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**Second Regional Training Workshop on Stock Assessment in Support the Implementation of the International Commitments for Sustainable Use of Fisheries Resources**

SEAFDEC Secretariat, Bangkok, 23-27 May 2022

**Workshop Prospectus**

1. **Background**

Most Southeast Asian countries are major producers for exporting fish and fish products in international markets and  SEAFDEC has been supporting ASEAN Member States in raising the awareness of the key fisheries issues in the regional context in achieving the international and regional commitments as the basic framework for the sustainable management of fisheries resources. The efforts made by the Southeast Asian countries to improve their respective fisheries management policies and regulations towards sustainability have greatly contributed to this success.

Over the years, international organisations have also supported capacity building ASEAN members to meet their international commitments such as SDGs, and relevant conventions for food security and the health of the oceans.These include UNCLOS, UNFSA, SDGs, FAO CCRF, SSF among others. There is also the regional policy framework, the ASEAN-SEAFDEC Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region Towards 2030, which highlights priority actions to establish reference points, and come up with estimated biomass or capacity level to determine the maximum sustainable yield, allowable biological catch, or allowable effort for marine fisheries in support of achieving sustainability.

SEAFDEC with funding support from the Japanese Trust Fund has been providing a regional platform for its Member Countries to address international fisheries-related issues which have implications for the sustainable development of fisheries and aquaculture in the Southeast Asian region (*e.g.* FAO, meetings of RFMOs, CITES, WTO negotiations on fisheries subsidies, etc) and has supported its Member Countries on awareness raising for international fisheries-related issues.

This is in line with the ASEAN-SEAFDEC Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region Towards 2030 on “*Promote joint ASEAN approaches and positions in international trade in fish and fishery products produced in the region, by harmonizing the standards, criteria, and guidelines, and developing mutually-recognized agreements on sustainability and food safety management systems*” and the Plan of Action #82: *strengthen cooperation and mechanisms among AMSs to work towards common positions that could be reflected in international fish trade related fora, e.g. World Trade Organization (WTO), Food and Agriculture Organization of the United Nations (FAO)/COFI Sub-committee on Fish Trade, Office International des Epizooties (OIE), Codex Alimentarius Commission (CAC), and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)”* 

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 achievements of 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 the 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,”.*

In 2020 and 2021, SEAFDEC organized a webinar series on Fisheries Subsidies, to obtain updated information on the status of the negotiation from key relevant agencies/countries, and to facilitate sharing of information among the Member Countries on this issue. While noting the recommendations that were made by the SEAFDEC Council during its 53rd Meeting, the Council requested the capacity building for stock assessment in particular on how to determine the reference points that would define overcapacity and overfishing.

In December 2021, FAO and SEAFDEC co-organized the first regional training workshop on stock assessment (December 13-17 2021), with the aim of obtaining the first level understanding of the current status and regional capacity on stock assessment and examined available data sets. The datasets identified and first level training provided has enabled the country participants to start working on the stock status estimations from their data.

This Second Regional training workshop, (30 May to 7 June, 2022) will reconvene these participants and their stock data, for a second round of training in analysis and modelling, under the guidance of FAO stock assessment trainers and SEAFDEC resource persons. The outcome is expected to be the development of a group of stock assessments for commercial fishery species in the region and for the first time, an assessment-data based assessment of major stocks in in the sub-region.

1. **Objectives of the Training Workshop**
2. To build on the first regional training workshop to provide participants with a deeper understanding of the concepts of population dynamics models and how to develop them on a species context for management.
3. To provide participants with hands on experience in using the latest computational tools to analyse fishery and other environmental data and understand how to collect and analyze data for ecological and environmental studies. This will primarily be done with the help of labs and tools in Excel and R.
4. To mentor the participants in the examination of their datasets to enable them to assess the status of their resources.
5. To exchange views and identify participants and their country needs, including potential for a medium and/or long-term capacity development program in the region through a series of the comprehensive training courses in the future
6. **Date and Venue**

The Training Workshop will be held on 30th May to 7th June, 2022 in hybrid format:

