COMMON OCEANS

Project: Sustainable Management of Tuna Fisheries
and Biodiversity Conservation in the ABNJ

ABNJ Workshop Summary Report: Indian Ocean Tuna Harvest Strategies Capacity Building

Colombo, Sri Lanka | 22-23 March 2017

April 2017

Partners: FAO, gef, WWF, ISSF

With support of: Ocean Outcomes

Executive Summary

A capacity building workshop was held in Colombo, Sri Lanka on 22-23 March 2017 with a goal to create a better understanding among Indian Ocean States of the precautionary approach, Harvest Strategies (HSs) and management strategy evaluation (MSE) for sustainable tuna fisheries. Interest in the workshop was underscored by the participation of 29 individuals from 15 countries, representing a diverse range of roles and experience in Indian Ocean Tuna Commission (IOTC) processes.

The workshop was part of the “Sustainable Management of Tuna Fisheries and Biodiversity Conservation in Areas Beyond National Jurisdiction” (ABNJ Tuna Project). On 5 November 2013, the Global Environment Facility approved the five-year ABNJ Tuna Project, which the United Nations Food and Agriculture Organization (FAO) coordinates.

The workshop featured an agenda of creative interaction and dialogue among participants, aimed at providing hands on opportunities to learn harvest strategy concepts and run mock simulations of management strategy evaluations of harvest control rules. Presentations and facilitation were given in English, but where possible, written materials also were provided to participants in French. Breakout sessions were conducted in both French and English.

Evaluation results from the workshop indicated that attendees gained an increased understanding of the importance of HSs and significantly increased both their knowledge of HS principles and concepts and also their confidence in being able to apply them in Commission settings. Participants expressed a strong need for Commission assistance for additional resources to enhance in-country training and engagement of managers, fishers and stakeholders, as well as to develop national level science expertise to support Commission level HS processes. There was strong support among workshop participants for sustainable tuna management enabled by deliberate management strategy evaluation of tradeoffs among potentially competing management objectives.

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Introduction

A capacity building workshop was held in Colombo, Sri Lanka on 22-23 March 2017 with a goal to create a better understanding among Indian Ocean States of the precautionary approach, Harvest Strategies (HSs) and management strategy evaluation (MSE) for sustainable tuna fisheries. Ultimately, a key objective of the workshop was to help accelerate the development of tuna HSs within the Indian Ocean via a unique agenda incorporating the key elements of fisheries management issues currently relevant to Indian Ocean Tuna Commission (IOTC) members. Interest in the workshop was underscored by the participation of 29 individuals from 15 countries and assistance from another 15 resource experts. (Appendix A).

The workshop was part of the "Sustainable Management of Tuna Fisheries and Biodiversity Conservation in Areas Beyond National Jurisdiction" (ABNJ Tuna Project). On 5 November 2013, the Global Environment Facility approved the five-year ABNJ Tuna Project, which the United Nations Food and Agriculture Organization (FAO) coordinates. The overarching project is focusing on three component areas:

1) Supporting implementation of sustainable and efficient fisheries management and fishing practices;
2) Reducing illegal, unreported and unregulated fishing through strengthened and harmonized monitoring, control and surveillance; and
3) Reducing ecosystem impacts from tuna fishing, including bycatch and associated species.

WWF is the lead organization for a number of the ABNJ Tuna Project outputs, including supporting the improved understanding of the application of the precautionary approach through HSs by tuna Regional Fisheries Management Organisations (RFMOs).

The March 2017 Sri Lanka workshop was the second of two rounds of workshops planned for each tuna RFMO over the 5-year life of the ABNJ tuna project. The first Indian Ocean workshop was held in Sri Lanka in 2014.

In accordance with the ABNJ Tuna Project, funding for attendance at the workshop was only provided for participants from developing countries, however the workshop was open to all Indian Ocean coastal states and IOTC members.

Sri Lanka 2017 Workshop Goals, Objectives & Design

Within this overall project background and context, a specific goal and objectives were developed for the workshop to guide the design of an agenda and approach.

Overall Workshop Goal

Build capacity of decision-makers (primary target audience) so that they can engage in tuna RFMO management deliberations in an informed manner and have a reasonable chance of effectively representing their interests in a way that is also consistent with sustainable resource outcomes – i.e., 'level the playing field' so that commissioners from countries with less sophisticated management systems and technical support can meaningfully participate in

RFMO decision making regarding harvest strategies-harvest control rules (HS-HCRs).

Workshop Context, Agenda & Summary

Context

Lack of clearly defined HCRs among tuna RFMOs is a central weakness and threat to maximizing long-term fishery benefits from global tuna management. The most powerful states routinely block effective, progressive management decisions within multi-national tuna RFMOs to protect their perceived harvest allocation interests. Decision processes around HS-HCRs are technically complex. Historically communications between scientists and decision makers have been ineffective at creating sufficient understanding among commissioners for them to effectively engage in and influence the decision process. This workshop was intended to help remedy that gap by increasing understanding of all states to engage, particularly by using simpler and more creative communication and interaction strategies aimed at the target commissioner audience.

Agenda

The workshop's agenda is in Appendix B. General design elements included a focus on HS principles and management roles on Day 1, coupled with a Day 2 focus on HCRs and MSE. The agenda was designed to be interactive with emphasis on active dialogue rather than presentations.

Day 1 Summary

The Hon. Mr. Mahinda Amaraweera, the Sri Lankan Minister of Fisheries and Aquatic Resources Development, opened the workshop with a welcoming address (Figure 1). The first day was designed in a bookend fashion with presentations by Alejandro Anganuzzi and Wetjens Dimmlich on the ABNJ project and the workshop's context. Dale Kolody introduced harvest strategy concepts. This introduction was followed by two interactive, small group breakout sessions designed around storytelling and game strategies to engage participants, in order to create learning through sharing and discussion. To maximise involvement, the participants were broadly grouped into tables where either English or French was the primary language spoken. Finally the bookend was completed via a presentation by Dr. Jerry Scott to reinforce information around any HS principles, while also reviewing example outputs of harvest strategy analyses that scientists would be providing decision makers in the IOTC process.

The first of the breakouts was designed to get the participants thinking about the commission process and management objectives. Each member of the group rolled a large die with the following fishery management process roles represented: commissioner, fisheries minister, stock assessment scientist, fisher, RFMO Secretariat, and NGO campaigner (Figure 2). The participant would then discuss that stakeholder's role and objectives in relation to a series of situations (maximize employment, maintain livelihood of local fishers, maximize average catch, stay above B_{lim}, keep stock in "green"/safe zone, minimize annual variation, and minimize ecosystem impacts).

Figure 1. Sri Lanka Minister of Fisheries and Aquatic Resources Development, the Hon. Mr. Mahinda Amaraweera, opened the Sri Lanka ABNJ 2017 workshop with a welcoming address.

The central idea here was a tool to get dialogue started at the workshop and to support the objective of helping participants understand different roles in the process and help them clearly envision where and how decision making engagement can effectively occur. Each group reported back on their key learnings or points of interest. The exercise was effective in breaking the ice and naturally leading to further discussions. It also highlighted that the understanding of some roles (e.g., RFMO Secretariat) is limited.

