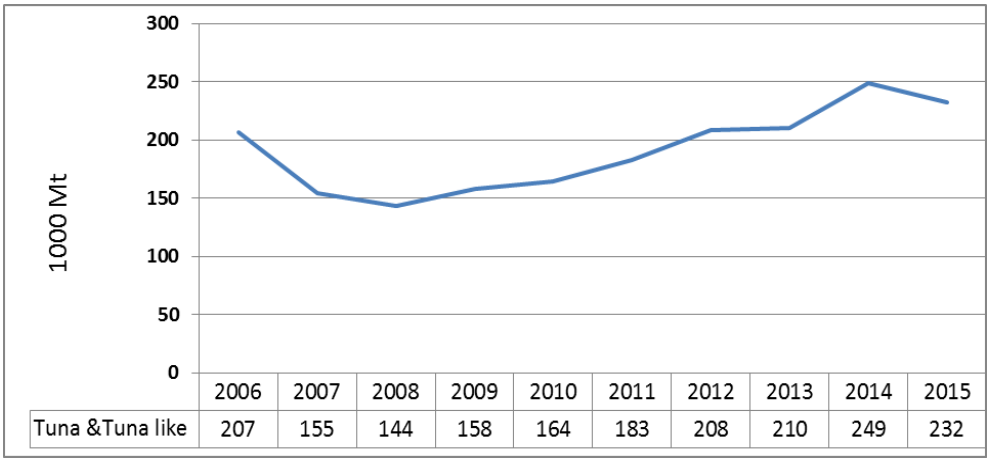
(C) Purse seiners

3. Catch and Effort (By Gear and Species):

a. Catch

Catch and effort and biological data of the coastal and offshore large pelagic fishery are collected at the 43 fish landing sites and recorded in the capture fishery data collection system routinely. Catch and effort data were collected in all the 43 landing sites by stratified random sampling by the samplers, in this way, 10% of total fishing crafts for different vessel classes of fishing dhows and boats are picked out randomly and their fishing data will be registered. Large pelagic species are mainly comprised of 6 tuna species, 2 seerfish species, 4 billfish species and 7 sharks. Landing surveys are undertaken to obtain data on catches in the artisanal fisheries.

In 2015 the nominal catch of tuna and tuna-like species recorded in the landing site around 232000Mt, of which about 115000Mt from coastal waters and the rest 117000Mt belongs to offshore fishery. Those catch consist of tropical tuna 83750Mt, neritic tuna 128720Mt, billfish 19530Mt, shark 7135Mt and other large species around 12388Mt.



	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Tuna &Tuna like	207	155	144	158	164	183	208	210	249	232

Figure3.1 Nominal catch quantity of Tuna&Tunalike Species in the IOTC Area

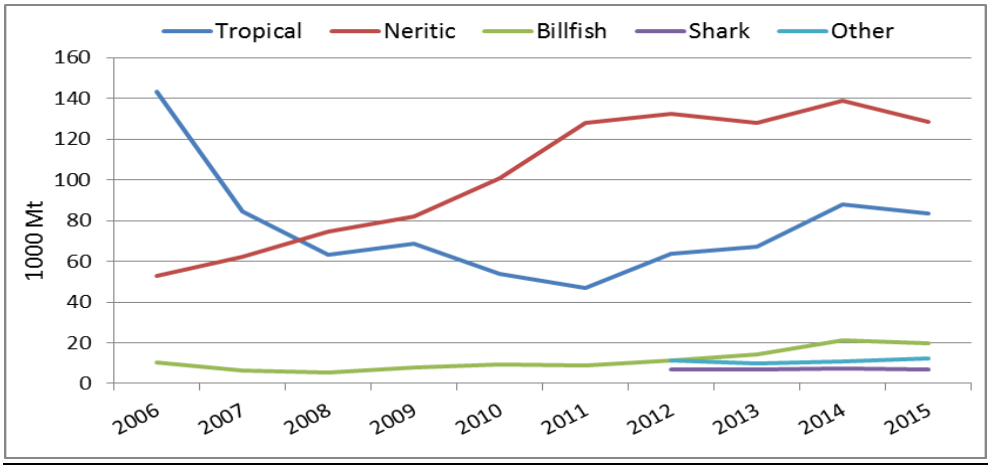


Figure3.2. Nominal catch quantity of tuna and tuna-like species reported for the all fleet

Figure3.4 shows the nominal catches by gear type reported for the all fleet. In 2015 total catch for purse seine, Gillnet and trolling was estimated 5308 Mt, 241121Mt and 5122 Mt respectively. Gillnet with 95.9% of Catch is the dominant fishing gear followed by Purse seiners 2.1%, and around 2% comes from Trolling vessels.

