



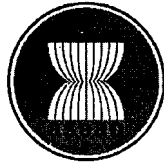
# **PROCEEDINGS OF THE ASEAN-SEAFDEC REGIONAL MEETING ON FISH TRADE AND ENVIRONMENT**

**Bangkok, Thailand  
14-16 October 2002**



**THE SECRETARIAT  
SOUTHEAST ASIAN FISHERIES DEVELOPMENT CENTER**





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## **PREPARATION AND DISTRIBUTION OF THIS DOCUMENT**

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Suraswadi Building  
Kasetsart University Campus  
P.O. Box 1046 Kasetsart Post Office  
Bangkok 10903, Thailand.

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## FOREWORD

Recognizing the importance of the issues related to trade and their impacts on fisheries in the ASEAN region, SEAFDEC has developed a regional program on Fish Trade and Environment. The program was initiated in 1999 and since then SEAFDEC, in collaboration with the ASEAN and SEAFDEC Member Countries, has been implemented a regional program on Fish Trade and Environment to address the importance of fish trade through the promotion of proper conservation and management to ensure sustainable fisheries in the region and in the future.

The ASEAN and SEAFDEC Regional Meeting on Fish Trade and Environment was organized by the SEAFDEC Secretariat in Bangkok, Thailand from 14 to 16 October 2002. The Meeting was initiated as part of the collaborative program on Fish Trade and Environment under the ASEAN-SEAFDEC Fisheries Consultative Group (FCG) mechanism. This regional meeting focused on the important issues of fish trade in the ASEAN and SEAFDEC Member Countries relates to sharks, marine turtles and chemical residues in farmed shrimps, all of which need urgent attention at the regional level to jointly discuss ways to tackle them and conclude with possible regional policy options and actions to promote sustainable fish trade in the ASEAN region.

The Proceedings contain the papers presented at the meeting on issues discussed during the previous SEAFDEC meetings on Fish Trade, trade related issues on sharks, review of shark fisheries in the ASEAN region, CITES-potential impacts to fisheries and trade, the regional proposal on the implementation of International Plan of Action for the Conservation and Management of Sharks; issues related to the conservation of marine turtles including the introduction of by-catch of marine turtle issues, recent issues on the US shrimp embargo, marine turtle conservation and management in the ASEAN region; and the issue on antibiotic residues of farmed shrimp, both from member countries in the region and resource persons from FAO and Taiwan.

The achievement of the meeting contained in the Proceedings supports the ASEAN common positions of the ASEAN-SEAFDEC Member Countries on issues related to fisheries management and trade and while stressing the need to strengthen the existing ASEAN-SEAFDEC collaborative programs related to the improvement of management of shark fisheries, conservation and management of marine turtles and antibiotic residues of farmed shrimps.

For the organization of the meeting, SEAFDEC is thankful to the Government of Japan for their support under the Trust Fund, and to the ASEAN Secretariat, Mr. Lee Yuen Tong, Alternate Council Director for Singapore as the Chairman of the Meeting, and to all the participants and resource persons for their active participation and contribution to provide the valuable information contributed thus to attain the achievements of the Proceedings.

We hope these Proceedings will be useful and providing information to the fisheries related government agencies in the region to encourage and properly promote effective conservation and management of fisheries to ensure sustainable fish trade in the region.



Niwes Ruangpanit  
Secretary-General  
SEAFDEC



## **EXECUTIVE SUMMARY**

### **INTRODUCTION**

The Association of Southeast Asian Nations (ASEAN) and the Southeast Asian Fisheries Development Center (SEAFDEC) Regional Meeting on Fish Trade and Environment was organized by the SEAFDEC Secretariat in Bangkok, Thailand from 14 to 16 October 2002. The Meeting was initiated as part of the collaborative program on Fish Trade and Environment under the ASEAN-SEAFDEC Fisheries Consultative Group (FCG) mechanism.

The Meeting was attended by delegates from the ASEAN and SEAFDEC Member Countries namely Brunei Darussalam, Cambodia, Indonesia, Japan, Malaysia, Myanmar, Philippines, Singapore, Thailand and Vietnam (except Lao PDR), the ASEAN Secretariat and SEAFDEC as well as resource persons from the Food and Agriculture Organization of the United Nations (FAO), the ASEAN Fisheries Federation (AFF), Indonesia, Taiwan, Thailand, Vietnam and SEAFDEC.

The Meeting discussed important issues related to fish trade in the ASEAN region with emphasis on trade related issues on sharks, by-catch of marine turtles, and antibiotic residues of farmed shrimps as well as concluded required policy and actions to promote sustainable fish trade in the ASEAN region.

### **CONCLUSION AND RECOMMENDATIONS**

Recognizing the importance and needs for sustainable management of fisheries and promotion of fish trade taking into consideration the Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region, adopted at the ASEAN-SEAFDEC Millennium Conference, the Code of Conduct for Responsible Fisheries (CCRF) and relevant International Plans of Action (IPOAs), i.e Conservation and Management of Sharks;

Reaffirming the conclusion and recommendations of the 1999 SEAFDEC Preparatory Meeting on Issues of International Fish Trade and Environment as well as the Regional Technical Consultation on Fish Trade in the ASEAN Region;

Stressing the need to strengthen the existing ASEAN-SEAFDEC collaborative programs related to the improvement of management of shark fisheries, conservation and management of marine turtles, antibiotic residues of farmed shrimps;

The ASEAN and SEAFDEC Member Countries, after deliberation, hereby agreed to the following conclusion and recommendations:

#### **I. Common Positions of the ASEAN-SEAFDEC Member Countries on Fisheries Management and Trade**

- 1.1 To support the ASEAN common positions that the management of commercial fisheries, including shark fisheries, should come under the purview of FAO and the CCRF and not the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) as endorsed at the Senior Official Meeting (SOM) of the 23<sup>rd</sup> Meeting of the ASEAN Ministers on Agriculture and Forestry (AMAF) in October 2001.
- 1.2 To support the ASEAN common positions for the 12<sup>th</sup> Meeting of the Conference of the Parties to CITES (COP12) to be held in November 2002, which was discussed at the 2<sup>nd</sup>

Meeting of ASEAN Expert Group on CITES (AEG-CITES) in August 2002 and subsequently endorsed by the 24<sup>th</sup> AMAF in October 2002 that:

- CITES listing proposals should be based on the principle of sustainable use of resources in relation to any species;
- There must be scientific-based data provided by a competent scientific authority;
- Other than CITES, other competent authorities such as FAO, ITTO, etc. exist to sustainably manage these species;
- ASEAN as a group should proactively promote the management of marine and tree species issues to be addressed by relevant competent authorities and not CITES; and
- ASEAN countries may also support other countries on CITES issues not of direct interest to ASEAN.

## **II. Improvement for Management of Shark Fisheries in the ASEAN Region**

2.1 To take actions to incorporate shark fisheries management measures within their national fisheries management policy and framework.

2.2 To agree that collection and analysis of data and information and efforts to understand the status and trends are an important basis for the appropriate fisheries management policy and actions, and take the following urgent actions, particularly for the improvement and standardization of the collection of the information and data, including scientific data, of shark fisheries;

- Expanding the classification of some major commercial shark species into the national fisheries statistics considering the national fisheries on sharks;
- Use of species composition as an indicator for better understanding of the dynamic of shark fisheries;
- Development of pilot projects to understand and manage shark fisheries;
- Improvement of the coordination mechanism with the industries to collect and understand the status and trend of shark fisheries;
- Promotion of research activities to maximize utilization of harvested sharks and identification of species of shark products.

2.3 To accommodate the above-agreed actions into the “Regional Guidelines of the Code of Conduct for Responsible Fisheries” so as to harmonize the above actions with other fisheries management requirement.

## **III. Issues Related to the Conservation of Marine Turtles**

3.1 To support the ASEAN common positions in the implementation of conservation and management of marine turtles concluded at the ASEAN Sectoral Working Group on Fisheries (ASWGFi) in April 2002 and subsequently endorsed by the 24<sup>th</sup> AMAF in October 2002, the following should be promoted:

- ASEAN should focus their efforts in the implementation of the existing ASEAN’s Memorandum of Understanding (MOU) and request SEAFDEC for further support in this regard;
- ASEAN should also expand efforts to address the issues that may have adverse effect on fish trade and ASEAN fishing industry, including the issues on TED. The expanding activities should also cover public information programs to demonstrate ASEAN and SEAFDEC seriousness and commitment with regard to marine turtle conservation in the region; and



- The Member Countries urged to expedite the establishment of national coordinators among the ASEAN Member Countries to be led by Malaysia as the regional coordinator, in enhancing marine turtle conservation and management program in the region as well as to organize a meeting led by Malaysia to discuss the development and expansion of this cooperation program, and requested financial support from SEAFDEC for the organization of the meeting.

3.2 Bearing the above in mind, to agree to the following:

- Comprehensive and quantified assessments of the factors of either fisheries or non-fisheries sectors (e.g. pollution, coastal area development, tourism, transportation, etc.) and their impacts on the reduction of marine turtle population should be conducted;
- The outcomes of these assessment could be used as the basis to strengthen the current measures to conserve marine turtles;
- The outcomes of these assessments should be appropriately collated and disseminated to enhance the awareness of the importance on marine turtle conservation;
- The Member Countries should consider collective ASEAN-SEAFDEC publications to document the marine turtle conservation programs and activities that have been undertaken in their respective countries for international distribution;
- ASEAN and SEAFDEC Member Countries reiterated that a comprehensive marine turtle conservation program is most effective for marine turtle conservation. The use of Turtle Excluder Devices (TEDs) might be one of the possible options to alleviate the current trade problems in relation to by-catch of marine turtles. However, considering that the current trade problems are partly derived from the limited knowledge of the regional environment of the trade partners, the above assessment outcomes should be used to mitigate the trade problems on by-catch of marine turtles.

#### **IV. Antibiotic Residues of Farmed Shrimp**

- 4.1 To promote the implementation of the ASEAN guidelines on Good Aquaculture Practices in farms.
- 4.2 To closely regulate and monitor the usage of antibiotics in the aquaculture practices.
- 4.3 To develop a public awareness program on the effects of usage of these antibiotics.
- 4.4 To develop ASEAN-SEAFDEC training programs on the detection of antibiotics residues.



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**REPORT OF THE ASEAN-SEAFDEC REGIONAL MEETING  
ON FISH TRADE AND ENVIRONMENT**

**Bangkok, Thailand  
14-16 October 2002**

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**I. INTRODUCTION**

1. The Association of Southeast Asian Nations (ASEAN) and the Southeast Asian Fisheries Development Center (SEAFDEC) Regional Meeting on Fish Trade and Environment was organized by the SEAFDEC Secretariat in Bangkok, Thailand from 14 to 16 October 2002. The Meeting was initiated as part of the collaborative program on Fish Trade and Environment under the ASEAN-SEAFDEC Fisheries Consultative Group (FCG) mechanism.
2. The Meeting was attended by delegates from the ASEAN and SEAFDEC Member Countries namely Brunei Darussalam, Cambodia, Indonesia, Japan, Malaysia, Myanmar, the Philippines, Singapore, Thailand and Vietnam (except Lao PDR), the ASEAN Secretariat and SEAFDEC as well as resource persons from the Food and Agriculture Organization of the United Nations (FAO), the ASEAN Fisheries Federation (AFF), Indonesia, Taiwan, Thailand, Vietnam and SEAFDEC. The list of participants appears as Annex 1.

**II. OPENING OF THE MEETING**

3. The Secretary-General of SEAFDEC, Mr. Panu Tavarutmaneegul, welcomed all participants and resource persons to the Meeting. He cited the importance of this Meeting in providing forum for the ASEAN and SEAFDEC Member Countries to discuss several issues on Fish Trade and come up with regional policy options to be further promoted in the region. He then declared the Meeting opened. His Welcoming Address appears as Annex 2.

**III. ELECTION OF THE CHAIRMAN**

4. Mr. Lee Yuen Tong, Alternate Council Director for Singapore, was elected as the Chairman of the Meeting.

**IV. ADOPTION OF THE AGENDA**

5. The Agenda of the Meeting, which appears as Annex 3, was adopted.

**V. REVIEW OF THE OUTCOMES OF THE 1999 SEAFDEC PREPARATORY MEETING ON ISSUES OF INTERNATIONAL FISH TRADE AND ENVIRONMENT AND THE REGIONAL TECHNICAL CONSULTATION ON FISH TRADE IN THE ASEAN REGION**

6. The SEAFDEC Secretariat briefly presented the issues discussed during the SEAFDEC Preparatory Meeting on Issues of International Fish Trade and Environment organized in

1999, and the Regional Technical Consultation (RTC) on Fish Trade in the ASEAN Region organized as preparatory Meeting for the ASEAN-SEAFDEC Millennium Conference. The presentation appears as Annex 4.

7. The Meeting recognized the importance and needs for management of sustainable fisheries and promotion of fish trade taking into consideration of the Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region adopted at the ASEAN-SEAFDEC Millennium Conference, the Code of Conduct for Responsible Fisheries (CCRF) and relevant International Plans of Action (IPOAs).
8. The Meeting reaffirmed the conclusion and recommendations of the 1999 SEAFDEC Preparatory Meeting on Issues of International Fish Trade and Environment as well as the Regional Technical Consultation on Fish Trade in the ASEAN Region.
9. The Meeting also stressed on the need to strengthen the existing ASEAN-SEAFDEC collaborative programs related to the improvement of management of shark fisheries, conservation and management of marine turtles and antibiotic residues of farmed shrimp.
10. The Meeting supported the ASEAN common positions that the management of commercial fisheries, including shark fisheries, should come under the purview of FAO and the CCRF and not the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) as endorsed at the Senior Official Meeting (SOM) of the 23<sup>rd</sup> Meeting of the ASEAN Ministers on Agriculture and Forestry (AMAF) in October 2001.