Results of the large group discussion are below:

1. Maximize Employment
    a. Fisher: protecting their turfs from foreign fleets, maintain rights
    b. Commissioners: harvest and supply chain
    c. NGO: safety issues, slave labor
    d. Minister: getting votes
    e. Secretariat: silence and collecting data
    f. Scientists: want options and good science
2. Maintain livelihood of local fishers
    a. Fisher: maintain infrastructure, capacity building, value-added processing
    b. Commissioners: maintain good legislation, be aware of the consequences that commissioners decisions would have on local fishers

   c. NGO: support co-management
   d. Minister: make good decisions and strategies
   e. Secretariat: make good decisions and strategies
   f. Scientists: provide good advice to decision makers
3. Maximise average catch
   a. Fisher: best decisions
   b. Commissioners: juveniles, compliance,
   c. NGO: ecosystem impacts
   d. Minister:
   e. Secretariat: logistics and data
   f. Scientists:
4. Stay above B_{lim}
   a. Fisher: maintain logbook, co-management, follow the rules
   b. Commissioners: need info to make decisions
   c. NGO:
   d. Minister: communicate message
   e. RFMOs: metrics and explain rules
   f. Scientists: collect data and test assumptions
5. Keep stock in “green” zone/safe zone
   a. Fisher: collect data in logbooks, understand rule and laws before going out to fish
   b. Commissioners: oversee management of stocks
   c. NGO: provide awareness
   d. Minister: provide enforcement,
   e. Secretariat: pass information into law
   f. RFMOs: hold meetings
   g. Comoros comment - need to discuss the role of media. NGOs go to the media for awareness. Ministers are concerned about their public image and the media can play a role in that.
6. Minimize annual variation
   a. Fisher: depends on type of fisher, need to take precautionary approach, but ensure they can pay back rents
   b. Commissioners: should take all perspectives into consideration
   c. NGO: desire to have lesser quota and obey harvest control rule
   d. Minister: deciding on quota system, TAC is important to ensure sustainable livelihood
   e. Secretariat: total stock should be taken into consideration when making decisions
   f. Scientists: TAC should be set on annual basis
   g. Question: when demand is high, fishers will more to maximize profit
      i. NE Seafood response: NE Seafoods tries to source from multiple regions to meet demand, but not overfish the stocks in one area
7. Minimize ecosystem impacts
   a. Fisher: need to maintain their livelihoods
   b. Commissioners: reduce bycatch

c. NGO: community mobilizations, fishers are poor so need NGO support to motivate poor fishers
d. Minister: No observations
e. Secretariat: provide advice and guidance, gather and disseminate information to member states, follow up from member states to submit their data
f. Scientists: No observations

Figure 2. Dice used to facilitate small group breakout sessions and storytelling - Sri Lanka 2017 ABNJ workshop.

The second small group breakout consisted of a game to take 24 harvest strategy principles and arrange/map them on the floor in a way that seemed logical with respect to their interrelationships (Figure 3). The intent was to help build an understanding of these principles and their relationship in the management process by sharing ideas and their rationale. A resource person fluent in the group's language assisted each group to answer questions about particular concepts as the need arose, but with the simple purpose to provide helpful information and not guide or direct the exercise. The exercise generated significant discussion and helped identify gaps in understanding. While there were core themes in the mapping, no two groups mapped the principles in the exactly same way.

Figure 3. Arranging harvest strategy principles during small group, breakout session at the Sri Lanka 2017 ABNJ workshop.

Day 2 Summary

After an opening recap of Day 1 led by the facilitator, Mr. Ian Cartwright, the agenda was designed to more fully introduce harvest control rules (HCRs) and management strategy

evaluation (MSE) aspects of tuna harvest strategies. This comprised a mix of presentation material with small group, breakout sessions where participants got hands on experience running and 'playing with' a simplified MSE model, coined the 'tuna MSE'.

Following Mr. Cartwright's preview of the session, Alejandro Anganuzzi provided an introduction to MSE concepts and approaches. Dan Fu presented on management objectives and performance measures used to evaluate MSE results and led participants into a group sessions using the tuna MSE (Figure 4). The first exercise was to introduce participants to the TunaMSE R program and get them familiarized with the interface using the 'manual projection' tab. After participants were comfortable with the tool, they were asked to build on their understanding of MSE by exploring the difference between manual and Harvest Control Rule (HCR) projections; HCR projections using constant catch to maximize long-term average catch; and HCR projections using the threshold rule to maximize long-term average catch.

The last of the exercises was a competition among tables to find the best HCR for four different scenarios:

1. Maximising long term catch, maintaining the stock in the green where Pgreen ≥ 50%
2. Maximising long term catch, maintaining the stock in the green where Pgreen ≥ 60%
3. Maximising Pgreen, while ensuring long-term catch being above 340,000 t
4. Minimizing annual catch variation, maintaining the stock in the green zone (Pgreen ≥ 50%), while maintain long-term catch at or above 340,000 t

Figure 4. Working with tuna MSE demonstration tool - breakout session at the Sri Lanka 2017 ABNJ workshop.

The winning table of each round received a large bar of chocolate. The participants were animated during the exercise and enthusiastically engaged in the competition. A key to maintaining the participants' engagement through the end was to have each group's answers to the questions visible on the main screen. In this scenario, we used an excel spreadsheet so that the groups could see how they measured up against each other. This heightened the sense of friendly competition.

After the MSE competition, Dale Kolody and Alejandro Anganuzzi linked the workshop's goals to applications made within IOTC. Finally, facilitator Ian Cartwright wrapped up the workshop with discussions about what went well with the workshop design, what might be improved and what participants might do moving forward to apply the knowledge learned.

Workshop Evaluation Feedback

Participants (including any resource people who chose to respond) completed an evaluation form at the end of the workshop (Appendix C). The form's key purposes were to assess ABNJ Tuna Project metrics and help understand how well workshop objectives had been met, particularly whether attendees: (1) gained an improved understanding of HS and HCR principles and tools; which (2) would enable their more effective engagement in tuna RFMO processes designed to adopt related policies and management measures. This section reviews the results of various aspects of the 31 surveys that were completed in writing at the workshop and then subsequently entered into SurveyMonkey software to assist with analysis.

Demographics of Participants

The survey included four questions to gather background on the participants with respect to their attendance at RFMO related meetings, their roles, their country/organization affiliations and their experience.

RFMO related meetings attended

Nearly 50% of the participants participate in fisheries preparatory meetings in their home countries, and 83% of the participants attend IOTC meetings (commission meetings, working parties, and scientific meetings). Those not involved in Commission processes included some of the workshop organizers, consultants and NGOs.

Participant Roles

Attendees reflected a diverse mix and sometimes multiple roles among the choices of fisheries manager/director (52%), scientific advice (19%), management advice (26%), policy advice (10%), NGO (13%), and industry member (3%). Another 10% identified other roles that included law and food safety.

Country/organization affiliation and language

Participants predominantly identified themselves as being from an IOTC Contracting Party (93%), developing state (14%), and coastal state (24%), while 3-7% identified with IOTC observer status, IOTC Cooperator or developed state. Attendees represented a diversity of languages with English, French, Portuguese noted.

Years in the fisheries sector

Responses ranged from 7 months to 44 years of experience in the fisheries sector, with an average of 16 years and a median of 20 years.

