



**THE FOURTH REGIONAL WORKSHOP ON SHARED STOCKS:
RESEARCH AND MANAGEMENT
IN THE SOUTH CHINA SEA**

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**IMPLEMENTATION OF PAST RECOMMENDATIONS FROM
THE SHARED STOCKS WORKSHOPS:
THE SEAFDEC EXPERIENCE**

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Implementation of Past Recommendations from the Shared Stocks Workshops: the SEAFDEC Experience

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1. Background

The FAO/SEAFDEC Workshop on shared stocks in the Southeast Asian region was first held in Bangkok on 18-22th February 1985. During the Workshop, several main issues regarding the shared fish stocks in the South China Sea were discussed.

The Workshop highlighted that sustainable fisheries resources management was one of the important roles that each country has to implement within its jurisdiction. Stocks of fish that lie entirely within the EEZ of a country can be duly managed by the country concerned without affecting the interests of other countries. However, most stocks are not limited to a single EEZ but instead cover more than one EEZ waters, or extending into an area of open sea beyond the single EEZ, such that they are actually shared by two or more countries. Intensive fishing on one part of this shared stock, even though this is carried out in one's own EEZ, is likely to affect the catches on the other parts of this stock in the other EEZs. To ensure rational utilisation of the resources and harmonious fishing, any management measure that need to be implemented on the shared stock would thus need to be carefully coordinated among the countries concerned.

The workshop has also identified possible shared stocks of the region, covering coastal pelagic fish, demersal fish, prawns/shrimps and cephalopods (see Table 1). The United Nations Convention of the Law of the Sea (UNCLOS) defines the shared stock as "stock occurring within the EEZ of two or more coastal states, or both within the EEZ and in an area beyond and adjacent to it." Gulland (1980) and Caddy (1982) classified different types of shared stocks, *i.e.* as "migratory shared stocks" and "trans-boundary shared stocks".

Table 1. Listing of shared stocks occurring in the Southeast Asian region

Migratory shared stocks

1. Mackerels, *Rastrelliger* spp.; *R. brachysoma*, *R. kanagurta* and *R. faughni*
2. Round scads, *Decapterus* spp.; *D. maruadsi*, *D. macrosoma*, *D. russellii*, and *D. kurroides*.
3. Sardines, *Sardinella* spp.; *S. fimbriata*, *S. gibbosa*, *S. leiogaster*, *S. longiceps* and *S. sirm*.
4. Anchovies, *Stolephorus* spp.; *S. heterolobus* and *S. indicus*.
5. Trevallies: *Caranx* spp., *Carangoides* spp., *Alectis* spp. and *Selaroides* spp. and *Selar* spp.
6. Hardtail, *Megasiaspis cordyla*
7. Spanish mackerels, *Scomberomurus* spp.
8. Small tunas: Frigate and bullet tunas (*Auxis* spp.), Kawakawa (*Euthynus affinis*), Longtail tuna (*Thynnus tonggol*).
9. Shrimps and Prawns, Penaeidae; *Penaeus*, *Metapenaeus* and *Parapenaeopsis*.
10. Large species of cuttlefish and squid.

Trans-boundary shared stocks

1. Demersal Fish: Nemipteridae, Synodontidae, Priacanthidae, Lutjanidae, Serranidae, Sphyraenidae and Sciaenidae.
2. Cephalopods: Octopus, Small species of cuttlefish and squid.

Migratory shared stocks include those migratory species of fish, crustacea or mollusk which have a definite migration beyond the border of one EEZ. **Trans-boundary shared stocks** are non-migratory fish, whose area of distribution is crossed by a common boundary separating the exclusive fishing zones of two adjacent countries.

The FAO Fisheries Report (FIRM/R337, 1985) has identified some preliminary estimates of the shared fish stocks in the South China Sea. However, the stocks units were not differentiated scientifically, and further studies were very much needed.