## **VI. TRADE RELATED ISSUES ON SHARKS**

### **6.1 Introduction of Trade Related Issues on Sharks**

11. The SEAFDEC Secretariat made a brief introduction on shark fisheries, taking into account the returned questionnaires from the Member Countries. The presentation appears as Annex 5.
12. The Meeting took note that there is a lack of statistical data on shark due to the low importance of the species as food fish. In addition, most countries in the ASEAN region have no mechanism to collaborate with industrial fisheries in the collection of information on sharks due to the fact that most of sharks are caught as by-catch of other fishery activities.
13. With respect to the utilization of shark, the Meeting took note that in most of the Member Countries, harvested sharks are fully utilized, either for food or non-food products.

### **6.2 Review of Shark Fisheries in the ASEAN Region**

14. The resource person from MFRDMD, Mr. Ahmad Ali, made a brief review of shark fisheries in the ASEAN region and its impact to trade. His presentation appears as Annex 6.

15. The resource person from Taiwan, Mr. Dah-Wen Shieh, informed the Meeting of the outcome of the Shark Conference 2002: Sustainable Utilization and Conservation of Sharks, organized from 13 to 16 May 2002 in Taipei, Taiwan. Fisheries and utilization of sharks in Taiwan was also presented to the Meeting as a case study. The presentation appears as Annex 7. The Meeting took note that the harvested sharks in Taiwan are fully utilized. Several research programs have also been conducted to collect information to support stock assessment and management of sharks.

### **6.3 CITES-Potential Impacts to Fisheries and Trade**

16. The resource person from Thailand, Dr. Choomjet Karnchanakesorn, gave general introduction on CITES with respect to fisheries. His presentation appears as Annex 8.
17. Ms. Faustina Ida Harjanti, representing the representative from the 2<sup>nd</sup> Meeting of ASEAN Experts Group on CITES, presented outcomes of the Meeting (held in Kuala Lumpur, Malaysia in August 2002), specifically on the issue related to fisheries, as appears as Annex 9.
18. The Meeting supported the ASEAN common positions for the 12<sup>th</sup> Meeting of the Conference of the Parties to CITES (COP12) to be held in November 2002, which was discussed at the 2<sup>nd</sup> Meeting of ASEAN Expert Group on CITES (AEG-CITES) in August 2002 and subsequently endorsed by the 24<sup>th</sup> AMAF in October 2002 that:
  - CITES listing proposals should be based on the principle of sustainable use of resources in relation to any species;
  - There must be scientific-based data provided by a competent scientific authority;
  - Other than CITES, other competent authorities such as FAO, etc. exist to sustainably manage these species;
  - ASEAN as a group should proactively push for the management of marine and tree species issues to be addressed by relevant competent authorities and not CITES; and
  - ASEAN countries may also support other countries on CITES issues not of direct interest to ASEAN.

### **6.4 The Regional Proposal on the Implementation of International Plan of Action for the Conservation and Management of Sharks**

19. The representative from FAO, Mr. Ross Shotton, made a brief introduction on management and utilization of shark, as well as the activities undertaken by FAO, particularly through the Government Cooperation Program (GCP). His presentation appears as Annex 10.
20. The SEAFDEC Secretariat made a brief regional proposal on the implementation of International Plan of Action for the Conservation and Management of Sharks. The proposal appears as Annex 11.
21. The Meeting agreed to take actions to incorporate shark fisheries management measures within their national fisheries management policy and framework.
22. The Meeting also agreed that collection and analysis of data and information and efforts to understand the status and trend are the important basis for the appropriate fisheries

management policy and actions, and would take the following urgent actions, particularly for the improvement and standardization of the collection of the information and data, including scientific data, of shark fisheries:

- Expanding the classification of some major commercial shark species into the national fisheries statistics considering the national fisheries on sharks;
- Use of species composition as an indicator for better understanding of dynamic of shark fisheries;
- Development of pilot projects to understand and manage shark fisheries;
- Improvement of the coordination mechanism with the industries to collect and understand the status and trend of shark fisheries; and
- Promotion of research activities to maximize utilization of harvested sharks and identification of species of shark products.

23. The Meeting suggested to accommodate the above-agreed actions into the “Regional Guidelines of the Code of Conduct for Responsible Fisheries” so as to harmonize the above actions with other fisheries management requirement.

## **VII. BY-CATCH OF MARINE TURTLE ISSUE**

### **7.1 Introduction of By-catch of Marine Turtle Issues**

24. The SEAFDEC Secretariat made a brief introduction on the issues of by-catch of marine turtle based upon responses of the ASEAN Member Countries through questionnaires. His presentation appears as Annex 12.

### **7.2 Recent Issues on Shrimp Embargo**

25. The resource person from Thailand, Dr. Waraporn Prompoj, presented overall background of United States shrimp embargo and the recent approach on the situation in Thailand as appears as Annex 13.

### **7.3 Marine Turtle Conservation and Management in the ASEAN Region**

26. The resource person from MFRDMD, Mr. Ibrahim Saleh, made a review on ASEAN Marine Turtle Conservation and Management Program as appears as Annex 14.

27. The Meeting supported the ASEAN common positions in the implementation of conservation and management of marine turtles concluded at the ASEAN Sectoral Working Group on Fisheries (ASWGF<sub>i</sub>) in April 2002 and subsequently endorsed by the 24<sup>th</sup> AMAF in October 2002 that:

- ASEAN should focus their efforts in the implementation of the existing ASEAN’s Memorandum of Understanding (MOU) and request SEAFDEC for further support in this regard;
- ASEAN should also expand efforts to address the issues that may have adverse effect on fish trade related issues and ASEAN fishing industry, including the issues on TED. The expanding activities should also cover public information programs to demonstrate ASEAN and SEAFDEC seriousness and commitment with regard to marine turtle conservation in the region; and



- The Member Countries urged to expedite the establishment of national coordinators among the ASEAN Member Countries to be led by Malaysia as the regional coordinator, in enhancing marine turtle conservation and management program in the region as well as to organize a meeting led by Malaysia to discuss the development and expansion of this cooperation program, and requested financial support from SEAFDEC for the organization of the meeting.

28. Bearing the above in mind, the Meeting also agreed to the following:

- Comprehensive and quantify assessments on the factors of either fisheries or non-fisheries sectors (e.g. pollution, coastal area development, tourism, transportation, etc.) and their impacts on the reduction of marine turtle population should be conducted;
- The outcomes of these assessment can be used as the basis to strengthen the current measures to conserve marine turtles;
- The outcomes of these assessments should be appropriately collated and disseminated to enhance the awareness of the importance on marine turtle conservation;
- The Member Countries should consider collective ASEAN-SEAFDEC publications to document the marine turtle conservation programs and activities that have been undertaken in their respective countries for international distribution;
- ASEAN and SEAFDEC Member Countries reiterated that a comprehensive marine turtle conservation program is most effective for marine turtle conservation. The use of Turtle Excluder Devices (TEDs) might be one of the possible options to alleviate the current trade problems in relation to by-catch of marine turtles. However, considering that the current trade problems are partly derived from the limited knowledge of the regional environment of the trade partners, the above assessment outcomes should be used to mitigate the trade problems on by-catch of marine turtles.

## **VIII. ANTIBIOTIC RESIDUES OF FARMED SHRIMP**

### **8.1 Introduction of Antibiotic Residues of Farmed Shrimp**

29. The SEAFDEC Secretariat made a brief introduction on the issue of antibiotic residues of farmed shrimp based upon responses of the ASEAN Member Countries through questionnaires. The presentation appears as Annex 15.

30. The Meeting noted that any standards of antibiotics set by importing countries for farmed shrimp should be consistent with CODEX standards.

### **8.2 Review of Antibiotic Residues of Farmed Shrimp**

31. The resource person from Indonesia, Mr. Saadullah Muhdi, presented the case study on the issues of shrimp in Indonesia. The presentation appears as Annex 16.

32. The resource person from Vietnam, Mr. Nguyen Tu Cuong, briefly presented the problems on antibiotic residues faced by Vietnam as appears as Annex 17.

33. The resource person from the Asian Fisheries Federation (AFF) gave additional view on the issues of antibiotic residues from the industry point-of-view. He informed the Meeting of approaches to tackle with the antibiotic issue, which include 1) Exclude banned drugs from the production chain; 2) Conduct environmental study to determine present level of natural exposure; and 3) Conduct social and economic impact studies related to the use of antibiotics on all concern, from producers to consumers.
34. The Meeting agreed to promote the implementation of the ASEAN guidelines on Good Aquaculture Practices in farms. The Meeting also agreed to closely regulate and monitor the usage of antibiotics in the aquaculture practices as well as to develop public awareness programs on the effects of usage of these antibiotics.
35. The Meeting suggested that ASEAN-SEAFDEC training programs on the detection of antibiotic residues should be developed.

## **IX. CONCLUSION AND RECOMMENDATIONS**

36. The Meeting adopted the conclusion and recommendation as follows:

### **Common Positions of the ASEAN-SEAFDEC Member Countries on Fisheries Management and Trade**

- To support the ASEAN common positions that the management of commercial fisheries, including shark fisheries, should come under the purview of FAO and the CCRF and not the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) as endorsed at the Senior Official Meeting (SOM) of the 23rd Meeting of the ASEAN Ministers on Agriculture and Forestry (AMAF) in October 2001.
- To support the ASEAN common positions for the 12th Meeting of the Conference of the Parties to CITES (COP12) to be held in November 2002, which was discussed at the 2<sup>nd</sup> Meeting of ASEAN Expert Group on CITES (AEG-CITES) in August 2002 and subsequently endorsed by the 24<sup>th</sup> AMAF in October 2002 that:
  - CITES listing proposals should be based on the principle of sustainable use of resources in relation to any species;
  - There must be scientific-based data provided by a competent scientific authority;
  - Other than CITES, other competent authorities such as FAO, ITTO, etc. exist to sustainably manage these species;
  - ASEAN as a group should proactively promote the management of marine and tree species issues to be addressed by relevant competent authorities and not CITES; and
  - ASEAN countries may also support other countries on CITES issues not of direct interest to ASEAN.

### **Improvement for Management of Shark Fisheries in the ASEAN Region**

- To take actions to incorporate shark fisheries management measures within their national fisheries management policy and framework.
- To agree that collection and analysis of data and information and efforts to understand the status and trends are an important basis for the appropriate fisheries management policy and actions, and take the following urgent actions, particularly for the improvement and standardization of the collection of the information and data, including scientific data, of shark fisheries;

- Expanding the classification of some major commercial shark species into the national fisheries statistics considering the national fisheries on sharks;
- Use of species composition as an indicator for better understanding of the dynamic of shark fisheries;
- Development of pilot projects to understand and manage shark fisheries;
- Improvement of the coordination mechanism with the industries to collect and understand the status and trend of shark fisheries;
- Promotion of research activities to maximize utilization of harvested sharks and identification of species of shark products.
- To accommodate the above-agreed actions into the “Regional Guidelines of the Code of Conduct for Responsible Fisheries” so as to harmonize the above actions with other fisheries management requirement.

### **Issues Related to the Conservation of Marine Turtles**

- To support the ASEAN common positions in the implementation of conservation and management of marine turtles concluded at the ASEAN Sectoral Working Group on Fisheries (ASWGFi) in April 2002 and subsequently endorsed by the 24<sup>th</sup> AMAF in October 2002, the following should be promoted:
  - ASEAN should focus their efforts in the implementation of the existing ASEAN’s Memorandum of Understanding (MOU) and request SEAFDEC for further support in this regard;
  - ASEAN should also expand efforts to address the issues that may have adverse effect on fish trade and ASEAN fishing industry, including the issues on TED. The expanding activities should also cover public information programs to demonstrate ASEAN and SEAFDEC seriousness and commitment with regard to marine turtle conservation in the region; and
  - The Member Countries urged to expedite the establishment of national coordinators among the ASEAN Member Countries to be led by Malaysia as the regional coordinator, in enhancing marine turtle conservation and management program in the region as well as to organize a meeting led by Malaysia to discuss the development and expansion of this cooperation program, and requested financial support from SEAFDEC for the organization of the meeting.
- Bearing the above in mind, to agree to the following:
  - Comprehensive and quantified assessments of the factors of either fisheries or non-fisheries sectors (e.g. pollution, coastal area development, tourism, transportation, etc.) and their impacts on the reduction of marine turtle population should be conducted;
  - The outcomes of these assessment could be used as the basis to strengthen the current measures to conserve marine turtles;
  - The outcomes of these assessments should be appropriately collated and disseminated to enhance the awareness of the importance on marine turtle conservation;
  - The Member Countries should consider collective ASEAN-SEAFDEC publications to document the marine turtle conservation programs and activities that have been undertaken in their respective countries for international distribution;
  - ASEAN and SEAFDEC Member Countries reiterated that a comprehensive marine turtle conservation program is most effective for marine turtle conservation. The use of Turtle Excluder Devices (TEDs) might be one of the possible options to alleviate the current trade problems in relation to by-catch of marine turtles. However, considering that the current trade problems are partly derived from the limited knowledge of the regional environment of the trade partners, the above assessment outcomes should be used to mitigate the trade problems on by-catch of marine turtles.

