



Government of Republic of Maldives

Ministry of Fisheries and Agriculture
Velaanaage Complex, 7th Floor
Malé - 20096, Republic of Maldives

**MALDIVES NATIONAL REPORT
SUBMITTED TO THE
INDIAN OCEAN TUNA COMMISSION SCIENTIFIC
COMMITTEE - 2011**

M. Shiham Adam
Hussain Sinan
Mohamed Ahusan
A. Riyaz Jauharee

<p>In accordance with IOTC Resolution 10/02, final scientific data for the previous year was provided to the Secretariat by 30 June of the current year, for all fleets other than longline [<i>e.g.</i> for a National report submitted to the Secretariat in 2010, final data for the 2009 calendar year must be provided to the Secretariat by 30 June 2010)</p>	<p>Yes <see below></p>
<p>In accordance with IOTC Resolution 10/02, provisional longline data for the previous year was provided to the Secretariat by 30 June of the current year [<i>e.g.</i> for a National report submitted to the Secretariat in 2010, preliminary data for the 2009 calendar year was provided to the Secretariat by 30 June 2010).</p> <p>REMINDER: Final longline data for the previous year is due to the Secretariat by 30 Dec of the current year [<i>e.g.</i> for a National report submitted to the Secretariat in 2010, final data for the 2009 calendar year must be provided to the Secretariat by 30 December 2010).</p>	<p>Yes <see below></p> <p>Note: <i>The licensing of foreign longline fishery was suspended in early 2010. Four Maldivian longliners are licensed to operate in EEZ in 2011.</i></p>
<p>If no, please indicate the reason(s) and intended actions:</p> <p>Maldives may have not submitted data officially to the IOTC. However Maldives have provided detailed catch and effort data for the Working Parties. Maldives regularly including 2010 data. Maldives will be submitting the data in the required 1x1 degree format early 2012.</p>	

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EXECUTIVE SUMMARY

Maldives has a tuna fishery dating back hundreds of years. Fishing is conducted from pole-and-line vessels using livebait. Tuna catches increased to an all time record of 167,000 t in 2006 but have been steadily declining since then. The catch of 2010 was about 60,000 t, more than 50% lower than catches reported in 2006.

The pole-and-line method contributes 75-80% of all tuna landings. A handline fishery targeting surface dwelling large yellowfin fishery started in later 1990s. Current catches from landline fishery are estimated to be 10,000 - 12,000 t exported fresh to lucrative markets of EU. Longline fishing is restricted to a licensed foreign fleet of round 25-30 vessels operating in outer EEZ of 75 miles and beyond. Licensing was suspended in 2010. A domestic fleet is now being developed with 4 vessels licensed to fish outside 100 miles range.

Maldives used to have an important troll fishery targeting kawakawa and frigate tuna in the coastal areas and atoll basins. The fishery no longer exists and so trolling is now a very minor component of the tuna fishery.

The national data collection is based on an enumeration system and requires use of conversion factors to estimate total catch. The conversion factors in use are inadequate both in magnitude and its coverage leading to potential bias in the estimate of total catches. Use of conversion factors however, is now getting less important as catches are also been recorded in weights and being reported through logbook system introduced in January 2010. Reporting from both methods will continue until fishermen have accustomed to reporting through logbooks.

Maldives has limited amount of recreational fishing targeting large-bodied reef fish varieties in the so called 'night fishing'. More recently recreational fishing for pelagics is getting popular in the tourism sector. At present there is no formal method of the recording catches.

The two main component of the tuna fishery (PL and HL) are extremely selective in their targets and therefore have almost zero bycatch and nothing is discarded. Sharks and other non-target species do occur in the longline fishery and their reporting is mandatory under the new rules on longline fishing.

1 BACKGROUND

Maldives is a tuna fishing nation with long tradition dating back hundreds of years. Until the 1980s the tuna fishery was the mainstay of the Maldivian economy, providing major source employment and food. Tuna products remains the most important export commodity from the Maldives earning about 100 million US\$ per year. Although spectacular growth of expansion of tourism in the country has declined its economic importance, tuna fishing continues to provide the main source of employment in the outer islands. The fishery sector contribution to GDP declined from about 30% in the 1970s to less than 10% in 1997-2000. During the last 10 years it was around 6-8%.

