
**CATCH RECONSTRUCTION OF NERITIC TUNA LANDINGS OF PAKISTAN BASED
ON DATA COLLECTED BY WWF-PAKISTAN'S CREW BASED OBSERVER
PROGRAMME**

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Abstract

Neritic tuna forms important component of commercial fish landings of Pakistan. The statistical data of neritic tuna alongwith other species of tuna and tuna like species is regularly provided by Government of Pakistan to IOTC. WWF-Pakistan started a crew based observer programme in 2012 which includes collection of information about tuna landings, including neritic tuna. This data was collected which was used for calculating annual tuna landings for Pakistan. A major difference in the two set of data (Government data and observer data) was observed. In order to reconcile the two data, a catch reconstruction exercise of catches of tuna and tuna like species was made in consultation with the Government of Pakistan. The exercise revealed that the catch of tuna species in most cases is underreported. Data of landings of neritic tuna have also some disparities. The major difference was found to be in the case of frigate tuna whose annual landings was reported to be less than 100 m. tons by Government of Pakistan whereas data collected by the observers indicates its landings to be very high (about 9, 184 m. tons in 2015). Such disparities are now resolved in the two data sets and reconstructed data is now being submitted to IOTC by Government of Pakistan which will resolves issues related with tuna statistical data.

Introduction

Neritic tuna contributes substantially to the total tuna landings of Pakistan. It supports a large fisheries mainly based in the coastal and continental shelf areas of Pakistan. It involves two categories of fishing boats. Those engaged in tuna fishing throughout the fishing season (from August through May) and those which are mainly engaged in demersal gillnet fishing and opportunistically engage in tuna fishing during some parts of the year when tuna landings are comparatively higher. Longtail tuna, kawakawa, frigate tuna, bullet tuna and striped bonitos are among the neritic tuna species in commercial catches whereas among tuna like species narrow barred Spanish mackerel, seerfish and barracuda are of common occurrence. Data for the landings of neritic species is collected and compiled by the two provincial fisheries departments of Sindh and Balochistan which is provided to federal fisheries institution i.e. Marine Fisheries Department for compilation and its transmittal to concerned agencies such as FAO and IOTC.

Serious gaps in data of commercial fish species have previously been noted (Hornby *et al.*, 2004; FBS, 2009) and it was observed that in most cases under-reporting of

commercial species is made. This may be mainly attributed to data collection mechanisms being adopted by the provincial fisheries departments.

In October 2012, WWF-Pakistan started a crew-based observer programme on board tuna gillnet vessels which was aimed to improve the tuna catch data as well as collection of information about bycatch species. Compilation of the data based on observer programme revealed that there are anomalies in the data being collected through observer programme and those reported in the Government statistics. Present paper deals with the reconstruction of the data from 1999 to 2016 based on information collected through observer programme and comparing it with landings data being reported by Government of Pakistan.

WWF-Pakistan's Crew Based Observer Programme

Pakistan has a large tuna gillnet fleet consisting of more than 500 wooden vessels which operate in coastal (territorial waters) and offshore waters (Exclusive Economic Zone) as well as some venturing in the Area Beyond National Jurisdiction (ABNJ). In October 2012, WWF-Pakistan started an observer programme on these vessels in order to collect information about tuna catches as well as about the bycatch of commercially important species including about megafauna (turtles, whale sharks, dolphins and whales)

Initially, efforts were made to train and place 'external' observers with bachelor degrees in science. However, due to the length of fishing trips (about 35 days on average) and inadequate facilities on board, this approach was abandoned. Instead, one of the crew members (usually the skipper) was trained and given a monetary incentive to collect data on tuna catches and other related information such as bycatch. Within a short time, these crew-based observers generated an unexpected quantity of useful data about various aspects of tuna gillnet operation and catches of target and non-target species.

Following the initial success of the first two crew-based observers in 2012, the number of observers was increased to four in 2013. In 2015, a FAO/GEF/Common Ocean Project regarding Area Beyond National Jurisdiction was initiated through which the number of observers was gradually increased from 4 to 75 by the end of 2016 increasing the coverage of the monitoring of the tuna gillnet fishing fleet (Fig 1).

Tuna fishing operations in Pakistan are being conducted throughout the year except during June and July which is a traditional closed season. In some years fishermen stop their operation in May and restart in August extending the close season for three or three and half months, coinciding with southwest monsoon. During typical operations, a 6 to 8 km long gillnet is set before sunset and is retrieved the next morning.

