Possible approach to estimate accurate tuna catch statistics in the IOTC area of Indonesia after 1995

Bachtiar Gafa 1/ and Tom Nishida 2/

1/ (kanlutmb@indosat.net.id) Research Institute of Marine Fisheries (RIMF), Jakarta, Indonesia RIMF, Jl. Muara Baru Ujung, Komplek Pelabuhan Perikanan Samudera, Jakarta, 14440, Indonesia

2/ (tnishida@enyo.affrc.go.jp) National Research Institute of Far Seas Fisheries (NRIFSF), Japan, 5-7-1, Orido, Shimizu City, Shizuoka, Japan 424-8633

Contents

Submitted to the second working group meeting on data collection and statistics (IOTC): December 4, 2000, Victoria, Seychelles

1. Introduction

Indonesia has been the 2nd-4th largest tuna fishing nations (in terms of catch in tons) in the Indian Ocean since 1993, which has been exploiting more than 100,000 tons of tuna and tuna like species (Anon, 1999). However, Indonesian tuna catch statistics by gear and species were not available for many years. Hence, IPTP and IOTC have been estimating them by using available sources of the information (*personal communication with Miguel Herrera, Data Manager, IOTC*). Because of such large amount of catch exploited by Indonesia, it is urgent and essential to estimate accurate catch by species and gear to achieve reliable tuna stock assessment and fisheries management.

Under such circumstances, IOTC dispatched Dr Chris Mathews (UK) for about one month in August 1999 to investigate some potential sources of species and gear specific tuna catch information. As suggested in his report (IOTC/Mathews, 1999), some detail tuna statistics are likely available in the WASKI offices under the Director General of Fisheries (DOF) (*note: WASKI in Indonesian abbreviation means Monitoring Control Fish Service Surveillance*). Appendix A shows the organizational chart of Fisheries Administration and Research Institute of Indonesia for the current one (to the end of 2000) and the new one (from 2001) (Nishida, 2000). From this chart, the position of the WASKI is understood.

As we had a chance to visit one of the WASKI offices located in Bali PROVINCE on March 8, 2000, we checked this potential source of information. This document reports the outline of the findings, some possible approach to estimate accurate tuna catch by species and gear based on the WASKI information and recommendations.

2. National catch statistics collection system and tuna catch statistics

In order to understand the current national (tuna) catch statistics, we review its collection system as a first step. Dr Tadashi Yamamoto (Japan) made the fundamental design of the national fisheries (catch) statistics collection system during 1974-78, which remained almost same at present. Followings are the explanation of this system:

There are 27 PROVINCES in Indonesia (*note: There used to be 28 PROVINCES but East Timor PROVINCE declared her independence in 1999 and left out from Indonesian PROVINCE*). In each PROVINCE there are a number of DISTRICTS. In each DISTRICT, three basic fisheries statistics are collected and complied as explained in BOX 1

BOX 1: Three basic fisheries (catch) statistics collected in the DISTRCT level

(1) Catch statistics of commercial fishing company
(collected at its own landing facility) (monthly catch statistics)

Each fishing company makes the report of the fishing trip. But, in the monthly summary, tuna and tuna like species are divided into three types, TUN (all tuna species + all billfishes), SKJ (skipjack) and TONKOL (small tunas). Catch reports of all fishing companies are sent to the DISTRCT fisheries office, which makes monthly catch statistics of fishing companies. It is likely that gear information are not available in the monthly summary.

(2) Catch statistics of small-scale (non-commercial fishing company) fisheries from public landing center (monthly statistics)

Field workers (enumerators) check landing (catch) every Wednesday in the selected public landing centers in each DISTRICT. They estimate the total monthly catch in each DISTRCT by three steps, i.e., (a) total catch in all landing sites in Wednesday is estimated by raising sample catch collected in selected landing center to the whole public landing centers, (b) total weekly catch in each DISTRICT is estimated by raising catch in (a) to the whole week catch by multiplying 5 and (c) the global monthly catch in each DSITRCT is computed by adding and adjusting the weekly catch statistics.

