

Sri Lanka National Report to the Scientific Committee of the Indian Ocean Tuna Commission, 2011

Authors

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Information on Fisheries, Research and Statistics

Final scientific data for the previous year was provided to the secretariate by the 30th June 2011	Yes 07/07/2011
Final longline data for the previous year is due to the secretarite by 30th December 2010	Yes 07/07/2011

Executive Summary

Sri Lanka is one of the oldest and most important tuna producing island in the Indian Ocean. Longline and the Gillnet are the main fishing gears used for harvesting of tuna and tuna like species. operation of the longlines has become more popular among fishermen, due to the provision of better quality fish than the gillnets. A recent survey indicated that around 20% of the local fishing fleet, used only longline with greater number of hooks per set, as the principal fishing gear, by mechanizing the gear operation, with line-haulers. Two boat types, OFRP and IMUL, which categorised based on the size/length and the duration of the fishing trip are being operated in Neritic and Oceanic provinces around Sri Lanka. According to this categorization, six boat types are being operated with the length of 6-7M, OFRPs (one day operating) and 9-10M, 10-12M, 12-15M, 15-18M length IMUL (operating oneday and >1day). Around 3700 boats are actively operated during the period of 2009 – 2010, for large pelagic fishery. About 1% of them are <15M in length.

The catches of tuna fishery resources are mainly, Yellowfin tuna (*Thunnus albacares*), Bigeye tuna (*Thunnus obsesus*), Skipjack tuna (*Katsuwonus pelamis*), Kawakawa (*Enthynnus affinis*), Frigate tuna (*Auxis thazard*) and Bullet tuna (*Auxis rochei*). The estimated total production of large pelagic species in 2010 was 136,626Mt. which is an increment of 28% to the production in 2009. Major portion of the catches of large pelagic varieties, in 2010, consisted of tunas; 91,903mt. (66% of the total). Among tunas, skipjack tuna dominated the production, with 55,438Mt., followed by yellow fin tuna with 26,959Mt. Yellowfin tuna production has shown an increase of about 10%. Export of Chilled- yellowfin tuna has become a lucrative venture in recent times. Hence attention is being paid to the production maintenance of the quality of the tuna catch in terms of handling, storage and transport. Shashimi tuna and tuna-loins, etc. Of the yellowfin tuna are exported mainly to Japan and EU markets.

Billfish variety caught along with the tuna, are black marlin (*Makaira indica*), blue marlin (*Makaira nigricans*), Striped Marlin (*Tetrapturus audax*), Sail Fish (*Istiophorus platypterus*) and Swordfish (*Xiphias gladius*). The rare occurrence of another billfish species named as shortbill Spearfish (*Tetrapturus angustirostris*) in recent times. The contribution of billfish to the total production was around 9% .

Out of about 60 shark species recorded, around 46 species are of pelagic and demersal., where as only about 12 species are of commercial importance. Difficulties in species identification is a major challenge in keeping records of shark catches. Pelagic sharks contributing about 3% of the total production of large pelagics. DFAR and NARA has already initiated preparation of National Plan of Action (NPO) for sharks with the assistance of BOBLME project. Difficulties in species identification is a major challenge in keeping records of shark catches. As a result NARA has planned to do a taxonomic study on sharks and to prepare a species identification guide with the assistance of the project.

Department of Fisheries and Aquatic Resources has already completed the basic requirements for introduction of log books for the off shore fishing vessels of Sri Lanka, the log book record keeping is scheduled to start from 2012. Several government institutions, are involved in marine fisheries statistics collection and processing. The overall system is quite complex. Recently Ministry of Fisheries and Aquatic Resources Development has received assistance from the IOTC/OFCF to improve a National data reporting system covering all data collecting agencies .

National report of Sri Lanka

Scientific Committee of Indian Ocean Tuna Commission - 2011

1. Background / General Fishery Information

Sri Lanka is one of the oldest and most important tuna producing islands in the Indian Ocean. Exploration and exploitation of tuna fishery resources around this island have shown that the tuna resources of Sri Lanka are mainly, Yellowfin tuna (*Thunnus albacares*), Bigeye tuna (*Thunnus obsesus*), Skipjack tuna (*Katsuwonus pelamis*), Kawakawa (*Enthynnus affinis*), Frigate tuna (*Auxis thazard*) and Bullet tuna (*Auxis rochei*) (Joseph et al. 1985; Dissanayake 2005). Exports of Chilled- yellowfin tuna has increased in recent times with much attention being paid to the production, maintenance of the quality of the tuna catch in terms of its handling, storage and transport. Shashimi tuna and tuna-loins, etc. From yellowfin tuna are exported mainly to Japan and EU markets in 2010 exports amounted to 4856Mt. valued at US\$ 46.5 million (MFAR 2010).