The largest and most important component of the Maldivian tuna fishery is the livebait pole-and-line fishery. The fleet has undergone major changes over the past decades. More recently there has been a significant increase in size and engine power of these vessels. A second component of the fishery is the trolling fleet. The fishery used to be a subsistence one but disappeared over the past 20 years, mainly as a result of socio-economic changes in the country (Ahusan and Adam, 2011a, Ahusan and Adam, 2011b). A third component is the handline fishery which started in the early 2000 in response to the opening of the fresh large yellowfin export markets (Jauharee et al., 2011).

Pole-and-line fishery in the Maldives is restricted to waters within 40-50 miles range, but often returning home by evening. Pole-and-line fishing is mostly carried from around anchored fish aggregating devices deployed around the perimeter of the archipelago about 12-14 miles from the shore. More than 40 AFADs are maintained throughout the year the Ministry of Fisheries and Agriculture.

Longline fishery has always been associated with foreign licensed vessels operating in EEZ (beyond 75 miles). The licensing, and therefore the fishery, was suspended in early 2010 following an executive order of the Parliament. Since then no additional foreign license has been issued. The Government is keen to re-start the longline fishery with involvement of Maldivians. Currently there are four Maldivian vessels registered for longline fishing in the EEZ of the Maldives.

The most important component of the tuna catch is skipjack (*Katsuwonus pelamis*), which contributes about 75% to the total reported tuna landings. Yellowfin tuna (*Thunnus albacares*) is the second most important species, contributing some 13% to the total tuna catch. Other tuna species taken include kawakawa (*Euthynnus affinis*), frigate tuna (*Auxis thazard*) and bigeye tuna (*Thunnus obesus*). Catches of bigeye are not distinguished from yellowfin tuna in the national statistics.

Recorded tuna landings were around 23,000 t in mid 1970s before the fleet was mechanized. Although catches were slow to increase, by early 1990 the landings doubled. By 2000 over 100,000 t were reported. Tuna catches rose to an all time record of 167,000 t in 2006. Catches and catch rates have been in decline since then. Reported catches of 2010 was 58,481t, over 50% lower than 2006 landings.

Reviews of the Maldivian tuna fishery are given in MRS (1996). More recent papers on Maldivian tuna fishery include Jauharee et al. (2011), Ahusan and Adam (2011a), Ahusan and Adam 2011b).

2 FLEET STRUCTURE

The Maldivian tuna fishing fleet underwent major changes since 1970. Prior to 1973 it was entirely a sailing fleet. Two types of vessel were present; sailing masdhoni (9-10 m LoA) for livebait pole-and-line and vadhudhoni (4-5 m LoA) for trolling. Both types of vessels conducted day trips. The former target essentially skipjack in the open ocean outside of atolls and the latter kawakawa and frigate tuna in the atoll-basins or in coastal areas.

Mechanizations of the vessels started in 1973 and by 1985 nearly all existing sailing vessels were mechanized. At the same time trolling vessels became less important and by 1990 the trolling fleet was no longer used for catching tuna, although very few vessels still report as sailing vessels.

Table 1: Number of Vessels ENGAGED in fishing in the Maldives Tuna Fishery. Note the minor contributions from sailing vessel (which are non-existent from early 1990s) has been omitted. LL vessels are NON-MALDIVIAN vessels operating in EEZ (> 75 miles) under license from the Ministry of Economic Development.