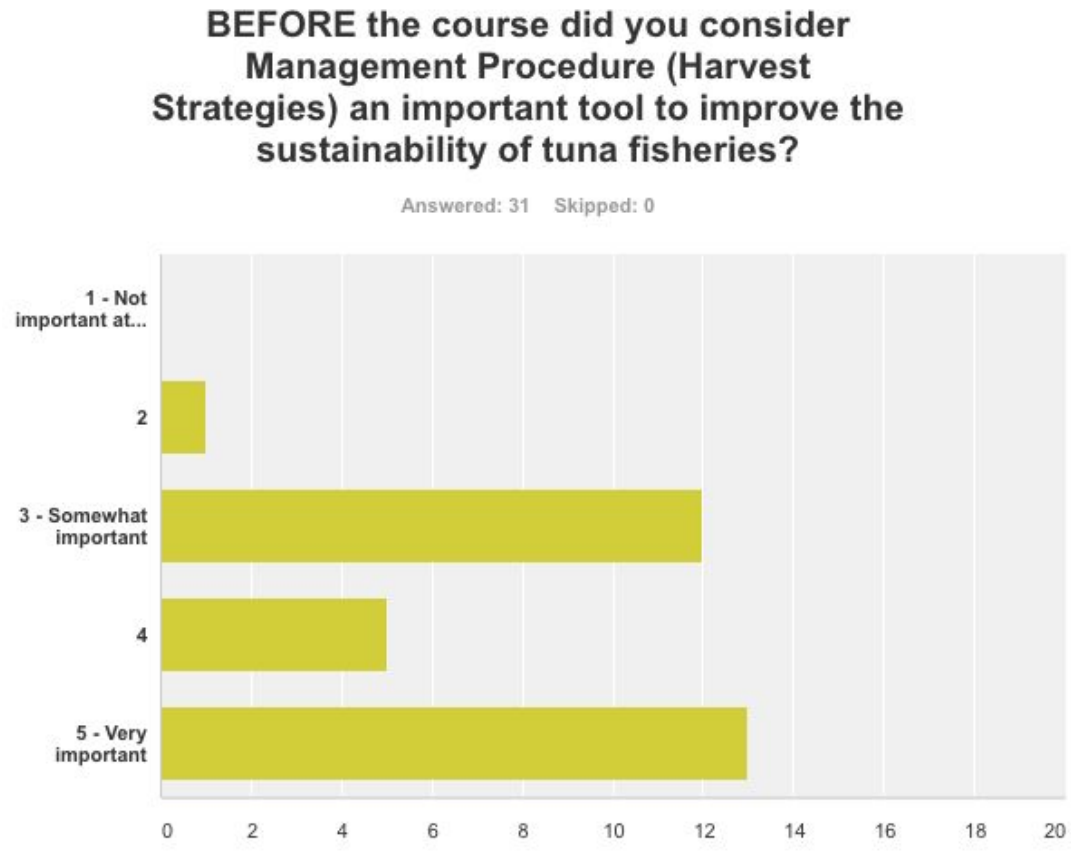
Gender

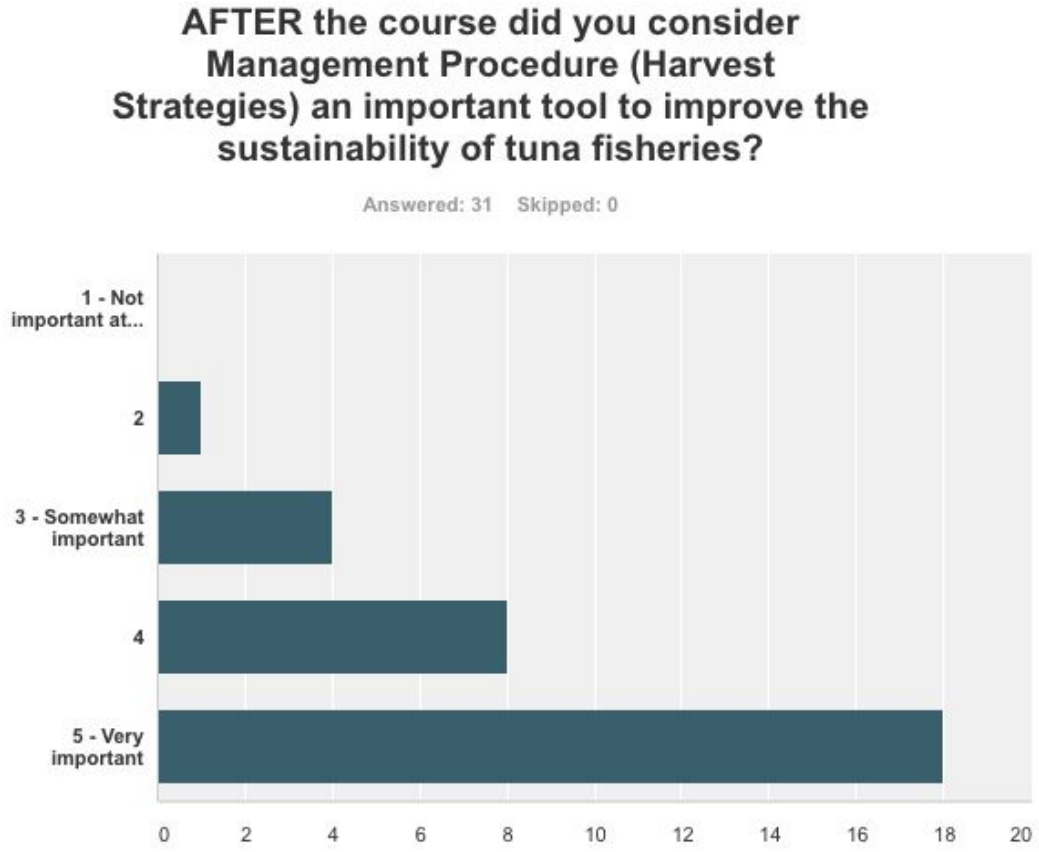
The survey did not include a question on gender, however gender of participants was noted at the workshop to meet the ABNJ Tuna Project reporting metrics. Of the 26 participants, 13 observers, 9 were female (23%) and 30 were male (77%).

Before & After Awareness

The survey asked participants how important they considered HS to be as a tool to improve the sustainability of tuna fisheries - before and after the workshop (on a scale of 1 to 5, with 1= not very important at all and 5 = very important). The before workshop responses averaged 4, with 42% indicating HS to be very important and 42% indicating only somewhat important or less. In comparison the after workshop rankings averaged 4.4, with 58% indicating HS to be very important and 16% indicating somewhat important or less (Table 1).

Table 1. Before and after confidence in engaging in management dialogues indicated by Sri Lanka 2017 workshop participants. Based on a ranking scale of 1 to 5, where 1 = not confident at all and 5 = very confident.