### **Antibiotic Residues of Farmed Shrimp**

- To promote the implementation of the ASEAN guidelines on Good Aquaculture Practices in farms.
- To closely regulate and monitor the usage of antibiotics in the aquaculture practices.
- To develop a public awareness program on the effects of usage of these antibiotics.
- To develop ASEAN-SEAFDEC training programs on the detection of antibiotics residues.

### **X. CLOSING OF THE MEETING**

37. In his Closing Remarks, SEAFDEC Deputy Secretary-General thanked the Chairman for proceeding the Meeting, as well as all the participants and resource persons for their active participation and contribution which enable the Meeting to come up with fruitful outcomes. He also thanked SEAFDEC Secretariat, including all the supporting staff, in making the Meeting success, and declared the Meeting closed. His Closing Address appears as Annex 18.

## LIST OF PARTICIPANTS

### BRUNEI DARUSSALAM

Haji Alias Haji Shari  
Special Duties Officer

No. 13 Jalan hulaut/Tanjung Nogka  
Ka. Mulaut, Brunei Darussalam  
Phone: (673-2) 382113, 383067  
e-mail: alias\_shari@fisheries.gov.bn

Ranimah Haji A Wahab (Mrs.)  
Fisheries Officer

Department of Fisheries  
Ministry of Industry and Primary Resources  
Jalan Menteri Besar, Berakas BB3910  
Brunei Darussalam  
Phone: (673-2) 383067  
Fax: (673-2) 382069  
e-mail: ranimah\_wahab@fisheries.gov.bn

### CAMBODIA

Ing Try  
Deputy Director

Department of Fisheries  
P.O. Box 582, 186 Norodom Blvd.  
Phnom Penh, Cambodia  
Phone/Fax: (855-23) 219256  
Mobile phone: (855) 11957884  
e-mail: tmmp.cam@bigpond.com.kh

Pich Sereywath  
Fisheries Officer

Department of Fisheries  
P.O. Box 582, 186 Norodom Blvd.  
Phnom Penh, Cambodia  
Phone/Fax: (855-23) 219256  
Mobile phone: (855) 12917626  
e-mail: maric@bigpond.com.kh

### INDONESIA

Suharyadi Salim  
Director for Fisheries Resources

Directorate-General of Capture Fisheries  
Jl. Harsono RM. 3  
Ragunan - PS. Minggu  
Jakarta 12550, Indonesia  
Phone/Fax: (62-21) 7811672  
e-mail: dfrmdgf@indosat.net.id

Iskandar Ismanadji  
Chief of Sub-Directorate of Fish Enterprise &  
Processing

Directorate General of Aquaculture  
Jl. Harsono RM. 3  
Ragunan - PS. Minggu  
Jakarta 12550, Indonesia  
Phone: (62-21) 78836255  
Fax: (62-21) 7803196  
e-mail: uph\_budidaya@cbn.net.id

## **JAPAN**

Kyoichi Kawaguchi  
Deputy Director-General of Fisheries Agency  
and SEAFDEC Council Director for Japan

Ministry of Agriculture, Forestry and Fisheries  
1-2-1, Kasumigaseki, Chiyoda-ku  
Tokyo 100-8907, Japan  
Phone: (81-3) 35028111

Nobuyuki Yagi  
Deputy Director for International Affairs,  
Administrative Division, Fisheries Agency

Ministry of Agriculture, Forestry and Fisheries  
1-2-1, Kasumigaseki, Chiyoda-ku  
Tokyo 100-8907, Japan  
Phone: (81-3) 35915613  
Fax: (81-3) 35028220  
e-mail: nobuyuki\_yagi@nm.maff.go.jp

Shingo Fukui  
Chief, Ecosystem Conservation Office,  
Fisheries Agency

Ministry of Agriculture, Forestry and Fisheries  
1-2-1, Kasumigaseki, Chiyoda-ku  
Tokyo 100-8907, Japan  
Phone: (81-3) 35020736  
Fax: (81-3) 35021682  
e-mail: shingo\_fukui@nm.maff.go.jp

Kihoko Tokue (Ms.)  
Interpreter

Bangkok Garden  
289/733 Naradhiwas Rajanakarindra Road  
Bangkok, Thailand  
Phone/Fax: (66-2) 6720642  
e-mail: kihoko-7@yahoo.co.jp

## **MALAYSIA**

Abdul Hamid Abdul Shukor  
Director of Planning and Development and  
National Coordinator for Malaysia

Department of Fisheries Malaysia  
Ministry of Agriculture  
8<sup>th</sup> Floor, Wisma Tani  
Jalan Sultan Salahuddin  
50628 Kuala Lumpur, Malaysia  
Phone: (60-3) 2698-2011  
Fax: (60-3) 2691-0305

Mohd. Shaupi Derahman  
Director of Resource Management and  
Protection

Department of Fisheries Malaysia  
9<sup>th</sup> Floor, Wisma Tani  
Jalan Sultan Salahuddin  
50628 Kuala Lumpur, Malaysia

## **MYANMAR**

Myint Pe

SEAFDEC Secretariat  
P.O. Box 1046, Kasetsart Post Office  
Bangkok 10903, Thailand  
Phone: (66-2) 9406326 to 29  
Fax: (66-2) 9406336  
e-mail: myint@seafdec.org

**PHILIPPINES**

Gil A. Adora  
Regional Director

Bureau of Fisheries and Aquatic Resources  
Regional Office No. 8  
Tacloban City, Philippines  
Phone: (63-053) 3214801, 3211732  
Fax: (63-053) 3211732  
e-mail: clabfar@tac.webling.com

Edwyn B. Alesna  
Chief, Foreign Trade Section

Bureau of Fisheries and Aquatic Resources  
860 Quezon Avenue, Arcadia Bldg.  
3008 Quezon City, Philippines  
Phone: (63-2) 3725046, 3737453  
Fax: (63-2) 3737453  
e-mail: ealesna@pacific.net.ph

**SINGAPORE**

Lee Yuen Tong  
Director, Food Supply & Technology  
Department and Chief Fisheries Officer, and  
SEAFDEC Alternate Council Director for  
Singapore

Agri-food & Veterinary Authority of Singapore  
5 Maxwell Road, #04-00, Tower Block  
MND Complex, Singapore 069110  
Phone: (65) 63257604  
Fax: (65) 62206068  
e-mail: Lee\_Yuen\_Tong@ava.gov.sg

Lye Fong Keng (Ms.)  
Head, CITES Section, Animal & Plant Health  
Inspection Division

Agri-food & Veterinary Authority of Singapore  
City Veterinary Centre  
25 Peck Seah Street, Singapore 079315  
Phone: (65) 2270670  
Fax: (65) 2276403  
e-mail: LYE\_Fong\_Keng@ava.gov.sg

**THAILAND**

Somsak Chullasorn  
Senior Expert in Marine Fisheries and  
National Coordinator for Thailand

Department of Fisheries  
Ministry of Agriculture and Cooperatives  
Kasetsart University Campus  
Phaholyotin Road, Bangkok 10900, Thailand  
Phone: (66-2) 5613150  
Fax: (66-2) 5620561  
e-mail: somsakc@fisheries.go.th

Anuwat Nateewathana  
Director of Fishery Museum

Department of Fisheries  
Ministry of Agriculture and Cooperatives  
Kasetsart University Campus  
Phaholyotin Road, Bangkok 10900, Thailand  
Phone: (66-2) 5796729  
Fax: (66-2) 5796687  
e-mail: anuwatn@fisheries.go.th

## **VIETNAM**

Vu Van Trieu  
Vice Director-General, International  
Cooperation Department, and SEAFDEC  
Alternate Council Director for Vietnam

Ministry of Fisheries  
10 Nguyen Cong Hoan Street  
Ba Dinh District, Hanoi  
Socialist Republic of Vietnam  
Phone: (84-4) 7719608, 8317693  
Fax: (84-4) 7716702  
e-mail: vuvantrieu@mofi.gov.vn

Vo Van Son  
Senior Expert of the Planning and Investment  
Department

Ministry of Fisheries  
10 Nguyen Cong Hoan Street  
Ba Dinh District, Hanoi  
Socialist Republic of Vietnam  
Phone: (84-4) 7719613  
Fax: (84-4) 7719602  
e-mail: vovanson@mofi.gov.vn

## **ASEAN SECRETARIAT**

### **Somsak Pipoppinyo**

Assistant Director (Food, Agriculture and  
Forestry), Bureau of Economic and Functional  
Cooperation

ASEAN Secretariat  
70A, Jl. Sisingamangaraja  
Kebayoran Baru, Jakarta 12110, Indonesia  
Phone: (62-21) 7262991  
Fax: (62-21) 7398234  
e-mail: somsak@aseansec.org

## **SEAFDEC**

### **SECRETARIAT**

Panu Tavarutmaneegul  
Secretary-General

SEAFDEC Secretariat  
P.O. Box 1046, Kasetsart Post Office  
Bangkok 10903, Thailand  
Phone: (66-2) 9406326 to 29  
Fax: (66-2) 9406336  
e-mail: sg@seafdec.org

Junichiro Okamoto  
Deputy Secretary-General and Deputy Chief  
of the Training Department

e-mail: dsg@seafdec.org

Yasuhisa Kato  
Special Advisor

e-mail: kato@seafdec.org

Kitjar Jaiyen  
Advisor

Phone: (66-2) 9406334

Sutham Sitthichaikasem  
Information Program Coordinator

e-mail: sutham@seafdec.org

Somnuk Pornpatimakorn  
Administrative and Finance Coordinator

e-mail: somnuk@seafdec.org



Pouchamarn Wongsanga (Ms.)  
Policy and Program Coordinator a.i.

e-mail: pouch@seafdec.org

Suriyan Vichitlekarn  
Program Manager

e-mail: suriyan@seafdec.org

Mao Sam Onn  
SEAFDEC WGRFP Member

e-mail: samonn@seafdec.org

Saadiah binti Ibrahim (Ms.)  
SEAFDEC WGRFP Member

e-mail: saadiah@seafdec.org

Myint Pe  
SEAFDEC WGRFP Member

e-mail: myint@seafdec.org

Severino L. Escobar, Jr.  
SEAFDEC WGRFP Member

e-mail: escobar@seafdec.org

Mala Supongpan  
SEAFDEC WGRFP Member

e-mail: mala@seafdec.org

Vu Dung Tien  
SEAFDEC WGRFP Member

e-mail: vuzungtien@seafdec.org

#### **TRAINING DEPARTMENT**

Bundit Chokesanguan  
Information and Extension Division  
Head/Special Departmental Coordinator

SEAFDEC Training Department  
P.O. Box 97, Phrasamutchedi  
Samut Prakan 10290, Thailand  
Phone: (66-2) 4256100 (10 lines)  
Fax: (66-2) 4256110 to 11  
e-mail: bundit@seafdec.org

Somboon Siriraksophon  
Research Division Head

e-mail: somboon@seafdec.org

Phattareeya Suanrattanachai (Ms.)  
Socio-economic Section Head

e-mail: phattareeya@seafdec.org

#### **MARINE FISHERIES RESEARCH DEPARTMENT**

Tan-Low Lai Kim (Ms.)  
Head, Fish Quality Management &  
Technology Section/Special Departmental  
Coordinator

Marine Fisheries Research Department  
2 Perahu Road, off Lim Chu Kang Road  
Singapore 718915  
Phone: (65) 790-7973  
Fax: (65) 861-3196  
e-mail: Tan-Low\_Lai\_Kim@ava.gov.sg

#### **MARINE FISHERY RESOURCES DEVELOPMENT AND MANAGEMENT DEPARTMENT**

Ibrahim Saleh  
Chief, MFRDMD

Fisheries Garden, Chendering  
21080 Kuala Terengganu, Malaysia  
Phone : (60-9) 6163150 to 52  
Fax : (60-9) 6175136  
e-mail : ibrseafdec@po.jaring.my

## FAO

Ross Shotton  
Fishery Resources Officer, FIRM

Food and Agriculture Organization of the  
United Nations (FAO)  
Viale delle Terme di Caracalla  
00100 Rome, Italy  
Phone: (39-06) 57056481  
Fax: (39-06) 57053020  
e-mail: ross.shotton@fao.org

Simon Funge-Smith  
Aquaculture Officer

FAO Regional Office for Asia and  
the Pacific (FAO/RAP)  
Maliwan Mansion, 39 Phra Athit Road  
Bangkok 10200, Thailand  
Phone: 66-2-6974176  
Fax: 66-2-6974445  
e-mail: simon.funge-smith@fao.org

## RESOURCE PERSONS

Faustina Ida Hardjanti (Ms.)  
CITES Section

CITES Management Authority – Indonesia  
Manggala Wanabhakti  
Blok 7, 7<sup>th</sup> Floor  
Jl. Gatot Subroto  
Jakarta Pusat, Indonesia  
Phone/Fax: (62-21) 5720227  
e-mail: cites@dephut.cbn.net.id

Saadullah Muhdi  
Director of Marketing

Ministry of Marine Affairs and Fisheries  
Jalan M.T. Haryono, KAV. 52-53  
Jakarta 12770, Indonesia  
Phone: (62-21) 79180303 Ext. 2357  
Fax: (62-21) 79180803  
e-mail: muhdi@dcptan.go.id

Dah-Wen Shieh  
Deputy Administrator of Fisheries  
Administration

No. 2, Chaochow Street  
Taipei, Taiwan  
Phone: (886-2) 23217394  
Fax: (886-2) 23411953  
e-mail: dahwen@msl.ga.gov.tw

Choomjet Karnjanakesorn  
Senior Fisheries Officer

Department of Fisheries  
Ministry of Agriculture and Cooperatives  
Kasetsart University Campus  
Phaholyotin Road, Bangkok 10900, Thailand  
Phone/Fax: (66-2) 5798564  
e-mail: choomjek@fisheries.go.th

Waraporn Prompoj (Ms.)