Year	PL/HL	LL	Total
1985	988	--	988
1986	1009	--	1009
1987	1044	--	1044
1988	1096	--	1096
1989	1114	--	1114
1990	1151	--	1151
1991	1252	--	1252
1992	1347	--	1347
1993	1434	--	1434
1994	1410	--	1410
1995	1407	--	1407
1996	1395	--	1395
1997	1328	48	1376
1998	1271	46	1317
1999	1206	32	1238
2000	1137	49	1186
2001	1128	20	1148
2002	1102	43	1145
2003	1104	31	1135
2004	1082	36	1118
2005	1002	37	1039
2006	925	24	949
2007	894	25	919
2008	867	0	867
2009	920	16	936
2010	708	0	708

The masdhoni¹ fleet went through three major changes; one around late 1980 and the other early 1990 and the more recent one on the beginning of 2000. The first was the introduction of the second generation masdhoni with modification for installation of the engine with extended stern

¹ Masdhoni in Divehi literally means fishing vessels. Any vessels designed for pole-and-line skipjack fishing was called a masdhoni.

fishing platform. The vessel sizes gradually increased from the earlier 15-16 m LoA to about 20-25 m LoA. The second and major evolution was the construction of the vessel from fibreglass. The vessel not only increased to size of over 30 m LoA but also super-structure of the vessels greatly improved with the cabins, galley and wheel house. A more recent enhancement is the increase size of these vessels. Some of the vessels in the fleet are over 30 m LoA. Table 1 gives the number of vessels engaged in fishing in the Maldivian tuna fishery from 1985 to 2010.

3 CATCH AND EFFORT BY SPECIES AND BY GEAR

Reported national fish landings in 2010 were close to 95,000 t. Of these over 85% were tunas. These include, in the order of importance, skipjack, yellowfin, frigate and kawakawa. A minor quantity of bigeye tuna is caught with juvenile yellowfin in the pole-and-line catch which has been estimated from sampling carried in 1994/1995 (Anderson, 1996).

Total tuna catches reached an all time high of over 160,000 t in 2006 but dropped to less than 95,000 t in 2010. The most noticeable of this decline is the skipjack which dropped by more than 50% from 2007-2010 (Figure 1).

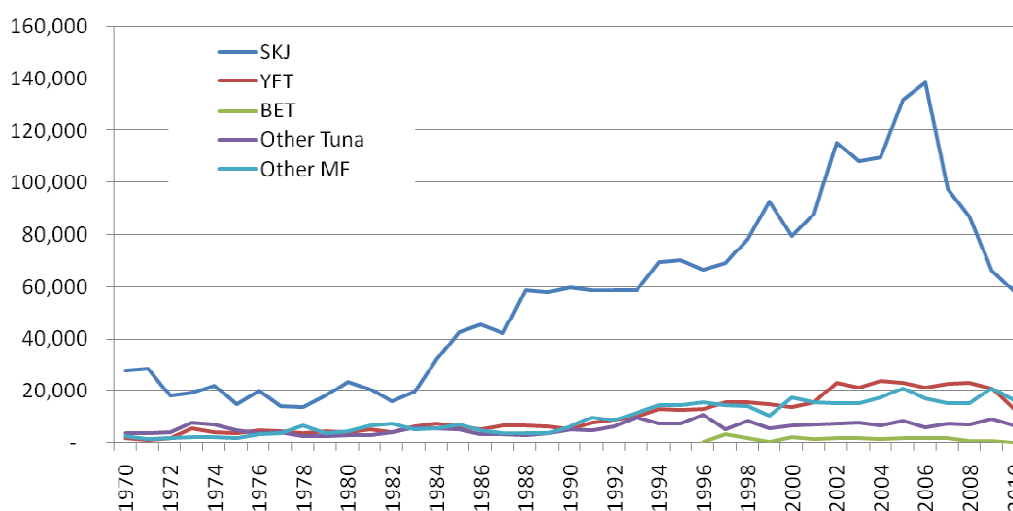


Figure 1: Time series of reported fish catches in the Maldives. SKJ = Skipjack; YFT = Yellowfin, BET = Bigeye tuna, Other tuna = Kawakawa and Frigate + Dogtooth., Other MF = Other Marine Reef Fish Varieties. Note that BET catches are estimated from the yellowfin tuna catch, see main report for details

Skipjack is essentially caught by pole-and-line gear with livebait. It is the most important fish species caught in the Maldives. The recent rapid declines of skipjack catch are a serious concern for the Maldives and are believed to be a combination of the over-exploitation and oceanographic changes in the area. Catch rates of the skipjack has also been declining and there is evidence that average sizes of skipjack in the Maldives has also decreased in the recent years (Adam, 2010, and Adam et al., 2011).