1. Onsite at SEAFDEC Conference Room, SEAFDEC Secretariat, Bangkok, Thailand
2. Online via Zoom meeting
3. **Timetable of the training course**

| Time | Activity | Responsible |
| --- | --- | --- |
| **Day 1 AM** |  |  |
|  | Opening Session |  |
|  | Recap of the first training |  |
|  | 1.Participants statements of progress and challenges encountered |  |
|  | * 1. Workshop participants overview | Rishi Sharma |
|  | * 1. Process Overview | Rishi Sharma |
|  | * 1. Data sets and fishery issues | Rishi Sharma |
|  | * 1. Overview of Assessments and Summary of what we want in a Good Stock Assessment and Report | Dan Ovando |
| **Day 1 PM** |  |  |
|  | 2.Data analysis Approaches practical (Intersessional work will decide what to do) | All trainers |
|  | Types of Data Available for Analysis | Participants |
|  | Approaches to Pursue | Sharma |
| **Day 1 End** | Wrap Up and Discussions | All |
| **Day 2** | **Mentored Dataset Examinations & analysis using models** |  |
| **Day 2 AM** | SPM Models -JABBA | Sharma |
|  | Example Datasets and use; | Sharma setup in R |
|  | Country Specific Examples | Participants with CPUE data along with landings data |
| **Day 2 PM** | LBSPR Models - | Ovando |
|  | Example Datasets and use; | Setup in R or Barefoot Ecologist |
|  | Country Specific Examples | Participants with Length data |
| **Day 2 End** | Wrap U and Discussions | All |
| **Day 3** | **Mentored Dataset Examinations & analysis using models** |  |
| **Day 3 AM** | Trend Data-JARA | Sharma |
|  | Example Datasets and use | Sharma setup in R |
|  | Country Specific Examples | Participants with some sort of time series of abundance data |
| **Day 3 PM** | Life History based approaches, PSA | Jensen |
|  | Example Datasets and use; | Setup and examination |
|  | Country Specific Examples | Participants with very little data other than species |
| **Day 3 End** | Wrap U and Discussions | All |
| **Day 4** | **Mentored Dataset Examinations & analysis using models** |  |
| **Day 4 AM** | LB Models, Cope DL Tool | Ovando |
|  | Example Datasets and use | Setup in R |
|  | Country Specific Examples | Participants with some sort of time series of abundance data |
| **Day 4 PM** | Examination of data and issues all participants | All |
| **Day 4 End** | Wrap U and Discussions | All |
| **Day 5** | **Datasets examination- All day using lessons learned previous days/ JABA/LBSSPR/JARA/DL\_Tool** | All |
| **Day 5 End** | Wrap U and Discussions | All |
| **Day 6** | **Results, wrap up, lessons learned** |  |
|  | 7.Summarizing Results of Assessments/ Data Poor to Data Rich | Indonesia, Thailand, Brunei |
| **Day 7** | **Results, wrap up, lessons learned** |  |
|  | 8.Summarizing Results of Assessments/ Data Poor to Data Rich | Malaysia, Vietnam and Philippines |
| 9.Next Steps/Reports of Assessments/Workshops/Paper for Journal | All Trainers |

1. **Participants and Resource Persons**

1. **Participants:** SEAFDEC Member Countries namely: Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Philippines, Thailand and Viet Nam
2. **Main instructors**: Dr. Rishi Sharma (FAO) will join onsite at SEAFDEC Secretariat, supported by FAO Resource Persons Dr. Daniel A. Ovando and Dr. Olaf Jensen
3. **Invited resource persons:** SEAFDEC/TD, SEAFDEC/MFRDMD and selected stock assessment experts from Member countries (Japan, Indonesia, Philippines, Thailand)
4. **Support staff:** SEAFDEC staff from Secretariat and Technical Departments

Total: about 35 persons

1. **Requirement of the Participants**
2. Fishery biologists/ researchers (senior and middle-level officers) who are responsible in data collection and analysis of data, and specialize in the stock assessment and using the models for the stock assessment for development of the management recommendations to the decision makers
3. Background knowledgeable in using software packages for stock assessment (Microsoft excel, R (Splus-like, etc)
4. It is requested for each country to prepare the data sets such as individual length and weight data (at least 12 months) by species, monthly or annual catch and effort data (for CPUE) fishery survey data (if have), for the practical session.