Department of Fisheries  
Ministry of Agriculture and Cooperatives  
Kasetsart University Campus  
Phaholyotin Road, Bangkok 10900, Thailand  
Phone/Fax: (66-2) 5798564  
e-mail: choomjek@fisheries.go.th

Panisuan Jamnarnwej  
Vice-President

Thai Frozen Foods Association  
92/6, Sathorn Thani II Bldg., 6<sup>th</sup> Floor  
North Sathorn Road, Bangrak  
Bangkok 10500, Thailand  
Phone: (66-2) 2355622  
Fax: (66-2) 2355625  
e-mail: panisuan@thai-frozen.or.th

Nguyen Tu Cuong  
Director of National Fisheries Inspection &  
Quality Assurance Centre

Ministry of Fisheries  
10 Nguyen Cong Hoan Street  
Ba Dinh District, Hanoi  
Socialist Republic of Vietnam  
Phone: (84-4) 8354966  
Fax: (84-4) 8317221  
e-mail: nafiqacen@gov.vnn.vn

Ahmad Ali  
Research Officer, Resource Exploration and  
Conservation Unit

SEAFDEC Marine Fishery Resources  
Development and Management Department  
(MFRDMD)  
Fisheries Garden, Chendering  
21080 Kuala Terengganu, Malaysia  
Phone: (60-9) 6163174  
Fax: (60-9) 6175136  
e-mail: aseafdec@po.jaring.my

#### OBSERVERS

Chung-Shan Lin  
Assistant Specialist

No. 2, Chaochow Street  
Taipei, Taiwan  
Phone: (886-2) 33436155  
Fax: (886-2) 23893158  
e-mail: tsunshan@msl.fa.gov.tw

Poungthong Onoora (Ms.)  
Legal Officer

Department of Fisheries  
Ministry of Agriculture and Cooperatives  
Kasetsart University Campus  
Phaholyotin Road, Bangkok 10900, Thailand  
Phone: (66-2) 5580201  
Fax: (66-2) 5580234  
e-mail: poungtho@fisheries.go.th ; or  
poungthong2@yahoo.com

Olivier Delahaye Gamucci  
Associate Professional Officer

SEAFDEC Secretariat  
P.O. Box 1046, Kasetsart Post Office  
Bangkok 10903, Thailand  
Phone: (66-2) 9406326 to 29  
Fax: (66-2) 9406336  
e-mail: odegas@seafdec.org

Theo Ebbers  
Consultant

SEAFDEC Training Department  
P.O. Box 97, Phrasamutchedi  
Samut Prakan 10290, Thailand  
Phone: (66-2) 4256100 (10 lines)  
Fax: (66-2) 4256110 to 11  
e-mail: thebbers@seafdec.org

#### SECRETARIAT OF THE MEETING

Nualanong Tongdee (Ms.)  
*Technical Secretary of the Meeting*  
Suphasuk Pradubsuk (Ms.)  
*Assistant Technical Secretary*

e-mail: nual@seafdec.org

e-mail: suphasuk@seafdec.org

Saowanee Wanothayarnchai (Ms.)  
Julasak Markawat  
Narumol Thapthim (Ms.)  
Matinee Boonyintu (Ms.)  
Anongnard Denrassameethep (Ms.)  
Sekson Sathitchote

e-mail: saowanee@seafdec.org

e-mail: secretariat@seafdec.org

e-mail: narumol@seafdec.org

e-mail: matinee@seafdec.org

e-mail: secretariat@seafdec.org

e-mail: secretariat@seafdec.org

**Annex 2**

**WELCOMING ADDRESS**

*by*  
*Mr. Panu Tavarutmaneegul*  
*SEAFDEC Secretary-General*

SEAFDEC Council and Alternate Council Directors,  
Distinguished delegates from ASEAN and SEAFDEC Member Countries,  
Representatives from the ASEAN Secretariat and FAO,  
Distinguished resource persons, participants, ladies and gentlemen,

It is my great pleasure to extend my warmest welcome to all of you to the ASEAN-SEAFDEC Regional Meeting on “Fish Trade and Environment”, this morning. I would also like to express our appreciation to all of you for sharing your valuable time to be with us here to share your experience and wisdom on issues related to fish trade in this region.

Since 1999, SEAFDEC, in collaboration with the ASEAN and SEAFDEC Member Countries, has been implementing a regional program on fish trade and environment due to their importance and impacts to fisheries in the ASEAN region. The program addresses the importance of fish trade through the promotion of proper conservation and management to ensure sustainable fisheries in the region.

The past two SEAFDEC meetings on issues related to fish trade in 1999 and 2001 were proved to be relevant to the needs of the Member Countries in tackling with the common issues of trade in fish and fishery products. This was very well confirmed at the ASEAN-SEAFDEC Conference on “Fish for the People” held in November last year, which issues of fish trade were extensively discussed and concluded in the Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region.

Besides issues related to Sanitary and Phytosanitary Measures, Fisheries Subsidies and Eco-labelling that have been extensively discussed, this regional meeting will focus on issues related to sharks, marine turtles and chemical residues in farmed shrimp. These three issues are currently voiced by the Member Countries as the important common concerns, which need urgent attention at the regional level to jointly discuss ways to tackle them.

It is believed that this Meeting will provide a basis for discussion on important issues on fish trade in ASEAN and SEAFDEC Member Countries and conclude possible regional policy options and actions to promote sustainable fish trade in the ASEAN region.

I am certain that with your invaluable contribution and wisdom, this Meeting will be able to come up with successful outcome to facilitate the future promotion of sustainable fish trade in the ASEAN region.

With that ladies and gentlemen, I wish to declare this Regional Meeting on Fish Trade and Environment open. Thank you.



**Annex 3**

**AGENDA**

1. Opening of the Meeting
2. Election of the Chairman
3. Adoption of the Agenda
4. Review of the Outcomes of the 1999 SEAFDEC Preparatory Meeting on Issues of International Fish Trade and Environment and the Regional Technical Consultation on Fish Trade in ASEAN Region
5. Trade Related Issues on Sharks
6. By-catch of Marine Turtle Issue
7. Antibiotic Residues of Farmed Shrimp
8. Other Fish Trade Issues
9. Conclusion and Recommendation
10. Closing of the Meeting





## **MEETINGS ON ISSUES OF INTERNATIONAL FISH TRADE AND ENVIRONMENT AND THE REGIONAL TECHNICAL CONSULTATION ON FISH TRADE IN ASEAN REGION**

*Suriyan Vichitlekarn*  
*SEAFDEC Secretariat*

### **1. INTRODUCTION**

Due to the importance of the issues related to trade and their impacts to fisheries in the ASEAN region, SEAFDEC has developed a regional program on fish trade and environment. The program was initiated in 1999 to provide a forum for discussion on regionally important issues related to fish trade prior to the WTO Ministerial Meeting held in Seattle in December 1999. Later, the program was endorsed as one of the collaborative program under the ASEAN-SEAFDEC Fisheries Consultative Group (FCG) mechanism in March 2000 and subsequently agreed at the Special Senior Official Meeting for the ASEAN Ministers on Agriculture and Forestry (SOM-AMAF) in April 2000. Since then, the program has been implemented as part of the SEAFDEC effort to support the ASEAN and SEAFDEC Member Countries in the promotion of sustainable fish trade in the region.

### **2. ASEAN-SEAFDEC COLLABORATIVE PROGRAM ON FISH TRADE AND ENVIRONMENT**

The SEAFDEC Preparatory Meeting on Issues of International Fish Trade and Environment was held in November 1999, in Bangkok, Thailand, as the initial activity of the program. The meeting came up with recommendations clarifying the regional requirements for fish trade, which was considered as a regionally important document. The recommendations were subsequently publicized at the International Forum including the COFI Sub-Committee Meeting on Fish Trade in March 2000. Considering the relevance of the program to the regional needs, the SEAFDEC Council recommended that future activities under this program be carefully planned considering the progress on the formulation of any global framework or initiatives that may have impacts on fish trade and fisheries in the region.

The issue of fish trade in the ASEAN region was later taken up as an integral part of the preparation for *the ASEAN-SEAFDEC Conference on Sustainable Fisheries in the New Millennium: "Fish for the People"* (the Millennium Conference), held in November 2001, Bangkok, Thailand. The Millennium Conference concluded a *Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region* (the Resolution and Plan of Action), considered as a regional policy framework and required actions to be undertaken, of which issues related of fish trade form an important part of these documents.

### **3. REGIONAL ISSUES OF FISH TRADE AND THEIR CONTEXT**

#### **SEAFDEC Preparatory Meeting on Issues of International Fish Trade and Environment**

The Meeting was held from 3-5 November 1999 in Bangkok, Thailand. The Meeting discussed major issues on international fish trade and environment and recognized the

importance of linkages between fisheries management and fish trade for achieving sustainable utilization of fisheries resources. To reconcile unregulated fishing practices at international levels, the Meeting discussed the attempt to promote sustainable fisheries, use of fisheries subsidies and trade measures. Recommendations of the Meeting are appended as Appendix 1.

The Meeting recognized that trade measures involving fish and fishery products, in most cases, are usually promoted by non-fisheries agencies in the government although the fisheries agencies are fully involved in sustainable fisheries issues. Government fisheries agencies should be more actively involved in their national initiatives on trade in order to accommodate the fisheries requirements into national trade policies. The Meeting also suggested that ASEAN and SEAFDEC should take a more active role in the formulation of recommendations to harmonize fish trade policies taking into consideration of the sustainable development of fisheries in the ASEAN region.

### **Regional Technical Consultation on Fish Trade in ASEAN Region**

The Regional Technical Consultation (RTC) on Fish Trade in ASEAN region was held in Bangkok, Thailand from 9 to 11 April 2001. The Consultation reviewed national policy and actions taken on fish trade by ASEAN and SEAFDEC Member Countries based on the recommendations concluded at the 1999 SEAFDEC Preparatory Meeting on Issues of International Fish Trade and Environment. The Consultation also discussed current status of issues related to international fish trade and their potential influence to the Southeast Asian region. The outcome of the Consultation was used as the basis for policy consideration on fish trade by the Member Countries as well as technical preparation for the Millennium Conference.

### **Trade Issues in the ASEAN-SEAFDEC Millennium Conference**

At the Millennium Conference, three topics related to fish trade, namely, Sanitary and Phytosanitary Measures, Fisheries Subsidies and Eco-labelling, were highlighted. The conclusion and recommendations related to the above issues were extensively discussed and endorsed, which formed a basis for the formulation of the Resolution and Plan of Action.

As adopted at the Millennium Conference, the following are the Resolution and Plan of Action related to fish trade in the ASEAN region.

“Strengthen the joint ASEAN approaches and positions on international trade in fish and fishery products indigenous to the region by harmonizing standards, criteria and guidelines.” (Resolution paragraph 15)

“Strengthen ASEAN trade policy on fish and fishery products through regional collaboration by harmonizing product standards and sanitary measures with international standards wherever appropriate, working towards harmonized guidelines for fish inspection and quality control systems among ASEAN Member Countries, strengthening fish inspection and quality control systems with regard to food safety and exchanging information on risk analysis.” (Plan of Action, paragraph D1)

“In collaboration with international technical organizations such as the Food and Agriculture Organization of the United Nations (FAO) and the World Trade Organization (WTO), assess the impact of government subsidies on fisheries, particularly on the needs of small-scale fisheries in the ASEAN region and sustainable fisheries.” (Plan of Action, paragraph D2)

“Anticipate and address the potential impacts of eco-labelling of ASEAN fish and fishery products.” (Plan of Action, paragraph D3)

#### **4. CONCLUSION**

It has been recognized that the fisheries related government agencies in the region are not always fully involved in the national policy formulation exercise on trade, including fisheries products. However, it is important that fisheries related government agencies should be informed of the initiatives particularly those that will have impacts on fish trade and fisheries in the region. This would then help facilitating the fisheries related government agencies to further coordinate with authorities directly responsible on fish trade. In addition, discussion on the issues related to fish trade and their potential impacts to fisheries in the region would provide information to the fisheries related government agencies. This would promote effective conservation and management of fisheries to ensure sustainable fish trade in the region.

Considering the nature of the issues of fish trade, based on global frameworks/initiatives, the regional program on fish trade will then be promoted in response to these emerging circumstances or when needs are arisen by the ASEAN-SEAFDEC Member Countries.

**Recommendations agreed at the SEAFDEC Preparatory Meeting on Issues of  
International Fish Trade and Environment  
at the Elizabeth Hotel,**

**Bangkok, Thailand  
3–5 November 1999**

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The Preparatory Meeting was attended by the Chairman of the SEAFDEC Council, Council Directors for the Philippines and Singapore, SEAFDEC Department Chiefs and senior SEAFDEC officers, representatives of the ASEAN Secretariat, FAO, and representatives of ASEAN and SEAFDEC member countries including Cambodia, Indonesia, Japan, Lao P.D.R., Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam.

The Meeting discussed major issues on international Fish Trade and Environment and recognized the importance of linkages between fisheries management and fish trade for achieving sustainable utilization of fisheries resources.

The Meeting noted that there were two major initiatives to reconcile unregulated fishing practices at international levels. One is the attempt to promote sustainable fisheries, the other being trade measures.

