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Fisheries Data Collecting & Processing System of IRAN

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Title: Fisheries Data Collection & Processing System of IRAN

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Abstract

This document presents summary Information about Fisheries Statistical Data collection system and Data processing method in Iran, Length Frequency data collection, database for fisheries catch, vessels, effort and fishery statistics software have been provided.

As fishery management require precise and on time data statistics in terms of capture fishery status, to this end, Iran Fishery Data Collection System (IFDCS) has provided and formulated since 1994. In addition, size frequency data has been complied since 2001. Over the years, variety of options has been added to the software structure accompanied with some training courses for field samplers and simultaneously the Software has been upgraded according to the modern software's and operating systems of the day. In this way, IFDCS is now active under SQL Server and the Delphi language.

For better collaboration with IOTC, much effort has carried out to extract all necessary outputs required to meet the concerned IOTC Resolutions. Now planning is ongoing to design the software under Web with two English and Persian languages. In this new software, we will take into account all IOTC & RECOFI demands and make it operational. Iran has taken various actions to implement the Scientific Committee and IOTC Resolutions and recommendations. In this respect in 2012, we proceeded with some actions and reporting provided for billfish species, big eye tuna, sharks and some other groups of species. It is noteworthy to say that for 2012, we could identify and include swordfish and marlines catch in our Data Base. we have implemented artisanal gillnets modification of logbook template to meet mandatory minimum statistic requirement, particularly with regards to data recording of vessel position in IOTC area for target species, By-catch and discard. Fishery for tuna and tuna-like species is a major component in large pelagic fisheries in Iran and one of the most important activities in the Persian Gulf and Oman Sea.

Introduction

In 2012 total fish production in Iran was 839,000 tons, which can be distributed as 55% (500,000 tons) from southern water, 5%(40,000 tons) from northern water and 40%(339,000 tons) through inland water.(Figure 1 - 4)

The total catch in 2012 was 500,000t; out of which around 197,000t.(Figure 5 - 6) was of Tuna(6 species) &Tuna like Species(2 species); this means that Fishery for tuna and tuna-like species is a major component in large pelagic fisheries in Iran and one of the most important activities in the Persian Gulf & Oman Sea. There are 4 coastal provinces in that areas about 11 thousand vessels consist of fishing boat, dhows and vessel which are engaged in fishing in the coastal and offshore waters. Gillnet and purse seine are two main fishing methods used by Iranian vessels to target large pelagic species (especially tuna and tuna-like) in the IOTC area competency and some of small boats used trolling in coastal fisheries.

Iran has taken various actions to implement the Scientific Committee recommendations and IOTC Resolutions, one of them is national action to improve data collection system and upgrade data collection software to SQL SERVER 2008 and under web since 2011. We have implemented for Iranian industrial purse seiners and artisanal gillnets modification of logbook template to meet mandatory minimum statistics requirement, particularly about data recording of vessel position in IOTC area for target species, By-catch, and discard**.**

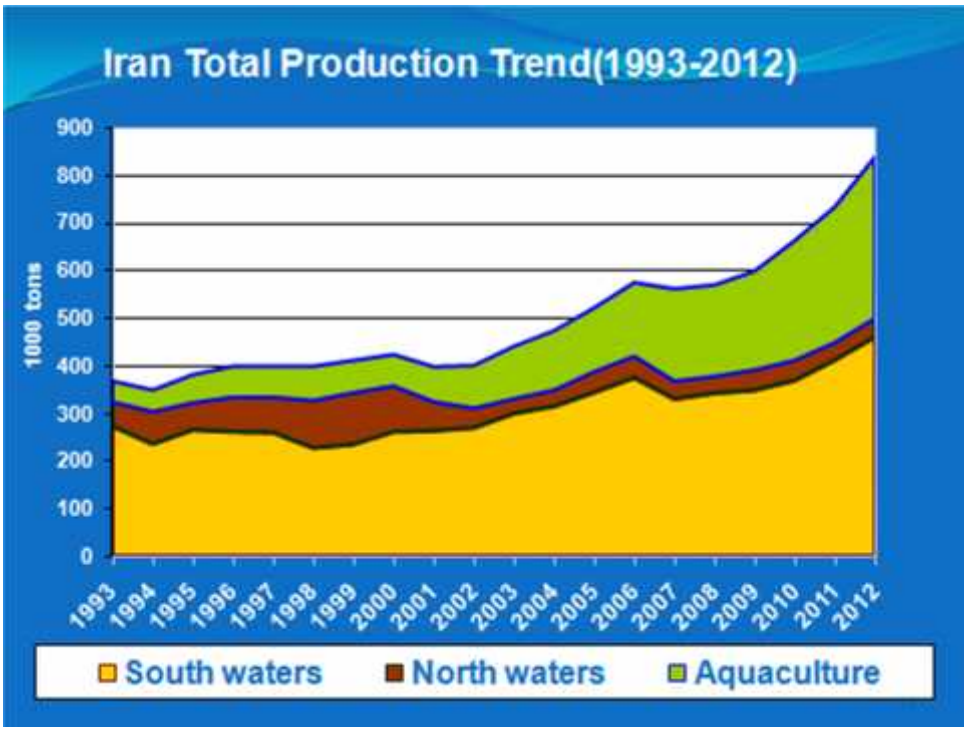


Figure 1.Iran Total Production Trend(1993-2012)

