FAO regional workshop for a network of practitioners on fishery stock assessment

Bangkok, Thailand January 23 to 25, 2023

Hybrid format

Background

The fisheries of Asia are a critical component of food security and the broader Asian economies. Asian marine fishery landings reported to FAO (wild capture, not including aquaculture) have averaged 38 million tonnes per year since the mid-1990s, accounting for nearly 49% of the worlds marine capture fishery production, which directly involves over 50 million people and a regional population of billions. Over the past 30 years, the reported catches from capture fisheries have been declining in the Northwest Pacific, nearly doubling but now stable in the Western Central Pacific, and a slower rise in the Eastern Indian Ocean, now stable.

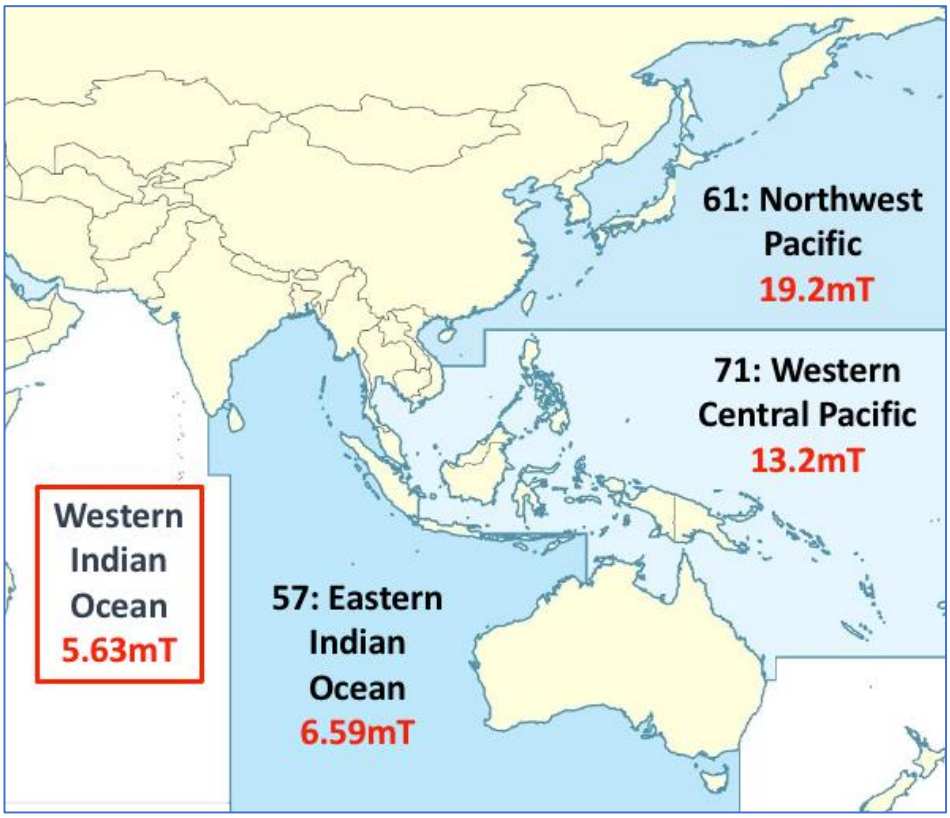

Figure 1. Marine fishery landings from Areas 57, 71 and 61 (FAO FishstatJ 2022).

Despite the importance of fisheries to the Asian economy, scientific monitoring and management are modest, with most stocks lacking modern scientific stock assessments. During the period from 1980 to 2000, stock assessment programmes were carried out in most countries assisted by regional and international scientists in the Asian region (e.g. Silvestre et al, 2003)[1]. There are still a number of stock assessment scientists in the region and national stock assessment programmes have continued, however, very few stock assessment reports have been published in recent years.

[1] G. Silvestre, L. Garces, I. Stobutzki, M. Ahmed, R.A. Valmonte-Santos, C. Luna, L. Lachica-Aliño, P. Munro, V. Christensen and D. Pauly (eds.) (2003) Assessment, Management and Future Directions for Coastal Fisheries in Asian Countries. WorldFish Center Conference Proceedings (no.67).

Part of the reason maybe confidentiality, but it is also because this work is not being made publicly available in English.