The meeting expressed its concern that the above initiatives are not always developed in a coordinated manner.

The Meeting recognized that trade measures involving fish and fishery products, in most cases, are usually promoted by non-fisheries agencies in the government although the fisheries agencies are fully involved in sustainable fisheries issues.

The Meeting noted that in international fora, trade measures are being used to reconcile unregulated fisheries, and envisaged that further trade measures would be used as management tools to promote sustainable fisheries.

The Meeting expressed concern that the global initiatives sometimes give less importance to regional specificity.

In this connection, in order to pursue these initiatives at national and regional level, and to have greater participation and involvement of fisheries agencies in trade issues, it is recommended that:

1. Government fisheries agencies should promote sustainable fisheries in order to achieve sustainable trade in fish and fishery product;
2. The fisheries sector should be treated as a separate group in WTO negotiations, due to renewable nature of fisheries resources and the multi-functionality of fisheries.

3. Government fisheries agencies should be more actively involved in their national initiatives on trade in order to accommodate the fisheries requirements into national trade policies.
4. International rules harmonizing fish trade issues with sustainable fisheries issues must take into account the specific situation and other factors including socio-economics in the region.
5. Government agencies should take into consideration other factors besides subsidies that may promote over-capacity in fishing, and should not agree to proposal on the elimination of fishery subsidies without determining its relationship with overfishing or over-capacity.
6. In depth analysis on the effects of fisheries subsidies on over-capacity together with other factors, which cause over-capacity or unsustainability, be conducted by competent international technical organizations such as FAO.
7. ASEAN and SEAFDEC member countries provide the Secretariat of SEAFDEC with the list of government's support to fisheries in order to assist FAO in its analysis on fisheries subsidies by end of January 2000.
8. Regional organizations such as SEAFDEC should be more involved in policy issues on fish trade in order to provide appropriate information on fish trade to relevant agencies of the ASEAN and SEAFDEC member countries.
9. SEAFDEC and ASEAN should take a more active role in the formulation of recommendations to harmonize fish trade policies with sustainable fisheries issues through the Regionalization program of the Code of Conduct for Responsible Fisheries (CCRF).
10. The ASEAN – SEAFDEC Fisheries Consultative Group should be used as the mechanism to develop common positions on issues on sustainable fisheries and sustainable trade in fish and fishery products at international fora such as WTO, CITES, and FAO. SEAFDEC could assist ASEAN and SEAFDEC member countries in compiling various national and regional studies on the important fisheries issues, including sharks, Southern Bluefin Tuna (SBT) and CCRF and collaborate with FAO in order to accommodate the regional situations into the global framework.

## Conclusion and Recommendations of the Regional Technical Consultation on Fish Trade in ASEAN Region

Bangkok, Thailand  
9-11 April 2001

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### Introduction

At the invitation of the Secretariat of the Southeast Asian Fisheries Development Center (SEAFDEC), the Regional Technical Consultation (RTC) on Fish Trade in ASEAN region was held in Bangkok, Thailand from 9 to 11 April 2001.

The Consultation was attended by the representatives from ASEAN and SEAFDEC Member Countries (ASCs), observers and resource persons from Taiwan, the Food and Agriculture Organization of the United Nations (FAO), the Marine Stewardship Council (MSC), the World Trade Organization (WTO), the Department of Fisheries, Thailand and SEAFDEC. The Consultation reviewed national policy and actions taken on fish trade by ASEAN and SEAFDEC Member Countries based on the recommendations concluded at the 1999 SEAFDEC Preparatory Meeting on Issues of International Trade and Environment and discussed current status of issues related to international fish trade and their potential influence to the Southeast Asian region. The outcome of the Consultation would be used as the basis for policy consideration on fish trade by the ASCs as well as technical preparation for the ASEAN and SEAFDEC Conference on Sustainable Fisheries for Food Security in the New Millennium: "Fish for the People", scheduled from 19 to 24 November 2001.

### Conclusion and Recommendations

After the deliberation, the Consultation recommended that:

The recommendations concluded at the 1999 SEAFDEC Preparatory Meeting on Issues of International Fish Trade and Environment are still valid and could be further promoted, incorporating additional recommendations agreed in this Consultation. However, the following sentence should be replaced in the item number 2 of the recommendations, which reads "*the fisheries issues should be treated separately and in an appropriate manner in WTO framework, due to renewable nature of fisheries resources and the multi-functionality of fisheries*".

#### *I. Subsidies to Fisheries Sector*

- 1.1 A regional policy including scope and context of subsidies to fisheries sector taking into account the national/regional specificity should be elaborated. The regional policy can be proposed as a regional contribution to the international definition which may be formulated. The ASCs should be more actively involved in the international exercise establishing an internationally agreed definition and classification of subsidies to fisheries sector.
- 1.2 In order to define the usefulness of subsidies to fisheries sector at national and regional levels, potential and empirical effects in term of production, trade, natural resources and

environment and fishing communities from different types of subsidies to fisheries sector should be further studied.

- 1.3 Several types of government programs intended to promote fishery management and sustainable development at national level including infrastructure development, research, extension and training are not the prime concern on the international debate on subsidies to fisheries sector. Such government programs should not be referred to subsidies to fisheries sector.

## ***II. Eco-labelling***

- 2.1 Eco-labelling in the context of the ASCs should be regarded as “labeling in relation to sustainable fisheries and environmental issues”.
- 2.2 Proposals for eco-labelling should be viewed in a wider context as one of the many possible tools for fishery management under the CCRF. However, study and fact-finding will need to be developed to assess its wider implication for industrial and non-industrial fisheries and trade in fish and fishery products.
- 2.3 Right and responsibilities on the promotion of the issue as a part of fishery management tools in national waters should be prerogative to the States, as stipulated in 1982 UNCLOS. In addition, at this moment, States especially fishery related agency, have the scientific and technical competence on the fishery management including supporting data and information. Therefore, the fishery related agencies in the ASCs should take a proactive role and be the national agency to ensure proper implementation of any labeling scheme to address fishery management and environmental issues.
- 2.4 In order to harmonize these actions to be initiated by the ASCs, a regional collaborative mechanism should be promoted in the Millennium Conference coordinated by SEAFDEC.
- 2.5 With respect to highly migratory fish stocks which management responsibility have already been given to the appropriate regional fisheries management organizations, the ASCs should support measures complementary to fishery management including labeling in relation to sustainable fisheries and environmental issues.
- 2.6 Regional guidelines/criteria on labeling relating to sustainable fisheries and environmental issues should be developed and promoted as a regional reference and inputs for development of international guidelines/criteria for eco-labelling.

## ***III. Sanitary and Phytosanitary (SPS) Measures***

- 3.1 The fishery related agencies of the ASCs should keep pace with the development and involve themselves in ensuring that the countries’ representatives are aware of the issues in the discussion on the SPS issue in the ASEAN Free Trade Area (AFTA), WTO SPS Committee, CODEX and OIE.
- 3.2 Close regional collaboration on SPS for both food safety and fish health management issues should be strengthened, especially taking into account following points:
  - Sharing of experiences between the ASCs
  - Provide training to enhance and strengthen human resource capacity in the region
  - Harmonisation of standards
  - Development of a common stand in international forum

- 3.3 ASEAN-SEAFDEC Collaborative program on “Fish Trade and Environment” will be used as an overall framework dealing with fish trade issues. SPS issues should be appropriately addressed in the program. On-going activities by MFRD on HACCP and AQD on Fish Diseases programs could be used as the starting point for technical assistance to the member countries.
- 3.4 Thailand was requested to take the leading role (acting as the lead ASEAN country for the program) for SPS issues under the ASEAN-SEAFDEC Collaborative program on “Fish Trade and Environment”.

#### ***IV. Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)***

- 4.1 The fishery related agencies of the ASCs should coordinate within their governments on the appropriate level of involvement in their national CITES authority and participation in CITES meetings. Existing ASEAN CITES mechanism should be strengthened to deal with fishery issues.
- 4.2 The ASCs should support FAO involvement in CITES including the review and development of the listing criteria on commercially harvested aquatic animal species in order to ensure the appropriate consideration of fishery management aspects. For this purpose, the ASCs should support active role of FAO as the competent UN fishery technical agency in CITES.
- 4.3 The ASCs should be fully involved in the FAO process of the development of new criteria in the related meetings.

The ASCs should be proactive in developing a regional mechanism to coordinate their efforts in dealing with CITES issues, starting with the issue of shark fisheries. The ASCs should take appropriate actions to implement the International Plan of Action for the Conservation and Management of Sharks.



## INTRODUCTION OF TRADE RELATED ISSUES ON SHARK FISHERIES

*Severino L. Escobar, Jr.*  
*The Working Group on Regional Fisheries Policy from the Philippines*  
*Southeast Asian Fisheries Development Center*

### 1. INTRODUCTION

Shark fisheries make up only a small percentage of the species targeted by the world's fisheries. However, over the past two decades, human exploitation of sharks has substantially increased worldwide, as sharks have become a valuable resource. They are of primary importance in some regions of the world, sustaining important fisheries in some countries. Moreover, they have been, and are, a cheap but valuable source of protein for coastal communities dependent on subsistence fisheries. Humans can utilize much of the carcass for food or other uses. Sharks are exploited for their meat, fins, skin, liver, teeth, cartilage and other internal organs.

As a result of over-exploitation, some populations are now believed to be endangered in several areas of the world. Scientific data are scarce, but biologists think that of the 100 exploited species, 20 or so are in most trouble and are considered vulnerable, endangered or critically endangered.

Subsequently, a growing international concern over the possible effects of continued exploitation is emerging with the need for improved control of fishing for shark fisheries. There are signs that governments, too, are beginning to take the problem seriously. CITES resolution on the biological and trade status of sharks (Conf. 9.17) and Decision 10.73 and respective related decisions by COFI XXI, XXII and the Kyoto Conference in 1995 resulted in an FAO work program which led to the adoption of the International Plan of Action (IPOA) for the conservation and Management of Sharks.

This introductory paper compiles pertinent information and issues related to shark fisheries. Likewise, a compilation of country feedbacks on issues related to sharks is presented and analyzed.

### 2. GENERAL INFORMATION

#### 2.1 Biology and characteristics of sharks

Sharks belong to the *Chondrichthyes* class, together with *rajiformes*, torpedos, sawfish, skates, rays, chimaeras and elephant fish. They are part of a family of fishes known as cartilage fishes. These fish differ from the *Osteichthyes* or bony fish as they possess a cartilaginous skeleton instead of a bony skeleton. The great majority of the commercially important species of chondrichthyans are elasmobranchs, where sharks are included.

Shark populations are extremely heterogeneous and are represented by a great variety of species, roughly 479 species classified into 35 families. They differ markedly in habits and

biology, in particular in growth and reproduction. They are found throughout the world in a wide variety of habitats from the bottom of marine oceans to freshwater rivers, lakes, inshore estuaries and lagoons, from polar waters to warm tropical regions. They live in coastal waters, open sea, at different depths, even as low as 2,000 meters. Only 5% are really oceanic. There are species, such as the megamouth shark (*Megachasma pelagios*), which inhabit the ocean depths; while hammerheads (*Sphyrna spp.*) and sandbar sharks (*Carcharhinus plumbeus*) prefer shallow coastal waters. Sharks vary greatly in size from the colossal whale shark (*Rhincodon typus*), which can exceed 12 meters, to the pygmy sharks (*Euprotomicrus bispinatus*), which are full grown at 25 cm. Most species are highly migratory and travel great distances, such as mako sharks (*Isurus spp.*), blue shark (*Prionace glauca*) and whitetip shark (*Carcharhinus longimanus*), which are pelagic, but other species are localized. There are species with a limited distribution and those which are widespread. There are also wide differences in their social behaviour: some species are solitary, like the thresher sharks (*Alopias spp.*), but they can assemble when attracted by shoals of prey. There are species that tend to segregate geographically on the basis of age and sex, such as sandbar, blue and dogfish (*Squalidae*). They can live as long as 60-70 years like the tope sharks (*Galeorhinus galeus*), or they can have a shorter lifespan like the roughly 20 years of the blue shark. They can take up to 20-25 years to mature like the dusky shark (*Rhizoprionodon taylori*). Not all sharks are totally carnivorous. There are species such as the whale, basking (*Cetorhinus maximus*) and megamouth sharks which eat predominantly plankton. Shark reproductive strategies also vary widely from one species to another. They can be oviparous, viviparous or ovoviviparous as many species lay eggs, others have placentas, and some produce embryos. The gestation time can be long (two years) and the number of offspring can reach 300 (e.g. the whale shark) or be limited to one (e.g. the sandtiger shark (*Carcharias taurus*)).

In general, the life history of sharks is characterized by slow growth rates, low fecundity potential, relatively late sexual maturation, long life spans and so they are classified by ecologists as strong **K** strategists. **K** strategists refer to a variable normally employed by ecologists in describing life histories of species wherein their population at or near saturation density or carrying capacity can exist indefinitely in a certain environment or habitat. Species intermediate to **K** strategist are not advantageous to have high birth rate and they tend to put a great deal of resource into raising only a few young. Furthermore, they are usually the top predators in their communities and are therefore comparatively sparsely distributed. So, they possess biological peculiarities and an ecological role that indicate that they could be particularly sensitive to an increase in fishing exploitation.