Billfish variety caught along with the tuna, is another important category targeted by the large pelagic fishery in Sri Lanka. As there is a good market demand for billfish species, local fishermen have paid considerable attention to catch, handle and process this category as well. The production of billfish in the deep-sea areas of the Neritic and in the Oceanic waters are generally considered to be only secondary to tuna species. With the expansion of the fishing range of the small-scale fishing fleet conducting multi-day fishing operations for large pelagic fish, since the early part of the 1980s, billfish catches also have increased considerably, highlighting their importance in the large pelagic/ fisheries of Neritic and Oceanic waters around Sri Lanka. Five species of billfishes have been identified in local commercial landings of Sri Lanka: black marlin (*Makaira indica*), blue marlin (*Makaira nigricans*), Striped Marlin (*Tetrapturus audax*), Sail Fish (*Istiophorus platypterus*) and Swordfish (*Xiphias gladius*). The rare occurrence of another billfish species named as shortbill Spearfish (*Tetrapturus angustirostris*) has been reported in recent times in the commercial landings, in Sri Lanka (Joseph and Amarasiri, 1986; Maldeniya, et al., 1987 and Foster, 1987).

Large-pelagic sharks species are also very prominent in the large pelagic fish production and have an equally valuable market in the country, besides the demand for their fins, in the Chinese market. The total number of shark species recorded from Sri Lanka is around 60.

Around 46 species of pelagic and demersal sharks, have been identified from commercial landings (Amarasooriya, 2001). However, only about 12 species are of commercial importance (Joseph, 1999). Among these, silky shark (*Carcharhinus falciformis*) account for more than 50% of the shark species landed by weight and further, this species is abundant in Neritic zone as well as Oceanic waters (Amarasooriya, 2001). Oceanic whitetip shark (*Carcharhinus longimanus*) and hammerhead shark (*Sphyrna spp*) are the next two dominant species and species-groups, in the landings and seem to be more abundant in the Oceanic waters. Rest of the shark species such as, blue shark (*Isurus oxyrinchus*), shortfin mako shark (*Isurus oxyrinchus*) and the thresher shark (*Alopias spp*) occur more in sub-surface layers (Joseph, 1999), than in the surface layer, as evident from the tuna longline catches in the Indian Ocean and elsewhere.

2. Fleet structure

The fishing fleet is registered under the provisions of the regulations made under Fisheries and Aquatic Resources Act No 2 of 1996. Department of Fisheries and Aquatic Resources (DFAR) maintains a vessel registry. Vessels have been categorized based on the size/length and the duration of the fishing trip. According to this categorization, six boat types can be identified operating in the large pelagic fishery (Table 1). Boat category OFRP is used for the coastal fishing activities and the other IMUL categories are involved in the offshore fishing activities. Around 4000 boats are now engaged large pelagic fishery and nearly 3700 boats are actively operate in this fishery. Major gear used in different fleet categories and number of vessels operate. under each category are summarized in table 1 for a period of 2009 – 2010.

Table 1: Type of boats operating in the marine fisheries in Sri Lanka
(Large Pelagic Database NARA)

No	Boat category	Boat Descriptions	Gear/s	Number of boats	
				2009	2010
1	OFRP (UN1)	6-7m FRP dinghy, Outboard engine 8-40 HP, Operate in coastal waters. Fishing duration – 1 day	LL HL	232	180
2	IDAY (UN2A)	9-10 m FRP or wooden. Inboard engine (single) - 40 HP. No ice box or insulated fish hold, no gear hauler, navigational or acoustic equipments. Operate in coastal waters. Fishing duration – single day	GN, LL	335	445

3	IMUL (UN2B)	9-10 m, FRP wooden. Inboard engine (single) - 40 HP. Insulated fish hold - no gear hauler, may have GPS/eco-sounder/fish finder. Operate in offshore waters. Fishing duration – 5-12 days	GN, LL	1080	1124
4	IMUL (UN3A)	10-12m, FRP wooden. Inboard engine (single) - 60 HP, Insulated fish hold and may have gear hauler/GPS/eco-sounder/fish finder. Operate in offshore waters. Fishing duration – 5 - 20 days	GN LL	1732	1810
5	IMUL (UN3B)	12-15 m, FRP or wooden . Inboard engine (single) - 60 + HP. Insulated fish hold and may have freezer facilities. Gear Hauler/GPS/eco-sounder/fish finder. Operate in offshore waters. Fishing duration – 10 - 30 days	GN LL	714	732
6	IMUL (UN4)	15-18m, Operate in offshore waters. Fishing duration – 10 - 30 days.	LL HL	36	37