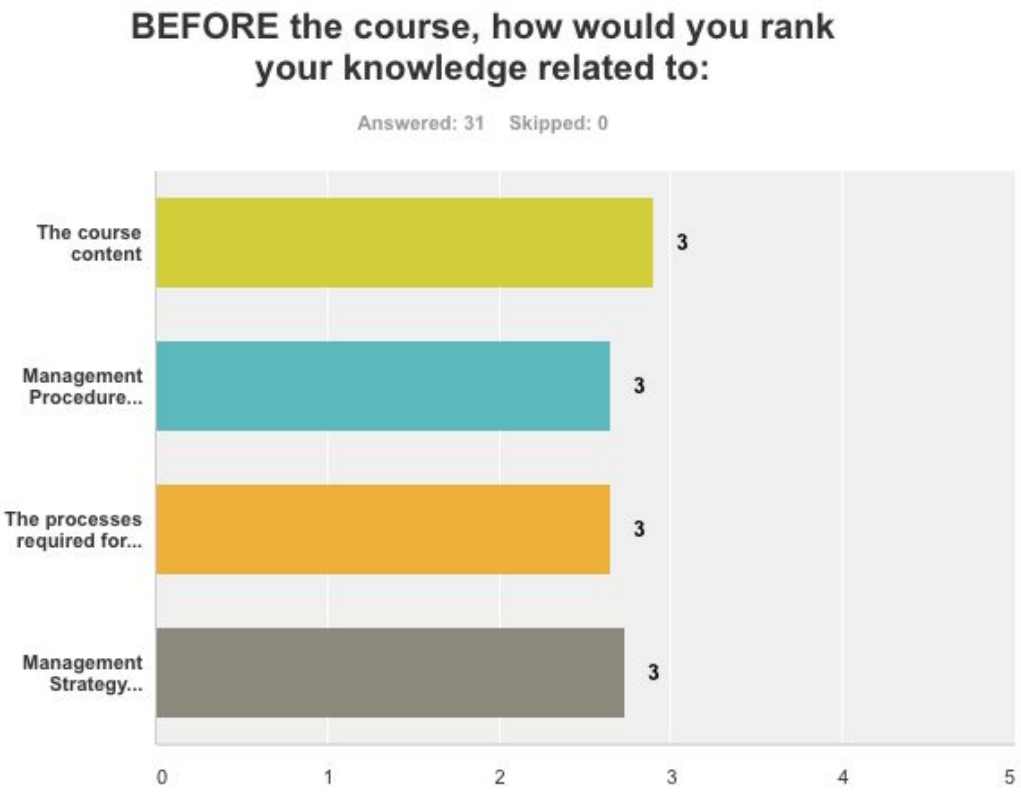


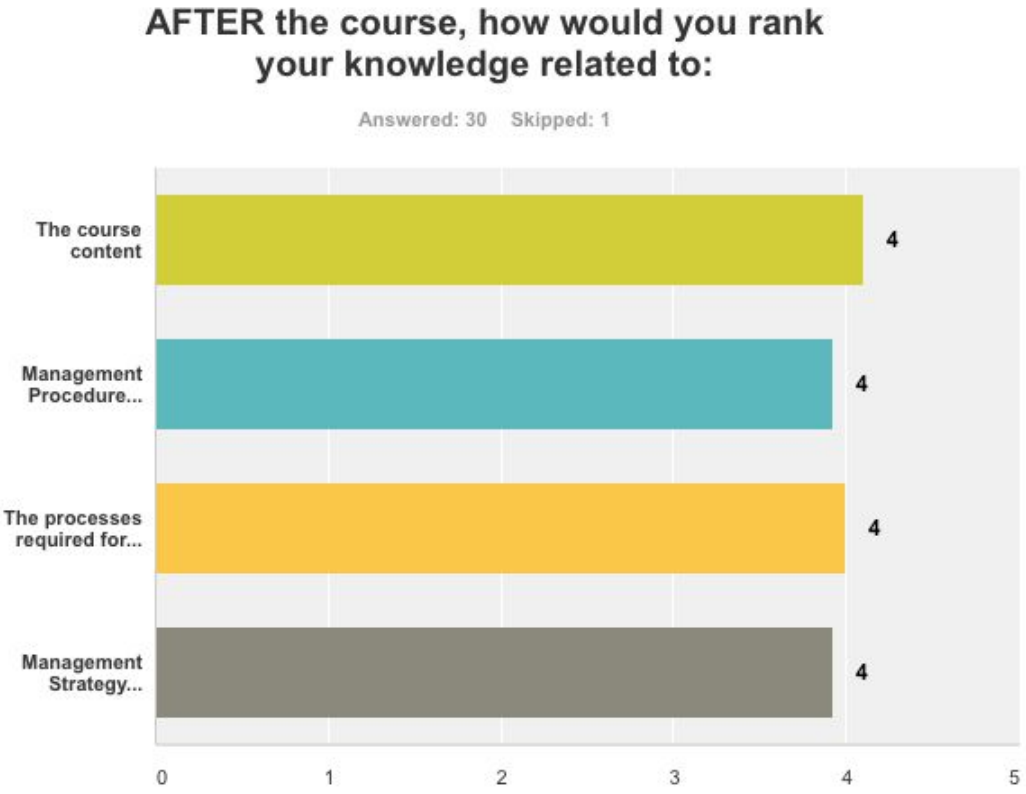


Before & After Knowledge

Participants were asked to rank their knowledge of 'course content' from a before and after workshop standpoint related to three topical areas: (1) harvest strategies and reference points; (2) processes within IOTC for further development and implementation of harvest strategies and conservation measures; and (3) Management Strategy Evaluation (MSE) to compare trade offs among achieving different fishery objectives. In all categories responses indicate sizable increase in knowledge as summarized in Table 2.

Table 2. Before and after knowledge indicated by Sri Lanka 2017 workshop participants in three key areas discussed. Based on a ranking scale of 1 to 5, where 1 = limited and 5 = very good.


BEFORE the course, how would you rank your knowledge related to:
Answered: 31 Skipped: 0
The course content
Management Procedure...
The processes required for...
Management Strategy...
3
3
3
3
0
1
2
3
4
5


AFTER the course, how would you rank your knowledge related to:
Answered: 30 Skipped: 1
The course content
Management Procedure...
The processes required for...
Management Strategy...
4
4
4
4
0
1
2
3
4
5

TOPICAL AREA	BEFORE		AFTER	
	Average ranking	Percentage of above average responses (i.e., 4 or 5)	Average ranking	Percentage of above average responses (i.e., 4 or 5)
Knowledge of the use of Harvest Strategies and reference points for management of tuna stocks	2.7	26%	3.9	80%
Knowledge of the IOTC processes to further development and implementation of harvest strategies and conservation measures	2.7	19%	4.0	80%
Knowledge of Management Strategy Evaluation (MSE) to compare trade offs among achieving different fishery objectives	2.7	26%	3.9	70%

Effectiveness of Workshop Content

The evaluation survey was designed to gather information on the workshop's possible impact on the participants' level of understanding of key harvest strategy principles and concepts, and whether that understanding would support the use of these ideas and a confidence to engage in Commission dialogues surrounding development and implementation of HS-HCR type management measures. The results from these queries is summarized below.

Improved Understanding

Participants were asked whether they had a similar or improved level of understanding after the workshop surrounding nine topical areas, which included various harvest strategy principles, how these principles are used by IOTC, the roles of different actors in the Commission process, types of management objectives, an understanding of trade offs among objectives and why harvest strategies are tested with simulation models.

Responses indicated that nearly 90% of the attendees had an improved understanding of how management principles are used by the IOTC to manage fisheries; the advantages of using HS to manage a fishery; and what the precautionary approach to management is. Questions that scored between an 80-89% rating were: the types of performance objectives for the fishery (86%); and why harvest strategies are tested in simulation models (81%).

Questions that scored a 70-79% rating were: the difference between a target and limit reference point (72%); that objectives may require trade offs (70%); what the next steps are for the IOTC to adopt a Management Procedure for tuna species (79%); and the role of the different actors in the harvest strategy decision-making process (77%). For the following workshop, some concentration should be put into making sure these lower scoring topical

areas are addressed more thoroughly.