## 2.2 Utilization and importance of sharks

Though sharks make up only a small percentage of the species targeted by the world's fisheries, they are extremely versatile and humans can use much of the carcass. Fins have become one of the world's most lucrative fisheries' commodities, particularly appreciated in Chinese cuisine. Shark cartilage has been claimed to be beneficial in a great variety of diseases, such as arthritis, psoriasis colitis, acne, enteritis, phlebitis, rheumatism, peptic ulcers, hemorrhoids, herpes simplex, melanoma, recently also AIDS, and above all cancer. Even though its benefits are unproved, a new market for cartilage as an alternative therapy for cancer treatment and prevention has been created. Sharks are also valued for their liver oils, specially the hexaunsaturated isoprenoid alkene squalene. It is estimated that one ton of squalene could require the livers of 2,500 to 3,000 sharks. Nowadays liver oil is mainly used in the textile and tanning industries and in the production of cosmetics, pharmaceutical

products, and lubricants. The skins can be manufactured to produce high-quality leather or used as an abrasive. Discards are also used for the production of fishmeal and fertilizer. In addition, shark teeth and jaws are marketed and sold.

### **3. MAJOR INTERNATIONAL AND DOMESTIC ISSUES ON SHARK FISHERIES**

#### **3.1 Unregulated and unmonitored trade**

Sharks are exploited not only for their meat but also for their fins, skin and internal organs. The trade in sharks and shark products is vast and, in some cases, increasing. In many regions, increased trade in shark products especially shark fins has played a significant role in increased shark harvests in recent years. At the same time, majority of shark fisheries and trade remain largely unregulated and unmonitored in spite of international and domestic control measures in place.

#### **3.2 By-catch and utilization of sharks**

In addition to being directly targeted in various commercial and recreational fisheries throughout the world, a great number of sharks are taken as by-catch in fisheries targeting other species. The increase in price and demand for fins have also created the problem on the proper and full utilization of sharks. Shark fins are now the world's most expensive fishery products, although the value varies according to color, size, thickness and fin needle content. Oftentimes, only this most valuable part is used and processed while the rest of the animal is thrown back into the water or discarded, and ultimately unrecorded.

#### **3.3 Lack of research and development programs**

Few nations have the capability to develop and conduct their research activities on sharks. Often, these nations rely on other sponsors to provide financial assistance to ultimately conduct research activities on their fisheries. This problem is even more compounded by the scarcity of nations to sponsor such undertaking. Subsequently, limited knowledge of shark biology, of the size and status of their stocks, of the real volume of their captures and their population dynamics presents serious difficulties for fishery management. With this handicap, shark fisheries data and statistics are rather limited and questionable.

#### **3.4 Absence of national management measures and plans**

The absence of conservation and management measures in the national level is even a major cause for concern. Without such measure or program in place, the fishing pressure and the continued disregard of over-exploitation of shark fisheries will always pose a threat and endanger the population of sharks.

### **4. INTERNATIONAL INSTRUMENT FOR THE CONSERVATION AND MANAGEMENT OF SHARKS**

The International Plan of Action for Conservation and Management of Sharks (IPOA-Sharks) has been developed to ensure the conservation and management of sharks and their long-term sustainable use. The instrument has been elaborated within the framework of the Code of Conduct for Responsible Fisheries. Though voluntary in nature, it

encourages all concerned States and fishing entities, members and non-members of FAO, to adopt a national plan of action for the conservation and management of shark stocks.

## 5. PRELIMINARY INFORMATION AND ASSESSMENT OF SHARK FISHERIES IN THE ASEAN AND SEAFDEC MEMBER COUNTRIES

To initially obtain general information on the shark fisheries of the ASEAN and SEAFDEC member countries, the SEAFDEC Secretariat has devised a simple questionnaire highlighting on six particular issues related to sharks, to wit:

1. *Does your country fully develop collaborative mechanism with industries (large-scale) in order to collect required data and information?*
2. *Does your country have shark fisheries (as target species)?*
  - 2.1 *If yes, what kind of fishing gears is used to catch sharks and how?*
  - 2.2 *If yes, where are their locations?*
  - 2.3 *If not, how (fishing gears) they catch sharks as part of by-catch?*
3. *What are the main shark species caught by local fishers?*
4. *What are the general usages of sharks?*
5. *What is your shark classification on shark in your national statistics?*
6. *Are there any research activities on conservation and management of shark?*

*Of the ten SEAFDEC Member Countries, eight countries have responded and complied with the Secretariat request. Their responses were summarized accordingly:*

### 5.1 Brunei Darussalam

Brunei has so far not developed any collaborative mechanism with large-scale or commercial industries to collect data and information on sharks. Sharks are taken as by-catch by the following fishing gears – bottom set long line, demersal trawl, hand line and trammel. The main shark species caught are *Carcharirus sp.*, *Sphyrna lewini*, *Rhinobatus thouini* and *Mustelis sp.* Generally, the shark's meat is eaten fresh. Subsequently, sharks are classified as *Sharks* under classification of Grade IV. Brunei has collaborated with SEAFDEC to conduct its research activities on the conservation and management of sharks. The initial stage of the research activity covered the taxonomy and the biology of sharks and rays. The activity is being or was implemented under the Regional Project: The Study, Conservation and Management of Sharks in Southeast Asia.

### 5.2 Cambodia

The development of collaborative mechanism with commercial or large-scale industries to collect sharks data and information has never happened. Likewise, shark fisheries do not exist and fishermen are not inclined of going into shark fishing. Accidentally (or incidentally), sharks are caught by trawl net, scomberomous gill net, floating gill net, purse seine net and other surrounding nets. *Cephaloscylium fasciatum*, *Galeocerdo cuvier*, *Scoliodon walbeehmi*, *Sphyrna zygaena* and *Stegostoma varium* are the main shark species

being caught. Generally, shark products as fin, meat and liver are used for food. In its national statistics, sharks are not classified. Similarly, there is no specific national research activity or program on sharks but rather on fisheries in general.

### 5.3 Indonesia

Previously, no mechanism has been developed to collaborate with commercial or large-scale industries in the collection of data and information on sharks. Until recently, enumerators were assigned on board fishing vessels following the recommendation made from the collaborative research between Australia and Indonesia. By and large, shark fisheries are target species of bottom long lines and gill nets commonly caught in Pelabuhan Ratu (West Java), Cilacap (Central Java) and Tanjung Luar, Lombok, Nusa Tenggara Barat (Sunda Lesser). Majority of large sharks come from single boat that stayed out at sea for up to a month, taking nearly a week just to reach the fishing grounds (northwards in Java Sea). The main shark species caught by the local fishers are: *Chiloscyllium punctatum*, *Carcharhinus falciformis*, *Carcharhinus limbatus*, *Galeocerdo cuvier*, *Prionace glauca*, *Carcharhinus longimanus*. In terms of its utilization, various parts of shark are used for food, leather and as an ingredient in medicines. Based on the Indonesia statistical report, sharks are classified under sharks together with rays. International Research reports that there are about 128 species of sharks. At present, research programs are underway to conserve sharks. Research activities are being implemented collaboratively between CSIRO Marine Research of Murdoch University, an Australian organization, and the Research Institute for Marine Fisheries (RIMF) of the Indonesian Institute of Science, Center for Agricultural and Socio-economic Research. The research project was the result of an initiative developed by the DGCF proposing a collaborative research on shark in 2001 with the aim to (1) evaluate the socio-economic status of the artisanal fishery and to describe the main biological, catch, and gear characteristics of the fishery; (2) develop a preliminary assessment of the status of the stocks and the extent to which they may be shared with Australia; and (3) provide training and advice to Indonesian scientists with respect to issues that may be important with regard to possible alternative management option for the fishery.

### 5.4 Malaysia

Like the two previous countries, Malaysia has not collaborated with commercial and large-scale industries in the collection of its sharks data and information. Collection of data on sharks is, however, conducted from fish landing places. Further, shark fisheries are not directly targeted but are rather taken as by-catch mainly by trawl net, drift gill net and hook and line. The commonly caught shark species are *Carcharhinus sorrah*, *Carcharhinus sealei*, *Carcharhinus dussumieri*, *Laxodon macrorhinus* and *Chiloscyllium indicum*. Sharks are mainly used for food especially products such as fin, meat and liver. Sharks are eaten wholly and there is no discards. The meat is sold fresh or dried. The jaws are sold as rare souvenir items. Cartilage and some other discarded parts of the fish are used as bait for fish and crab trap. Small sharks, as well as those that are non-edible or unsuitable for bait are sold to fishmeal factories for fertilizers. Together with rays, sharks are classified under *Elasmobranch* and together they are classified under ISSCAAP Group No. 37. So far there is no research activity being conducted for purposes of conservation and management of sharks. But previously, between 1996-1997, the Darwin Elasmobranch Biodiversity Conservation and Management Project has been implemented in Sabah, particularly in the Island of Borneo. The project was undertaken collaboratively among several institutions – the Department of Fisheries Sabah, the IUCN Species Survival Commission's Shark

Specialist Group, WWF Malaysia and the University Malaysia Sabah. The project was funded under the auspices of the UK government's Darwin Initiative for the Survival of Species.

## 5.5 Myanmar

There is no collaborative mechanism developed with the large-scale or commercial industries on the collection of sharks data and information. Geographically, sharks inhabit in the coastal areas of Myanmar where they are incidentally caught by long line and drift gill net as by-catch. Shark species mainly caught are *Atelomyxerus marmoratus* (Marble catfish), *Carcharhinus palasorrah* (Blue shark), *Carcharhinus ablimarginatus* (Silver tip shark), *Sphyrna blochii* (Hammerhead shark), *Sphyrna lewini* (Scallop hammerhead shark), *Sphyrna zygaena* (Round headed shark), *Rhincodon typus* (Whale shark), *Pristis suspidatus* (Pointed saw fish), *Pristis microdon* (Small tooth saw fish), and *Pristis ziisron* (Green saw fish). Generally, shark products like fin, meat and liver are used for food. Information on the classification of sharks and research activities are not available.

## 5.6 Philippines

To some extent, collaborative mechanism with commercial or large-scale industries to collect data and information on sharks is undertaken. The mechanism exists in areas where enumerators are assigned to collect catch and effort data. Sharks are directly targeted or landed as by-catch. Commercial fishing gears like trawl, hook and line, and long line are commonly employed to catch sharks. Municipal or small-scale gill net, hook and line, long line, spear, fish corral and baby trawl are also used for catching the target fisheries. In addition to being targeted in commercial or small-scale fisheries, sharks are also taken as by-catch with fishing gears like purse seine, filter net and beach seine. Sharks are located all over the country but the main species caught are dogfish, requiem, hammerhead and thresher sharks. Generally, sharks are exploited for its fins only while its meat is also utilized for food and leather. Basically, the national statistics classify shark fisheries as shark only. Currently, research activities are being undertaken to collect catch and effort data for stock assessment and shark species identification purposes.

## 5.7 Thailand

At present there exist no collaborative mechanism between the Department of Fisheries (DOF) and the commercial or large scale fishery industries in Thailand. Mechanisms for collaboration do exist however between and among DOF, the Ministerial Notification of the Ministry of Finance, and the Ministry of Commerce, where DOF collect some data and information from the two latter ministries. Further, sharks comprise not the target fisheries but only make up a small portion of by-catch caught by various types of fishing gears such as trawls, purse seine nets, gill nets, bottom long lines, and bamboo stake traps. Large trawlers contribute much to the shark by-catch in Thailand. The main shark species caught by Thai fishermen are *Carcharhinus spp.*, *Chiloscyllium spp.*, *Sphyrna spp.*, *Stegostoma spp.*, and *Scoliodon spp.* The dominant species of sharks in the catch is *Carcharhinus dussumieri* (Whitecheek shark), *Sphyrna lewini* (Scalloped hammerhead shark), and *Stegostoma fasciatum* (Zebra shark). Sharks have been consumed in fresh, smoked, dried (both salted and sweetened) and shark fin soup. In addition, the liver is used to produce fish liver oil while the skin is used for leather goods making. Thailand's fishery statistics classify

sharks into mixed species groups of sharks and rays. However, information related to research activities for the conservation and management of sharks is not available.

## 5.8 Vietnam

To some extent, mechanism for collaboration with commercial or large-scale industries to collect data and information on sharks is developed. Currently, the collection of fisheries statistics is being undertaken by two agencies. Firstly, it is collected by the Ministry of Fisheries through its Provincial Fisheries Departments collecting mainly fisheries data. Likewise, enumerators are sent to the provinces to collect specialized data such as shrimp, some species of fish like tuna. Secondly, it is also collected by the General Statistics Department, through its provincial and city branches, which gather all kinds of data, including fisheries data. Subsequently, the data are always reflected in general terms such as fish, shrimp, mollusk indexed by province. Nevertheless, shark fisheries are not target species but are incidental catches of long line, gill net and trawl net. Sharks inhabit all over the country but the main species that are caught are *Sphyrna lewini* (Hammerhead shark), *Carcharhinus dussumieri* (White shark), *Chiloscyllium grimseum* (Grey shark), *Sphymidae spp.* and *Orectolobidae*. Sharks meat are rarely consumed but other products as sharks fin are used especially for fin soup while sharks liver are used for oil pill. Vietnam's national statistics classify sharks and rays under family and species. Interestingly, studies have been conducted on the taxonomy and distribution of sharks' species but conservation and management of sharks receive little regard due the resource low economic value.