3. Catch and Effort (By species and gear)

The estimated total production of large pelagic species in 2010 was 136,626Mt. which is an increment of 28% to that of 2009. Major portion of the catches of large pelagic varieties, in 2010, consisted of tunas; 91,903mt. (66% of the total). Among tunas, skipjack tuna dominated the production, with 55,438Mt., followed by yellow fin tuna with 26,959Mt. Yellowfin tuna production has shown an increase of about 10%. The contribution of billfish to the total production was around 9% followed by the pelagic sharks contributing to about 3% and seer fish about 1% (Table 2 and 3).

Among the different fishing gears used for catching large pelagic fish, large-mesh gillnet (GN) or gillnet cum longline (LL), were the most used, in tuna fisheries. This combination contributes to more than 75 % of the total fishing effort for tunas. In this combination, there are around 150 pieces of gillnets of 5” or 6” stretched mesh, and around 200 -700 longline hooks. However the number of pieces of nets and the number of hooks in a set varied, depending on the category of the boat. Around 20 – 25 boats operated long-line, with a set of more than 1000 hooks able to reach a fishing depth-range of 70 m to 100 m, when fully setteled. Trolling-lines and hand-lines are also used during calm sea conditions. It has been

observed that the operation of the longlines became more popular among fishermen, because it provided better quality fish than the gillnets. A recent survey indicated that around 20% of the local fishing fleet used only longline with larger number of hooks per set, as the principal fishing gear, which mechanizing the gear operation by installing line-haulers.

Table 2: Annual catch (Mt) of primary species and major kinds of gear used to exploit the large pelagic species in 2010 (Large Pelagic Database NARA).

Variety	Species	FAO Spp. codes	Neritic Province	Oceanic Province	Total	Gear/s
Tuna	Yellowfin tuna	YFT	845.9	26,112.60	26,958.50	GN/LL/HL
	Skipjack tuna	SKJ	1,655.90	53,782.4	55,438.30	GN/LL
	Kawakawa	KAW	191.20	1,401.00	1,592.20	GN/LL
	Frigate tuna	FRI	17.40	4,480	4,497.50	GN/LL
	Bullet tuna	BLT	136.60	2,061.70	2,198.30	GN/LL
	Bigeye tuna	BET	0.00	537.70	537.70	LL
	Other tuna	TUX	10.80	669.40	680.20	GN/LL
	Sub total		2,857.80	89,044.90	91,902.70	
Seer fish	Seer fish	SEE	116.90	1,199.80	1,316	GN/HL/LL
Bill fish	Marlin	MAR	198.4	5,462.50	5,660.90	GN/LL
	Sailfish	SFA	239.5	3,424.80	3,664.30	GN/LL
	Swordfish	SWO	14.5	3,101.10	3,115.60	GN/L
	Sub total		452.4	11,988.40	12,440.80	
Sharks	Sharks	SKH	504	3,633.40	4,137.40	LL / GN
	Mammals	MAM	0.00	0.00	0.00	
	Other bony fish	OTH	938.60	224,889.40	25,828.00	GN/LL
TOTAL			4,869.70	130,755.90	135,625.60	

Table 3: Historical annual catch of primary species for a period of 2006 to 2010.

(Large Pelagic Database NARA).