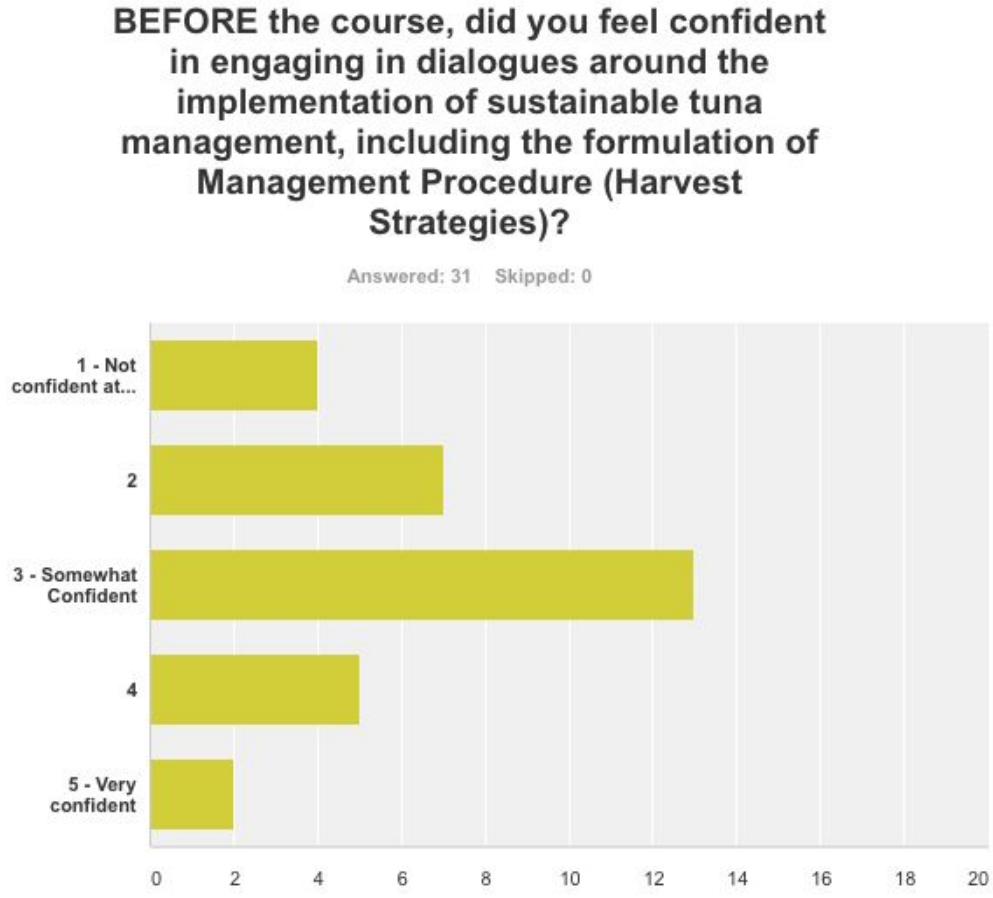
Expected Use of Knowledge

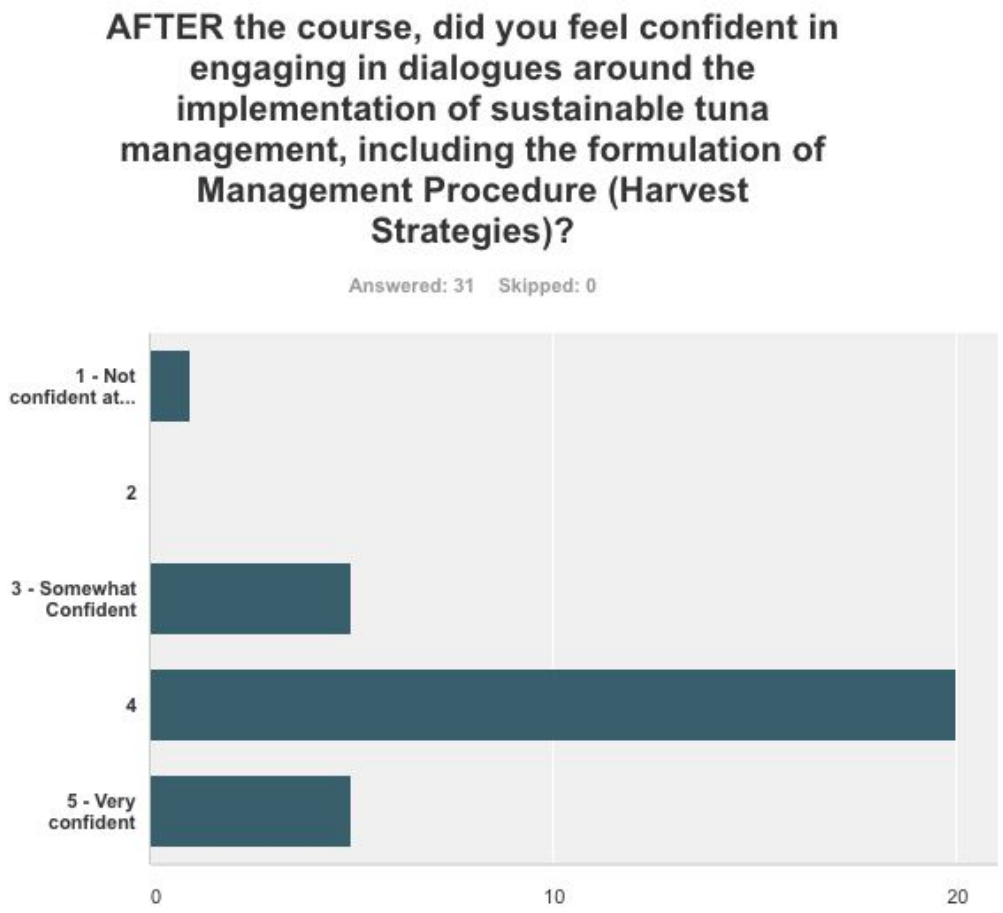
When asked if they would use the knowledge gained at the workshop in each of the preceding nine topical areas, over 85% respondents replied 'yes', with the range from 86 to 100%.

Confidence to Engage in Management Process Dialogues

Participants were asked to rank their confidence to engage in dialogues around the implementation of sustainable tuna management including the formulation of harvest strategies, from a before and after workshop standpoint. Respondents noted a significant increase in confidence to do so after the workshop as summarized below in Table 3.

Table 3. Before and after confidence in engaging in management dialogues indicated by Sri Lanka 2017 workshop participants. Based on a ranking scale of 1 to 5, where 1 = not confident at all and 5 = very confident.





TOPICAL AREA	BEFORE		AFTER	
	Average ranking	Percentage of above average responses (i.e., 4 or 5)	Average ranking	Percentage of above average responses (i.e., 4 or 5)
Confidence to engage in dialogues around the implementation of sustainable tuna management including the formulation of harvest strategies	2.81	23%	3.9	81%

Workshop Delivery

The survey included questions about the amount and level of content presented and discussed, where 97% of the respondents indicated that the quantity of material was 'good' (on a 1 to 3 scale from 'not enough' to 'too much'). Similarly, 93% of attendees rated the level of content 'good' (on a 1 to 3 scale from 'too simplistic' to 'too complicated').

Written comments on the questionnaires added some additional thoughts to these ratings, a

number of which were echoed in workshop discussions. While the level of content was rated as 'good' there were some comments that scientists should be mindful that managers benefit from simplified language, explanations, and speaking slower as many of the attendees did not have English as their native language. Many suggested that receiving the presentation material in advance of the meeting would help people digest it, be better prepared to engage, and able to take notes. Finally there was some discussion about the potential need for a longer than 2-day meeting given first, the complexity and depth of material; and second; the need to rest between arrival and start of workshop so that they are better alert Day 1.

Other Insights: Future Workshops & Commission Process

Besides the evaluation survey results summarized above, considerable feedback was received from workshop participants during the Day 2 wrap-up and through one-on-one discussions.

Highlights from Participants

A number of important ideas were expressed by the participants that have implications for future workshops and Commission processes. A few of these are highlighted below:

- **English language a barrier for a number of native French, Portuguese, and Arabic speakers –**

  Multilingual resource people assisted during each breakout session and participants were organized to take best advantage of this assistance. But the challenge was a key impediment. Some solutions suggested were to have resource materials translated into Portuguese or Arabic (French and Spanish translations already existed) and having the presenters and facilitators enunciate and speak slower.

- **Incorporate more breakout sessions to break up longer lectures**

  Though attendees gave positive feedback to the presentations, a few did comment that some of the presentations were long and made it difficult to follow along. It was suggested that more breakout sessions or small group activities be incorporated to break up the longer lectures.

- **Some confusion with the dice game**

  In regards to the first breakout session activity, the dice game, some participants found it confusing and were not able to engage as well as they could have. Suggestions would be to explain the game better at first or completely revise the game so that the objective is more straight-forward.

- **Revisions to TunaMSE activity Day 2**

  Because much of the TunaMSE activities relied on attendees to understand the interface, it was suggested that the presenter do a live demo of the interface to get the audience familiar to the interface. In addition, in regards to the competition, it was suggested that groups move through the problem sets together and regroup at the end of each problem, as opposed to giving all of the problems at once and checking back with them 45 minutes later.

Topics in Need More Attention

The final question asked of participants was to list topics that they would like to see in future

workshops and/or would have liked to have more attention on during the current workshop. These suggested responses are divided into sections:

- **Data collection**
  - Methods that countries use to collect fisheries data for their stock assessments
  - Best practices for data collection and sharing
- **The validation process for each type of fishing gear and fishing grounds**
  - How RFMOs should take necessary actions to help fishery harbors be ready to implement the new rules and collect data
  - Existing research on tuna food chain and greater food web
- **Management Procedure (MP)/HS/HCR processes**
  - How MP/HRC are adopted in IOTC meetings
  - What are the decision-making processes
  - Development of management objectives, HCRs, and science communication
  - Intent and relationship of HS principles - possible more pre-meeting material on this as a way of testing uptake through floor tile game
- **Details of MSE**
  - Cost of MSE (money, time, human energy)
  - Basic concepts of allocations
- **Obstacles**
  - Define strategies and approaches
  - Resolutions, the evolution, and the constraints

Acknowledgements

A design team of Rich Lincoln (O2), Daniel Suddaby (O2), and Alejandro Anganuzzi (FAO) worked closely with project partners to assist with planning content and approach for the Sri Lanka 2017 workshop. Chris Grieve (Meridian Prime) and Mr. Lincoln were responsible for creative design of the interactive breakouts that used storytelling and game strategies, while Mr. Anganuzzi provided contextual analysis throughout the workshop. A big thanks to Dr. Andre Punt who created the tuna management strategy evaluation (MSE) demonstration tool that allowed participants the hands-on training opportunity to test the implications of various HCRs on achievement of fishery performance metrics.