(3) Catch statistics of small-scale artisanal fisheries at small fishing villages landed not in (1) & (2) (Quarterly catch statistics)

Catch and number of fishing boats are investigated in the selected small-scale artisanal fishing village by quarter. The total quarterly DISTRICT catch is estimated by raising sample quarterly catch to the whole DISTRICT using the numbers of boat operated.

Then DISTRICT fisheries offices send their quarterly fisheries statistics to PROVINCE fisheries offices, which summarize PROVINTIAL quarterly fisheries statistics. Finally, PROVINCE fisheries offices send their quarterly fisheries statistics to the DGF, which make the annual national fisheries statistics. BOX 2 summarizes these flows.

BOX 2: Flowchart to estimate national catch statistics

Quarterly DISTRICT fishing company catch based on (1)
+
Quarterly DISTRICT small-scale fisheries catch based on (2)
+
Quarterly DISTRICT artisanal fisheries statistics based on (3)
↓
Quarterly DISTRICT fisheries statistics

Quarterly PROVINCE fisheries statistics

Annual national fisheries statistics (DGF)

Note: Catch of tuna and tuna like species are classified into three groups without gear breakdown, i.e., TUN (tuna and billfishes combined), SKJ (skipjack) and TONKOL (neritic small tuna combined)

3. Information available in the WASKI offices

We now understand that the current national fishery collection system cannot provide monthly tuna catch by gear and species. Thus, we investigated other potential information sources of tuna catch by species available in the WASKI, which was suggested by Dr Chris Mathews (IOTC consultant). We visited the Bali WASKI office located at the beginning of the Benoa port in March 8, 2000. Then we found following two types of logbook information, which were the original logbook data of (1) in the BOX 1, i.e., information from fishing vessels belonging to the fishing companies.

3.1 Old logbook system (1995-99)

In 1995, Indonesia started the data collection of commercial fishing vessels belonging to the fishing companies using the logbook system. Table 1 shows the logbook form for the small longliners. Forms for other gears are also available. As clearly observed, there are data entries for species and gear specific tuna catch. However, when the WASKI complies monthly tuna statistics, they classify them into three categories without gear breakdowns, i.e., TUN (tuna and billfishes combined), SKJ (skipjack) and TONKOL (small tuna such as longtail tuna, kawakawa etc. combined), which are the same category as in the national statistics. Then, they make monthly summary statistics.

3.2 New logbook system (2000-)

From February this year (2000), the DGF (Director General of Fisheries) of Indonesia, introduced and started a new logbook system, which includes :

New Logbook Form A: Arrival and departure records of fishing boats	(to be filled by fishing masters)
New logbook Form B: Catch records	(to be filled by WASKI officers)
New logbook Form C: Fishing boat information	(to be filled by WASKI officers)

In the new logbook system, tuna catch by species and gear are also collected. It is likely that they make the computerized system for these new information.

Table 1 Logbook form (old type: 1995-1999)

LAPORAN PENANGKAPAN IKAN
FISHING LOG

FORMULIR – A MCS (DIISI OLEH AHLI PERIKANAN / ABK)

1. Nama kapal : (Boat Name) .....
2. Nomor ijin (Spi / Sipi) : (License number) .....
3. Tanggal berangkat : (Date of departure) .....
4. Tanggal tiba : (Date of Arrival) .....
5. Jumlah basket / blong : (Number of baskets) .....
6. Bahan bakar : (fuel) Ton .....
7. Es : (Ice) Ton .....
8. Umpan : (Bait) Kg/ekor .....
9. Air tawar : (Fresh water) Ton .....
10. Daerah penangkapan : (Fishing ground) → degree or rough location .....
11. Jumlah tarikan : (number of operation) Kali .....

Jumlah Hasil Tangkapan	**Export (whole fish)**		**Reject**		**Jumlah**	
Jenis / Species	**Ekor**	**Kg.**	**Ekor**	**Kg.**	**Ekor**	**Kg.**
Blue Tuna (sirip biru)						
Yellowfin Tuna (sirip kuning)						
Bigeye Tuna (mata besar)						
Albacore						
Billfish (Setuhuk)						
Shark (Hiu / Cucut)						
Other Fish (Ikan Lain)						
J u m l a h						

Diperiksa oleh,

Pengawas Kapal Ikan.