One of the global effects of having limited information on recent stock assessments is that there is an apparent lack of assessments from the Asian region to contribute into FAO's global analyses of the status of world fish stocks. These analyses are in turn, used to inform on the global progress towards achieving SDG14 to "Conserve and sustainably use the oceans, seas and marine resources for sustainable development", particularly targets addressing:

a) Natural resources and people with focus on: Sustainable fishing; conserving coastal and marine areas; Increasing the economic benefits from sustainable use of marine resources; and
b) How these outcomes above can be achieved through: Increasing scientific knowledge, research and technology for ocean health; supporting small-scale fishers.

Different teams of scientists relying on the same public databases of catch data using different methods (that make different assumptions and aggregate data in different ways) have come up with different overall assessment of the status of global fish stocks., ranging from around to one-third are overfished (FAO, 2022[2]) to two-thirds of global stocks are overfished (Worm et al. 2009[3]). These conclusions are not universally accepted and have been criticized for their reliance on a global stock assessment database (RAM Legacy) in which fisheries from developing countries are seriously under-represented (Ricard et al. 2012[4]).

Although this database has been greatly expanded over the past decade and now includes stocks representing more than half of global fishery landings, FAO's world assessment continues to primarily rely on 'traditional' full statistical stock assessments, as well as some data-limited assessments or expert elicitation methods where stock assessments are not available. It is possible that the selection bias in favour of larger stocks with formal assessments is behind their relatively optimistic outlook compared to Worm's, global assessment. FAO's methodology also tends to aggregate stocks into larger units, versus the Worm et al. approach, which could be another factor explaining the differences.

This uncertainty highlights the fact that the database, and analyses based on it, remain limited by the lack of publicly available and reliable fisheries data and stock assessments from developing countries in Asia such as India, Thailand, Malaysia, Myanmar, Indonesia, Viet Nam and the Philippines. These countries represent some of the largest producers of capture fish in the world with four countries ranked in the top 10 capture fisheries producers globally (Indonesia [2], India [3], Viet Nam [7], Bangladesh [10]; FAO, 2022). Fisheries in these countries range from large-scale industrialized fisheries for demersal fish such as grouper, threadfin bream and pony fish and pelagic fish like oil sardine, herring, and tuna through to artisanal fisheries for nearshore and estuarine species such as blue swimming crab and shellfish. No single management approach is likely to be effective at all these scales. There have been efforts made by the Asian countries to improve their respective fisheries management policies and regulations towards sustainability and meet international commitments such as the SDGs, and relevant conventions for food security and the health of the oceans (inter alia: UNCLOS, UNFSA, SDGs, FAO CCRF, FAO VG-SSF)

The "ASEAN-SEAFDEC Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region Towards 2030" is a regional policy framework highlights priority actions to establish reference points, and come up with estimated biomass or capacity level to determine

[2] FAO. 2022. The State of World Fisheries and Aquaculture 2022. Towards Blue Transformation. Rome, FAO. https://doi.org/10.4060/cc0461en

[3] Worm, B.; Hilborn, R.; Baum, J.K.; Branch, T.A.; Collie, J.S.; Costello, C.; Fogarty, M.J.; Fulton, E.A.; Hutchings, J.A.; Jennings, S.; et al 2009. 'Rebuilding global fisheries. Science 2009, 325, 578–585.

[4] https://doi.org/10.1111/j.1467-2979.2011.00435.x

the maximum sustainable yield, allowable biological catch, or allowable effort for marine fisheries in support of achieving sustainability.

With the lack of stock assessments in Asia, it's impossible to determine whether fish populations are overexploited or, potentially, underexploited relative to their ability to support sustainable yields. At a national level in the Asian region, fishery yields have been largely flat over the past decade, while the Asian population, and thus the need for sustainable protein sources, has continued to increase.

Does the current plateau in fishery yields represent the maximum sustainable yield or is greater harvest possible? If higher yields are possible, do we get there by fishing harder or by rebuilding overfished stocks? How will we know if we do not assess our stocks?

On international trade-related issues, the World Trade Organization (WTO) has been working with WTO members for over two decades to negotiate an international commitment toward achieving SDGs, covering the scope of fishery subsidies and ways to regulate them. During the WTO Ministerial Conference in Buenos Aires in 2017, the WTO was mandated to continue the discussion to meet Target 6 of the SDG14 "by 2020, prohibit certain forms of fisheries subsidies which contribute to overcapacity and overfishing, and eliminate subsidies that contribute to IUU fishing, and refrain from introducing new such subsidies, recognizing that appropriate and effective special and differential treatment for developing and least developed countries should be an integral part of the WTO fisheries subsidies negotiation,".

