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HARVEST STRATEGIES FOR TROPICAL TUNA IN ARCHIPELAGIC WATERS OF INDONESIA: UPDATE

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INDONESIA

Harvest Strategies for Tropical Tuna in Archipelagic Waters of Indonesia: Update

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Introduction

Indonesia has initiated the development of Harvest Strategy (HS) for tropical tuna in the IAW since November 2014. The aim of developing the HS is to enable Indonesia to manage its tropical tuna fishery within its IAW with an adaptive way which can be measurable and predictable in achieving its management objective. This work is a participatory and consultative process which involved various relevant stakeholders, including central and local Governments, managers, fishing associations, industries, companies, Non-Government Organizations (NGOs), scientists and experts.

This is the first attempt to the develop harvest strategy for Indonesia's tuna fishery, a specific harvest strategy framework has been developed through a collaborative work between Center for Fisheries Research (MMAF, Indonesia) and the WCPFC under the West Pacific East Asia – Sustainable Management (WPEA-SM) with the involvement of CSIRO experts. WPEA-SM has supported the development of Indonesia's National Tuna Management Plan (NTMP) and the interim harvest strategy framework for tropical tuna fishery in Indonesia's archipelagic waters (FMAs 713, 714 and 715) as well as the port-based sampling program for at least 10 years.

Prototype operating models (OMs) have been developed for skipjack and yellowfin tuna, based on the relevant WCPFC regional stock assessments. These models provide the basis for testing the performance of specific alternative harvest strategies and providing government and stakeholders with results to select the most appropriate harvest strategy for each species for implementation. Summary of specification and process of developing prototype OMs and preliminary examples of harvest strategy framework for skipjack tuna and yellowfin tuna in Indonesian archipelagic waters is provided by Hoshino *et al*. (2018). These models are conditioned using the WCPO stock assessment outputs as well as Indonesian port-sampling data. Progress of the harvest strategy development has been reported in the Scientific

Committee meeting of the WCPFC - SC14 (WCPFC-SC14-2018/MI-IP-06) and Regular Session of the Commission – WCPFC 14 (WCPFC14-2017-DP26) and 15 (WCPFC15-2018-DP28).

Further works are required to determine productivity of tropical tuna (population biology parameters) in the archipelagic waters that required in the operating models (in the context of management strategy evaluation), and its socio-economic information and bio-economic modeling for the different sectors of the tuna fisheries. These are expectedly covered by the collaboration between CFR – MMAF and CSIRO under ACIAR project (FIS/2016/116) that commenced since late 2018. This paper provides an update of the process of the HS development for the tropical tuna in the Indonesia's archipelagic waters (FMAs 713, 714 and 715).

Harvest Strategy Development Process

The process of development to current status of the harvest strategy has been conducted in a consultative, collaborative and multi-stakeholder approach. Lead government institutions have been the Directorate of Fish Resources Management, Directorate General of Capture Fisheries and the Centre for Fisheries Research, both under the Ministry of Marine Affairs and Fisheries. Under the direction of the Directorate of Fish Resources Management and by instruction from the Director General for Capture Fisheries a steering committee was established comprised of officials from DGCF, Centre for Fisheries Research and some external expert advisors.

Additionally, a technical group was established and led by the Centre for Fisheries Research which included technical guidance and input from Commonwealth Science and Industrial Research Organisation (CSIRO), with extensive experience in the harvest strategies and MSE, and supported by various stakeholders, including NGOs and academia.

Multiple stakeholder consultations and technical workshops have taken place over the last years, fostering a transparent and participative environment for harvest strategy development. Summary of harvest strategy development process for tropical tuna in the Indonesia's Archipelagic Waters (Figure 1).

Stakeholder Workshop – Management Related Process

During the Stakeholder workshop in 2017, 5 (five) priority selected management measures were selected (WCPFC15-2018-DP28):

a. Limit on use of Fish Aggregating Devices.

b. Spatial closures (of important spawning or nursery grounds) and temporal closures (during important events such as spawning).

c. Number of fishing days (per gear, for semi industrial and industrial vessels).

d. Number of vessels – limited entry (per gear; for semi industrial and industrial vessels through licensing, permits, taxing, royalties).

e. Total Allowable Catch (TAC) limits per Fishery Management Area.