	Species	FAO codes	2006	2007	2008	2009	2010
Tuna	Yellowfin tuna	YFT	25,772.96	27,015.49	19,259.65	23,758.20	26,958.50
	Skipjack tuna	SKJ	33,811.07	51,772.06	51,885.57	52,486.20	55,438.30
	Kawakawa	KAW	2,157.96	1,003.77	269.70	217.30	1,592.20
	Frigate tuna	FRI	721.06	105.90	19.56	15.80	4,497.50
	Bullet tuna	BLT	852.44	449.09	94.90	88.90	2,198.30
	Bigeye tuna	BET	270.29	91.80	193.45	110.20	537.70
	Other tuna	TUX	61.40	5,470.07	4,124.90	5,063.00	680.20
	Sub total		63,597.18	85,908.18	75,847.73	81,739.60	91,902.70
Seer fish	Seer fish	SEE	992.90	1,386.40	582.35	620.30	1,316.70
	Sub total		992.90	1,386.40	582.35	620.30	1,316.70
Bill fish	Marlin	MAR	5,005.92	6,601.79	2,105.16	2,476.60	5,660.90
	Sailfish	SFA	4,310.29	3,863.19	2,347.92	2,733.70	3,664.32
	Swordfish	SWO	1,627.58	1,849.69	1,324.00	1,467.00	3,115.60
	Sub total		10,943.79	12,314.67	5,777.08	6,677.30	12,440.80
Sharks	Sharks	SKH	2,101.17	2,123.44	1,870.62	2,059.30	4,137.40
	Sub total		2,101.17	2,123.44	1,870.62	2,059.30	4,137.40
Mammals	Mammals	MAM	00.00	00.00	00.00	00.00	00.00
	Other bony fish	OTH	7,278.79	11,489.48	15,500.10	14,685.90	25,828.00
	Sub total		7,278.79	11,489.48	15,500.10	14,685.90	25,828.00
TOTAL			84,913.83	113,322.17	99,577.88	105,782.40	135,625.60

Though the gear types and their combinations used in the exploitation of the large pelagic species are summarized in Table 3, it has not been possible to estimate relative quantities of the various species caught by the gears operated, individually or as a combination, during

each fishing trip. Further, it is difficult to extrapolate these to the historical information on these fisheries. As the fisheries for the large pelagics, are not only geared for multi-species, multi-gear operations but are also operating variable combinations of these gears, at different times, it is extremely difficult to standardize fishing effort to any one them as the standard gear. Detailed entries of each fishing operation including the combination of gears used and the catch details corresponding to those combinations, may be too much to record in log-books. However the proposed log book system by Department of Fisheries and Aquatic Resources (DFAR) contains three separate data recording sheets for longline, gillnet and any other type of gear. Department of Fisheries and Aquatic Resources has already completed the basic requirements for introduction of the log books for the off shore fishing vessels of Sri Lanka. Data recording in log books has been regularized under the provisions of the Fisheries Act, and the log book record keeping is scheduled to start from 2012.

4. Recreational Fishery

In Sri Lanka, there was a sporadic recreational fishery in the 1970's for sail fish and marlins, around Sri Lanka, which was undertaken by local and foreign enthusiasts. Currently there is no evidence of a recreational fishery for the large pelagic species in Sri Lanka. However government of Sri Lanka has given priority to developing of tourism in the country and the DFAR has planned to enact an amendment to the Fisheries and Aquatic Resources Act, of 1996, to provide provisions for recreational fisheries.

5. Ecosystem and by-catch Issues

Government of Sri Lanka has taken a firm decision not to grant permission for purse seining, either in the Neritic or in the Oceanic waters. Several incentive schemes have been launched by the government to induce gill netters to take up long line fishing. This will minimize the negative impacts associated with gill net fisheries in the destruction of protected species such as marine turtles, dolphins and other non-targeted fin-fish species and results good quality fish with reduced post harvest losses.

Recently trawling is completely banned with a view to protect the marine benthic environment which form the living, feeding, breeding and the nursery area for most marine organisms. Moreover light fishing is also banned emphasizing the sustainability of the fish stocks. The fish discards are negligible in both Neritic and Oceanic waters, because there is a

demand for all species caught. Discards were mainly fish-offal, bones and the fins of fish. However, these are now used in preparing fish meals and for fish silage.

Four harmful gears such as push net operations, harpooning for marine mammals, moxy nets, gill net and bottom set gill net/ trammel net operations on coral reef or rocks have been prohibited under the fishing operations license regulations of 1996. Use of explosives and stupefying substances is completely prohibited under an amendment made to the present Act in year 2004, enforced with increased severity.

5.1 Sharks

About a decade back pelagic-shark fishery was a main fishery in Sri Lanka and used a specific long line called shark long line. However at present the pelagic-sharks is generally considered to be incidental, the gillnet and long line fishery targeting the tuna and tuna-like species. The estimated total shark production in 2010 was 4137Mt.

There is a strong demand for shark fins for export. Salted and dried flesh has a considerable demand in Sri Lanka. Hence, usually whole shark with fins land in Sri Lanka. This emphasise the optimum use of the shark catches. However landing of sharks with fins attached to the body is regulated by a gazetted notification since year 2001.

DFAR and NARA has already initiated preparation of National Plan of Action (NPO) for sharks with the assistance of BOBLME project. Difficulties in species identification is a major challenge in keeping records of shark catches. As a result NARA has planned to do a taxonomic study on sharks and to prepare a species identification guide with the assistance of the project.