Most countries in the region have several stock assessment scientists, but there is very little interaction among them and few opportunities to exchange experiences and learn from each other. FAORAP and NFI in partnership with SEAFDEC, Murdoch University and IPB University, and other regional and national institutions have been delivering capacity-building workshops in the Asian region. There is a strong need to harmonize this activity, to benefit from shared learning and exchange understanding of techniques and experiences on how to assess the diverse and complex fisheries of the region under different levels of data availability and resourcing that typifies the regional developmental context

The FAO Regional Office for Asia and the Pacific (FAORAP), with the support of the FAO Fishery and Aquaculture Division (NFI) is working towards a long-term goal of establishing an organized network of stock assessment practitioners that will regularly communicate and cooperate in capacity building and sharing knowledge on applying appropriate methods for assessing the status of stocks in the Asian region. The strategic value to FAO is that the network members will contribute to improving the assessment of fishery resources in the Asian region and assist with sharing this information with FAO. This will support FAO's global process of collating stock assessment information and reporting on the state of global fisheries.

The network will also contribute to regional capacity development using tools and methods to contribute to improved national stock assessments for fishery management and national reporting requirements for the SDG 14 fisheries indicator.

The need for capacity development and improved cooperation in stock assessment have been identified as priorities for action by:

a) **The 36th Session of the Asia-Pacific Fishery Commission (APFIC)** which *"..emphasized the importance of fishery management grounded on science for sustainable marine and inland fisheries. It acknowledged the challenges related to lack of adequate capacity for conducting stock assessment and analyses"* ;
b) **The 37th FAO Asia-Pacific Regional Conference (APRC)** which recommended to …*"build capacity for development and implementation of sustainable fisheries management plans, fisheries stock assessment and sustainable aquaculture systems, in cooperation with relevant regional fishery bodies";*

c) **The 34th Session of the FAO Committee on Fisheries (COFI)** which *"Requested to FAO to consider, in future SOFIA reports, additional information and methodological improvements to better reflect the regional status of fish stocks" ;* and
d) **The 53rd Meeting of the SEAFDEC Council**, and the "*ASEAN-SEAFDEC Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region Towards 2030*"

Purpose

FAO will convene a "*Regional workshop for a network of practitioners on fishery stock assessment*" *("FAO Regional Assessment workshop")* from 23-25 January 2023, which will bring together an identified group of regional stock assessment practitioners from across the Asian region, to review their methods and preliminary findings on the status of fisheries that they study.

This workshop builds on two FAO and SEAFDEC co-organized regional training workshops on stock assessment, with the aim of obtaining the first level understanding of the current status and regional capacity on stock assessment and examined available data sets. It also draws in other complementary work under parallel initiatives funded by other donors and FAO.

The network group convened by the workshop will seek to reinvigorate some historic or existing networks of practitioners at regional and national levels. The primary target group is Government fishery research officers as they are the data holders and responsible for national activities related to the assessment of fishery resources. There are also associated fishery professional and regional organizations, universities, environmental organizations, and NGOs that are also engaged in support or collaboration with local or national initiatives. Academic researchers are most typically involved in developing analytical and modelling approaches and supervising the research which can be applied to the data collected. They are also involved in training the next generation of fisheries biologists, modellers and stock assessment practitioners.

The network group will provide overviews of the range of methods that are applied to different stocks and fisheries, encompassing fisheries with different levels of data (i.e. data-poor, data-limited to data-rich) that they are using in the region. These will be compared and contrasted with the ultimate goal of providing options for countries to apply these approaches in determining appropriate levels of exploitation of their fisheries, as well as providing updated reports on the status of the fish stocks covered by the assessments in the Asian region. This is currently poorly reported and is currently a major gap in the assessment of the state of global fish stocks prepared by FAO.

Objectives

The objectives of this workshop are:

1. To give a broad background on the status of stock assessments in Asia and an overview of the status of stocks in Asia;
2. To understand what assessments are being carried out in Southeast Asia, Southern Asia, and southern China, and the approaches being used to make these assessments;
3. To identify approaches that are best suited to different fisheries within the region, given the current resources available for assessments and level of data collection;
4. To identify human capacity development needs to enhance stock assessments in the region; and
5. For the long-term, to examine the value of forming a network of people for assessing Asian fish stocks and build a community of practice in stock assessment.