## 6. CONCLUSION

Drawing upon the information presented in the previous discussion, the conservation and management of shark fisheries within the national territorial waters of the ASEAN-SEAFDEC country-respondents is boldly wanting. Mechanisms and other effective strategies to obtain relevant data and information on sharks are likewise inadequate and deficient. Furthermore, sharks are valued according to country preferences. While shark fisheries may be directly targeted in certain countries, generally, sharks are landed from multi-species fisheries or taken as by-catch in fisheries targeting other species. Dogfish, requiem, hammerhead, thresher, whitetip, silky, blacktip, and blue sharks mainly compose the catch for target shark fisheries. Commonly employed fishing gears and methods of catching ranges from the most sophisticated to the least conventional ones such as trawl, long line, hook and line, gill net, fish corral and spear. Incidental and by-catch of sharks are taken mostly by long line, drift gill net, trawl, hook and line, trammel net, hand line, beach seine, filter net, purse seine and other surrounding nets. The main composition for shark by-catch includes whitecheek shark, grey bamboo shark, scalloped hammerhead shark, zebra shark, blue shark, smooth hammerhead shark, silver tip shark, sawfishes, etc. Interestingly, sharks are obviously appreciated for its extreme versatility particularly for its fins, meat, liver, skin and cartilage. However, sharks will continue to become more vulnerable to over-fishing if national management plans are not put in place to ensure sustainable use of sharks.



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## REVIEW OF SHARK FISHERIES IN THE ASEAN REGION

*Ahmad Ali and Mahyam Mohammad Isa*  
*Marine Fishery Resources Development Management Department*  
*Southeast Asian Fishery Development Center*

### 1. INTRODUCTION

Shark fisheries have historically represented only a minor and relatively low-value contribution to the overall fisheries production of all SEAFDEC member countries. However, there has been an apparent rise in the trade of shark fins in the last decade which focusing more on a substantial fishery and little is known about this fishery. Shark species are currently in demand for their fins, cartilage, skin, meat, oil and livers.

Due to lack of management and research on sharks, little is known about its sustainable level. Consequently, very little is known about the biology and ecology of the most sharks' species. Despite the global pressure on this resource, only few nations include sharks fishery in their management regimes.

This report compiles available fisheries information on sharks through published reports on statistics, shark trade and conservation conventions, seminars, meetings, workshops and visual market survey in all the major fish markets and fishing port of Peninsular Malaysia, Sabah, Sarawak and Brunei Darussalam.

### 2. BIODIVERSITY AND TAXONOMY

The elasmobranch biodiversity of this region is among the richest in the world with at least 136 species of sharks (Compagno, 1997). The "Region" as define here includes the tropical waters of the South China Sea and adjacent waters) with those countries fronting the South China Sea (including freshwater habitats): Thailand (Gulf of Thailand), Malaysia (Peninsular Malaysia, Sarawak and Sabah) Singapore, Kampuchea (Cambodia), Vietnam, China, Taiwan, Philippines, Indonesia (Kalimantan and Brunei). However, information relating to the shark fauna of the region is still poorly known. Many new species are continually being discovered and recorded, and numerous taxonomic problems still need to be resolved before a complete biodiversity baseline can be established. More complete studies are however hampered by general lack of research and reference collection, lack of access to the regional data management and information systems, the near absence of a comprehensive regional identification guide to the shark species found here and a clear shortage of taxonomists in the region.

#### 2.1 Indonesia

Indonesia has richest chondrychthian in the world. Only relatively small number of research and publications on chondrychthian has been carried out in Indonesian waters. However, the elasmobranch fauna in the Indonesian shallow water is as rich as the Australian waters and little is known about its habitats in the deeper water. It has been estimated that Indonesia has at least 350 chondrychthian species.

Among the major shark species caught in Indonesia are blacktip reef shark (*Carcharhinus melanopterus*), spot-tail shark (*Carcharhinus sorrah*), whitetip reef shark (*Triaenodon obesus*), scalloped hammerhead (*Sphyrna lewini*), blue sharks (*Prionacea glauca*) and gulper shark (*Centrophorus squamosus*).

## **2.2 Malaysia**

Information regarding the sharks and rays in Malaysia is still scanty and inadequate. More than 116 species of elasmobranch are reported to inhabit within the Economic Exclusive Zone of Malaysia, comprising more than 62 species of sharks from 15 families, more than 54 species of rays from 12 families and 2 species of *Chimaera* (Ahmad *et al.*, 1998, Ahmad, 2002-unpublished report). In Sabah, a total of 32 species of sharks and 41 species of rays has been recorded during the 18 months elasmobranch biodiversity project in 1997 (Manjaji, 1997).

## **2.3 Philippines**

In the Philippine waters, 52 species of sharks were reported to be found in the survey conducted by Fish and Wildlife Service, U.S Department of Interior in the early 1950s but at present, only 20 species were confirmed to occur. But, this does not mean that other species are no longer found in the Philippines waters (Barut & Zartiga, 1997).

## **2.4 Thailand**

In Thailand, at least 145 species of elasmobranch from 34 families and 13 orders may probably occur in the Thai and adjacent waters. These consist of one species of chimaera, 74 species of shark and 70 species of batoids. The dominant groups are ground sharks (Carcharhiniformes), comprising 49 species from 5 families and stingrays (Myliobatiformes), constituting 45 species from 6 families. Eighteen species of this elasmobranch are known to inhabit in deeper waters. A total of 15 species are oceanic, 108 species are coastal species and 10 species inhabit freshwaters or penetrate in euryhaline waters (Chavalit, 1997).

## **2.5 Brunei Darussalam**

Information regarding the sharks and rays in Brunei Darussalam is still scanty and inadequate. Fifteen species of sharks from 5 families and 2 orders were recorded during research team from MFRDMD and JICA expert visited Brunei from 4 to 7 November 2000.

## **2.6 Vietnam, Singapore, Cambodia and Myanmar**

Information from the above countries was not available during this report writing

## **3. SHARK RESOURCES**

Figure 1 show the landings (in metric tons) of sharks for 5 SEAFDEC member countries (Malaysia, Thailand, Philippines, Singapore and Indonesia) from 1975 to 1997. Data from other countries such as Myanmar, Cambodia, Vietnam and Brunei are not available during this report preparation. Indonesia is the top harvester and the trend is increasing with a total

landing of about 854,681 metric tons and an average of 37,160 metric tons/year (1975-1997). Philippines is the second with the total landing of 125,287 metric tons with an average of 5,966 metric tons/year (1977-1997). Malaysia is the third with a total landing of 121,411 metric tons and an average of 5,571 metric tons/year (1977-1997) Thailand is the fourth with a total landing about 86,564 metric tons and an average of 4,122 metric tons/year (1977-1997). Singapore is the least country with a total contribution of 6,471 metric tons and average of 308 metric tons/year (1977-1997).

Figure 2 show the landings of sharks in value (US\$) for 4 SEAFDEC member countries (Malaysia, Thailand, Philippines, Singapore) from 1975 to 1997. Data from other countries such as Indonesia, Myanmar, Cambodia, Vietnam and Brunei are not available during this report preparation. Malaysia is the top and the trend is increasing with an average of US\$ 3,015/year. Philippines is the second with an average of US\$ 2,970/year followed by Thailand at an average of US\$1,496/year. Singapore is the least country with an average of US\$ 215/year.

#### **4. DISTRIBUTION OF FISHERY AND THE HARVESTING PROCESS**

##### **4.1 Indonesia**

###### **4.1.1 Landings**

Fisheries statistics indicate that sharks and rays are caught throughout Indonesia. Between 1987 and 1991, sharks and rays accounted for only 2.4% of total fisheries production. Indonesia has considerably increased its elasmobranch catch from 1,000 metric tons in 1950 to 95,600 metric tons in 1997, which represents 12.1 % of the total world chondrychthian catches. This amount represents only 2.6% of the total Indonesia catches. This growth has been particularly significant since the mid 1970s. Indonesia does not report chondrychthian catches by species but only provided at the level of "sharks and rays" which were at 59,450 metric tons and 36,100 metric tons, respectively in 1997.

The targeting of carcharhinid sharks such as the white and black tip reef shark appears to have a long history in Indonesia. This is because that specialist shark fisherman from southeast Sulawesi has targeted sharks for centuries. During long annual voyages they fished for shark using handlines (Wallner & McLoughlin, 1995).

Much of Indonesia shark fisheries are small-scale fisheries using relatively small canoes and simple gear. Most of these activities occur in shallow water of coral reef and coastal environments. However, the increase in the price of shark fins has resulted in greater fishing effort being directed towards these species. Sharks are also captured as by-catch by industrial fisheries. When using set gillnets, set longlines and handlines, sharks and rays are caught along with other species. Longlines are often used to target demersal species such as snappers and groupers. Baits used include skipjack, dolphin, dugong, cow and cat and these baits are attractive to shark. Target fishing for shark is now focused on area such as Nusa Tenggara, Timor Sea, North Sulawesi, northern Maluku and northern Irian Jaya.

During the late 1970s, landing of sharks were concentrated around the central and western provinces, in the Java Sea, Strait of Malacca and Indian Ocean. However during the next five years, landings increased uniformly although proportionally large amount of catches were observed in South Sulawesi, north and south coast of West Java (Chen, 1996).

By 1990, most of the region with historically larger landings had experienced significant decreases in landings. These include the west coast of North Sumatra; the north and south coasts of West Java and East Java; the north coast of Central Java and South Kalimantan. Landings in some of these regions, particularly those that experienced declines around the mid 1980s have increased tremendously especially in areas such as south coast of West Java, north coast of Central Java and South Kalimantan. However, landings in other regions such as the north coast of East Java and South Kalimantan have continued on a decreasing trend.

Landings in the other western provinces, such as West Sumatra, the west coast of Lampung, Bengkulu and the Strait of Malacca coasts of Aceh and North Sumatra have continued to increase but not reaching 2,000 metric tons. The provinces of South Sumatra, the east coast of Lampung and Central Kalimantan are all in the Java Sea. Unlike neighboring regions, the landings from north coast of Java were initially low but continuously increase at an increasing trend.

Most of the western and central provinces have experienced greatest expansion in the landings during the early 1980s. Since then, catches have generally decreased or remained relatively stable. In the eastern provinces, particularly Maluku, North Sulawesi, West Nusa Tenggara and Irian Jaya, there were large increased in landings during the late 1980s. Apart from Irian Jaya, there was no consistent decrease in landings in any of these provinces from 1985 to 1992. However, in East Nusa Tenggara, Maluku and North Sulawesi had decreased in landings between 18 and 42% in 1993.

There are a number of locations where demersal elasmobranchs such as white-spotted guitarfish are being targeted specially for their fins. Their fins are worth more than 1.5 times from other species. This species have been heavily targeted in the Java Sea, Maluku and Irian Jaya.

#### **4.1.2 Exploitation of shark by foreign vessel**

Evidence from Indonesia fishers suggest that there are large numbers of foreign vessels targeting for shark in the deeper offshore waters of eastern Indonesia (Banda Sea between East Timura and the island of Seram). Majority of these vessels is of Taiwanese origin and some were Korean boats. These boats are based in Bitung, North Sulawesi. The target species was probably blue sharks (*Prionace glauca*). In early 1970s, Taiwanese vessels began fishing in the Arafura Sea for sharks. They used drifting gillnets to catch Australian black tip shark (*Carcharhinus tilstoni*), spot tail shark (*C. sorrah*) and tunas. McLoughlin *et al.*, (1994) have reported that 55 Taiwanese gillnetting vessels were licensed to fish in the Indonesia waters.

## **4.2 Malaysia**

Shark caught in Malaysia are normally as by-catch. On both east and west coasts of the Peninsular Malaysia and Sabah, trawls accounted for 60 to 70% of the local shark catches and 72 to 93% of rays. Purse seines contributed less than 1% of the total shark landings in Peninsular Malaysia. In Sarawak, large-scale otter trawls were estimated to land 70% of the rays annually but only 30% of the shark. In general, shark landings by trawl have decreased since 1990 from as high as 80% (of the total shark landing) in 1991, to only 46% in 1994, despite a threefold increase in total landings for the same period. The increase in shark landings is mostly due to an increase use of drift/gill nets and hooks and line methods. Other gears that caught sharks are portable traps, other seines and stationary traps.

Sharks are caught throughout Malaysian waters with Sarawak and Sabah contributing higher catch as compared to west and east coasts of Peninsular Malaysia. The average total landing of sharks from Peninsular Malaysia and Sabah/Sarawak from 1988-1995 are 2,280 metric tons/year to 3,672 metric tons/ year, respectively.

Some of the important ports that land a large quantity of shark are LKIM Kuantan, LKIM Batu Maung (Peninsular Malaysia), Kota Kinabalu and Sandakan in Sabah and Tg. Manis in Sarawak.

#### **4.3 Thailand**

Thai elasmobranch fisheries are mainly from large-scale activity. The Fisheries Statistics of Thailand indicates that the catch of shark since the 1960's varied from 9 to 12 metric tons. Since the late 1980s, the landings of shark were on the average of 11.8 metric tons. The shark landings have not been restricted to its coastal waters as the fishery was also caught in waters of other nations, including Indonesia, Vietnam and Malaysia, Myanmar and Bangladesh. Most of the fishermen within the Thai waters do not directly target for shark.

The important fishing ground for the sharks in Thailand is the Gulf of Thailand and Andaman Sea. Most of the catch on both coasts were taken by trawlers followed by gill nets, purse seines and hook and line/longlines.

From 1989 to 1995 (not including 1991), the catch of sharks from the gulf was on average at 2,415 metric tons/year while the contribution from the Andaman Sea, only 911 metric tons/year (Chen, 1996). Some of the more important fishing ports are located around Songkla Lake and its coastal areas of Chumporn Province, Aung Thong National Park (Surat Thani Province) and Prachuap kirikhan.