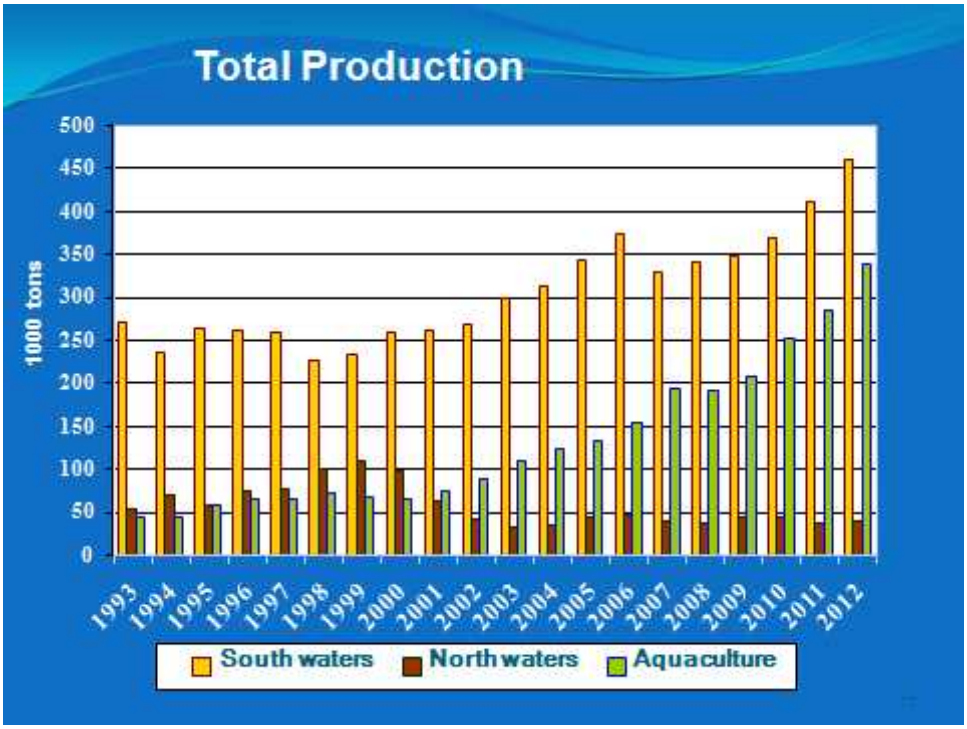


Figure 2.Iran Total Production Trend (1993-2012)

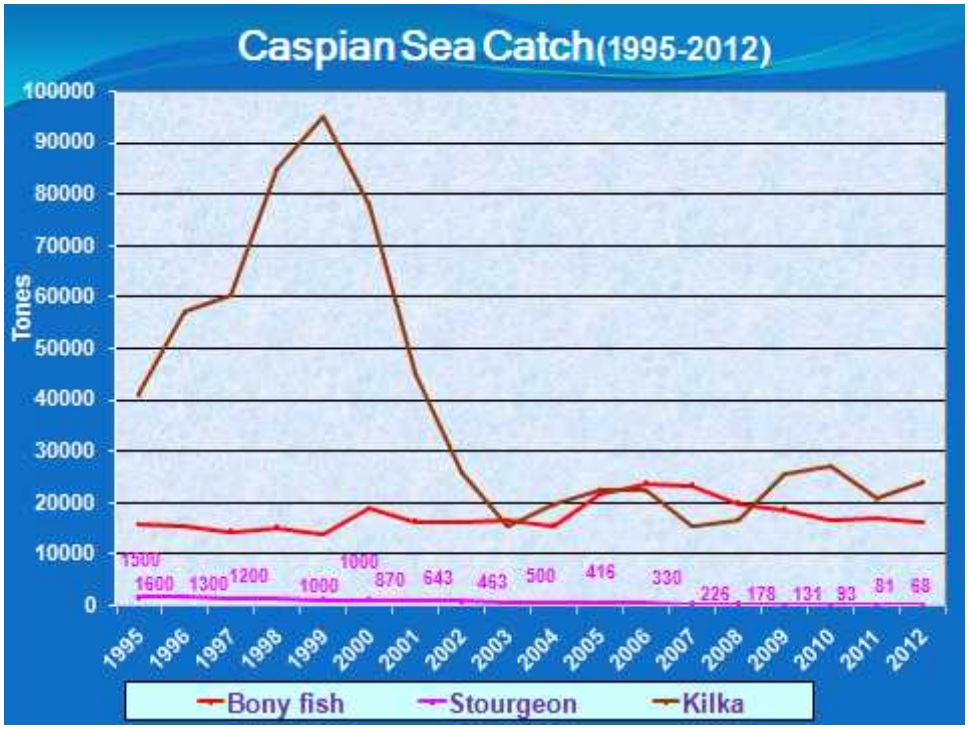


Figure 3.Caspian Sea Catch Trend (1995-2012)