Workshop outputs

1. A workshop report that contains:
    i. A consolidated picture of the status of some diverse assessed stocks in the Asian region;
    ii. An overview of the types of assessments that are being carried out in Southeast Asia, Southern Asia, and southern China, and the approaches being used to make these assessments;
    iii. Recommendations on approaches that are best suited to different fisheries within the region, given the current resources available for assessments and data collection;
    iv. An identification of human capacity development needs to enhance stock assessments in the region; and
    v. An examination of the viability and value of forming a network of professionals that are engaged in stocks assessment and build a community of practice in stock assessment.
2. A collection of reviewed and edited background papers that will form a collection of recent stock assessments for the Asian region.
3. A collection of posters presented at the workshop.

Agenda

A total of 10 oral presentations and 12 posters have been identified (with an additional 4 possible posters). The oral presentations are to be at the whole of country or regional scale within country, with an overview of the fisheries and their status to be given.

Workshop Programme

ALL TIMES Bangkok time [GMT+7]

Day 1 (Monday, January 23, 2023)	
08.45-09.00	**Short opening of workshop** Quick introductions and workshop objectives,
09.00-11.00	**Plenary Session 1:** Thematic presentations (20 mins + 10 mins Q&A) (with on-line participants)
09.00-09.15	Scene setting: High level picture of Asian marine fisheries, where they are and their value, characteristics and diversity *Simon Funge-Smith (FAO Regional Office)*
09.15-09.45	Single species stock assessments for a range of data in Asia *Ricardo Amoroso (University of Washington, USA; National University of Comahue Argentina)*
09.45-10.15	Assessing stocks for multi-species fisheries: a multi-species approach relevant to the Asian region *Beth Fulton (CSIRO, Australia)*
10.15-10.45	The status of Asian fish stocks and why FAO is gathering information *Rishi Sharma (FAO, Italy)*
10.45 – 11.15	**Morning Tea**
11.15 -12.30	**Plenary Session 1 continued:** Thematic presentations (20 mins + 10 mins Q&A) (with on-line participants)
11.15 – 11.45	Model implementation and management of resources in the South China Sea (SCS) – Fishing industry and recent assessment of 8- 10 stocks. Suggestions for sustainable fishing on the resources of the SCS. *Zuozhi Chen (South China Sea Fisheries Research Institute, China Academy of Fisheries Science)*
11.45-12.30	**Plenary Session 2:** Short country overview presentations of stock assessments **and status of fish stocks** (with on-line participants), using the powerpoint template provided. **Brief overview of 12 minutes +3 mins Q&A per country**
	Southeast Asia: • Indonesia (*Indra Jaya*) • Malaysia (*Sallehudin Jamon & Effarina bt. M Faizal Abdullah*) • Philippines (*Francisco Torres & Melanie Villarao*)
12.30 – 13.30	**LUNCH**
13.30 – 15.00	**Plenary Session 2 (cont.)** • Thailand (*Pavarot Noranarttragoon & Nipa Kulanujaree*) • Cambodia (*Chea Tharith & Ly Kunthy)*
	South Asia: • Bangladesh (*Al Mamun & Mohammed Shriful Azam)* • India (*Jayasankar*) • Maldives (*Mohammed Ahusan and Mohammed Shimal*) • Sri Lanka (*Sinesha Karunarathne*)
15.00 -	**Plenary discussion** – lessons from the posters
15.00 – 15.30	**Afternoon tea**
15.30-17.00	**Plenary Session 2: Poster Session**