5.2 Sea birds

Sea bird catches are not reported in Sri Lanka due to the nature of the fishery and the gear used.

5.3 Marine Turtles

Marine turtles are legally protected under Fauna and Flora Protection Ordinance, No.2 of 1937 and the Fisheries Ordinance of 1940, with severe sanctions. In addition catching of marine mammals and turtles is prohibited Under Fisheries and Aquatic Resources Act No.2 of 1996. In 1979, Sri Lanka signed the CITES agreement which prohibits member nations from trading of endangered species including turtles and their parts and products. The punishments

have been increased by Fauna and Flora protection (amendment) Act No. 49 of 1993. There are several turtle conservation projects operating in the coastal stations around the island by the voluntary organizations. DFAR and NARA in collaboration of these organizations conduct awareness programs to the fishermen on releasing of turtles if incidentally caught to a fishing gear.

6. National data collection and processing system

Statistical Unit (SU) in the Ministry of Fisheries and Aquatic Resources plays the major role in the collection compilation and reporting of fisheries statistics. The DFAR and NARA are involved in fisheries data collection while Ceylon Fishery Harbour Corporation (CFHC), Ceylon Fisheries Corporation (CFC) and Sri Lanka Customs (SLC) indirectly contribute to this procedure. Fishing boat owners association, Fish trade organization, fishing boat and gear manufactures, boat builders, some suppliers of ice and fuel also maintain fisheries related data for their own use.

National Aquatic Resources Research and Development Agency (NARA)

NARA has a well established large pelagic fishery data collection programme since 1994. Twelve samplers are based at major harbours in the West, South-West, South, South-East, East and North-East Coasts. They collect data on the catch and effort, according to craft-gear combination, craft kind and size categories, for all major large pelagic varieties. The computerized database and a routine reporting system, is also in place (Maldeniya, 1998).

An updating of the tuna catch-sampling programme was undertaken, in late 2004, with technical and financial assistance from Indian Ocean Tuna Commission (IOTC) and the Overseas Fishery Cooperation Foundation of Japan (OFCF). The objective of this collaborative project involving NARA, IOTC and OFCF was to strengthen data collection, compilation and processing systems, for Sri Lankan fisheries for tuna and billfish and thereby, enable reliable estimation of the annual production and the fishinf-effort, by area, species and season and also to improve the qualitative and quantitative aspects of the sampling of length-frequency distribution of the tunas and other related species (IOTC, 2005).

Department of Fisheries and Aquatic Resources (DFAR)

In Sri Lanka, island wide fishery statistics collection programme is conducted by DFAR for over 45,163 fishing crafts. DFAR has an island wide net work with 15 Assistant Directors

incharge in fisheries districts which have been divided to Fisheries Inspector Divisions (FID). Fisheries inspectors have been appointed for each FID. Fisheries inspectors select well representative landing sites within their division to collect statistics to estimate the monthly production. They make eye estimates of major commercial groups (weight only) in off-shore fishery. Under this sampling scheme, data collection covers all landing sites. There is no comprehensive data collection on tuna fisheries. However, they cover all tuna varieties in four categories such as yellow fin, skip jack, small tuna (FRT) and other tuna (TUX). In addition they conduct sample surveys and report the proportion of tuna species in the tuna catch.

Ceylon Fisheries Harbours Corporation (CFHC)

The CFHC collects a range of data on the activities of industrial and multi-day boats using its fisheries harbours. Their interest is primarily on the usage of the harbour facilities by vessels, collection of harbour fees accordingly and the movements of vessels between their harbours. The data is used for planning, development and designing of harbour. They don't have direct interest on fish landings, as they do not collect any charge from the catches landed by vessels.

Ceylon Fisheries Corporation (CFC)

CFC is empowered to purchase and sell fish throughout Sri Lanka. CFC maintains a database on all fish purchases and sales including domestic production. CFC has its own records of purchases of fish from the foreign fleet landing by varieties in the designated harbour at Mutwal, Colombo. The data includes fish variety, weight and price. Since January 2002, CFC has also recorded quantity of fish exported for sashimi. Custom keeps records of imports and exports of all commodities, including fishery products.

In year 2010 MFARD has received IOTC financial and technical assistance to improve the National data reporting system covering all data collecting agencies such as DFAR, NARA, CFHC and CFC. The assistance has been delivered through the OFCF and now we are in the process of establishing a central data base system at MFARD. With the implementation of this system, MFARD will streamline the data handling to report at IOTC.