A special thanks goes to Yelmaz Mujtaba (WWF Pakistan), Umair Shahid (WWF Pakistan), and Angelina Skowronski (O2) for their central role in organizing the workshop and for making its conduct seamless under a set of remarkably challenging circumstances. Special guidance for the workshop was provided by Jerry Scott (ISSF) and Dale Kolody (CSIRO).

The success of the workshop would not have been possible without the masterful facilitation and entertainment skills of Ian Cartwright and the excellent presentations of The Hon. Minister Mahinda Amaraweera, Wetjens Dimmlich (WWF), Alejandro Anganuzzi, Dale Kolody, Dan Fu, and Jerry Scott. Additionally, we deeply appreciate the special assistance of Rab Nawaz (WWF Pakistan), Vinod Malayilethu (WWF India), Dr. Shiham Adam, and Achmad Mustofa (WWF Indonesia) as resource experts during the small group breakout sessions.

Appendix Materials

Appendix A: Participant List

PARTICIPANT LIST	
Name	Country
Mr. Duto Nugroho	Indonesia
Mr. Wudianto	Indonesia
Ms. Estela Chichava Juliao Mausse	Mozambique
Ms. Hadija Mussagy	Mozambique
Ms. Mwaka Barabara	Kenya
Mr. Shadrack Kamau	Kenya
Mr. Mahamoudou Abidina	Comoros
Ms. Mamaou Oulda Adbadllah Said	Comoros
Mr. Adam Ziyad	Maldives
Dr. Shiham Adam	Maldives
Mr.Ali Ramzani	Iran
Mr. Hedayat Allah Mirmoraadzehi	Iran
Ms. Yothakong Tirabhorn	Thailand
Mr. Wongkeaw Aekkarat	Thailand
Mr. Christian Nzowa	Tanzania
Mr. Shuya Nakatsuka	Japan
Mr. Masahiro Akiyama	Japan
Mr. Ahmed Darar Djibril	Djibouti
Mr. Asif Riaz	Pakistan
Mr. Allaudin Ahmed	Pakistan
Mr. Rodney Govinden	Seychelles
Mr. Muhammad Akbar Qazi	Pakistan
Ms. H P K Hewpathirarta	Sri Lanka
Ms. Mariam Sultana	Bangladesh

Mr. Mohammad Ismail Golder	Bangladesh
Ms. H L N Sandamali Herath	Sri Lanka

OBSERVERS

Name	Organization	Country
Mr. MM Ariyaratna	Ministry of Fisheries	Sri Lanka
Mr. Chintha Perera	Ministry of Fisheries	Sri Lanka
Mr. Ishara Rathnasooriya	Ministry of Fisheries	Sri Lanka
Mr. S A M Azmy	Ministry of Fisheries	Sri Lanka
Mr. Claude Fernando	Ministry of Fisheries	Sri Lanka
Mr. M C L Fernando	Ministry of Fisheries	Sri Lanka
Mr. W M M R Adikari	Ministry of Fisheries	Sri Lanka
Mr. Muhammad Khurshid	Ministry of Fisheries	Sri Lanka
Mr. Roshan Fernando	Ministry of Fisheries	Sri Lanka
Mr. W M Wanninayake	Ministry of Fisheries	Sri Lanka
Mr. Vinod Malayilethu	WWF	India
Mr. Achmad Mustofa	WWF	Indonesia
Ms. Cassie Leisk	New England Seafood	New England Seafood

PRESENTERS & RESOURCE PEOPLE

Name	Organization	Country
Alejandro Anganuzzi	FAO	Italy
Angelina Skowronski	Ocean Outcomes	USA
Dale Kolody	CSIRO	Australia
Dan Fu	IOTC	Seychelles
Daniel Suddaby	Ocean Outcomes	UK
Gerald Scott	ISSF	USA
Ian Cartwright	Thalassa Consulting	Australia
Rab Nawaz	WWF	Pakistan
Rich Lincoln	Ocean Outcomes	USA
Umair Shahid	WWF	Pakistan
Wetjens Dimmlich	WWF	Seychelles

Yelmaz Mujtaba	WWF	Pakistan
Minister Mahinda Amaraweera	Fisheries Minister	Sri Lanka

Appendix B: Agenda

Project: Sustainable Management of Tuna Fisheries and Biodiversity Conservation in the ABNJ

Smart Fishing Initiative

Areas Beyond National Jurisdiction: Indian Ocean Tuna Management Workshop

22 and 23 March 2017
Colombo, Sri Lanka

Workshop Aims

The goal of this workshop is to create a better understanding among Indian Ocean States of the precautionary approach, Harvest Strategies (HSs) and management strategy evaluation (MSE) for sustainable tuna fisheries in the context of tuna fisheries.

Ultimately, the objective of this workshop is to accelerate the development of tuna HSs within the Indian Ocean by creating a unique agenda that considers some of the key elements of fisheries management issues currently relevant to Indian Ocean Tuna Commission (IOTC) members. Participation in this workshop will empower coastal states to engage meaningfully in the developments that are occurring with Indian Ocean tuna management over the coming two-four years.

The Event

The workshop program will include discussion of Harvest Strategy frameworks and the principles of sound fisheries management. This workshop will provide the platform and background knowledge for participation in the Indian Ocean regional level MSE work, and will explain how MSEs contribute to the development of robust harvest strategies that are most likely to meet the objectives of IOTC members and stakeholders.

International experts, with specific experience and expertise in the IOTC, will present on these management themes both generally and in the context of the Indian Ocean. The Sri Lanka workshop will provide an introduction to: the precautionary principle, the process of HS development; the expected elements of a HS, for example management objectives, scope and levels of risk; the use of MSE to evaluate harvest control rules; and the application of HSs. Throughout the workshop, participants will also break out into small groups, to discuss relevant needs and issues specific to the Indian Ocean and allow for more in-depth understanding of how the concepts and tools presented in the workshop may assist in addressing them. On the second day of the workshop participants will embed their learning through MSE simulation exercises.

Workshop Context

The workshop is part of the "Sustainable Management of Tuna Fisheries and Biodiversity Conservation in Areas Beyond National Jurisdiction" (ABNJ Tuna Project). On 5 November 2013, the Global Environment Facility approved the five-year ABNJ Tuna Project, which the United Nations Food and Agriculture Organization coordinates. The overarching project will focus on three component areas:

1. Supporting implementation of sustainable and efficient fisheries management and fishing practices
2. Reducing illegal, unreported and unregulated (IUU) fishing through strengthened and harmonized monitoring, control and surveillance
3. Reducing ecosystem impacts from tuna fishing, including bycatch and associated species

WWF is the lead agency for a number of the ABNJ Tuna Project outputs, including supporting the improved understanding of the application of the precautionary approach through HSs by tuna Regional Fisheries Management Organisations (RFMOs).

The Sri Lanka Workshop is part of the first round of two rounds of workshops for each RFMO planned over the 5-year life of the ABNJ tuna project.