Crew-based observers use standardized data sheets to record the quantity and species of fish that are caught. They also record information about bycatch and non-target species including megafauna. The observers are provided with digital cameras to take photographs of the fish and other species caught during each haul. On the completion of each fishing trip, the observers are interviewed and during this debriefing, information about area of fishing, commercial catch and bycatch species and other details are verified and compared with the recorded data.

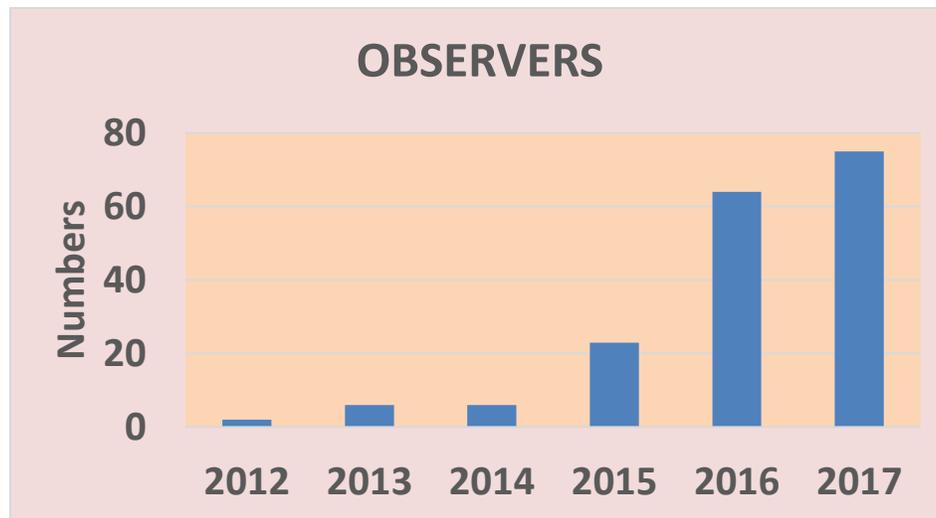


Fig. 1. Number of crew-based observers on board tuna gillnet vessels of Pakistan

Fisheries Data Collection Practiced in Pakistan

There are 7 major landing centres in Pakistan, of which 5 i.e. Jiwani, Gwadar, Pasni, Ormara and Damb are located in Balochistan and Karachi and Ibrahim Hayderi are located in Sindh Province. In addition there are 28 small landing places along Balochistan coast whereas in the Sindh (mainly in the Indus Delta) there are 30 small landing stations. Staff of provincial fisheries department is deputed at all large landing centres and some smaller but important centers to collect landings data of commercially important species. There is no data collection system at smaller fish landing centers. Details of this data collection system is also given in IPTP (1991).

The landing data is not collected from each boat but information about total landings is obtained from the auctioneers. The collected information is compiled by the respective fisheries departments of the two provinces. Information about smaller landing centre is mainly based on mere estimates. The data collection is seemingly marred with a number of issues as data of fish transshipped at high seas and those transferred from one fishing vessels to another is not recorded. Similarly under reporting has been observed in case of information provided by auctioneers. This results in anomalies in the tuna landings data available with the provincial fisheries departments and compiled

by federal fisheries organization (Marine Fisheries Department) if compared with the data being recorded by WWF-Pakistan.

Data Compilation by WWF-Pakistan

The monthly summary sheet for each fishing trips of every observer is compiled on the basis of data recorded for each haul. The data for each observer is then added up to determine the yearly catch made by the observer. This information is used for averaging and calculating annual landings for each category of the boat. Annual landing is calculated by multiplying with number of each category of boats being employed in tuna gillnet fisheries. The data is calculated for 2013 to 2016 whereas back calculation is done using various multipliers for catch reconstruction from 1999 to 2016. No calculation was done for the years prior to 1999 because the difference between the Government data and calculated data was found to be very small. Data for 2002 to 2015 is presented here indicating the difference between government data and reconciled data.

Tuna Landings

The reconstructed data and data provided to IOTC of tuna species by Government of Pakistan is plotted in Fig. 2 which revealed that Government data seems to be mere extrapolation of the previous year data whereas the reconstructed data taken into account the changes that taken place in fisheries including impact of Somali piracy on tuna fisheries, change in fleet compositions etc. The data indicates that there is underreporting in case of Government data which is about 41 % less than reconstructed data in 2002 whereas this difference is about 68 % in 2015.