Structure of the existing data collection program in NARA

The concept of sample based estimation is aimed at determining the following; total fishing effort, total production, percentage composition of the species in the total production,

gear-wise production of each species, total length frequency distribution for each tuna species etc. This is done by raising the sample size of a species in relation to its production level, and pooling the length frequency distributions to determine the overall length frequency distribution for the total production of each species, for each month and for the whole year. This will help to assess the annual trends in the fisheries for each tuna species, and to be able to carry out an overall assessment of the population of each species, in the Indian Ocean. This could be achieved by pooling the corresponding production, fishing effort and other data, for each species, for all the fisheries, in all the coastal and distant nations, involved in fishing for tunas, in the Indian Ocean. This programme has been designed to cover the data from large pelagic species, exploited by the fleet of day-boats operating in the Neritic province and the fleet of multi-day of different size/ endurance categories, operating in the Oceanic province (Williams, 1995). Data are being collected according to stratified random sampling. Stratification of the sampling is determined by: the locations of fish-landing sites around the country; the size and or endurance categories; the categories of craft and gear combination(s); the locations of the fishing ground; by season (monthly); the species landed; the size frequency distribution of the species. Others may be added according to the objectives of the assessments. According to the recent modification, undertaken by the IOTC and OFCF combined programme the time of the day, is also being recorded, to take the effect of the temporal stratification, on the fishing efficiency. The catch rate/hook rate may be relatively greater, in the morning and evening or night.

Spatial strata

The coastline around Sri Lanka has been divided into seven statistical zones (Figure 3). In each zone major and minor landing sites have been identified and complete sampling is to be carried out at all the major landing sites, while effort data is collected in the minor landing sites also, on a regular basis.

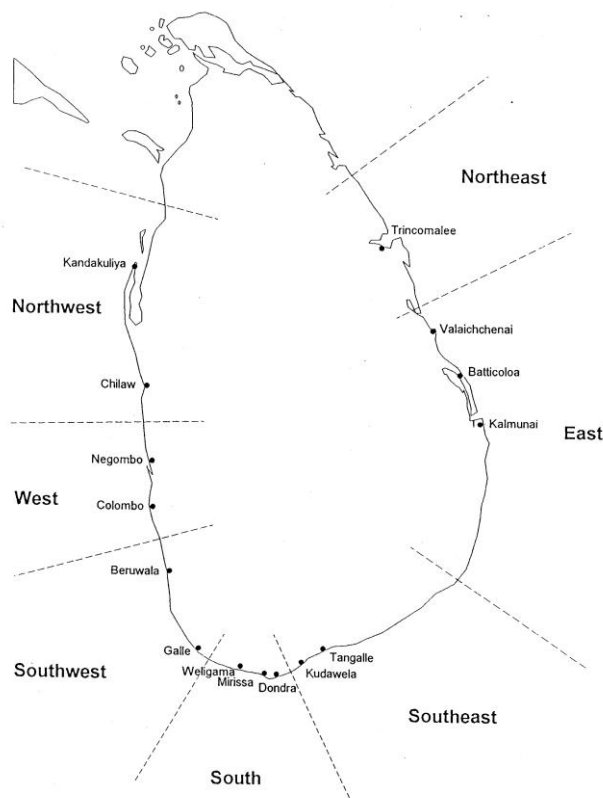


Figure 1: Principal statistical zones and major landing centers used in estimating offshore fish production in Sri Lanka.

Temporal strata

Data are collected on a daily basis and estimates are carried out on a monthly basis.

- **Allocation of sampling sites and days**

The selection of landing sites for sampling is done randomly. At the beginning of the each month, the responsible research officer prepares the time table for sampling. Sites are visited on a rotational basis according to the time table. Sometimes adjustments will be made in the time table due to the seasonality of the fishery. The number of days allocated for landing sites may vary from one month to another.

- **Data collected**

Data collectors are supposed to collect following data at the landing sites.

1. Daily effort

Total number of boats landing on each day, as well as, the total number of sampled crafts according to boat categories, are recorded. After the modification mad by IOTC /OFCF

programme, samplers are expected to record the boat's names and registration numbers as well. Data are recorded in a daily effort sheet.

2. Catch data

The total catch of each species is recorded either by weight or numbers. At the same time skippers are also interviewed to gather information about the type of fishing gear(s) operated during the trip. Catch and effort data sheet is used to record these data.