**Annex 1**

**Second Regional Training Workshop on Stock Assessment in Support the Implementation of the International Commitments for Sustainable Use of Fisheries Resources**

SEAFDEC Secretariat, Bangkok, 30th May- 7th, June 2022

**CONCEPT NOTE**

1. **Background and Rationale**

The fisheries of Southeast Asia are a critical component of food security and the broader Southeast Asian economy. The Food and Agriculture Organization of the United Nations (FAO) estimates that 1-2 Billion people are directly employed in the fisheries sector in Southeast Asia. Southeast Asian fishery landings (wild capture, not including aquaculture) have averaged 4 million tons per year since the mid-1990s (Fig. 1, FAO 2011), meaning that 40% of the worlds’ production from this area directly/indirectly impacts close to a billion people. Most of the fish caught in Southeast Asia are used for food (although a proportion is used for fish meal or fish oil).

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**Figure 1**. Marine fishery landings from Area 57 (FAO 2011).

Despite the importance of fisheries to the Southeast Asian economy, scientific monitoring and management are modest, with most stocks lacking modern scientific stock assessments. Without stock assessments, it is impossible to determine whether fish populations are overexploited or potentially underexploited relative to their ability to support sustainable yields. At a national level in this region, fishery yields have been flat over the past decade, while the Southeast 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?

From a scientific perspective, the Southeast Asian region’s fisheries represent an opportunity to learn about the success and failure of fishery management strategies across a wide diversity of scales and management approaches. Southeast Asia’s fisheries range from large-scale industrialized fisheries for pelagic fishes like oil sardine, herring, and tuna to artisanal fisheries for nearshore and estuarine species. No single management approach is likely to be effective at all scales. A growing body of research on small scale and artisanal fisheries suggests that despite the lack of traditional top-down management by the central government, many of these fisheries have managed to avoid the “*tragedy of the commons*” problem where common-pool resources are inevitably degraded (Feeny et al. 1996; Ostrom et al. 1999). At the same time, recent work on community co-management, a widespread approach to management of small-scale fisheries, has elucidated the characteristics of such systems that lead them to be effective (Gutierrez et al. 2011).

There is currently a lively scientific debate about the global status and trends of marine fisheries. The most recent evaluations suggest that, at a global level, populations of exploited marine fish and invertebrate have declined 38% between 1970 and 2007, but have, on average, been stable since the early 1990s (Hutchings et al. 2010). Approximately two-thirds of marine fish populations are currently below the population size that would produce the maximum sustainable yield, but only one-third of marine fish populations are now being fished at rates that will lead to depletion below this level (Worm et al. 2009). For many overfished populations, fishing has been reduced and the stage is now set for their recovery. These conclusions have been criticized[[1]](#footnote-0) for their reliance on a global stock assessment database – the RAM Legacy database (Ricard et al. *2012*) in which fisheries from developing countries are seriously under-represented. The database has been greatly expanded over the past decade and now includes stocks representing more than half of global fishery landings. Nevertheless, the database, and analyses based on it, remain limited by the existence and public availability of fisheries data from many developing countries in the Asian region with significant capture fisheries, including India, Thailand, Malaysia, Myanmar, Indonesia, Viet Nam and Philippines.

A long-term challenge is to address the reluctance of some national fisheries agencies to make their assessment data publicly available. It is understood that this is partly due to a perception that submitting data into public databases denies the opportunity to fishery scientists to use their data for their own research and journal publications. The model used in the workshop process and beyond, is one of true collaboration. Involved fisheries agency scientists will be full partners in this assessment analysis and research. It is envisaged that the results will enable them to publish their work in, or be co-authors to, scientific journal publications. An intended secondary benefit would be that more junior level staff will be able to access and experience high-level training in stock assessment techniques.

**Primary objective:** *To empower and build capacity locally in target countries so as to better inform fishery management in the countries in Southeast Asia based on scientific evidence, and contribute to increased understanding of status and trends of fisheries in developing countries.*

1. **Capacity building workshops**

Participation in the physical/hybrid assessment workshops will provide awareness raising and preliminary training to government fisheries personnel in modern stock assessment techniques. It is anticipated that the sensitization and training of government fisheries personnel will contribute to increased awareness within fishery agencies familiar with the state-of-the-art stock assessment techniques.