.....

NIP. .....

Tanggal lapor : .....

Nama Pengisi/ABK : .....

Tanda tangan : .....

4. Estimation of tuna catch statistics by species and gear using the WASKI information

We now understand that the WASKI offices in every DISTRICT have the original tuna catch data by gear and species from all the fishing companies in the old logbook system after 1995. However, these are available only in the original paper form (raw data) and not yet computerized. Thus, if we computerize this information, we can get accurate tuna catch by gear and species from 1995 to 1999. After 2000, we can also use the computerized catch data by gear and species based on the new logbook system. In addition, because the logbook system includes information of the location of fishing operation, we can also obtain the 5x5 area and month based catch/effort information of the longliners.

However, catch from the non-fishing companies (non-commercial small-scale fisheries and artisanal fisheries, i.e., (2) and (3) in BOX 1) need to be also added. Their catch is about 10-20% of the total catch. If we can get the total catch for these fisheries, we can estimate catch by gear and species using species composition by gear obtained by the logbook information. Table 2 shows the current catch data situation of the IOTC database in Indonesian and possible improvement using the WASKI data after 1995.

Table 2 Current catch data situation of the IOTC database in its water in Indonesian and possible improvement using the WASKI data after 1995.

Year	Current situation	Sources of information for possible improvement of catch by gear and species and also 5x5/month data in the IOTC water of Indonesia available at the WASKI offices
1950-1994	Estimated by IPTP/IOTC	(no sources : same as in the current IOTC database)
1995-1997		Old logbook system data ➔ improvement is expected
1998-1999	(To be provided later using same estimation methods as before)	
2000-		New logbook system data ➔ improvement is expected

5. Recommendations

Based on the findings in our visit, recommendations are stated as below in order to obtain more accurate tuna and tuna species catch by gear and species and also 5x5/monthly longline data:

- We check only the WASKI in the Bali PROVINCE. It is hoped that similar data are available in other WASKI offices in the Indian Ocean side of Indonesia. This matter needs to be investigated.

- It is recommended to acquire funds to computerize the WASKI raw data available in the paper format.

- It is recommended to monitor non-commercial small scale and artisanal catch data (2) and (3) in BOX 1 by establishing the IOTC sampling programs.

- As there are no size and biological data available in the WASKI logbook data, such information need be collected by establishing the IOTC sampling programs.

Acknowledgement

We thank two WASKI officers in Bali PROVINCE to provide important information. We also appreciate Dr Subhat Nurhakim (DG of RIMF), Dr Moch F. Sukadi (DG of CRIFI) and Mr Simba Fukuda (Assistant Director, Training affair division of OFCF) who assisted our trip to Bali.

Reference

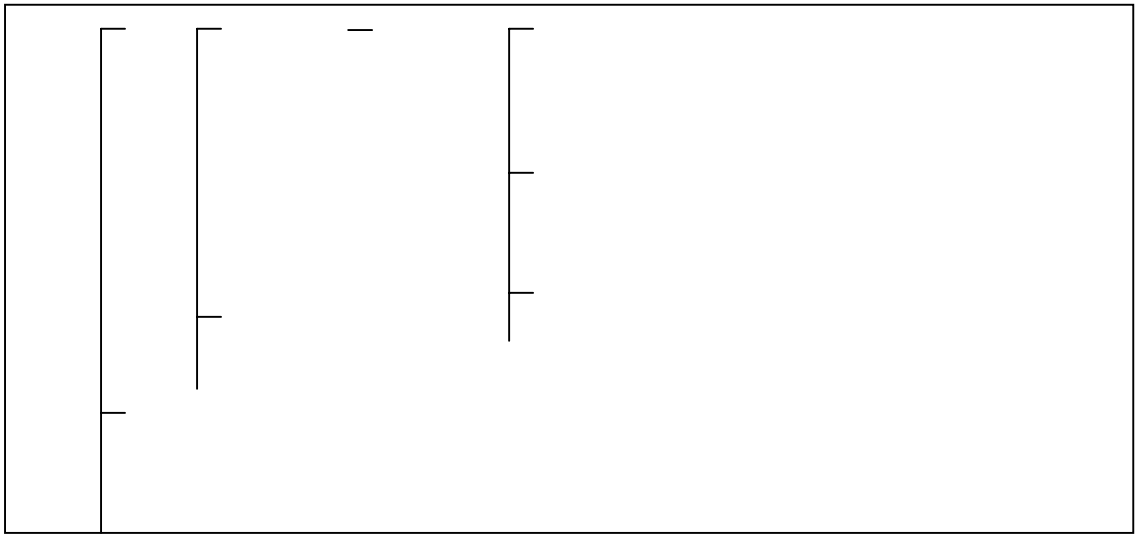
Anon. (1999) : Indian Ocean Tuna Fisheries Data Summary, 1988-1997, IOTC Data Summary No. 19, 101pp.