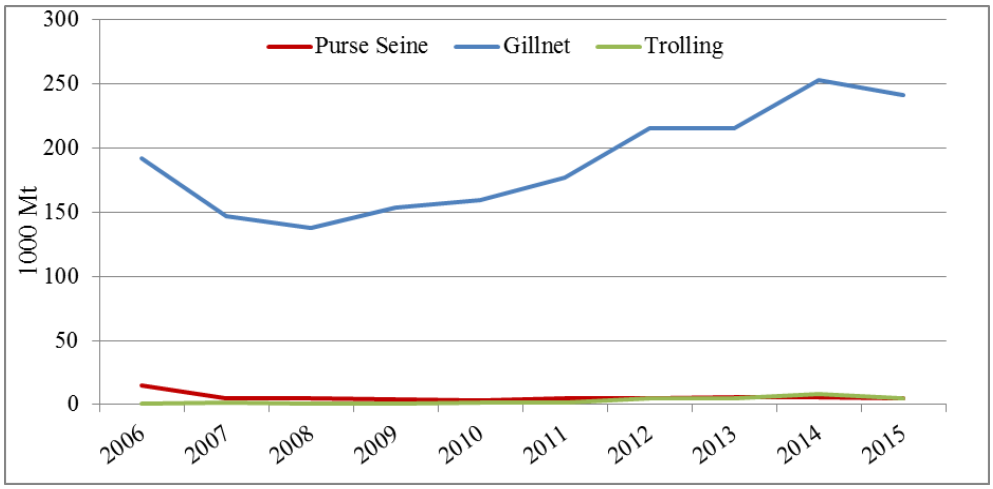
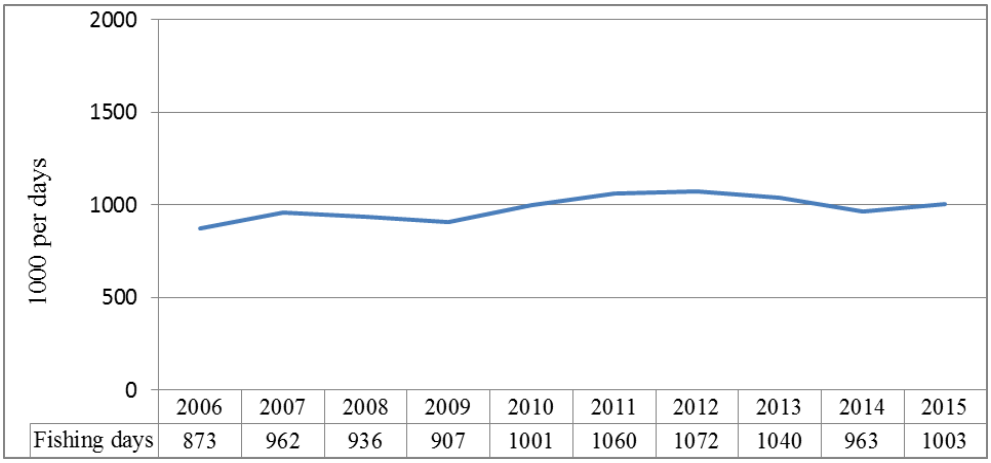


Figure3.4.Nominal Catch by Gear Type

b. Fishing effort:

Figure3.5.Shows the trend fishing effort for tuna and tuna-like species for the all fleet consists of purse seine, gillnet and trolling. In 2015, for tuna and tuna-like catches around one million days fishing efforts was Carried out, of which 772000 days was operated by Gillnet, 1080 days by purse seine and 230000 days done by trolling fisheries(Figure4.2).



	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Fishing days	873	962	936	907	1001	1060	1072	1040	963	1003