Stock assessment techniques are changing rapidly – particularly as countries improve their data collection – and the power of computing enables more sophisticated modelling and analysis. The more empirical approaches to fishery management that have previously been used to manage some marine fisheries can now be enhanced or replaced with more science-based assessment.

A secondary objective of the hybrid workshop is to build understanding of the impact of fisheries on the populations they target. This is one of the fundamental goals of stock assessment and without such an understanding, it is impossible to manage fisheries toward any sort of optimum, such as the maximum sustainable yield (MSY) or maximum economic yield (MEY).

1. **Approach used**

The workshop will be held in Southeast Asia and will focus on data exploration and background briefing on the fisheries chosen for assessment as well as training fishery management agency personnel in stock assessment techniques.

The approach used will be a formal quantitative synthesis of multiple datasets provided by the participants, using their now national data. The fishery assessment data which will be used for these stock assessments already exists within national fishery institutions. This data will probably include long-term trawl surveys, if available, from the Southeast Asian region and the catch records maintained by the agencies in the region. From the data, the workshop will develop an analysis of status of key fish stocks in Southeast Asia.

Fisheries that are chosen for assessment have been selected on the basis of (1) a need for new assessment because of, for example, economic importance or concerns over declining catches; and (2) availability of data to conduct a credible stock assessment.

The specific fish and invertebrate populations targeted for these analyses was be chosen by workshop participants [but are expected to include inter alia: Indian oil sardine (*Sardinella longiceps*), Indian mackerel (*Rastrelliger kanagurta*), hilsa (*Tenualosa ilisha*), and species which support smaller fisheries].

Assessments for some of these species already exist but they are generally focused on regional sub-components of the stock or use methods (e.g., yield-per-recruit analysis) with limited validity that do not produce time trends of abundance. Altogether, it is hoped that assessments could be made for up to 10-20 fish and invertebrate stocks.

The new stock assessments which will be piloted with participants in the workshop will help answer two questions:

1. *How has the population size of fish and invertebrates targeted by fisheries in Southeast Asia changed through time?*
2. *How does the current population size and level of fishing in SE Asian fisheries compare to the levels expected to result in MSY?*

A core aspect of this approach is the workshop with Southeast Asian fisheries scientists, and foreign fisheries stock assessment experts. The Second Regional stock assessment training will be led by FAO workshop instructors and supported by the Southeast Asian Fisheries Development Center (SEAFDEC) regional resource persons and fishery experts.

Following the workshop and the finalization of the assessments, it may be possible to answer a final question through a “management meta-analysis” of assessed fisheries in Southeast Asia, including those for which assessments already exist, and those to be assessed as part of this project:

*3) What are the biological, management, and economic variables that distinguish “successful” Southeast Asian fisheries from less successful fisheries?*

The workshop will build the capacity and assist the participating fishery scientists to synthesise and analyse this data to develop national assessments that will contribute to their fishery management, and which may also contribute to global data sets to inform global status and trends in fish stocks.

**Participants**

Participants will be nominated by their countries and will come from national fishery research institutions. Many such fisheries personnel at government agencies are primarily trained as fish biologists with substantial field and laboratory experience. However, stock assessment is based just as much on the fields of statistics and applied mathematics and fisheries and these skills will be emphasized in the request for nomination of personnel.

**Workshop outputs**

The output of this second workshop is:

1. The provision of training to regional fishery scientists in improved stock assessment techniques and increase awareness of the potential for them to submit data to the public open-access RAM Legacy Stock Assessment Database, this could include:

* model estimates of biomass and fishing mortality rate time series
* catch time series and reference points
* Additional information: fishery survey data and existing stock assessments

1. Workshop participants will also be invited to publish the results of their individual stock assessments in a special issue of the Asian Journal of Fisheries
2. A synthesis of the assessments will contribute to the update of the FAO biennial review of global fish stocks for Area 57 and Area 71 respectively
3. Discussions with participants as to what sort of mechanisms or access controls could be created that might enable their submission of assessment data to the stock assessment database.

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1. <http://blog.nature.org/2011/01/daniel-pauly-fish-stock-global-world-fisheries/> [↑](#footnote-ref-0)