IOTC/Mathews, C. (1999): Report on the consultancy to Indonesia, IOTC/SC/99/04, 7pp.

Nishida, T. (2000): Report of the workshop on tuna investigation and research in Indonesia, (*In Japanese*), Internal document of National Research Institute of Far Seas Fisheries, 32 pp.

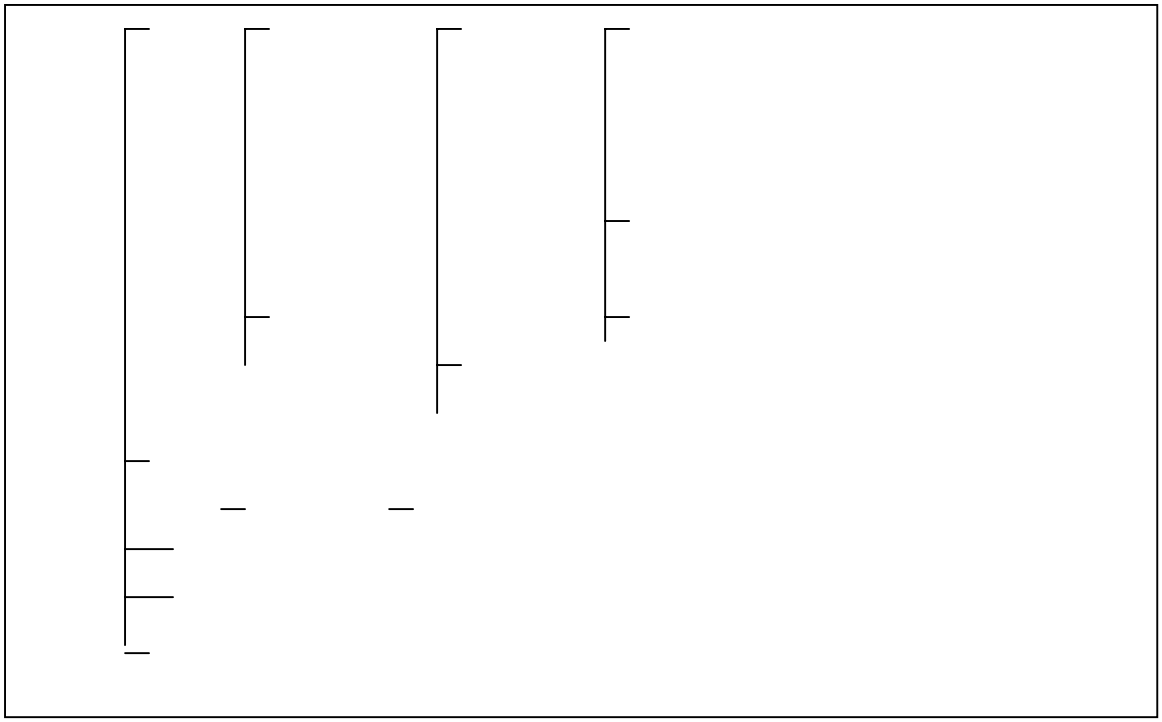
Appendix A: Organization chart of Fisheries Administration and Research Institute in Indonesia

(current organization chart to the end of 2000)



(*): Ministry of Agriculture

(new organization : from 2001)



(**) MINISTRY OF SEA EXPLOITATION AND FISHERIES (five divisions)