Yellowfin tuna is the second most important species caught in the Maldives. Prior 2000 the yellowfin tuna was caught from pole-and-line and from the licensed EEZ longline fishery. Since 2000, a specialized handline fishery was developed targeting surface dwelling large yellowfin (~ 100 cm FL). The catch is exported fresh. Currently about 10,000 t of processed fresh products are exported earning 30 million US\$ (30% of total fish export revenue) (Adam 2009). Reported total annual landings of yellowfin tuna remained about 5,000 t prior to 1990 but rose rapidly to about 23,000t in 2002 and remained around this level. This rapid increase in catch is attributed to the development of handline fishery.

Relatively small quantities of bigeye tuna are taken along with the yellowfin/skipjack catch in the pole-and-line catch. During mid 1990s this component is estimated to be around 500 t per

year which was about 0.5% of the total recorded catch (Anderson, 1996). Bigeye tuna are also caught by the longline gear operating in the EEZ which is roughly estimated at 1000t.

Table 2: Annual catch and effort (number of fishing days) estimates by gear and catches of primary species, for the IOTC Area of Competence. Data as recorded in Catch/Effort Database: Source: MoFA.

Pole-and-line							
Year	Effort	SKJ	YFT	BET	KAW	FRG	Other
2004	148,188	104,550	15,441	-	1,802	3,286	11,681
2005	134,180	130,317	16,036	-	1,996	4,541	10,681
2006	126,298	137,535	13,586	-	1,238	3,197	8,139
2007	119,258	96,288	14,193	-	1,846	3,511	8,015
2008	120,451	85,584	16,766	-	1,672	3,837	8,575
2009	124,366	65,018	15,279	-	2,099	4,740	12,382
2010	101,949	56,495	11,036	-	2,422	2,704	11,430
Handline							
Year	Effort	SKJ	YFT	BET	KAW	FRG	Other
2004	4,649	28	189	-	43	15	486
2005	29,593	425	3,563	-	153	141	2,694
2006	40,217	617	5,318	-	313	252	5,932
2007	35,757	757	6,504	-	574	188	4,406
2008	26,009	471	4,785	-	162	86	1,159
2009	28,892	666	3,523	-	516	294	5,046
2010	15,690	1,297	1,119	-	27	29	751
Longline							
Year	Effort	SKJ	YFT	BET	KAW	FRG	Other
2004	14,493	8	1,081	1,461	-	-	244
2005	10,889	2	1,300	1,756	-	-	116
2006	8,093	9	1,325	1,791	-	-	75
2007	11,299	2	1,242	1,687	-	-	231
2008	12,190	169	501	676	-	-	1,107
2009	9,174	-	464	626	-	-	173
2010	-	-	-	-	-	-	-
Trolling							
Year	Effort	SKJ	YFT	BET	KAW	FRG	Other
2004	57,221	5,124	6,071	-	411	302	3,511
2005	38,077	1,083	1,744	-	387	249	4,506
2006	23,005	232	840	-	121	83	1,611
2007	27,675	295	722	-	352	103	1,815
2008	34,456	849	983	-	220	118	3,881
2009	39,006	381	676	-	426	160	3,141
2010	34,631	687	981	-	368	174	3,858
Miscellaneous							
Year	Effort	SKJ	YFT	BET	KAW	FRG	Other
2004	6,080	47	159	-	33	34	638
2005	7,135	172	155	-	165	125	1,728
2006	2,011	65	19	-	-	-	49
2007	1,950	-	1	-	-	7	95
2008	1,474	-	-	-	-	-	55
2009	1,843	122	47	-	-	7	28
2010	376	-	-	-	2	1	85

Traditionally frigate and kawakawa are caught by trolling, often conducted in smaller vessels operating in the coastal atoll lagoons. The trolling fleet effectively died by the about late 1980s largely due to socio-economic changes. These days catch of kawakawa and frigate is mainly from pole and vessels (Ahusan and Adam, 2011a and b). Total catches of these two species ranged about 5,000 – 6,000t per annum.