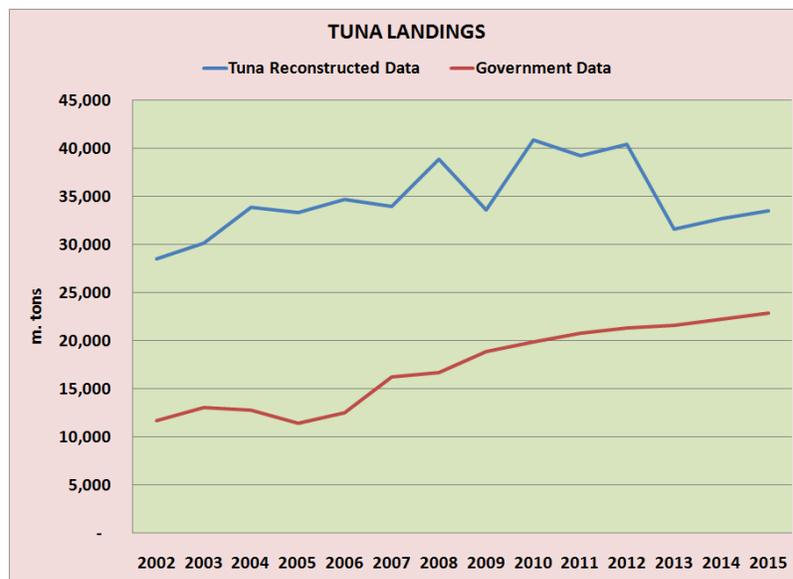


Fig. 2 . Tuna landings data (Reconstructed and Govt. Data)

Neritic Tuna Landings

The reconstructed data of neritic tuna species and the data provided to IOTC by Government of Pakistan is plotted in Fig. 3 which revealed that there is underreporting in case of Government data which is about 30 to 40 % less than reconstructed data in during 2002 and 2015.

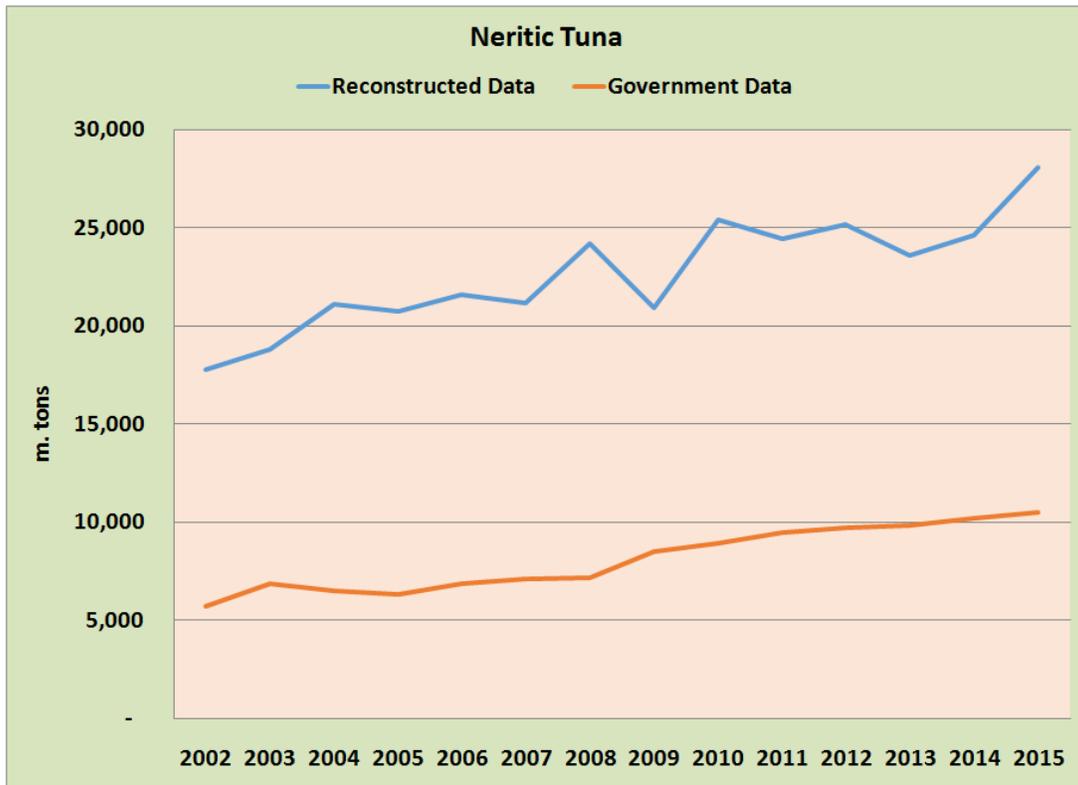


Fig. 3 . Neritic tuna landings data (Reconstructed and Govt. Data)

Longtail Tuna Landings

The reconstructed data of longtail tuna and its data provided to IOTC by Government of Pakistan is plotted in Fig. 4 which revealed that there is underreporting in case of Government data which is about 40 to 58 % less than reconstructed data in during 2002 and 2015.