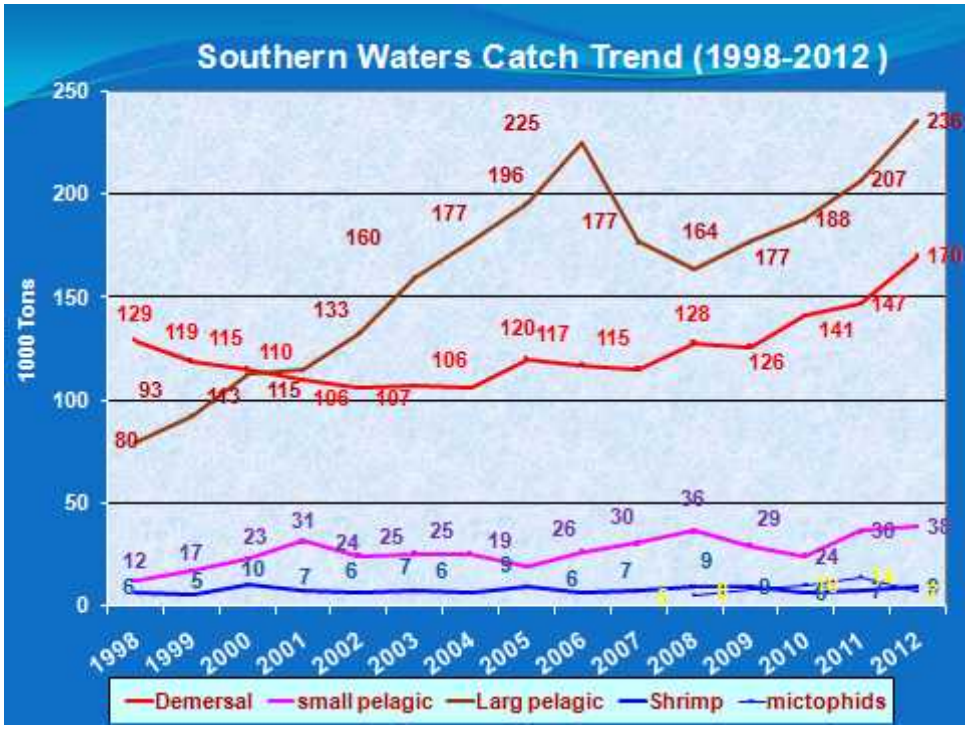


Figure4. Southern Waters Trend (1998-2012)

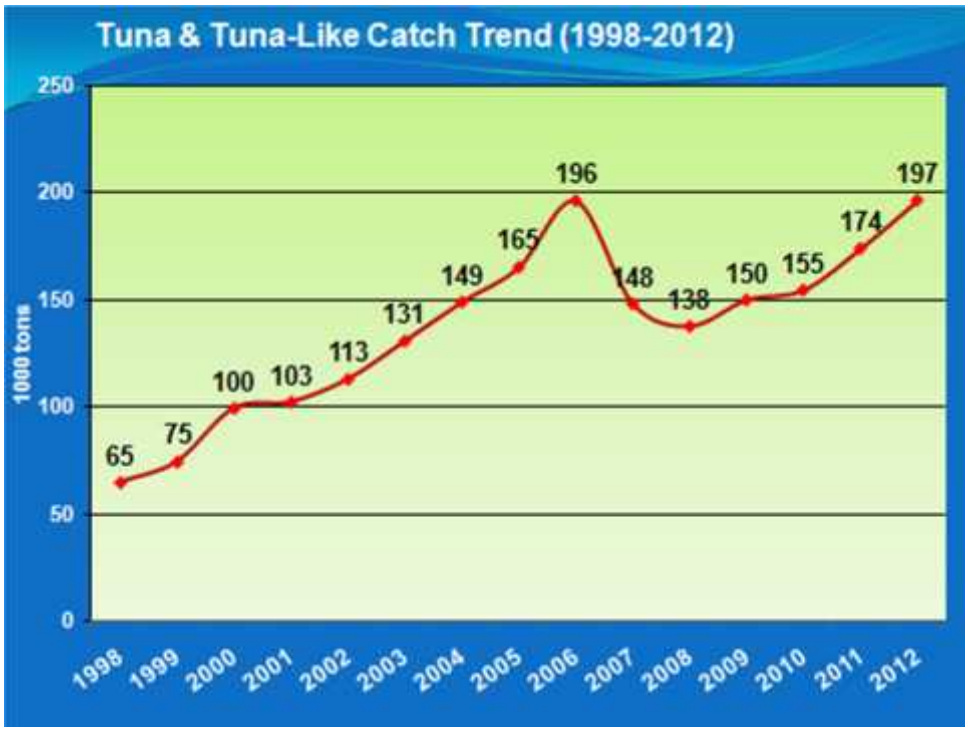


Figure5. Tuna & Tuna-Like Total Catch Trend (1998-2012)