Figure3.5.Trend of Tuna and Tuna like species fishing effort by all fleet

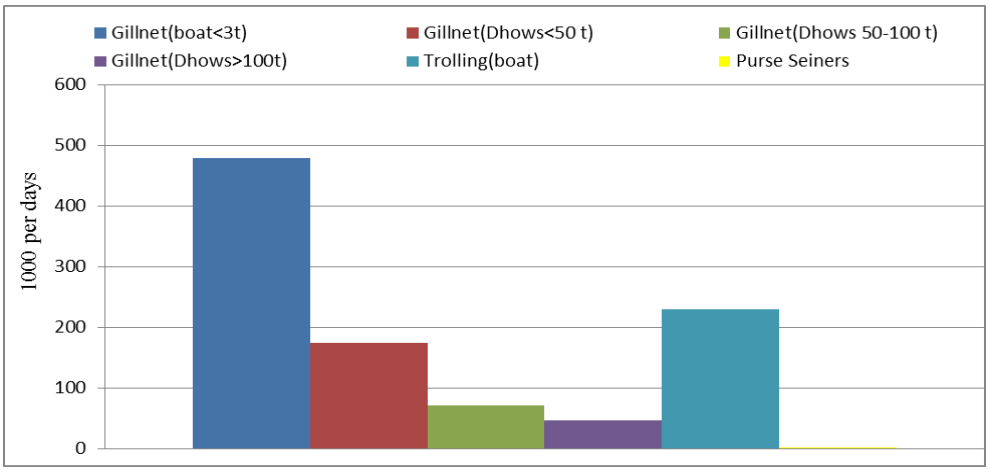
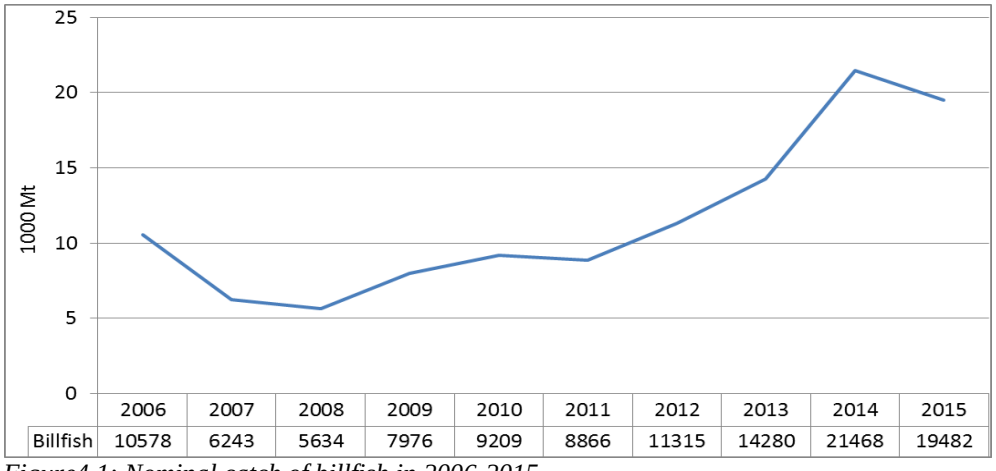


Figure3.6.Fishing effort for tuna and tuna like species by different vessel categories in2015

4. Billfish Catch:

Although billfish are not normally targeted species, they are very common in offshore gillnet catch are considered as by-catch species. As mention above billfish annual production is estimated to be about 19531Mt and this is around 8.4% of the total tuna and tuna like fish production. Figure4.1 showing a trend of landing of billfish is steadily increasing in the previous years. Reason for increased catch is not clear, could be due to increased statistical recordings, species misidentification. Iran has recently started collected information about landings of billfish which reveals that Indo-Pacific sailfish catch with 9745Mt is the most dominating species of billfish found followed by black marlin with 5958Mt, blue marlin 1816Mt, Swordfish 1174Mt and striped marlin is the rarest of all the billfishes which is seldom caught by large pelagic gillnetters (Figure4.2).



	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Billfish	10578	6243	5634	7976	9209	8866	11315	14280	21468	19482