The 1st harvest strategy implementation workshop in November 2018 recommended that there are no additional fishing permits for industrial fishing vessels (>30 GT) catching YFT and SKJ until the NTMP being reviewed in 2019. The review of NTMP has been commenced since March 2019 and expected to be completed by end of 2019. The 2nd harvest strategy implementation workshop will be held in October 2019 which is expected to agree on HCR and short-term management measures.

Technical Workshops – Scientific Related Process

In 2016, thirteen datasets were submitted as the first data submission for harvest strategy work. The data were collected from 2010 – 2015, and three datasets were selected for further harvest strategy development (WCPFC-SC14-2018/MI-IP-06, Satria and Sadiyah, 2018). The second data submission was in March 2019 for data collected from 2016 – 2018. Six datasets were received, the summary is provided in Table 1. These datasets were combined with the previous 3 datasets selected from the first data submission, to get longer time series data. Number of trips of pole and line, handline and longline for the two data submissions (data from 2010 – 2018) are provided in Table 2, 3 and 4, respectively. In order to investigate whether the data are meet the minimum requirement for the harvest strategy work and possible improvement of source of abundance and size indices, the Exploratory Data Workshop was conducted from 9th – 10th May 2019.

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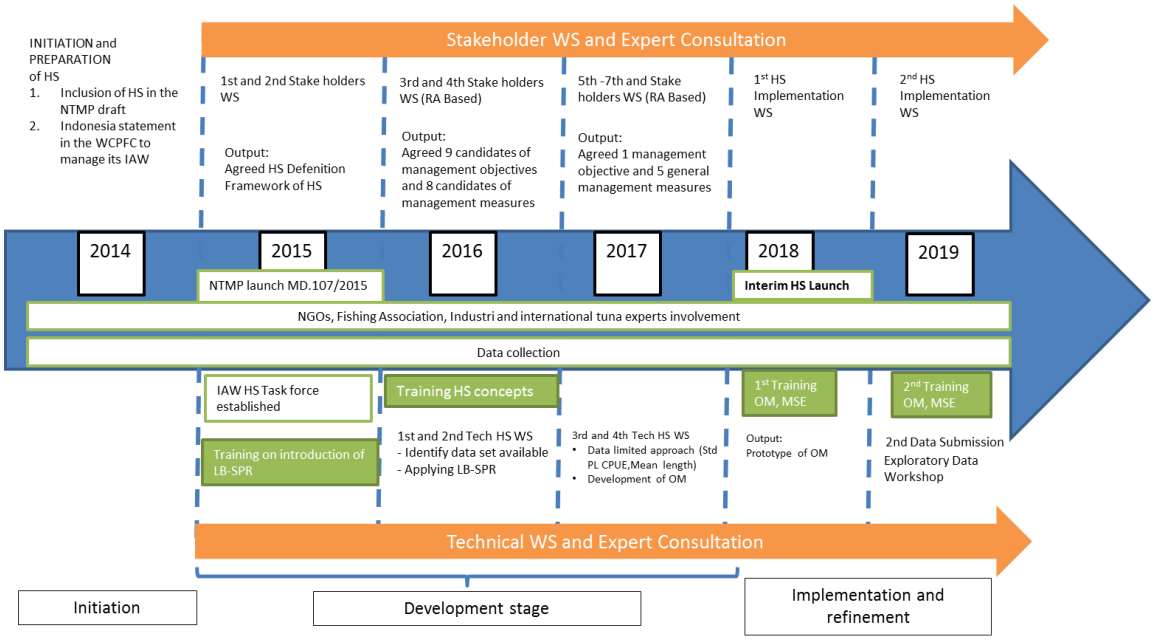

Figure 1. Summary of Harvest Strategy Development Process for Tropical Tuna in the Indonesia's Archipelagic Waters (modified from Satria and Sadiyah (2018))

Table 1. Summary of six datasets submitted to Second data submission in March 2019.