Kawakawa Landings

The reconstructed data of kawakawa and its data provided to IOTC by Government of Pakistan is plotted in Fig. 5 which revealed that there is highly underreporting in case of Government data which is about 51 to 96 % less than reconstructed data in during 2002 and 2015.

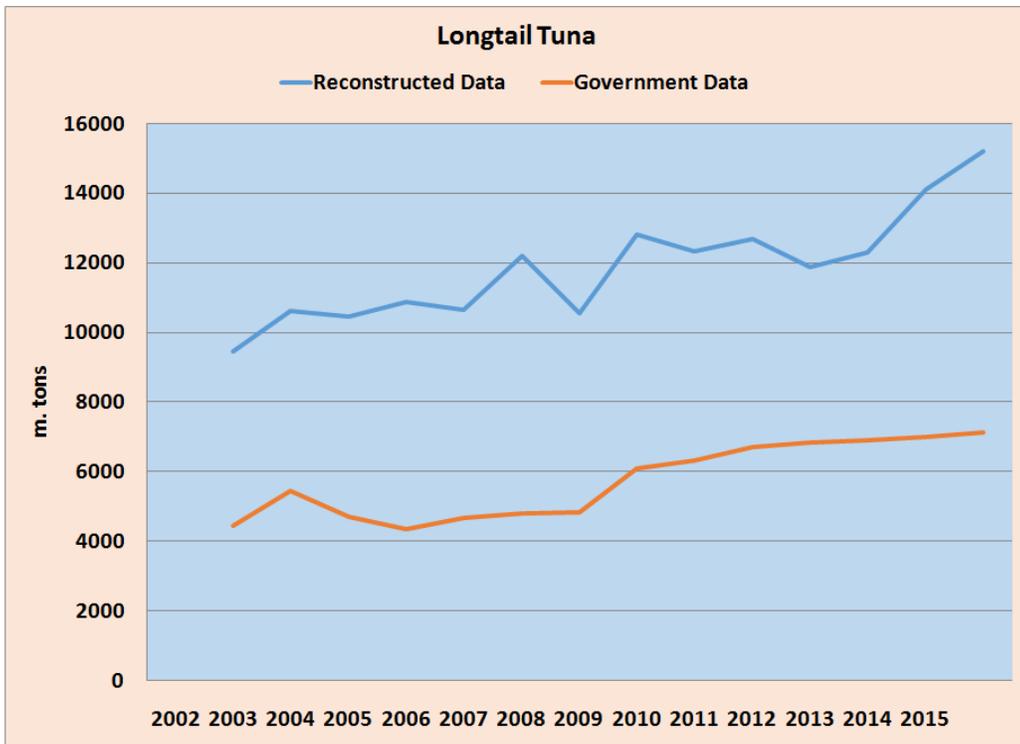


Fig. 4 . Longtail tuna landings data (Reconstructed and Govt. Data)