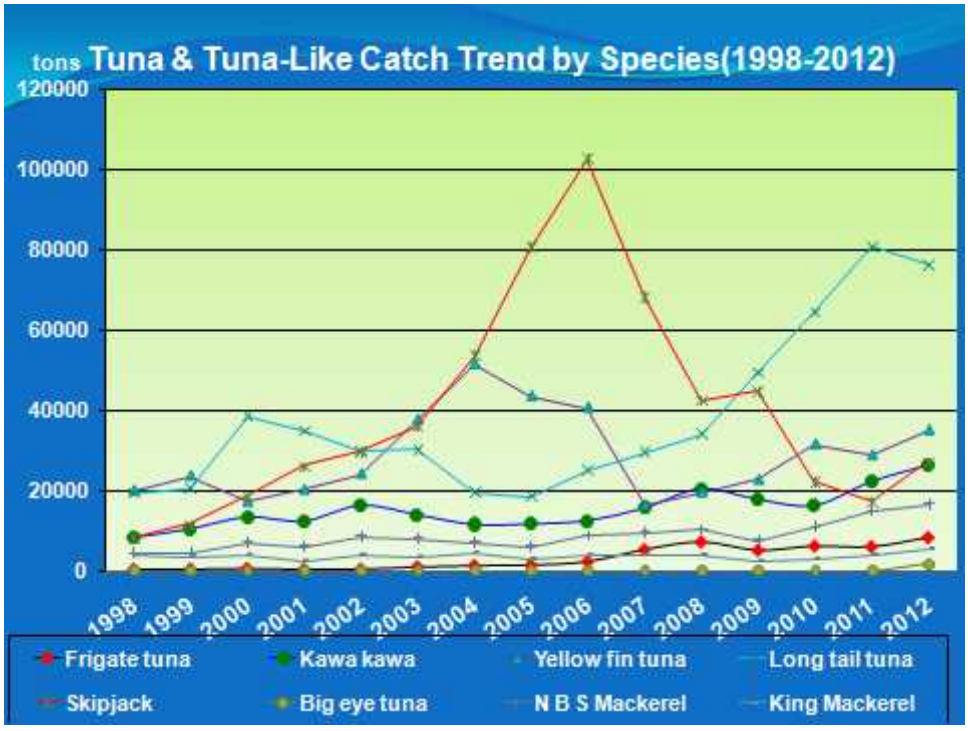


Figure6. Tuna & Tuna-Like Catch Trend by Species (1998-2012)

Data Collecting System

Iran's fisheries activities consists two parts that their fishing methods and fishing geographical features are quite distinct from each other:

1- Northern coastal provinces (Caspian Sea)

2- Southern coastal provinces (Persian Gulf & Oman Sea & Overseas)

Caspian Sea

There are 3 coastal provinces in northern waters which are fishing in their territorial waters with around 40,000 tons and 900 vessels and with three different fishing methods (Figure 7, 8):

1. Kilk (anchovy) Fishing

Around 700 fishermen with 73 fishing vessels in 4 fishing ground by Light-Conical Nets(funnel-shaped net) are engaged in anchovy fishing (3 major species) and total enumeration carried out by field sampler (observers)

2. Bony Fishing

Around 10,000 fishermen within 127 fishing cooperatives in 127 sites by beach seine method are engaged in 14 bony species fishing (3 major species) and total enumeration carried out by field samplers (observers) per each shot

3. Sturgeon Fishing

Around 600 fishermen with 196 fishing boats in 39 fishing ground by gill net method are engaged in sturgeon fishing (5 major species) and total enumeration carried out by field sampler (observers)

Note: Iran voluntarily has banned commercial fishing of sturgeon species since March 2012.

Figure 7.Caspian Sea Fishing Method & Active Fleet (2012)

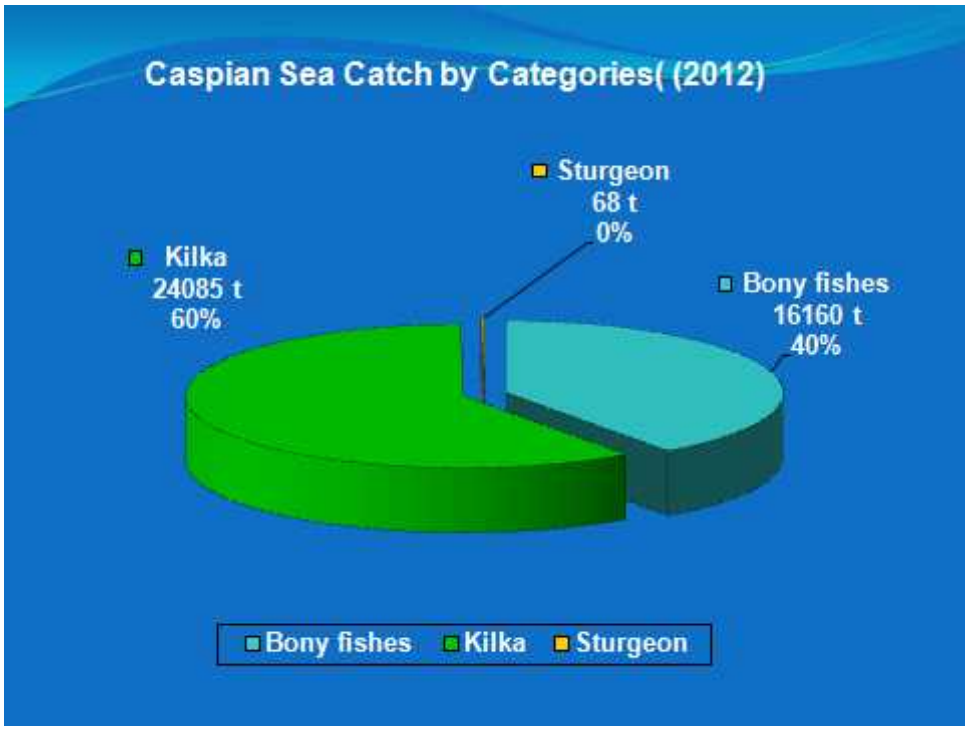


Figure8. Caspian Sea Catch by Categories (2012)

Persian Gulf & Oman Sea & Overseas

There are four coastal provinces in southern waters, which are fishing in their territorial waters with about 10700 vessels.