The Agenda

DAY ONE – 22 August 2017

0800 – 0850	REGISTRATION

0900 – 0930	OPENING	LARGE GROUP
	● Official Sri Lanka welcome	Alejandro Anganuzzi (IOTC) & Hon. Mr Mahinda Amaraweera, Minister of Fisheries & Aquatic Resources Development
0930 – 0945	PROJECT INTRODUCTIONS	LARGE GROUP
	● ABNJ Context: An ABNJ Overview	Alejandro Anganuzzi (ABNJ)
	● WWF Introduction	Wetjens Dimmlich
0945 – 1045	CONTEXT SETTING OVERVIEW	LARGE GROUP
	● Facilitators welcome and agenda summary	Ian Cartwright, Facilitator
	● Why We Are Here: Benefits	Alejandro Anganuzzi (IOTC)
	● Harvest strategy concepts	Dale Kolody
	● Context setting wrap up and set stage for Session 1	Ian Cartwright
1045 – 1115	BREAK	
1115 – 1230	SMALL GROUP SESSION 1	
	● **The Roles of Actors in Developing Harvest Strategies:** Exploring perspectives on management objectives	Ian Cartwright, Facilitator
	● Breakouts	
1230 – 1330	LUNCH	
1330 – 1500	SMALL GROUP SESSION 2	
	● **Harvest Strategy 101 Concepts**: Exploring and sharing participants' understanding	Ian Cartwright, Facilitator
	● Breakouts	
1500 – 1530	BREAK	

1530 – 1645	SMALL GROUP SESSION 3	
	Understanding Harvest Strategy Analyses: Kobe plots and other analytical outputs and understanding what they mean	Jerry Scott
	● Breakouts	
1645 – 1700	WRAP UP DAY 1	LARGE GROUP
	● Facilitated discussion	Ian Cartwright, Facilitator
1700	DAY 1 CLOSE	

DAY TWO – 23 August 2017

0900 - 0910	OPENING Day 1 reflections & Day 2 overview	LARGE GROUP Ian Cartwright, facilitator
0910 - 0930	**Management Strategy Evaluation (MSE) Concept Overview** ● Role of MSE	LARGE GROUP Alejandro Anganuzzi
0930 - 1030	SMALL GROUP SESSION 4 **Going Deeper:** Management objectives and performance measures to evaluate MSE results ● Basic Harvest Control Rules ○ What we do now ○ How to test decision choices on key management inputs ○ Simple automatic harvest control rule ● Breakouts	Dan Fu
1030 - 1100	BREAK	
1100 - 1230	SMALL GROUP SESSION 5 **Exploring Harvest Control Rules (HCRs)** ● Create and run various HCRs ● Comparing results and tradeoffs	Dan Fu

	• Simple automatic harvest control rule	
1230 - 1330	LUNCH	
1330 - 1500	SMALL GROUP SESSION 5 - Continued **Harvest Control 'Contest'** • The quest for an optimal solution	Dan Fu
1500 - 1530	BREAK	
1530 - 1600	PUTTING IT ALL TOGETHER • How this applies to upcoming IOTC processes	LARGE GROUP Dale Kolody & Alejandro Anganuzzi
1600 - 1630	HOW DID WE DO? • Workshop evaluation	LARGE GROUP Ian Cartwright, facilitator
1630 - 1700	WORKSHOP CLOSING • Closing thank you & send-off	LARGE GROUP Ian Cartwright, facilitator

Abbreviations/Acronyms

ABNJ	Areas Beyond National Jurisdiction
FAO	United Nations Food and Agriculture Organization
HS	Harvest Strategy
IOTC	Indian Ocean Tuna Commission
MSE	Management Strategy Evaluation
RFMO	Regional Fisheries Management Organization

Facilitator

Mr. Ian Cartwright – Thalassa Consulting

Ian Cartwright has worked in fisheries and fisheries management since 1975. He specialises in the development of fisheries policy and fisheries management arrangements including management plans. He provides a range of advice to governments, aid agencies and fisheries organisations in Australia and overseas. This work involves operating at the interface between industry, fisheries managers, researchers and NGOs and the brokering of mutually acceptable solutions to management issues. Past international work includes serving as the Deputy (Executive) Director of the Forum Fisheries Agency, facilitation of harvest strategy development for the Western and Central Pacific Fisheries Commission

and the development of national and state fisheries policies. Ian is currently a Commissioner of the Australian Management Authority and Chair of a number of fisheries management committees.

Moderators

Mr. Alejandro Anganuzzi – FAO

Mr. Alejandro Anganuzzi is currently the Global Coordinator for the Common Oceans Tuna Project, one of the four projects of the Common Oceans Programme, and the Executive Secretary (a.i.) of the Indian Ocean Tuna Commission. Mr. Anganuzzi is a biologist, originally from Argentina, who did postgraduate studies at the University of Washington, specializing in mathematical modelling of ecological systems. From 1984 to 1995, he worked for the Inter-American Tropical Tuna Commission (IATTC) in San Diego, California, on a range of environmental projects, including estimation of abundance of dolphins, modelling of tuna fisheries and development of statistical techniques for data analysis. In 1995, he assumed the direction of the Indo-Pacific Tuna Management and Development Programme (IPTP), a regional project of the United Nations Development Program and FAO, based in Sri Lanka, until 1997. In 1998, he became the Deputy Secretary and Science Manager of the Indian Ocean Tuna Commission (IOTC), until 2004, when he became the Executive Secretary of the IOTC. At the end of March 2013, he completed his third and final period as the Executive Secretary of IOTC. After June 2013, he became an advisor to the government of the Republic of Seychelles on fisheries management and Blue Economy matters until February 2014, when he assumed his current position in the Common Oceans Tuna Project. In May 2016, he was asked to take the position of Executive Secretary of IOTC once more, temporarily until a new official is appointed.

Dr. Wetjens Dimmlich – WWF

Wetjens Dimmlich is based in the Seychelles and leads the Indian Ocean Tuna Program for the World Wide Fund For Nature (WWF). Dr. Dimmlich completed his PhD in Fisheries Science at the University of Adelaide, Australia, under a scholarship funded by the South Australian tuna industry. He headed fisheries and oceanographic research units in the South Atlantic and Southern Oceans for 15 years, with a focus on pelagic species. He then moved into certification of sustainable fisheries, working with the Marine Stewardship Council (MSC), where he managed pelagic species under MSC assessment, including tunas, as well as contributing to the development of the MSC standard before finally spending several years managing the MSC's global fisheries accreditation program. He has been working with WWF since 2013 to support the development of sustainable fishing practices for tuna stocks in the Indian Ocean by coordinating WWF's initiatives to improve the management and sustainability of Indian Ocean tuna stocks, developing and managing Fisheries Improvement Projects (FIPs) throughout the coastal states of the Indian Ocean and leading WWF's stakeholder engagement with tuna fisheries seeking certification for sustainability.

Mr. Dan Fu – IOTC

Dan joined IOTC Secretariat since late 2016. Prior to joining IOTC, Dan has worked for 11 years as a Fishery Modeller in the National Institute of Water and Atmospheric Research of New Zealand (NIWA). Dan has ample experience in various aspects of fishery data analysis, including both age-and-length-structured models, as well as population modelling of marine mammals and seabirds. Dan has also been actively involved in developing analytic tools and software packages used for fishery

survey and catch sampling analysis, population modelling and assessment.

Dr. Dale Kolody – CSIRO

Dale Kolody has been involved with fisheries research since 1989, initially working with salmonids in western Canada, and predominantly tuna and billfish since joining CSIRO (Australia) in 2000. He also served 1-2 year stints at the Fisheries Research Services (Scotland), IOTC Secretariat (Seychelles) and SPC Oceanic Fisheries Programme (New Caledonia). His main research focus is stock assessment and management strategy evaluation, from the technical level through to communicating at the science-management interface, in domestic fisheries and a number of tuna-RFMO working groups (CCSBT, WCPFC and IOTC). He has been a curriculum developer and presenter in a few fisheries assessment and management training workshops.

Dr. Jerry Scott – Fisheries Consultant

Dr. Jerry Scott is an international consultant on fisheries issues and serves on ISSF's Scientific Advisory Committee. He has extensive experience, spanning more than 30 years, conducting quantitative stock assessment research on a diverse set of resources including Atlantic tunas and tuna-like species, marine mammals, coastal migratory pelagic and reef resources. In a former life, Jerry served as a director and senior advisor for the US NOAA-Fisheries Southeast Fisheries Science Center's (Miami, Florida) resource assessment research programs, conducting stock assessment research to support domestic and international management decisions on Atlantic, Gulf of Mexico, and Caribbean fisheries resources. From 2005 to 2010, he served as the elected chair of ICCAT's Standing Committee on Research and Statistics and was previously the chief US scientist to ICCAT.

