Status of Gillnet fisheries and Data Reconstruction of Tropical Tuna in Pakistan

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Abstract

Tropical tuna forms important component of commercial fish landings of Pakistan. Yellowfin and skipjack tunas are two important species that are caught in the coastal, offshore and from area beyond national jurisdiction (ABNJ). Government of Pakistan regularly provides the statistical data of tropical tuna along with other species of tuna and tuna like species to IOTC which was considered to be under reported and has other anomalies. WWF-Pakistan started a crew based observer programme in 2012 which includes collection of information about tuna (including tropical tuna) landings. This data was used for calculating annual tuna landings for Pakistan. A major difference in the two set of data (Government data and WWF-Pakistan's data) was observed. In order to reconcile the two data, a catch reconstruction exercise of catches of tuna and tuna like species was done in consultation with the Government of Pakistan. The exercise confirmed that the catch of tuna species in most cases is underreported and has other disparities. The major difference was found to be in the case of skipjack tuna whose annual landings was reported to be much higher by Government of Pakistan whereas data collected by the observers indicates its landings to be comparatively lower than reported figures. In case of yellowfin the data of annual catches provided to IOTC was much lower than reconstructed data. Such disparities are now resolved in the two data sets and reconstructed data is now submitted to IOTC by Government of Pakistan which will resolves issues related with tuna statistical data. Bigeye tuna is caught in commercial quantities by the gillnet fleet of Pakistan, therefore, not reported in the data. Length frequency data for tropical tuna is being compiled by WWF-Pakistan in consultation with Government of Pakistan and will be supplied to the Secretariat in next few months.

Introduction

Pakistan having a coastline of about 1,100 km extending between Indian border in the East and Iranian border in the West. There are about 70 fishermen settlement along the coast of Pakistan depending entirely on the exploitation of fisheries resources. Tuna is an important component of the commercial fisheries of Pakistan, however, tuna fleet is primarily based in Karachi, Gaddani, Pasni, Gwadar, Phushukan and Jiwani. It is estimated that about 820 fishing vessels of various categories are engaged in tuna fishing. Out of these, there are about 100 small scale vessels that are engaged in tuna fishing only for short period during the peak season.

There are eight species of tuna are landed in Pakistan. However, only five species contribute significantly to commercial catches. Longtail tuna (*Thunnus tonggol)*, yellowfin (*Thunnus albacares*), skipjack, (*Katsuwanus pelamis*), frigate tuna (*Auxis thazard*) and kawakawa (*Euthynnus affinis*) are commonly represented in the catch. Gillnet is the only fishing gear that is being used for catching tuna and other large pelagic fishes in Pakistan. A major of catch of large pelagic is transported to neighboring country mainly through boats based in Gwadar area and to a lesser extent through land routes. Smaller tuna species (kawakawa, frigate and bullet tuna) are exported in salted dried form to Sri Lanka.

Data for the landings of tuna species including that of tropical tuna is bring collected 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. The data of all tuna species are pooled and reported as “tuna” whereas landings of tropical tuna species are not separately reported. It was observed in most of the cases landing of tuna is under reported (Hornby *et al*., 2004; FBS, 2009).

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 1987 to 2016 based on information collected through observer programme and comparing it with landings data being reported by Government of Pakistan.

In the last IOTC Working Party of Tropical Tuna (WPTT180, it was decided that Government of Pakistan will reconcile it data with WWF-Pakistan from their crew based observer program which WWF-Pakistan had started aimed to improve the tuna catch data as well as collection of information about bycatch species. Considering that there are serious shortcomings in the landings data and to comply with decision of WPTT18, WWF-Pakistan carried out an exercise in collaboration with Marine Fisheries Department to reconstruct the data of tuna and tuna like species of Pakistan taking into account the data being generated through WWF-Pakistan crew based observer programme.

Fisheries Data Collection in Pakistan

There are 7 major landing centers in Pakistan, of which 5 i.e. Jiwani, Gwadar, Pasni, Ormara and Damb (Sonmiani) are located in Balochistan Province 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 centers and also on some smaller but important landing centers such as Gaddani, Sur and Bandri to collect landings data of commercially important species. Concerned fisheries department collects data from these fish landing centers, however, in case of Sindh province the data is compiled by Karachi Fisheries Harbour Authority who in turn obtain data from Fishermen's Cooperative Society (FCS). FCS conducts auction of fish at Karachi and Ibrahim Hayderi. The data thus obtained by the harbor authority, is extrapolated for other smaller landing centers of Sindh and cumulative data for fish landings is provided to Marine Fisheries Department. Data for various tuna species is not reported separately and only pooled data for tuna species is reported. In Balochistan data from major landing centers is collected by the staff of Fisheries Department which is sent to Assistant Director (Statistics) who compile and transmit data to Marine Fisheries Department. There is no system of data collection from remotely located landing centers.