A brief outline of the recommendations drawn during the FAO/SEAFDEC workshop on shared stocks is as follows:

- i) Identification of some species must be settled.
- ii) Participating countries should exchange specimens and information at regular intervals.
- iii) Distribution of pelagic shared stocks through acoustic survey needs to be determined and FAO was requested to organise training courses on acoustic survey techniques.
- iv) It was also recommended that participating countries should carry out tagging experiments on important shared fish stocks of pelagic fish.
- v) Reviewing the information gaps between areas in the region was also proposed.
- vi) Cephalopod was identified to potentially increase the catch in the region, and FAO was therefore requested to organise workshops on the assessment of this stock.
- vii) Participating countries were also requested to continue monitoring their length frequency data collection so as to obtain the stocks population dynamics.
- viii) Catch-effort statistics were recommended and data collection need to be improved by each participating country.
- ix) Resource surveys were strongly recommended.
- x) Some of the stocks are definitely shared between two or more countries, therefore co-operative research must be developed.
- xi) Fisheries oceanography was also stressed and each participating country must try to conduct such studies.

We believe that respective countries around the South China Sea region have implemented, to some extent, most of the items recommended at this Workshop.

Following the FAO/SEAFDEC workshop on shared stocks in 1985, a number of meetings/workshops were organised by relevant authorities, such as the "Working Group Meetings on mackerels and roundscads in the Straits of Malacca" which was organised by FAO/BOBP in 1985-1987, and Meeting on shared stocks as organised by AFPIC in 1996.

2. Research Work Implementations

Since the establishment of MFRDMD in July 1992, being the fourth department of SEAFDEC, three regional workshops on shared stocks have been successfully conducted. These were held in Terengganu. The first Workshop was held on 28-30th March 1994, followed by the second on 18-20th July 1995, and the third, on 6-8th October 1997.

The present Fourth Regional Workshop on Shared Stocks in the South China Sea is also held in Terengganu on 24-26th January 2000. The objectives of this workshop are:

- i) To identify the problems in the management of shared stocks in the South China Sea,
- ii) To identify appropriate management systems for the shared fish stocks in the South China Sea, and
- iii) To develop appropriate regional fisheries research and resources survey mechanisms in the South China Sea area.

3. Past recommendations and Implementations

From the last three Regional Workshops on shared stocks, a number of recommendations have been agreed upon. These are listed in Appendices I, II and III.

Some of these recommendations are subjected for implementation by SEAFDEC/MFRDMD, while others are for due consideration and implementation by the respective SEAFDEC Member Countries.

4. Research works on shared fish stocks in the South China

Research works carried out from recommendations at the workshops are listed below:

4.1. Research works

4.1.1. Collaborative Surveys

Following the recommendations (Item 3) agreed during the First Regional Workshop on Shared Stocks, four Interdepartmental Collaborative Research Surveys were successfully implemented by SEAFDEC. The surveys were:

- i) AREA I (the Gulf of Thailand and the east coast of Peninsular Malaysia), 1995/1996
- ii) AREA II (West coast of Sabah, Sarawak and Brunei Darussalam), 1997
- iii) AREA III (Philippine waters), 1998 and
- iv) AREA IV (Vietnam waters), 1999.

Two technical reports of the Interdepartmental Collaborative Surveys have been prepared and published by the SEAFDEC Secretariat;

- a) Proceedings of the First Technical Seminar on Marine Fishery Resources survey in the South China Sea, AREA I: Gulf of Thailand and the east coast of Peninsular Malaysia, and
- b) Proceedings of the Second Technical Seminar on Marine Fishery Resources survey in the South China Sea, AREA II: West coast of Sabah, Sarawak and Brunei Darussalam.

A seminar of the Collaborative Research Survey for AREA III was recently held in Manila in 1999, and the reports are still being compiled and prepared by the SEAFDEC Secretariat.

4.1.2. On-going research works

Besides the collaborative surveys, some of the works directly or indirectly related to the shared fish stocks were also taken into consideration in the three-year plan proposed by MFRDMD, as follows:

i) Fish taxonomic studies in the South China Sea. Fish specimens were collected, photographed, identified and preserved at the taxonomic room of MFRDMD. A field guide book entitled “Field Guide to Important Commercial Marine Fishes of the South China Sea” has been prepared and published by MFRDMD in 1998.