	12 Posters from in-person and online participants presented using 5 slide PPT template, with absolute maximum of 5 minutes for each presenter. **<u>Note: Automatic cut off at 5 minutes</u>**
	Multi-species demersal fisheries (WG facilitators)
15.30-15.35	Asian trawl surveys (*Mick Haywood*)
15.40-15.45	Philippines lizardfish (*Francis Buccat*)
	Small-medium pelagic species (non-large tuna) fisheries (WG facilitators)
15.45-15.50	SEAFDEC (*Supapong Pattarapongpan)*
15.50-15.55	Philippines *Sardinella* (*Divine Ignacio*)
15.55-16.00	Small Pelagic Species (*Decapterus macarellus*) from North Sulawesi (*Augustine Siska*)
16.00-16.05	Population parameters estimation and length-based assessment for data-poor mackerel scad in the South China Sea (*Kui Zhang*)
	Coastal inshore fisheries, including reef fisheries (WG facilitators)
16.05-16.10	Philippine blue swimming crab (*Sheryl Mesa*)
16.10-16.15	Grouper (*Plectropomus* sp.) from Karimun Jawa National Park *(Rian Prasetia*)
16.15-16.20	Snapper (*Lutjanus malabaricus*) from Saleh Bay West Nusa Tenggara (*Irfan Yulianto*)
16.20-16.25	Sri Lanka blue swimming crab (*Steve Creech*)
16.25-16.30	EDF's stock assessment in context of climate change (*Jose Ingles*)
16.30-16.35	Bangladesh assessment (*Jalilur Rahman*)
16.35-16.40	Thailand single species assessment *(Weerapol Thitipongtrakul)*
16.40-16.45	Thailand Blue Swimming crab *(Orawan Prasertsook)*
17.00-17.05	5 minute wrap-up for housekeeping (as working groups continue)
Day 2 (Tuesday January 24, 2023)	
08.30-08.45	**Overview of objectives of Working Group Session 1** *(offline - face-to-face participants only)* Introductions to each other and groups forming for working group session **Facilitators review the points emerging from the poster sessions and country papers related to their themes**
08.45 – 10.00	**Working group Session 1** *(offline - face-to-face participants only)* **Purpose/activity:** Review submitted papers and posters split by three themes and summarise the assessment processes, methods and data sources for the theme and the overall results of the assessments and status of resources in the region. Prepare of Powerpoint summary for each working group. *Working groups* i. Multi-species demersal fisheries [Facilitators: Derek Staples & Rishi Sharma] ii. Small-medium pelagic species (non-large tuna) fisheries [Facilitators: Ricardo Amoroso & Wily Campos] iii. Coastal inshore fisheries, including reef fisheries [Facilitators: Budy Wirywan & Neil Loneragan]
10.00 – 10.30	**Morning tea**
10.30 – 12.00	**Plenary Session 3: Working group presentations** (with on-line participants) Presentation by three working groups summarising the findings from WG Session 1 (*Each group has* 20 *minutes presentation plus 10 minutes Q&A*)
10.30-11.00	Multi-species demersal fisheries
11.00-11.30	Small-medium pelagic species (non-large tuna) fisheries
11.30-12.00	Coastal inshore fisheries, including reef fisheries

12.00-12.30	**Discussion**
12.30-13.00	**Plenary Session 5: Single and multi-species assessments** (with on-line participants) "Interpreting single-species assessments in a multispecies fishery – the use of indicator species". *Derek Staples* (Fisheries Consultant)
13.00 – 14.00	**LUNCH**
14.00 – 15.30	**Working Group Session 2** *(offline - face-to-face participants only)* *It is expected that the working groups will remain the same to maintain momentum. However, membership may be adjusted to reflect specific thematic interests of individuals* **Purpose/activity:** review advantages and disadvantages of the approaches being applied for the themes and identify gaps and needs for future assessments (e.g. capacity building, accessibility to data, harmonization etc.) for the theme. The working group will address the following questions: *1) Identify critical capacity building needs for the region to form the basis for a training program, a regional project or a recommendation on University/fishery courses should cover.* *2) Identify if possible, other approaches to assessing stocks e.g. small pelagics - better models or better methods, can indicator species be used for mixed stocks* *3) How do these assessments feed into management and do we need better communication on stock assessments to policy makers* **Prepare Powerpoint summary for each working group**.
15.30 – 16.00	**Afternoon tea**
16.00 - 17.00	**Plenary Session 6: Working Group presentations** (with on-line participants) Summary of findings from the working group Session 2 on Identifying gaps, needs and issues for stock assessment in Asia.
16.00-16.20	Multi-species demersal fisheries
16.20-16.40	Small-medium pelagic species (non-large tuna) fisheries
16.40-17.00	Coastal inshore fisheries, including reef fisheries
17.00	5 minute wrap-up for housekeeping (as working groups continue)
Day 3 (Wednesday January 25, 2023)	
08.30 – 9.30	**Plenary Session 7: Conclusions of the workshop to date** (with on-line participants) Discussion and overall conclusions from Working Group Sessions 1 and 2 from each of the three working groups
09.30 – 11.00	**Working group Session 3** *(offline - face-to-face participants only)* **Purpose/activity:** Theme for the working groups is "Future networking and capacity-building for enhancing stock assessment in Asia". 1. South Asia - Facilitators: Krishnan Pandian (Bay of Bengal IGO) , Rishi Sharma (FAO) and Sunil Mohammed (ex-CMFRI) 2. Southeast/East Asia- Facilitators: Supapong Pattarapongpan (SEAFDEC), Wily Campos, Zuozhi Chen (SCSFRI)
11.00 – 11.30	**Morning tea**
11.30 - 12.30	Working groups to prepare presentations for Final Plenary Session
12.30 – 13.30	**LUNCH**
13.30 -14.30	**Plenary Session 8: Working group presentations** (with on-line participants) Summary of findings on future networking.
14.00 -15.30	**Final plenary wrap up: Final conclusions and next steps (Online)**