Longline fleet is foreign-owned and operated in the EEZ, beyond 75 miles under a fishing license. Issuing of licenses has been suspended from March 2010. However, in 2011 Maldives has re-started longline fishery allowing exclusively for Maldivian-owned vessels. At the time of this writing four vessels have been licensed to fish outside 100 miles within the EEZ.

Fishing effort in Maldivian fleet is measured in number of days fishing. This was the most natural and easiest since fishing takes place on day-trips leaving early in the morning and returning by evening. The uniform fleet structure and use of essentially pole-and-line method for most of the tuna catches the choice for unit of effort is satisfactory. However, changes in vessels size, engine horse power, bait catching and holding capacity and several other operational factors, days of fishing as a measure of effort may not be appropriate. Additional information on the operational aspects is being sought through recent introduction of logbooks.

4 RECREATIONAL FISHERY

Recreational fisheries exist in the Maldives but their importance in terms of a fishery is not appreciated yet. Therefore, no separate data on recreational fisheries are reported in the Maldives. There are at least three categories of recreational fishing and therefore should be considered in the retained catch although their contribution in term of catches of tuna and allied species differ

Big game fishing: Big game is popular among the tourists and it is now common practice to have an outfit in every resort. Common target species are sail fish (*Makaira* spp.) and Dolphin fish (*Coryphaena hippurus*), but also large yellowfin and skipjack tuna. Tourist resorts have separate fishery landings forms and it is expected that their catch are recorded in the national fishery statistics.

Tourist night fishing is very popular among the tourists and targets wide-bodied reef fish varieties (Lutjanids, Lethrinids, Serranids, Carangids etc). It is extremely rarely that tourist night fishing catches pelagic species such as tuna.

Regular night fishing: Similar to tourist night fishing, the general public enjoys the recreational night fishing. Literally hundreds of trips per year would be undertaken from Malé alone. The fishery targets wide-bodied reef fish varieties (Lutjanids, Lethrinids, Serranids, Carangids, etc.) There are no institutionalized mechanisms for recording catch. Unlike in other countries, Maldives does not have fishing clubs where recreational fisheries are data recorded.

5 ECOSYSTEM AND BYCATCH

Maldives has a highly selective form of fishing with zero bycatch and discards. The pole-and-line method alone contributes 75-80% of the total national landings. Of the remaining 20%, trolling comprises 8% and reef fishing comprises 11%. Only 2% is from longlining. In the recent years longline would have contributed nil as the fishery was suspended.

A small longline fishery targeting sharks was in operation in the 1980s and early 1990s. The catches from the fishery were minimal in the recent years (Anderson et al., 2011). From March 2010 shark fishing and export of shark products are banned from the Maldives (Sinan et al. 2011).

Maldives imposed a 10 year moratorium on catching or harming of turtles in 1998. The moratorium was renewed in 2008 extending further 10 years with ban on egg-harvesting. Maldives is also a signatory for the IOSEA MoU signed on April 2010.

Livebait is critical for the skipjack pole-and-line fishery. The species exploited by tuna fleet are characterized by short generation times and high intrinsic rates of population growth. These are species that are not easily overexploited. Maldives has recently intensified monitoring of this fishery and are in the process of developing a bait fishery management plan

Seabirds and marine mammals is not an issue in the Maldives. However, the revised and new regulation on longline fishing includes measures to deter attraction of the sea-birds to longline bait and also other measures to mitigate shark and turtle catches.

6 NATIONAL COLLECTION AND PROCESSING SYSTEMS

6.1 LOGSHEET DATA COLLECTION AND VERIFICATION

Data collection through logbooks was introduced for the second time in January 2010. The introduction was preceded by a revision of the fishery regulation which required registration of vessels among others and mandatory reporting of data through logbooks. Fishery inspectors have also been placed in key fishing for supporting the implementation of the fishery regulation including facilitation to fishermen on completion of logbooks. Verification of logbooks has yet to be done.