Similar works are being carried out in Vietnamese waters since 1998, probably ending by the end of year 2000. The work is a joint cooperation between MFRDMD and Research Institute of Marine Products (RIMP), Vietnam.

Taxonomic and biological studies on shark and ray resources are also included.

ii) Standardised methodology on data collection

Standardising the methodologies and formats of data collection was one of the recommendations agreed upon at the previous workshop, and currently being prepared by MFRDMD. The document entitled “Field manual for fishery biology: Methods for measurement and collection of samples” has been published and distributed to member countries. While the standard methodologies mentioned are still not complete, they may serve for the purpose for young scientists to understand the work procedures involved in data collection, particularly on similar works implemented by each member country on the issues of shared fish stocks.

- iii) Population dynamics studies on Spanish mackerels in the South China Sea
- iv) Tuna tagging
- v) Catch-effort statistics
- vi) Tuna Statistics
- vii) Establishment of the guideline for acoustic survey methodology and analysis in the South China Sea.
- viii) Remote sensing for fish forecasting
- ix) Fisheries oceanographic and fish resource surveys (M.V. SEAFDEC)

4.2. Training

A series of training on acoustic methodology for researchers of the SEAFDEC Member Countries have been conducted, as follows:

- i) Regional training course on acoustic methodology. During the training the acoustic data obtained from the Interdepartmental Collaborative survey were used and analysed.
- ii) Regional training course on operation of FQ-70. Training conducted in April 1999, especially for researchers who are directly involved in the Interdepartmental Collaborative Survey.
- iii) On-job training on cooperative tuna tagging in Brunei-Sabah waters, followed by tuna tagging in Malaysia-Thailand waters

5. Future research works (2001-2003) related to shared stocks

- Fish taxonomic studies
- Biology and population dynamics of pelagic fishes of the South China Sea

- Oceanographic processes in the South China Sea and their influence on the fish resources
- Bio-economic analysis in fisheries management
- Tuna Statistic
- Catch-effort statistics
- Kinds, abundance and distribution of fish juveniles and larvae in the South China Sea
- Application of satellite data for fish forecasting
- Regional training course on acoustic methodology
- Verification of stock assessment in the South China Sea by hydro-acoustic method
- Technical working group meetings/Regional workshop on research and management of shared fish stocks in the South China Sea

6. Conclusions and recommendations

MFRDMD is hopeful that the discussions made during this workshop would give some guidance to the Department, especially in the planning of regional research works related to shared fish stocks for the future.

Fish biology and population dynamics studies on selected fish species of interest, as determined by the member countries, and stock determination and identification using biological parameters, as well as cooperative fish resource surveys and studies on environmental conditions that influence fish distribution should also be formulated. These works should be taken into the national research program of participating countries.

A Technical Working Committee, consisting of members from participating countries, should be established, and yearly meeting should be planned to report the progress of this program.

Working mechanism must be clearly recognized. As SEAFDEC is not a funding body for such projects, the implementation of this work at national level should be borne by respective country:

At the previous workshop, three major fish groups had been identified as the prime focus. These are Roundscads, Mackerels and small tunas. Study on fish population biology of these species may be necessary, and each country is suggested to incorporate this study in the national research plan.

The recommendations of the above issues are subjected for further discussion, and we hope this workshop could agree to some extent on research for the management of shared fish stocks, for benefit of the SEAFDEC Member Countries in the Southeast Asian region.

Appendix I:

Recommendations of the first regional workshop on shared stocks in the Southeast Asian region: Data collection and management related to shared stocks in the Southeast Asian region.