- **Gillnet fisheries** is used by fishing Boats and Dhows for Large Pelagic

- **Bottom Trawl** fisheries are using by Ships for Cuttlefish, lantern fish (mictophids) and Hair tail (Ribbon) in time-area closure.
- **SHRIMP Trawl fisheries** is using by Artisanal Boats, Dhows, and Industrial vessels for Shrimp in time-area closure.
- **Trap** (Gargoor) fisheries is used by boats and Dhows for Grouper, Cuttlefish and other Demersal species
- **Trolling, hook & line fisheries** is used by boats for Tuna species, Mackerel , Long tail Tuna,yellowfin Tuna and some Demersal species
- **Purse-seine(pair-boats) fisheries** by boats for Sardine and Industrial vessels Tuna

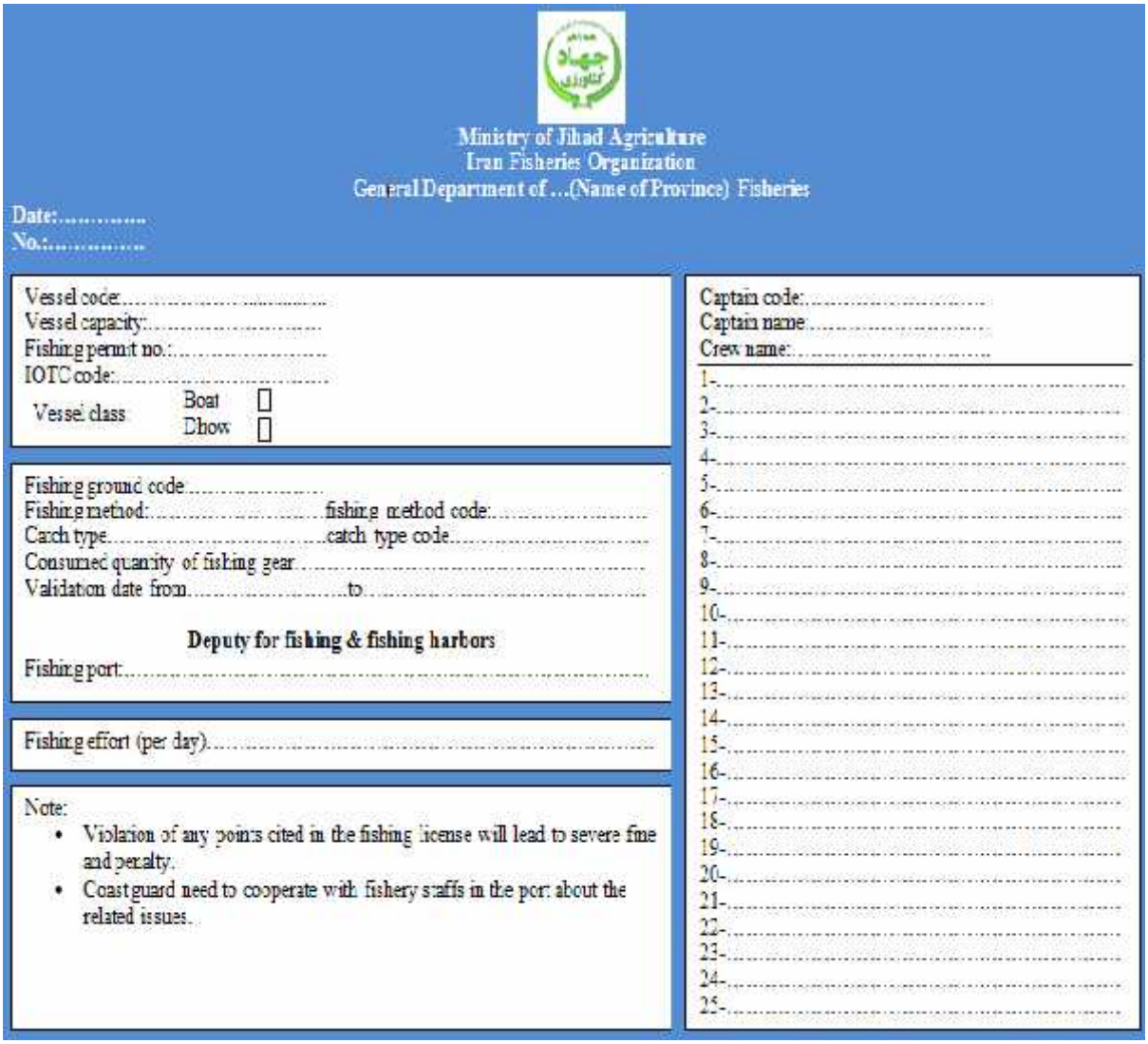
All of them needs fish license (permit) when they are going to sea for fishing operation. There are 63 basic landing centers in southern coastal waters to issue fishing permit for all the vessels. Fishing permit form which is also using for total enumeration in all landing sites for statistics on total effort of active fleet.

And also following fishing methods and total enumeration carry out by fishermen fishing cooperatives :

- **Beach-seine** fisheries is used by fishermen in limited area of Hormozgan province for Sardine
- **Set net** fisheries is using in tidal regions of Hormozgan province for shrimp, crap…

Fish permit include information about

Permit serial no, date of issue for permit, vessel code, vessel capacity(GT), fishing permit no, IOTC code, vessel type, fishing ground name & code, fishing methods name & code, catch type & code, number of fishing gears, fishing port name & code, captain and crew name & code, permitted duration of fishing operation at sea, fishing gears period at sea (per hours), also at the back of license the exact date for vessel departure and entrance will be endorsed.43 operators in above-mentioned provinces will computerize all of this information. However vessel activities and effort information is available by total enumeration (Figure 9.)