15.30	**Closing**

Table . List of poster presentations, authors and affiliations

Country	Topic	Authors	Affiliation
Bangladesh	Country paper	*Al Mamun & Dr. Mohammed Shriful Azam*	DOF, Bangladesh
	Bangladesh Poster (title tbc)	*Jalilur Rahman (tbc)*	WorldFish
Cambodia	Historic assessments country paper	*Chea Tharith, Ly Kunthy*	FiA, Cambodia
China South China Sea	Model implementation and management of resources in the South China Sea (SCS) – Fishing industry and recent assessment of 8- 10 stocks. Suggestions for sustainable fishing on the resources of the SCS.	*Zuozhi Chen*	South China Sea Fisheries Research Institute, CAFS
	Population parameter estimation and length-based assessment for data-poor mackerel scad *Decapterus macarellus* in the South China Sea	*Kui Zhang*	SCFRI
India	Country paper	*Jayasankar, Sathiananthan & Sunil Mohammed*	Central Marine Fisheries Research Institute & consultants
Indonesia	Country paper	*Indra Jaya*	Indonesia National Commission for Stock Assessment
	Grouper and Snapper fisheries of Saleh Bay	*Irfan Yulianto (virtual)*	Rekam, Indonesian Fisheries Research Center
	Medium pelagic fisheries of northern Java Sea	*Siska Augustina (virtual)*	Wildlife Conservation Society, Indonesia
	Red-bellied yellow tail fusilier *Caesio kuning* in the thousand islands region, north Java Sea	*Budy Wiryawan(in person), Rian (virtual)*	IBP University, IFRC, WCS-I
	Blue swimmer crab *Portunus pelagicus* fishery	*Tri Ernawati (virtual)*	Centre for Fisheries Research, BRIN
	Spiny lobster fishery, *Panulirus spp.*	*Mr Duranta (virtual)*	Center for Fisheries Research, BRIN
Maldives	Country paper	*Mohammed Ahusan & Mohammed Shimal*	MMRI, Maldives
Philippines	Country paper	*Francisco Sb Torres Jr & Melanie Villarao*	NSAP, BFAR

	Lizard Fish *Saurida tumbil*	*Greg Bucat (virtual)*	
	Blue Swimmer Crab *Portunus pelagicus*	*Sheryll Mesa (virtual)*	
	Scaly Mackerel, *Sardinella lemuru*	*Divine Ignacio (virtual)*	
Sri Lanka	Country paper	*Sisira Haputhantri & T.K. Sinesha Karunarathne*	NARA , DFAR
	Blue swimmer crab *Portunus pelagicus* fisheries in north-western Sri Lanka	*Dr Steve Creech*	Pelagikos
Thailand	Country paper	*Pavarot Noranarttragoon & Nipa Kulanujaree*	DOF Thailand
	Single species Thompson and Bell Model assessment	?	DOF Thailand
	Single species length-based spawning potential ratio	?	DOF Thailand
Thematic	Research trawl surveys in Asia	*Mick Haywood (virtual)*	FAO consultant
	Assessing stocks for multi-species fisheries: a multi-species approach relevant to the Asian region	*Beth Fulton*	CSIRO
	Single species stock assessments for a range of data in Asia	*Ricardo Amoroso*	Consultant
	The status of Asian fish stocks and why FAO is gathering information	*Rishi Sharma*	FAO
	Interpreting single-species assessments in a multispecies fishery – the use of indicator species	*Derek Staples*	Consultant
	Scene setting: High level picture of Asian marine fisheries, where they are and their value, characteristics and diversity	*Simon Funge-Smith*	FAO
	SEAFDEC Regional assessments	*Supapong Pattarapongpan*	SEAFDEC
	EDF's stock assessment in context of climate change	*Jose Ingles*	EDF