In both the provinces the data collection system does not take into on the catches of individual fish boats and as such are mere estimates.

A reliable data collection system of tuna species was established in Karachi with the assistance of Indo-Pacific Tuna Programme (IPTP) which continued till 1995. Daily monitoring of the tuna fishing boats used to be conducted from Karachi Fish Harbour which used to handle about 70 % of the tuna fleet of Pakistan (IPTP, 1991).

Data Compilation by WWF-Pakistan

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. Another 10 observers were added in 2017 making total crew based observers to 85.

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.

The data pertaining to various species collected by the observers is averaged and extrapolated for the tuna fleet. In this process information collected from smaller tuna fishing boats as well as information from distantly located fish landing centers is also incorporated which is collected by WWF-Pakistan through periodic visits to the area

Data, thus generated is shared with Government of Pakistan and using various multipliers and historical information about fleet and landings reconstruction of the data was carried out from 1997 and 2012. Data for 2013 to 2016 was generated from WWF-Pakistan's crew based programme whereas data from 1987 to 1996 was obtained from IPTP achieves.

Tuna Landing

Pakistan has a large tuna gillnet fleet consisting of more than 820 wooden vessels (Table-I) which operate in coastal (territorial waters) and offshore waters (Exclusive Economic Zone) as well as some venturing in the Area Beyond National Jurisdiction (ABNJ). Tuna fishing operations in Pakistan are being conducted throughout the year except during June and AugustJuly 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.

The reconstructed/reconciled data for tuna species is presented in Fig 1 which shows that there is significant difference between data previously reported to IOTC and the reconstructed/reconciled data sets. It is evident that data previously provided by Government of Pakistan is under reported for most of the years

Table-I: Types of Tuna Fishing vessels being Operated in Pakistan

Type of Vessel	Balochistan	Sindh	Total	Remarks
Small scale Neritic Tuna Gillnet Fishing vessels	120	80	200	
Larger Scale Offshore Tuna Fishing vessels	150	400	550	About 80 are double registered in Iran and Pakistan
Large Scale Offshore Vessels with onboard freezing facilities	70	0	70	Most of these vessels are double registered in Iran and Pakistan
Large scale tuna longlining	Nil	Nil	Nil	Since May 2009, no tuna longlining operation in Pakistan
	340	480	820	

Data is based on estimate, as exact information about registered boats is not available

Fig.1. Data of tuna species previously reported by Government of Pakistan to IOTC and reconstructed/reconciled data.

Tropical Tuna Landing

The reconstructed/reconciled data of tropical tuna also indicates serious anomalies. In case of skipjack, the landings previously reported was much higher than those reconstructed/reconciled (Fig. 2). Main reason for lower catches of skipjack is attributed to concentrated operation of Pakistani vessels near the Pakistan coast. Prior to 1999 a large of Pakistani fleet was operating in Somali waters and in the ABNJ, therefore, catch of skipjack was higher, however, because of high coast of diesel and apprehension of vessels by Omani and Yemeni authorities, operation in Somalia was gradually reduced. The catch of skipjack increases in 2016 because some vessels started operating in ABNJ and a few in operating in Somalia (about 8-10). Because of this reason, the catch of skipjack was lower during 1997 to 2012.