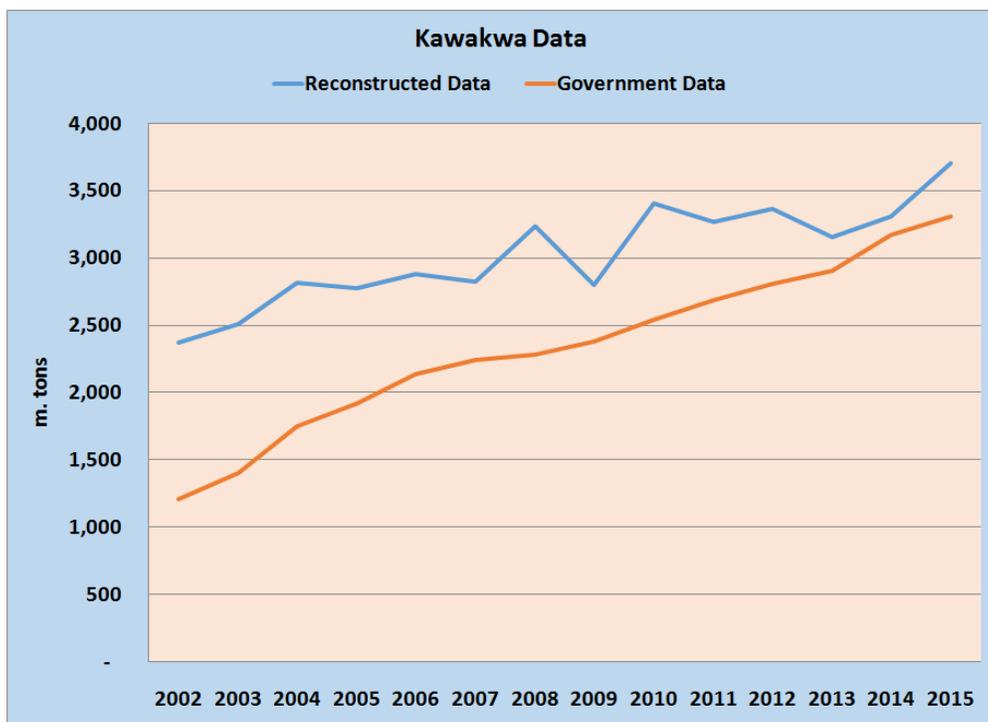


Fig. 5 . Kawakawa landings data (Reconstructed and Govt. Data)

Frigate Tuna Landings

The reconstructed data of frigate tuna and its data provided to IOTC by Government of Pakistan is plotted in Fig. 6 which revealed that there is highly underreporting. According to Government data the annual landings of frigate tuna is less than 100 m. tons whereas the information obtained through WWF-Pakistan's observer programme, frigate tuna is the third most dominating tuna species after yellowfin and longtail tunas. Its landing according to reconstructed data ranges between 6,116 m. tons in 2002 and 9,184 m. tons in 2015.

Bullet Tuna and Striped Bonitos Landings

The data provided by Government of Pakistan to IOTC does not mention about bullet tuna and striped bonitos, although these species can be seen in the commercial landings and also reported by the WWF-Pakistan's observers. However, their quantities are negligible. Striped bonitos are locally consumed but in most cases bullet tuna is discarded by the tuna gillnet vessels. Mesh size of the gillnets (about 15 cm stretched) is too large to retain bullet tuna, as well.

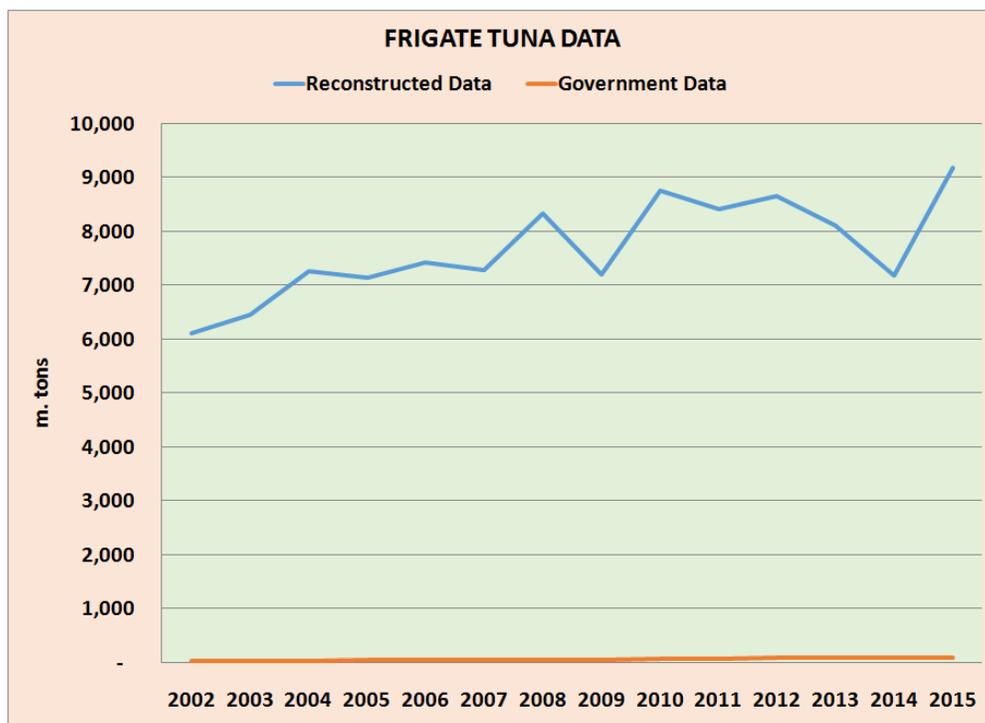


Fig. 6. Frigate Tuna landings data (Reconstructed and Govt. Data)