Figure4.1: Nominal catch of billfish in 2006-2015

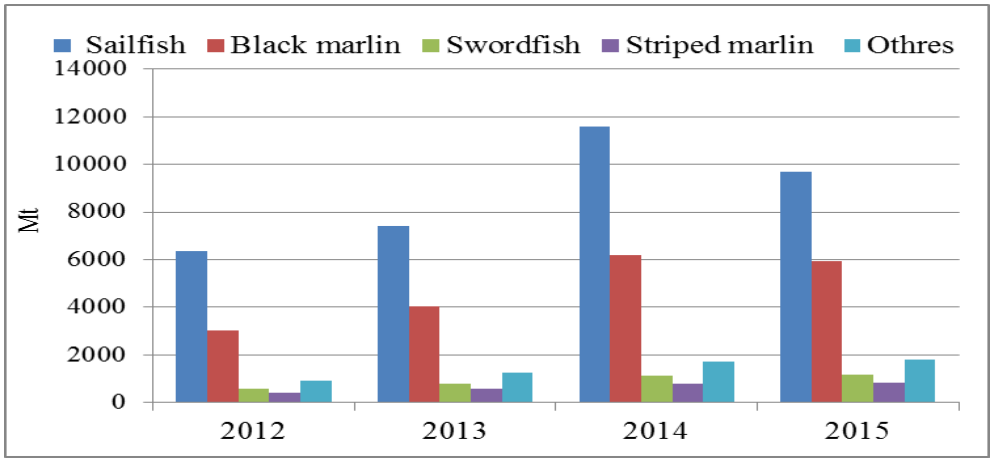


Figure4.2: landing billfish during 2012-2015

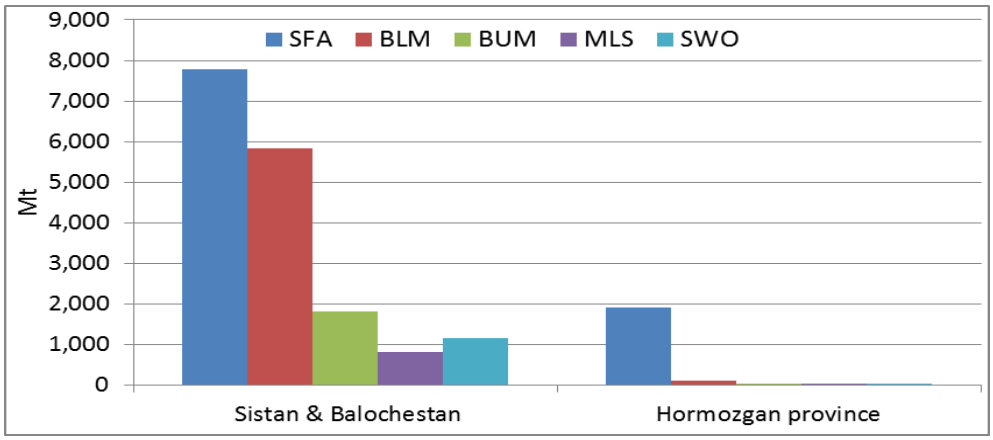


Figure4.3: Billfish landed in Balochestan and Hormozgan province in 2015

5. Seasonal variation of billfish:

Following figure shown the seasonality of catch component of billfish. Billfish clearly show bimodal seasonality, with a peak at the before and end of monsoon season (June, July and August) in Oman Sea, a huge No. of fishing vessels are alongside and thus tuna and tuna like species catch will decrease during this period.

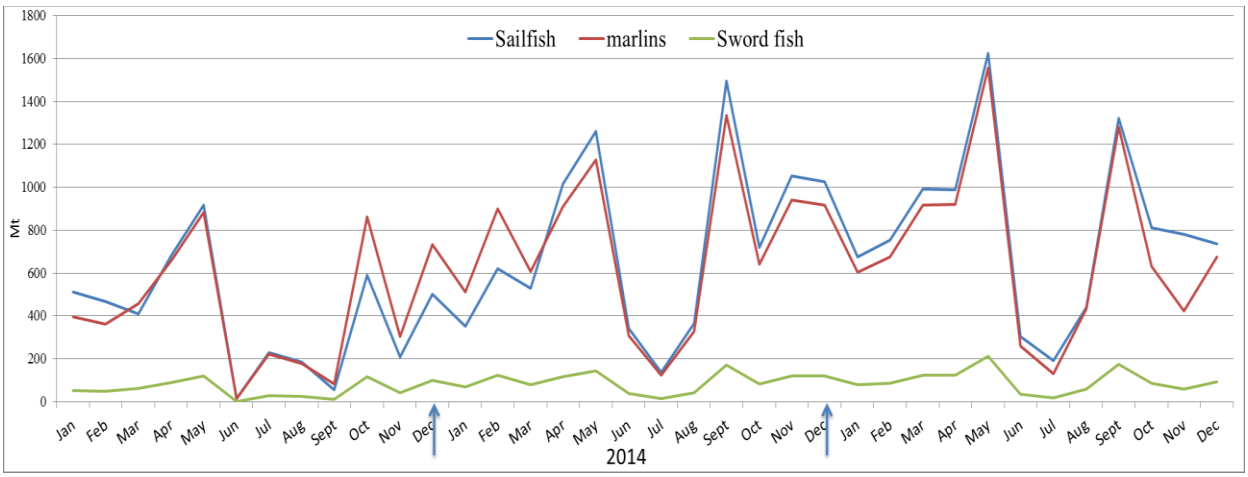


Figure5.1: Seasonal variation of billfish catches in 2013-2015

6. Actions taken for improvements of working party on Billfish:

Iran has taken various actions to implement the working party on billfish and Scientific Committee recommendations. During recent years many efforts have been made in our country in the field of tuna fishery, which how to fulfill the IOTC regulations and adapting it with national implementing condition and complying with the IOTC approvals,which lead to enhancement of compliance to provision and regulations from 11% in 2010 to 75% in 2015.

In past four years, Iran fishery is improving data collection system by completing of AMAR software to meet IOTC demanded outputs with a suitable reporting for by-catch composition for gillnet and pure sine fisheries. Iran Fisheries Organization (IFO) implemented the training courses for port samplers and Identification cards for billfish and sharks has been translated to Persian and distributed among port samplers and fishing vessels Captains to enhance the validity of identifying the billfish and sharks and reported to the IOTC secretariat.

During an extension services program, IFO has prepared some training courses and extension brochures and posters regarding to by catch. Also we have tried to train some crews of fishing vessels to prepare our information requirements base on IOTC regulations via observer reports.

References:

1-Iran Fisheries Statistics yearbooks 2010-2015

2-Data Collection System and Data Processing Method in Iran