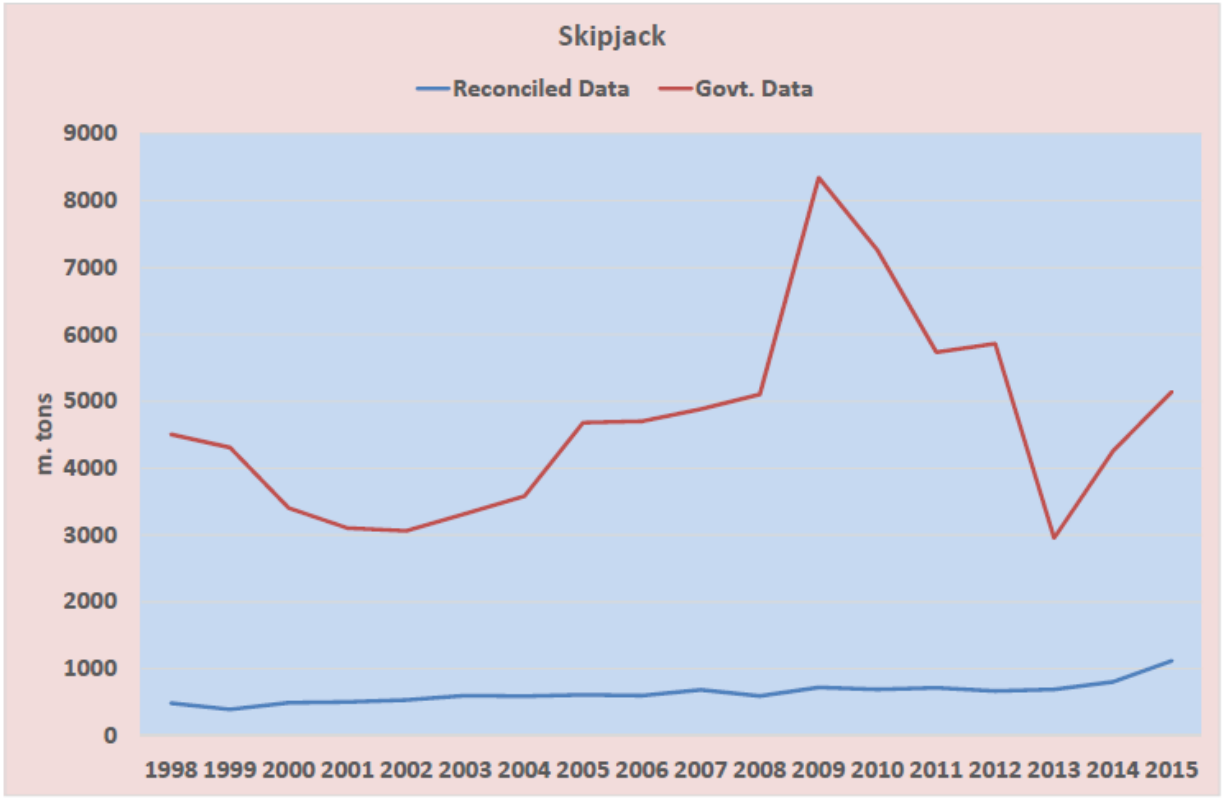

Fig. 2. Data of skipjack tuna previously reported by Government of Pakistan to IOTC and reconstructed/reconciled data.

The reconstructed/reconciled data of yellowfin tuna is presented in Fig 3 which shows the differences with the data previously communicated to IOTC. The data for 2003 to

2007 was higher in cases of those provided previously to IOTC than reconstructed/ reconciled data.