Ministry of Jihad Agriculture
Iran Fisheries Organization
General Department of …(Name of Province) Fisheries

Date:……
No.:……

Vessel code:……
Vessel capacity:……
Fishing permit no.:……
IOTC code:……
Vessel class Boat ☐ Dhow ☐

Fishing ground code……
Fishing method:…… fishing method code:……
Catch type……catch type code……
Consumed quantity of fishing gear……
Validation date from……to……

Deputy for fishing & fishing harbors

Fishing port:……

Fishing effort (per day)……

Note:
- Violation of any points cited in the fishing license will lead to severe fine and penalty.
- Coast guard need to cooperate with fishery staffs in the port about the related issues.

Captain code:……
Captain name:……
Crew name:……

1-……
2-……
3-……
4-……
5-……
6-……
7-……
8-……
9-……
10-……
11-……
12-……
13-……
14-……
15-……
16-……
17-……
18-……
19-……
20-……
21-……
22-……
23-……
24-……
25-……

Figure9. Fishing Permit form which is used in all landing sites for statistics on effort

Sampling Methods for Catch

For collecting catch data in those landing centers, we use sampling method with a classification in two stages. First stage is the classification of landing centers and choosing the sample landing centers**.**

Selected landing sites

A. The selection of sample landing sites is performed based on following provisions:

- -Diversification of fishing methods
- -High landings amount
- -Vessels with different capacities
- -Diversification of catch composition
- -Locating at main and common fishing grounds region
- -Based on these criteria 43 landing sites are selected from 63 as sample landing sites and catch data collection is performed in them

B. Second stage is the classification of landing centers in accordance with the capacity of different vessels in each landing centre. Because of the importance of vessel capacity in catch amount for different species

The size of artisanal vessels

Measured in GRT and they are classified in four categories for sampling purposes.

1-vessels less than 3 tonnes (fishing boats)

2-vessels between 3 to 20 tonnes

3-vessels between 21 to 50 tonnes

4-vessels >50 tonnes

Content of questionnaire form

Vessel Code,vessel Capacity,Landing Centre Code,Fishing ground code (26 fishing ground),Date of departure,Date of arrival,Fish permit serial No,Information related to Fishing method and gear (number and duration of the gear set in water) and also Name of 52 Species and amount of catch (Figure 10.)

Ministry of Jehadkeshavarzi
Iranian fisheries stock company
(Fish statistic Questionaire)

QUESTIONAIRE NO.----------

Table.A -Vessel Specification& Fishing groun

Vessel Code:	
Landing Centre Code:	
Fishing ground Code:	
Latitude:	
Fishing ground depth:	
Date of departure:	
Date of arrival	
Fish license serial No	:

Table. B - Information related to Fishing Method & gear

Fishing Method		No. of Gear used	Gear duration at sea
Trawl	Bottom		
	Midwater		
	Shrimp		
Gillnet	Bottom		
	Drift		
	Encircle		
Trap/Cage			
Longline			
Hook			
Trolling line			
Purse- seine			

Table.C - Species name & amount of Catch

Row	Species	Quantity (kg)	Row	Species	Quantity (kg)
1	Sawfish		28	Hilsa shad Indian shad	
2	Mullet		29	Parrot fish	
3	Pompano		30	Indian Mackerel	
4	Frigate Tuna		31	Spotted Sicklefish	
5	Malabar blood snapper		32	Indo-Pacific King Mackerel	
6	Greater lizard fish		33	Flounder/Sole/ Halibut	
7	Silver pomfret		34	Barracuda	
8	Black pomfret		35	Shark	
9	Wolf-herring		36	Cat fish	
10	Crab		37	Gizzard Shad	
11	Threadfin		38	Yellow Fin tuna	
12	Kawa Kawa		39	Trevally/Scad	
13	Fathead		40	Labster	
14	Sardine		41	Marlins/Sail fish	
15	Trevally/queen Fish		42	Cuttle fish	
16	Snapper		43	Karut croaker	
17	Ray		44	Shrimp	
18	Cobia		45	Grouper	
19	Japanese threadfin bream		46	Longtail tuna	
20	Grunter		47	Skipjack tuna	
21	Guitar fish		48	Hairtail / ribbon	
22	Seabreams		49	Black marlin	
23	Emperor		50	Big Eye Tuna	
24	Tigertoot Croaker		51	Mugilidae	
25	Crookerlike fish		52	Jelly fish	
26	Narrow-Barred Spanish mackerel			Total	
27	Spine foots / Rabit fishes			Crew edible fish	

Enumerator name & signature (Fill in date)

Figure10. A typical Questionnaire form used at sample landing sites for collecting catch-and-effort data for 52 species)

Species

52 categories of species/families are identified in the landings of artisanal vessels. Further classified as demersal, large pelagic, small pelagic and shrimp categories.9 species of tuna and tuna-like species are identified in the big pelagic category.