Curriculum Development

Mr. Rich Lincoln – Ocean Outcomes

Rich Lincoln has over 40 years of varied experience in fisheries research, management and policy in the North Pacific and working on global fisheries sustainability. He is Founder and Senior Advisor of Ocean Outcomes, an international non-profit that specializes in working with communities and industry to improve the sustainability of globally significant fisheries. Prior positions included Wild Salmon Center Program Director, International Policy Director for the Marine Stewardship Council in London, UK, and a long association with the Washington Department of Fish and Wildlife in various research, management and policy leadership roles. These roles included serving as bilateral chair of the Pacific Salmon Commission's Fraser Panel under the U.S.-Canada Salmon Treaty and developing co-management plans with Pacific Northwest treaty Indian tribes. Rich has advised the UN's Food and Agriculture Organization on its adoption of international fisheries ecolabelling guidelines, is member of the Pacific Fisheries Management Council and serves as a U.S. advisor to the North Pacific Anadromous Fish Commission.

Daniel Suddaby – Ocean Outcomes

Born and raised in London, England, Daniel has always had a passion for coastal environments, the ocean, and marine life. This passion has led to a 15-year career in the field of fisheries and marine conservation. As O2's Policy Director Daniel is responsible for expanding O2's portfolio of work, policies, and strategies, working closely with O2's regional program teams to improve understanding and implementation of sustainable fishery management policies. Prior to O2 Daniel spent six years at World

Wildlife Fund (WWF), most recently as Deputy Leader of WWF's Smart Fishing Initiative. There he led, managed, and coordinated WWF global engagement in tuna fisheries and provided strategic direction to WWF international on seafood engagement strategy. His past experience also includes a role as Senior Fisheries Certification Manager for the Marine Stewardship Council (MSC) where he improved the credibility of fishery assessments, lead and managed the technical review process of the MSC fisheries team, and developed and implemented policies and processes to strengthen the MSC fisheries assessment program. When not saving the ocean, Daniel is a keen climber and hiker, and he enjoys getting out into the countryside as much as he can. Daniel holds a B.Sc in Biology from Royal Holloway, University of London and an M.Sc. in Conservation from University College London.

Appendix C: Survey Questions

Evaluation Form

ABNJ Indian Ocean Tuna Management Workshop

Colombo, Sri Lanka, 22 & 23 March 2017

We are collecting information on who attends the ABNJ harvest strategy workshops, what participants gained from them, and how we can improve future workshops. Please answer all questions that you can. The information will be aggregated with other answers collected, and any reports related to this feedback will not identify individual respondents. We appreciate your feedback as it will help to improve the value of future workshops.

Please provide any additional feedback or details to any questions if you would like. This should only take a few minutes. Thank you for your participation!

Workshop Participation

1) **Do you attend...** (circle all that apply)

Commission meetings	Scientific committee meetings	Working Parties to committees
Preparatory meetings within your country	None of these	Other (please specify) _____ _____

2) **Your role is...** (circle all that apply)

Fisheries manager/ director	Scientific advice	Management advice	
Policy advice	NGO	Industry member	Other (please specify) _____ _____

3) **Is your country/organisation considered:** (circle all that apply)

IOTC Contracting Party	IOTC Cooperators	IOTC Observer Status	
G77 State	Non-G77 State	Coastal State	Other (please specify) _____ _____

4) **Approximately how long have you been involved in the fishery sector?** _____ years

BEFORE the Course Awareness & Knowledge

5) **BEFORE the course, did you consider Management Procedure (Harvest Strategies) an important tool to improve the sustainability of tuna fisheries?** (circle one)

Not Important		Somewhat Important		Very Important
1	2	3	4	5

6) **BEFORE the course, how would you rank your knowledge of the course content?** (circle one)

Limited		Neither Limited nor Good		Very Good
1	2	3	4	5

7) **BEFORE the course, how would you rank your knowledge of the use of Management Procedure (Harvest Strategies) and reference points for management of tuna stocks?** (circle one)

Limited		Neither Limited nor Good		Very Good
1	2	3	4	5

8) **BEFORE the course, how would you rank your knowledge of the processes required for further development and implementation of Management Procedure (Harvest Strategies) and conservation measures in the IOTC?** (circle one)

Limited		Neither Limited nor Good		Very Good
1	2	3	4	5

9) **BEFORE the course, how would you rank your knowledge of Management Strategy Evaluations (MSE) to compare trade offs among achieving different fishery objectives?** (circle one)

Limited		Neither Limited nor Good		Very Good
1	2	3	4	5

AFTER the Course Awareness & Knowledge

10) **AFTER the course, do you consider Management Procedure (Harvest Strategies) an important tool to improve the sustainability of tuna fisheries?** (circle one)

Not Important		Somewhat Important		Very Important
1	2	3	4	5

11) **AFTER the course, how would you rank your knowledge of the course content?** (circle one)

Limited		Neither LImited nor Good		Very Good
1	2	3	4	5

12) **AFTER the course, how would you rank your knowledge of the use of Management Procedure (Harvest Strategies) and reference points for management of tuna stocks?** (circle one)

Limited		Neither LImited nor Good		Very Good
1	2	3	4	5

13) **AFTER the course, how would you rank your knowledge of the processes required for further development and implementation of Management Procedure (Harvest Strategies) and conservation measures in the IOTC?** (circle one)

Limited		Neither LImited nor Good		Very Good
1	2	3	4	5

14) **AFTER the course, how would you rank your knowledge of Management Strategy Evaluations (MSE) to compare trade offs among achieving different fishery objectives?** (circle one)

Limited		Neither LImited nor Good		Very Good
1	2	3	4	5

Effectiveness of Course Content

15) **Do you feel you have a better understanding of:** (circle one for each question)

A) How the management principles discussed in the workshop are used by IOTC to currently manage fisheries?	Same	Improved
→ Will you use this knowledge in your work?	Yes	No

B) The advantages of using a Management Procedure (Harvest Strategy) to manage a fishery?	Same	Improved
→ Will you use this knowledge in your work?	Yes	No
C) What the precautionary approach is to management?	Same	Improved
→ Will you use this knowledge in your work?	Yes	No
D) The difference between a target and limit reference points?	Same	Improved
→ Will you use this knowledge in your work?	Yes	No

16) **Do you feel you have a better understanding of:** (circle one for each question)

A) Types of performance objectives for the fishery?	Same	Improved
→ Will you use this knowledge in your work?	Yes	No
B) That objectives may require trade-offs?	Same	Improved
→ Will you use this knowledge in your work?	Yes	No
C) Why Management Procedure (Harvest Strategies) are tested in simulation models?	Same	Improved
→ Will you use this knowledge in your work?	Yes	No
D) What the next steps are for the IOTC to adopt a Management Procedure (Harvest Strategy) for tuna species?	Same	Improved
→ Will you use this knowledge in your work?	Yes	No
E) The role of the different actors in the Management Procedure (Harvest Strategy) decision-making process?	Same	Improved
→ Will you use this knowledge in your work?	Yes	No

Overall Effectiveness of Course Content

17) **BEFORE the course, did you feel confident in engaging in dialogues around the implementation of sustainable tuna management including the formulation of Management Procedure (Harvest Strategies)?** (circle one)

Not Confident At All		Somewhat Confident		Very Confident
1	2	3	4	5

18) **AFTER the course, do you feel confident in engaging in dialogues around the implementation of sustainable tuna management including the formulation of Management Procedure (Harvest Strategies)?** (circle one)

Not Confident At All		Somewhat Confident		Very Confident
1	2	3	4	5

Course Delivery

19) **How do you feel about the volume of material covered in each section?** (circle one)

Too Much Good Not enough

20) **How do you feel about the level of the material covered given your prior experience?** (circle one)

Too Simplistic Good Not Enough

21) **How do you think the presentation of the material could be improved?** (write in below)

22) **Please identify the topics that you think needed more attention.** (write in below)

Thank you for your participation! It is greatly appreciated!