1. Collaborative research effort on shared stocks should be undertaken between and among Member Countries.
2. Individual countries should start on their own, to identify and verify whether there are national stocks which may probably be shared with their neighboring countries.
3. The Collaborative Research Project of the shared stocks for regional implementation for the identification and verification of shared stocks in the Southeast Asian region.
4. The program should include in its subsequent phases, the Assessment of the Status of Shared Stocks, and the Formulation of Management Strategies for these stocks.
5. Sufficient funds should be made available to SEAFDEC/MFRDMD and participating countries to implement the Programme.
6. SEAFDEC/MFRDMD should develop standard methodologies and format for data collection, processing and analysis to be used by participating countries in implementing the Programme. The methodologies shall include genetic analysis (mitochondrial DNA analysis) for stocks identification, and acoustic method for stock assessment.
7. The participants of the First Workshop on Shared Stocks should be considered as a permanent Working Group on Shared Stocks for the implementation of the programme, in order to forge continuity and commitment of national research inputs, and to sustain the enthusiasm of the scientist and research involved.
8. On-the job training, seminars and workshops should be organised by SEAFDEC/MFRDMD, for researchers from the participating countries.
9. The governments of participating countries should fully support the activities of the above-mentioned collaborative research project by providing the necessary logistics and manpower requirement.
10. Technical workshop agreed that the recommendations should submitted to the SEAFDEC program Committee and Council, for their consideration and approval.

Appendix II:

Recommendations of the Second Regional Workshop on Shared Stocks in the Southeast Asian Region.

1. In line with the Region's implementation of the provision of the UNCLOS regarding shared stocks of species between and among ASEAN and SEAFDEC Member Countries, it is imperative that information on these resources, as well as the environmental conditions affecting their distribution and abundance, be obtained.
2. Collaborative research efforts should focus on the assessment of the resources in the EEZ and international waters to serves as the scientific basis for recommending management option which can be agreed upon to properly utilise and shared these resources. Data exchange should be further promoted.
3. To prove the possibility of interactions between the shared/straddling/trans-boundary stocks of some species of round scads, mackerels, naritic tunas and other pelagic groups between and among coastal countries in the Southeast Asian region, there is a need to do collaborative works to determine similarity, dissimilarity in stocks and structure of their population through tagging, electrophoretic and mitochondrial DNA studies, morphology or any other means.
4. Very limited information on the relationship between production and environmental parameters in most SEAFDEC Member Countries is available. It has been observed that the environment has affected production of small pelagic fishes in the SEA region. In view thereof, collaborative oceanographic cruises and experimental fishing in contiguous areas of the Region should be conducted.
5. Statistical system on catch and effort for all species, in general, and those regarded as shared stock, in particular, should be established and made accurate as soon as possible.
6. Collaborative research works on shared stocks of round scads, mackerels and tuna should be organised and conducted among the countries in the Southeast Asian region.
7. Some kind of management measures be instituted by member countries to arrest the continual decline in production of roundscads.
8. Researchers from other countries should also be invited to participate as observers in the collaborative studies by M.V. SEAFDEC.

Appendix III:

Recommendations of the Third Regional Workshop on Shared Stocks in the Southeast Asian Region.

1. There is still very limited information on the hydrodynamics of the South China Sea in most SEAFDEC member countries. Recognising that a better understanding of this issue is deemed important especially in its relationship to the distribution of small pelagic fish resources, and consequently their overall production, it is recommended that more efforts and studies are needed to map accurately the various natural phenomena occurring in these waters. Moreover, there is strong need to comprehend the biological and physical processes working in the South China Sea.
2. For the short term, priority should be given to the study on the shared stocks of mackerels, roundscads and tunas. The study should focus on stock identification through various means (morphometric, meristics, DNA, tagging).
3. Due to increasing availability of information exchange and communication through the use of e-mail and internet, researchers in this region are strongly encourage to make use of such facilities for exchanging fisheries data or contacting on another.
4. As over-exploitation of shared stocks by any individual country will have an impact on the fisheries of neighboring countries, effort should be focused on establishing a joint management among the countries concerned.
5. SEAFDEC/MFRDMD need to play a more effective role in the collection and compilation of data/information published elsewhere for the use of researchers in the region.
6. SEAFDEC/MFRDMD needs to established better working relationships with other external and international agencies/organisations for the implementation of various regional programs.

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