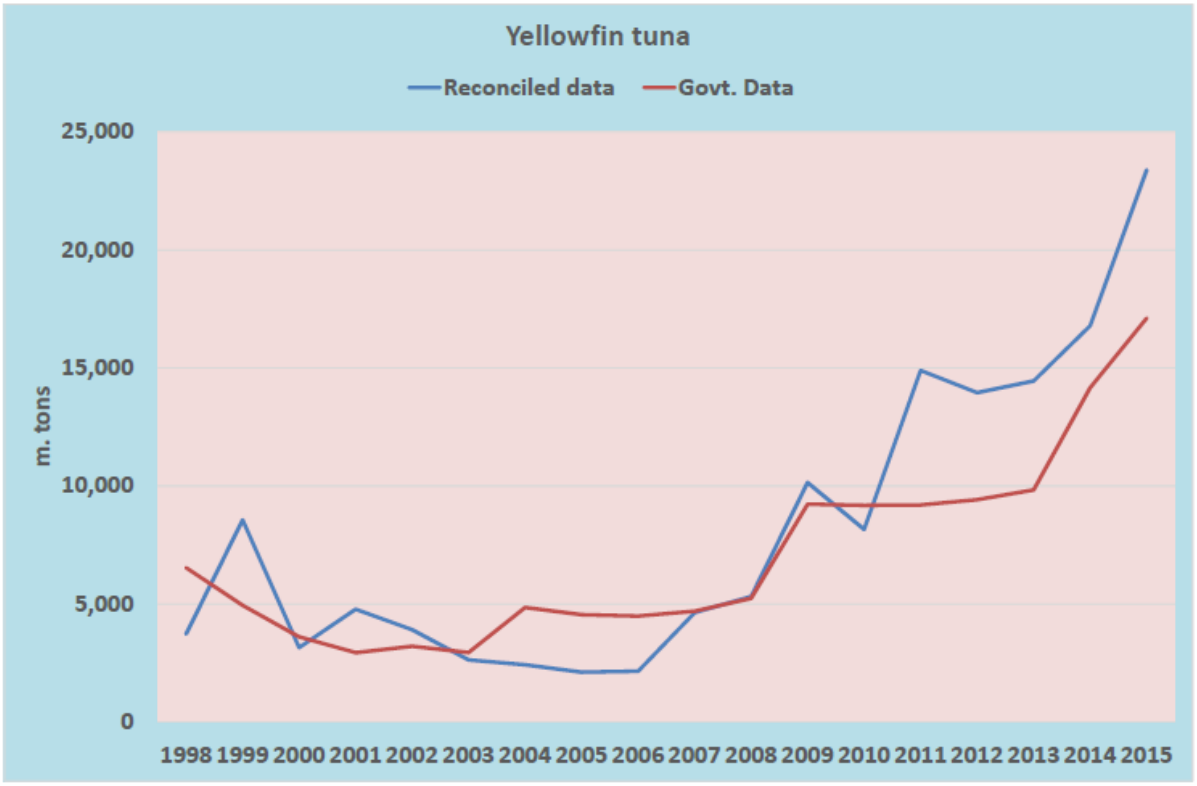

Fig. 3. Data of yellowfin tuna previously reported by Government of Pakistan to IOTC and reconstructed/reconciled data.

Discussions

Significant difference is noticed in the data that has previously been submitted to IOTC and those reconciled/reconstructed by Government of Pakistan based of data collected by crew based programme of WWF-Pakistan. A comparison of the data for year 2016 is presented in Table-II which shows major differences in the landings of frigate tuna which is reported to be only 214 m. tons whereas reconciled/reconstructed indicate the landings of frigate tuna to be 13,886 m. tons. In case of tropical tuna, major difference was noticed in case of skipjack whose landing according to Government of Pakistan data was 5143 m. tons whereas reconciled data shows it to be only 1,118 m. tons. In case of yellowfin tuna the data was also under-reported. Total landings of all tuna, Government of Pakistan data shows a total of 48,814 m. tons whereas reconciled data shows it to be 70,845 m.

tons. It may be added that bigeye tuna is not caught is commercial quantities and only stragglers are sometime observed in the catches of tuna gillnetters.

Table-II. Comparison of Data previously submitted to IOTC and reconstructed/reconciled data for the year 2016.

Species	Govt. Data	Reconciled Data
Total large pelagics	71,591	101,225
Tunas	48.874	70,845
Yellowfin	17,113	23,392
Longtail	17,769	21,047
Skipjack	5,143	1,118
Kawakawa	8,635	5,392
Frigate	214	13,886
Tuna nei	0	6010
Billfish	4,895	4,500
Narrow Barred Spanish Mackerel	13,941	20,459
Dlphinfish	3,881	5,421

The disparity in the two data sets is mainly because of inadequacy in the statistical data collection system which is being used by the provincial fisheries department. The data in most cases are mere estimates and are extrapolated from the data of the previous years. Data collection system established by WWF-Pakistan under its crew based observer programme provided an opportunity to calculate landings of large pelagic species which was reconciled with the data available with Marine Fisheries Department. In addition, reconstruction of the data for previous years (1996 to 2012) was also carried out. The

reconstructed and reconciled data has now been provided to IOTC which will enable to rationalize tuna and large pelagic fisheries catches of Pakistan. Marine Fisheries Department is persuading the provincial government to start proper statistical data collection (at least from tuna gillnetters) for which a series of training programmes is planned to be held in major landing centers. In addition, WWF-Pakistan is in process of developing an android based log sheet and its use on board tuna gillnetters which will help in improvement of the statistical data. Under the crew based observer programme of WWF-Pakistan, length frequency data of all important fish species (including tropical tuna species) being collected which is being compiled and will be provided to IOTC in next few months.

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