Sampling for estimating the amount of catches

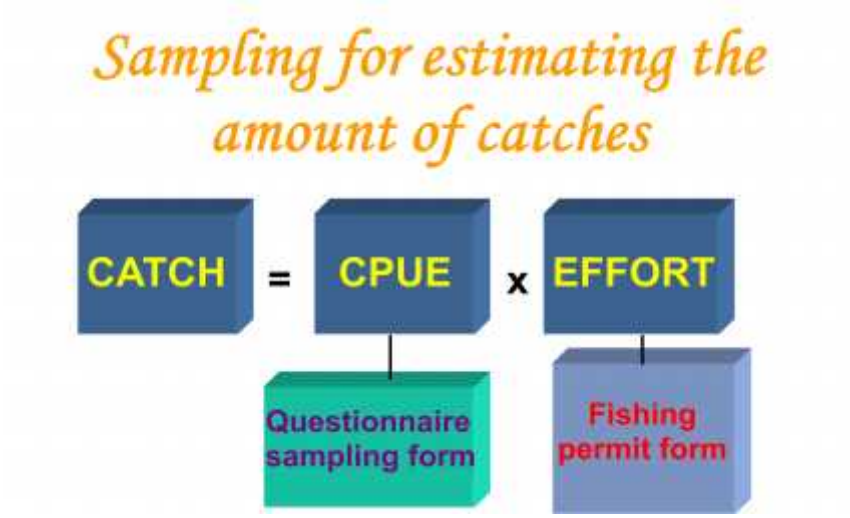
Landing surveys are undertaken to obtain data on catches in the artisanal fisheries. The methodology involves the sampling of 10% of the fleet taking into account: Landing site, Vessel type and their gear type, fishing area.

Forms for data collection

Fishing permit. (Figure 1.), A staff of 63 are involved in the activities related to licensing, control and monitoring.Questionnaire form for sampling site. (Figure 2.), 43 port samplers (enumerators) permanently stay on landing sites which they collect the data and fill out the forms, and collect length/weight frequency data. And another questionnaires are for beach seine, set net, logbook

Calculating total catch

Based on questionnaire sampling form and the permit form the catches will be raised.To increase accuracy, raising will be done based on month and per each landing centre and per vessel class(processing and reporting of statistics by software)



Industrial Vessels

Total enumeration procedure was adopted in order to obtain all relevant information on catch and effort. These vessels, Trawlers and Purse seiners are required to submit daily fishing logbooks on their operations.Inspections are undertaken at landing sites and observers are placed on board the vessels in order to obtain independent information as well as biological data on the species.

Data Validation and Verification

Control of Permit form and Questionnaire form by the Head of statistical unit in relevant city.This kind of control will then be done in province centre through computer.Again this will be repeated in Headquarter in tehran .Cross Check by total census in one or two landing site.

Final Control of Catch Data and Statistics

Final controls are performing in scientific committees which held in fisheries headquarter and provinces with following members comprising:

- Director General of Fishing affairs
- The head of catch statistics division
- The head of Stock management – Iran fisheries research organization(IFRO)
- The representative of Deputy administrative and planning

According to related issues, catch statistics supervisors from provinces, fishing affair experts from headquarter, and fishermen representatives are invited

Logbook Template for Gillnet Fishery

We have already carried out a logbook pilot plan for 50 gillnetters in 2011. Based on the Trial and error experiences learned in 2011, we provided a new Logbook Template in 2013 according to IOTC format for 400 active distant-waters Gillnetters engaged in tuna and tuna-like species. In this way related training courses convened for fishermen and fisheries experts on how to fill out the logbook template and compile the data according to IOTC mandates.(*Figure 11.)*

(LOGBOOK TEMPLATE FOR GILLNET VESSELS)

[illegible]		(Port Arrival)	(Port Departure)	(Serial No)
[illegible]		(Date Arrival)	(Date Departure)	(Reg No.)
[illegible]				(IOTC No)

Date	(Time & Position Start Set)			(Time & Position End Set)			(Time Start Haul)	(Length net)	(Tunas & Tuna Like Species)								(Billfishes)		(Sharks)		(Other (Name & Catch))		(Discards)	
	LAT.	LONG.	Time	LAT.	LONG.	Time			Bigeye tuna (BET)	Yellowfin tuna (YFT)	Skipjack tuna (SKJ)	Longtail tuna (LOT)	Kawakawa (KAW)	Frigate tuna (FRI)	[illegible]	[illegible]	(Black marlin)	(Sailfish) Other (Name & value) (Blue shark)	(Thresher shark)	(Shark …) Other (Name & value)				

: (Remark)

Figure11. Logbook template for Gill net vessels (active in overseas for tuna and tuna-like species)