6.2 VESSEL MONITORING SYSTEM

Work relating to introduction of vessel monitoring system (VMS) started in 2009. Hardware and software and testing have been complete for some time now. Two systems have been installed; one at the National Coast Guard and other at the Ministry of Fisheries and Agriculture. Initially 10 vessel locating devices (VLDs) were procured and 4 of them have been installed the, first being installed on 6 October 2011. Under the longline license agreement vessel are required to install VLDs which provide near-real time monitoring of their locations.

The programme will be slowly expanded to have them installed on handline vessels followed by all vessel licensed for tuna fishing.

6.3 OBSERVER PROGRAMME

An observer schemes have so far not been introduced in the Maldives. However, preparations on trainings of observes are under way. Accommodating observers on the board vessel have been made mandatory in the longline fishing license agreements and it is expected that once observers have been trained minimum requirement 5% coverage will be implemented. It should be noted longline vessel may not fish outside the EEZ of the Maldivian waters.

6.4 PORT SAMPLING PROGRAMME

A port sampling programme is not in place yet. Fisheries Inspectors deployed in 26 fishing islands, when their work programme is full enforce is expected to the carry out port sampling as part of their activities. It should be noted that under the implementation of EU – IUU fresh fish collectors (fish buyers) are required to record the details of catch and report to the Ministry which is being used as part of the issuing of catch certificate and to corroborate with the fishermen reported logbooks.

6.5 UNLOADING/TRANSHIPMENT

This section is not applicable to Maldives as Maldivian-flagged vessels do not tranship at sea in the IOTC Convention Area.

7 NATIONAL RESEARCH PROGRAMMES

It has been mentioned in earlier reports that catch effort data base in the Maldives required cleaning and improvements in the way compilation takes place. This has now become more important following the introduction of the logbook system and entry of catch data / collection from multiple points via the web.

A small grant funding (US\$ 35,000 for one year) has been sought to hire to work on the database for rectifying those issue. The intern is expected to work closely with fishery data entry staff on improving the process of entry, complication and reporting.

8 IMPLEMENTATION OF SCIENTIFIC COMMITTEE RECOMMENDATIONS AND RESOLUTIONS OF THE IOTC RELEVANT TO SC

No.	Resolution	Scientific requirement	CPC progress
05/05	Concerning the conservation of sharks caught in association with fisheries managed by IOTC	Paragraphs 1–12.	Fisheries targeting shark fishery is banned in the Maldives. Maldives have been reporting the landings of sharks annually to IOTC. However, Government plans to issue longline licenses to local vessels. Under the regulation for “Fishing and exportation of yellowfin tuna in the Maldives” vessels are obliged to fully utilise their entire catches of sharks. The vessels are also required to not to have onboard fins that total more than 5% of the weight of sharks onboard.
08/04	Concerning the recording of catch by longline fishing vessels in the IOTC area	Paragraph 1–3.	All vessels are required under the “Regulation for fishing and exportation of yellowfin tuna” to report the Ministry through longline log books in the vessels.
09/06	On marine turtles	Paragraphs 2, 8, 11, 12, 13 and 14.	Maldives is collaborating with IOSEA on issues relating to the conservation and management of turtles. There are guidelines on using line cutters and de-hookers onboard longline vessels in order to facilitate the appropriate handling and prompt release of marine turtles caught or entangled in longline fishery.
10/02	Mandatory statistical requirements for IOTC members and cooperating non contracting parties	Paragraphs 1–7.	Maldives regularly provides catch and effort data to IOTC.
10/06	On reducing the incidental bycatch of seabirds in longline fisheries.	Paragraph 7.	Under the “Regulation for fishing and exportation of yellowfin tuna in the Maldives” vessels are obliged to utilise sea bird mitigation measures in longline vessels as per the resolution.
10/12	On the conservation of thresher sharks (family Alopiidae) caught in association with fisheries in the IOTC area of agreement	Paragraphs 6 and 7.	Targeted shark fishery has been banned in the Maldives.
11/04	On a regional observer scheme	Paragraph 9.	Longline operations is yet to fully start in the Maldives and provisions are included in the “Regulation for fishing and exportation of yellowfin tuna in the Maldives” to facilitate the observer scheme.

9 LITERATURE CITED

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