3. Length weight data

Length and weight measurements are collected for the different species landed by the sampled boats, as well as, from boats which were not sampled for the catch and effort data. The data are recorded on a length weight frequency data sheet. Measuring tapes were used for length while weight is recorded individually or group wise, depending on the situation prevailing in the field. According to the recently improved sampling programme (IOTC /OFCF), samplers should record the length and weight, in accordance with the established codes (eg: Lower jaw-fork length –LJFLT- Lower jaw-fork length and GGT- Guttet weight)Total number of major tuna species; yellowfin tuna and skipjack tuna, measured are summarized in the table 4.

Table 4: Number of individual fish measured in 2010

Species Name	Number of Individuals
Yellowfin tuna	6876
Skip jak tuna	2887

- Data storage

The structure of the data base for the large pelagic species (*PELAGOS*) (ACCESS 2.0) was developed by Howell (1994), and is being used to store the raw data. This database was upgraded ACCESS 2003 in 2005 under the IOTC/OFCF programme still under modification, to suit the updated sampling programmes and the forms for the sampled data.

6.1 Log sheet data collection and verification

Department of Fisheries and Aquatic Resources has already completed the basic requirements for introduction of log books for the off shore fishing vessels of Sri Lanka. Data

recording in log books has been regularized, and the log book record keeping is scheduled to start from year 2012. At the end of each fishing trip the, master of the fishing vessel has to submit the catch data (two copies) to the harbour manager and to the officer of DFAR subsequently this data to be entered to the electronic data base. A preparation of a separate data base for log book data entry is in the process under the funding assistance of IOTC / OFCF.

6.2 Vessel Monitoring System (VMS) - present status

After careful technical assessments a VMS system has now been selected, which would fulfill and cater for the obligations as outlined in the IOTC resolution 06/03 on establishing a VMS system programme. Following the Sri Lankan Government procedures, approval has been obtained from the National Planning Department and has now been submitted to the External Resources Department to negotiate with the project finances after which the Cabinet approval will be sought.

6.3 Observer programme

Sri Lanka does not operate vessels more than 24m in length and has not developed the observer programme so far. However with the current development policies Sri Lanka looking forward to launch larger vessels operate in the high seas under the proposed fleet development plan. At present Sri Lanka is preparing the basic needs for high seas fishing. In this connection drafting of a new Act to have the provisions for high seas fishing in accordance with international conventions and obligations has been given the priority. Once provisions for enforcing of regulations for high seas fishing is included in the said Act the observer programme would be regularized and implemented in Sri Lanka, and look forward to assistance from IOTC to train people for the observer programme.

6.4 Uploading/ transshipment

Tuna and tuna like species are being landed by foreign fishing vessels at the designated fishery harbour at Mutwal, Colombo. Details of the landings are reported to IOTC in the given template. Landing is allowed after receiving a request minimum 24 hrs in advance by the vessel owners for the port entry with the valid documents of vessel registration and the authorization for fishing issued by the flag country. Only the vessels in the Authorized list of vessels of IOTC will be permitted to land fish at the designated port. Port inspectors have

already been appointed and are now being trained. The port inspections will start in January 2012.

7.National Research programmes

NARA is continuing the research on "Development of satellite based fishery forecasting system" with the objective of improving the fishing efficiency of yellowfin tuna. Information on fishing grounds with favourable sea conditions, is released on a weekly basis and digital-display screens are being fixed in the major fishery harbours, to disseminate information, for the benefit of the fishermen engaged in tuna fishery.

The fishing pattern over the past years has changed with the new trend towards long line fishing in the Oceanic waters. NARA is undertaking research on the incidental catches of shark species. Further molecular- biological studies have been initiated to assess the sub-populations of various oceanic shark species.

8. Implementation of scientific committee recommendations and resolutions of the IOTC relevant to the S.C.

8.1 Implementation of scientific committee recommendations

Recommendation 1 and 7

Reiterating our commitments to full participation in IOTC activities, Sri Lanka has prepared the National report for year 2011 according to the guideline set out by IOTC and submitted to the Secretariat within the given time line.

Recommendation 9

After a long absence from the working party meetings scientist from NARA participated for the Working Party on Billfish in 2011 with the assistance of IOTC.

Recommendation 11

MFARD has already put forward a proposal in year 2010 to obtain financial and technical assistances from IOTC/ OFCF to improve the existing sampling system covering artisanal and offshore catches of tuna and tuna like species. Data collecting officers of NARA and DFAR are to be trained under these provisions.

Recommendation 15

NARA is conducting reasearch to identify the incidental catches of shark by species. This is a molecular based taxonomic study to confirm the shark species.