Length Frequency Data Collection

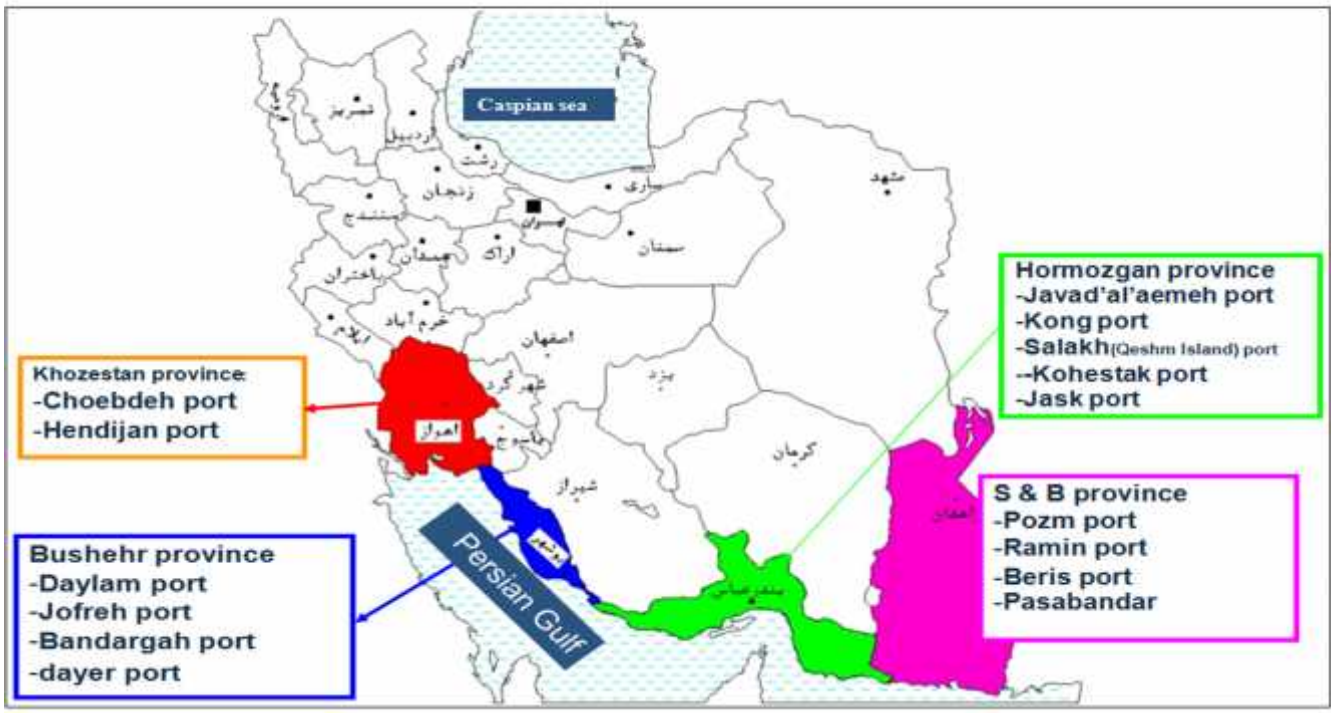
Ways of Collecting Biometry Data

- landing places biometry
- At-sea Biometry

Collected data includes:

- Length frequency (measuring Fork length)
- Weight frequency

Sampling Landing centers in each coastal Provinces



Measuring Method and Species

Sampling is carrying out based on fishing methods inter alia: Gillnet, Trap (wire trap), Trawl, Hook, Purse seine, trolling for each fishing method 500 fish per month measure and 200 fish weighted. The measure length is fork length.

A-Demersal species:

1. Silver pomfret
2. Black pomfret
3. Tiger tooth croaker
4. Grunter s
5. Groupers
6. Threadfin bream

B-Tuna and Tuna-like species:

1. Narrow-barred Spanish mackerel
2. Long tail tuna
3. yellow fin tuna
4. Kawakawa
5. Big eye tuna

Objectives of Biometry

- Obtaining the average length of a fish over a period by using length composition data to determine the overall state of species size exploitation
- To calculate number of cohorts for each species
- Determining the length-at-age of each species to show the rate of exploitation in accordance with the age of each species
- Estimation of growth parameters and mortality rates of species and use them for Virtual Population Analysis (VPA)
- To calculate the present exploitation pattern for each fish according to length maturity (LM50)
- obtaining length-weight relationship for each species annually

Iran Fishery Data Collection & Biometry Software

The data collection software is called AMAR, Which developed for the compilation, processing and reporting of statistics. AMAR is based on DELPHI and sqlserver2008, the database for fisheries catch and effort statistics is available since 1997. Now the software is changing to C # and under web. The modification of the software is in its final stage. We hope during the period of 6 months, the software passes its trail procedure and we came operational.

Implementation of IOTC Recommendation Resolution Relevant to the Data Collection System

1. Improving data collection system for Big eye tuna, Sharks, Billfish including species identification
2. Iran Fisheries Organization implemented the training courses for port samplers in this way Identification cards for billfish, sharks and big eye was Translated in Persian language and disseminated among port samplers and fishermen to identify different species
3. Incorporate logbooks in database (it's ongoing)
4. Amending Database to generate reports for the IOTC
5. Amending database to provide required reports to Iran fisheries organization (SHILAT) and other national and international entities
6. Extending database capabilities to enhance Reporting (partially done)
7. Report of catch by geographic area
8. Reporting catch and effort and size data according to grid 5° area, month strata and geographic area
9. Improving Size frequency data on purse seine and gillnet fisheries for big eye tuna and long tail tuna
10. We recommend IOTC to publish ID card for Billfish & Sharks in Persian language

Main Issues

1. Multi-species fisheries in the region
2. Sea pollution
3. Phenomenon of piracy (overseas fisheries)
4. Illegal Catch
5. Shortage of Manpower and funding for data collection section

Suggestions:

1. Giving more time to provide and submit reports to IOTC until august of next year since our calendar is not Christian and have less time to prepare the report in due time(30 June)
2. To maintain a pilot project by each member country to determine offshore fishery by-catch species by identifying the billfishes, sharks, tuna and other species and percentage of discard.(It's going in Iran)
3. To maintain training courses by IOTC and related entities, specific for observers & field samplers on data collection and statistics with special reference to IOTC resolutions & recommendations