Narrow Barred Spanish Mackerel Landings

The reconstructed data of narrow barred Spanish mackerel and its data provided to IOTC by Government of Pakistan is plotted in Fig. 6 which revealed that there is not

much difference between the reconstructed data and those reflected in Government data. Since narrow barred Spanish mackerel is caught a number of other fishing gears including demersal gillnet, handline and troll, therefore, it was not justified to compare the Government data with those reconstructed on the basis of WWF-Pakistan crew based observer programme.

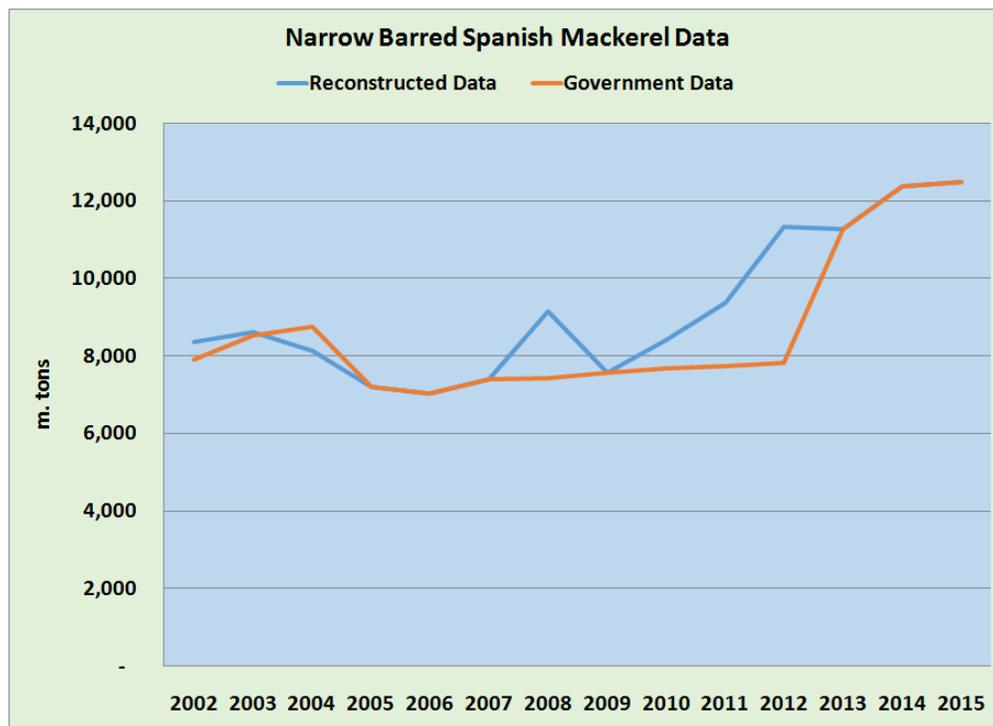


Fig. 7. Narrow Barred Spanish Mackerel landings data (Reconstructed and Govt. Data)

Discussions

Anomalies have been observed between the statistical data of neritic tuna alongwith other species of tuna and tuna like species that is regularly being provided by Government of Pakistan to IOTC and those calculated on the basis of data collected through WWF-Pakistan's crew based observer programme which was initiated in 2012. A major difference in the two set of data (Government data and observer data), therefore, a process of reconciliation of the two data set was made in consultation with Marine Fisheries Department. It was also decided that a catch reconstruction of tuna and tuna like species for the previous years (from 1999 to 2016) may also be made.

The exercise revealed that the catch of tuna species including neritic tuna in most cases is underreported. The major difference was found in case of frigate tuna whose annual landings was reported to be less than 100 m. tons whereas data collected by the observers indicates its landings to be about 9184 m. tons in 2015. Frigate tuna forms important component of the landings especially in case of those vessels which are operating in coastal waters.

Reconstructed data is submitted to Marine Fisheries Department, Government of Pakistan which will be transmitted to IOTC. It is expected that tuna catch reconstruction will resolve issues related with tuna statistical data from Pakistan.

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