Data series name	Data collection type	Sampling period	Sampling frequency	FMA coverage	% landing/gear coverage	Source of effort/catch data	Rel. abundance?	Size indices?
CFR - WPEA-SM	Port sampling	2016 - 2018	Daily	713 - 715	30% of # vessels landed. PL, PS, SHL, TLH, TR, LHL, LL	Effort (fishing days, hooks), total catch volume per port-sampled vessel	√, SKP, YFT, BET, ALB (Bitung)	√
DGCF - Logbook	Fisher logsheet	2016 - 2018	Setting	713 - 715	PL, PS, HL, LL	Effort (fishing days, hooks), Catch (per landing by species)	SKJ, YFT, BET	N/A
DGCF - Observer	Observer	2016 - 2018	Setting	713 - 715	PL, HL, LL, PS	Effort (fishing days, setting, hooks), Catch (per vessel by species)	SKJ, YFT, BET	Weight
MDPI	Port sampling	2016 - 2018	Daily	713 - 715	HL, PL, PS, TL	Effort (fishing days), Catch (per landing by species)	BET, SKJ, YFT	√
AP2HI	Observer	2017 - 2018	Setting	713 - 715	PL	Effort (fishing days), Catch (per setting by species)	BET, SKJ, YFT	√
SFP-LINI	Port sampling	2016 - 2018	Daily	713 - 715	HL	Effort (fishing days), Catch (per landing by species)	BET, SKJ, YFT	√

Notes: CFR – Center for Fisheries Research; DGCF – Directorate General for Capture Fisheries; MDPI – Masyarakat dan Perikanan Indonesia; AP2HI – Asosiasi Perikanan Pole and Line dan Handline Indonesia; SFP – Sustainable Fisheries Partnership; WPEA-SM – West Pacific East Asia-Sustainable Management.

Table 2. Number of pole and line trips collected (the first and second data submissions combined). The first submission is data from 2010 – 2015 and the second submission is data from 2016 – 2018.

Data series name	2010	2011	2012	2013	2014	2015	2016	2017	2018
CFR – WPEA-SM	657	584	391	572	557	283	61	396	128
MDPI	-	-	-	34	50	37	604	106	24
ACIAR	-	-	-	16	74	27	-	-	-
SFP	-	-	-	-	-	-	-	-	-
AP2HI	-	-	-	-	-	-	-	20	89
DGCF - Logbook	-	-	110	650	669	670	591	671	704
DGCF - Observer	-	-	-	-	-	-	15	8	60

Table 3. Number of handline trips collected (the first and second data submissions combined). The first submission is data from 2010 – 2015 and the second submission is data from 2016 – 2018.

Data series name	2010	2011	2012	2013	2014	2015	2016	2017	2018
CFR – WPEA-SM	706	1619	1121	2174	1809	1042	3805	3367	4166
MDPI	-	-	226	1363	1657	4068	4944	4874	5246
ACIAR	-	-	-	76	145	162	-	-	-
SFP	-	-	-	-	-	194	345	1313	1321
AP2HI	-	-	-	-	-	-	-	-	-
DGCF - Logbook	-	-	50	187	345	376	402	320	441
DGCF- Observer	-	-	-	-	-	-	8	-	9

Table 4. Number of longline trips collected (the first and second data submissions combined). The first submission is data from 2010 – 2015 and the second submission is data from 2016 – 2018.

Data series name	2010	2011	2012	2013	2014	2015	2016	2017	2018
CFR – WPEA-SM	131	196	164	40	63	12	30	34	131
MDPI	-	-	-	-	-	-	-	-	-
ACIAR	-	-	-	-	-	-	-	-	-
SFP	-	-	-	-	-	-	-	-	-
AP2HI	-	-	-	-	-	-	-	-	-
DGCF - Logbook	-	-	22	167	25	30	13	51	16
DGCF - Observer	-	-	-	-	-	-	-	12	1