8.2 Implementation of resolutions of the IOTC relevant to the scientific committee

Resolution	Implementation status
11/02 On the prohibition of fishing on data buoys	Once the Act is formulate for high seas fishing these conditions will be included to the fishing operation license. However general awreness has been made at the regular awareness programs carried out by DFAR. Extensive publicity has given through the Distrcet fisheries offices in this regard.
11/03 Establishing a list of vessels presumed to have carried out IUU fishing in the IOTC area	Effective action has taken including severe punitive measures, against the vessels found guilty of IUU fishing, and reported to the IOTC secretariat. VMS system will be implemented in near future. Steps have been taken to establish a coast guard unit, in the Department coming under the Ministry of Defence of Sri Lanka.
11/04 On a Regional Observer Scheme	Sri Lanka does not operate vessels >24m in length. However with the current development policies Sri Lanka is looking forward to launch larger vessels in the high seas. Therefore Sri Lanka most welcome to receive assitance from IOTC to train people for observer programme.
11/05 Establishing a programe for transhipment by large-scale fishing vessels	Not applicable
11/06 Concerning the recording of catch and effort by fishing vessels in the IOTC area of competence	Reporting of catch data by all mechanized boats (> 10m) has been made legally mandatory. New log books have been introduced and log book record keeping is scheduled to start from 2012. Preparation of a separate data base for log book data entry is in the process under the funding assitance of IOTC / OFCF.

10/01 For the Conservation and management of Tropical Tuna stocks in the IOTC area	Sea area closures will be intricated in the fishing operation license, through regularization of the high seas fishing Act. However general awareness has been made on the closed area (0° – 10° North, 40°-60° East) at the regular awareness programs carried out by DFAR and publicized through District fisheries offices in this regard. In order to prevent over exploitation of juvenile tuna especially yellowfin tuna and bigeye tuna and to reduce the vulnerability of by-catch species such as turtles and dolphins, any form of purse seines are banned within or outside the EEZ. Sri Lanka promotes long lines gradually phasing out gill net fishery. VMS system and the log book data recording will be implemented soon in Sri Lanka.
10/02 Mandatory statistical requirement for IOTC members and CPC's	Sri Lanka complied with IOTC requirement for data provision through submission of data according to the timelines given. Recently more attention has been drawn to collect, record and report the by-catch data.
10/03, Concerning the recording of catch by fishing vessels in the IOTC area	A new log book system has been introduced and regularised to record the catch data of large pelagics and to be implemented from 2012 January.
10/04 Regional Observer Scheme	Refer 11/04 above
10/05 Establishment of meeting participation fund for developing IOTC members and CPCs	In the past Sri Lanka did not have funds to participate in scientific committee, working party meetings and the Annual sessions of IOTC. Under resolution 10/05, Sri Lanka applied assistance to participate the said meetings recently and received favourable response from IOTC. In Sri Lanka where the data handling process is carried out more than on institution, participation of 2 officers through the assistance programme would help initiation of progress in a coordinated fashion.
10/06, Reducing the by- catch of seabirds in longline fisheries	There is no Sea bird by-catches in Sri Lanka due to the nature of the fishing gear used.
10/07, Record of licenced foreign vessels for tuna and swordfish	Sri Lanka does not permit foreign flagged vessels to operate within the EEZ.
10/08, Record active vessels	Sri Lanka provides necessary data of active vessels by

tunafishing for tuna and sword fish in the IOTC area	length size on a regular basis.
10/09, Concerning the functions of the compliance committee	No relevance.
10/09, Concerning the market related measures	Tuna and tuna like spesies are being landed by foreign fishing vessels at the designated fihery harbour at Mutwal, Colombo. Details of the landings are reported to IOTC in the given template.
10/11,Port state meaures to prevent deter and eliminate IUU fishing.	Tuna and tuna like spesies are landed by foreign fishing vessels at the designated fihery harbour at Mutwal, Colombo. Details of the landings are reported to IOTC in the given template. Landings are allowed provided a minimum 24 hrs advance notice given by the vessel owners for port entry, with valid documents of vessel registration and authorization for fishing issued by the flag country. Only the vessels in the Authorized list of vessels of IOTC are being permitted to land fish at the designated port. Port inspectors have already appointed and are being trained. The port inspections will be started from January 2012.
10/12, Conservation of thresher shark caught in association with fisheries	Preparation of NPOA on shark has been initiated with the assistance of BOBLME project.
10/13, Implementation of ban of tunaand non target spesies caught by purse seiners	Government of Sri Lanka has taken a firm decision not to grant permission to operate purse seining neither in the Neritic nor in the Oceanic provinces.

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