#### **4.4 Philippines**

In the Philippines, the most productive commercial fishing grounds for sharks, in order importance, are the West Sulu Sea, the Lamon Bay and the Visayas Sea. The data statistics from SEAFDEC from 1977 to 1995 showed that Mindanao is the main harvesting area for shark and rays, followed by Luzon and Visayas. The whale shark is highly exploited in the southern island of Pamilacan, Bohol and Camiguin at the Bohol Sea. The hunting season for this type of shark is normally from November to May with March and April considered as the peak months in the hunting.

Shark is not the primary target species with trawl as the main gear employed in the harvesting of shark. Other gears used in catching sharks are hook and line and handline. The sharks were also caught as by-catch in gears that are used to catch the large and small pelagic. In Luzon, the large-scale trawlers are the main gear but in Visayas, the main gear is large-scale purse seines. The harvest of shark from small-scale fisheries in Luzon, Visayas and Mindanao are mainly by hook and lines and gillnets. The hook and lines method was more effective in catching shark from Visayas and Mindanao. The catches from gill nets were normally smaller than that for hook and lines. Whale sharks hunting are carried out using traditional methods of metal spears or hooks. The catches are then towed to the village, and at its shallowest points, they were left to flounder.

The ports involved in the shark fisheries in Philippines included Pamilacan, Bohol, Turtle Island, Lubang, Mindoro, Calauit Island, Palawan, San Fernando and Pampanga. The main fishing grounds around Zamboanga were in Batorampon Point, near Batangway Labuan (west coast), and the Sta. Cruz Island, near Basilan at Sambay Island, Pilas Island, Jolo, Tawi-Tawi, Cotabato and Siasi.

#### **4.5 Brunei Darussalam**

Shark caught in Brunei Darussalam are normally as by-catch. Shark is not the primary target species with trawl as the main gear employed in the harvesting of shark. Other gears used in catching sharks are hook and line and handline. The important ports that land a large quantity of shark is Muara and Jerudung.

### **5. THE TRADE OF SHARKS AND SHARKS PRODUCTS IN ASEAN REGION**

Production and trade data are useful in highlighting important markets and uses for shark products. But it was difficult to obtain both catch and trade data that hampers and limit the correctness of reported volumes and values of shark products in the trade. They are often inadequate and not precise enough to state the species and areas of interest in this trade. Knowledge regarding utilization of sharks is often limited, as national fisheries statistics frequently do not record production and trade of the various shark products.

Asian countries sustain the leading chondrychthian fisheries. In 1996 their catches represented 55.4% of total world landings for these species. Consumption and trade of chondrychthian meat is rather limited. Shark meat is usually dried and salted, used in the production of fish balls, tempura, surimi, fish sausage, fish ham, fish cake and fish paste. According to FAO statistics, production of chondrychthian by Asian countries amounted to nearly 33,000 metric tons in 1997, with Pakistan being the main producer with 19,000 metric tons.

Hong Kong is the world's leading trading center for shark fins and significant consumer of shark fins. The consumption of shark meat is not very high. Shark meat is involved in the production of fish balls, which are used in the preparation of certain Chinese dishes and often exported to other neighboring countries. About 20-40% of shark meat was normally added to the cheaper varieties of fish balls. It was used in filling vegetable and soya bean products called *yeong tau fu*. However, with the increase in the price of shark meat it became uneconomical and shark meat has not been used for making fish balls in Hong Kong since 1997. Traditionally the consumption of shark and ray meat in Hong Kong was not widespread and only the poor and persons who lived near the coastline eat them.

#### **5.1 Singapore**

Figures 3, 4, 5 and 6 show the trend of import and export for shark fins of Malaysia, Thailand, Philippines and Singapore from 1977-1995 in metric tons and US\$. Singapore is the second largest shark fin trading nation after Hong Kong. Although Singapore's fishing fleets is not large, nevertheless, she is able to imports, process and export a wide variety of fish products that including sharks' meat and fins. Singapore has a number of traders dealing with import, export and wholesale markets in sharks' fin, although not all are specialized in one commodity. Most have a retail outlet supplying pre-packed shark products and a wholesale market supplying to hotels and restaurants.

Of the many species of fins imported into Singapore, two are most popular with the local restaurant trade. These are the fin of brown shark and blue shark. Species such as hammerhead shark, tiger shark, white sandbar shark are also common. However, by comparison, they are used in very small quantities.

Singapore exported dried or salted shark fin to more than 15 countries. The quantity was relatively small compared with regular export. It varied from as low of 1 ton valued at S\$ 51,000 in 1988 to as high of 254 tons, valued at S\$ 15,266 million in 1994. Singapore also exported prepared shark fin to more than 17 countries of which Hong Kong, Japan, Taiwan Province of China and the USA are the main buyer of the product.

In 1996, estimated quantity of fins consumed in Singapore is about 500 tons annually as compared to 400 tons in 1991. The highest demand for this product comes from the Chinese banquets held at major restaurants and hotels. By custom, shark is a powerful animal and by eating its meat, it was considered to engender strength and vitality to its consumer.

There was an increased in the opening up of the Chinese market and they are in demand for the fins of whale sharks. These fins were not usually popular products as their fin needles are inclined to be coarse in texture and ashy in taste. The Chinese demand for these fin were not for food, but mainly for display in the restaurants. The sheer size of these fins was enough to impress customers.

Singapore's shark export has only been reported to FAO since 1995. In 1997 they amounted to nearly 1,600 metric tons, worth US\$5.7 million. In the same year 1,400 metric tons were imported, valued at US\$ 4.7 million. Singapore exports shark meat to other Asian countries and to the EU. According to EUROSTAT statistics, in 1997 Singapore exported nearly 1,500 metric tons, valued at US\$ 4.3 million to the EU. Italy was by far the main outlet, taking 790 metric tons, followed by the Netherlands (310 metric tons), Germany (195 metric tons) and Greece (180 metric tons).

In Singapore, locally made processed and canned sharks' fin may be found on sale at most of the major market. Health food shops in the country also stock some of the shark products, the most frequent being in the form of squalene. Shark's cartilage manufactured in the USA, is sold here in small packages. The imports for both squalene and cartilage products come from Japan, New Zealand and the USA. To satisfy the modern consumer, instant "sharks' fins soup", conveniently packed for use in the microwave oven, are also provided at some local Chinese medicinal hall.

## **5.2 Malaysia**

In Malaysia, the Annual Fisheries Statistics does not differentiate the different species of sharks that are caught and processed. Data concerning these products are only available under the general heading of:

- i Frozen dogfish and other sharks
- ii Sharks' fin salted but not dried or smoked in brine
- iii Shark's fin dried weather or not salted but not smoked
- iv Shark's fin

The Malaysian trade in shark fin is on smaller scale and only about 2% of that of Singapore. Malaysia imports shark fins from more than 25 countries and exports to around 15 countries. Statistics on exports of shark meat have been reported since 1991 when they stood at 34 metric tons worth US\$ 42,000. Export has not been very regular and in 1997 they amounted to only 35 metric tons, worth US\$15,000. Before 1993 the Malaysian import tax on shark fin was 50%. In 1993 this was reduced to 30% and in the following year fell again to 20% but importers were then required to pay another 5% sales tax.

Some of the main markets for the Malaysian shark's fin (salted but not dried or smoked and in brine) are Singapore and Hong Kong. Malaysia also imports similar products from Singapore, Indonesia, Hong Kong and Thailand. Australia, Singapore, China and Hong Kong have been the major countries that provide raw shark's fins to Malaysia, while Malaysia in turn has provided export of the same products to Korea, Hong Kong, Brunei and Singapore.

Processing of sharks' fins in Malaysia is usually carried out as cottage industry by fishermen or middlemen. The meat is sold fresh, or dried, at almost all major markets in Malaysia. A small number of shark's jaws, and even teeth, are sold as rare souvenir items to enthusiasts. Cartilage, and some other discarded parts of the fish, is used as baits, for fish and crab traps. Small sharks, as well as those that are non-edible or unsuitable for baits, are sold to the fishmeal factories for fertilizers.

Most of the shark fin processors did not want their activities to be known by anyone outside the trade. The task was made more difficult by the fact that most traders do not advertise their activities in trade the directories, chamber of commerce or the dried seafood association. Except for the sale of popular products such as sashimi and sushi in local supermarkets, Malaysia shark fin processors have not ventured into processing of ready-to-eat products. However, attempts were made to produce canned shark fin soups. One established Malaysian company distributes pouched shark fin soups and dishes under its own label, but the product was processed and packed in Thailand.

The most well known and highly priced shark fin in Malaysia is the shovel-nose ray. The price of 4 piece set pectoral fin (36-48 inches) range between US\$ 195-220. Others often mention by traders is blue shark. It is believed that only 3% of the restaurants in Malaysia have knowledge to use different species and type of fins to their best advantage. Only 5 shark species are locally accepted as food table. Both meat and fins from species like *Carcharhinus falciformes*, *C. limbatus*, *C. macloiti*, *C. sorrah* and *Scoliodon laticaudus* are greatly in demand, and price of these items is on the increase. Some other species are preferred locally for their fins, especially among Chinese, and these included *C. melanopterus*, *C. sealei*, *Chiloscyllium indicum*, *Chiloscyllium punctatum*, *Squalus japonicus*, *Stegostoma fasciatum*, *Sphyrna lewini*, *Sphyrna mokarran*, and *Sphyrna zygaena*. Fins were normally extracted from very small sharks of less than 1 m. in size. Fresh fins and their processed items may be easily found at almost all main wet market especially in Kota Kinabalu and Sandakan in Sabah.

Health food shops here also stocked processing shark's fin and a variety of differently labeled imported shark products that include shark's cartilage and squalene. The shark's cartilage has been claimed to have some anti-vascularization or anti-angiogenesis properties, and has the potential to provide some cure for the following pathological conditions; cancer (prostate, breast, colon and central nervous system cancers), arthritis (rheumatoid disease,



progressive systemic sclerosis, osteoarthritis and mixed connective tissue diseases), skin conditions (burns, wound healing, psoriasis, eczema, hemangiomas, angiofibroma, kaposi's sarcoma), eye diseases (diabetic retinopathy, retrolental fibroplasia, macular degeneration, corneal vascularization, neovascular glaucoma) and inflammatory (bowel diseases).

### 5.3 Thailand

In the fishery statistics of Thailand, some information on sharks may be obtained under the category 'dogfish and other sharks excluding liver, in roes and/or frozen' and sharks' fin salted and whether or not salted. Base on the import and export of dogfish and other sharks from 1990, Canada has consistently been the biggest exporter of the product into the country. Between 1990 and 1992, the Netherlands, Norway and United Kingdom are also exported shark products to Thailand. The export of dogfish and other sharks from Thailand to other nations appeared inconsistent with only six receiving countries from 1990-1994. In 1994, the two countries that imported dogfish and other sharks from Thailand were PR China and Singapore. The export of 'shark fins dried, whether or not salted' during 1990-1994 was mainly to Hong Kong, Japan and Singapore. In 1997 exports were less than 500 kg, while in 1996 Thailand exported 200 metric tons, valued at US\$ 503,000, of frozen sharks of which 94.4% went to Singapore and the rest to Hong Kong. In the same year 415 metric tons of frozen sharks were imported. Canada was by far the main supplier with 180 metric tons, followed by Denmark, Germany, the USA and Australia. In 1997 imports of shark meat were 300 metric tons, worth US\$ 342,000.

There is no shark processing plants in Thailand. The presently well-established fish processing plants do not engage in shark processing due to the irregular supply. Therefore, all sharks processing is carried out as a cottage industry mostly by the families of the fishermen located in the provinces where the fishing fleets reside. The shark's meat is preserved as salted meat and as sweetened meat and mainly consumed by less wealthy people. Part of the meat is prepared in the form of fillets (fresh or frozen). Shark's fin of large shark is sold in dried or salted form to make the delicacy shark's fin soup. A small number of shark's jaws and teeth are sold as souvenirs to the tourist trade. Cartilage and other discarded parts together with small sharks are sold to fishmeal factories.

### 5.4 Philippines

In the Philippines, the different areas of the country employed a number of ways to affect the sale of shark's meat. In Luzon, the meat is sold fresh in the market, while in the Visayas and Mindanao, the meat is sold fresh or dried. The shark fins are dried first before being sold to particular buyers. Data collected from 1990-1994 showed the largest and most consistent importer of 'dried sharks' fins' from the Philippines is Hong Kong, followed by Singapore. Due to lack of data, the overall trend in this trade remains unclear. The National Statistics Office provided data for 'shark liver oil and fractions not 'chemically modified''. The Fisheries Statistics provided export figures for squalene oil. The primary importer for this former item is Japan, followed by Korea.

Shark meat is used to prepare fish balls and tempura in Zamboaga, before being sent to Manila for sale or export to the USA. However, since 1996, the preparation of fish balls from shark's meat has stopped due to the instability in the market price, and also from stiff competition for their limited supplies in the market.



The whale shark's fins are sold fresh or dried. A set of 8 fins may be obtained from a single fish. These fins are the most expensive part of the shark. Meat and skin belonging to the shark are also taken, but this (the taking of parts other than fins) has been reported to be a recent action. The innards (i.e. the stomach, intestines and heart) of the shark are now cooked as viand, a local favorite dish. Whale shark liver oil is used effectively as pesticide in the rice fields and coffee plantations at Talisayan. The shark's head also has some value for its meat and skin, but the rest of the body parts are thrown back into the sea. The whale shark fishery has now been reported by some fishers to be on the decline. In Visayas, fishermen reported its catch to be decreasing from 100 whale sharks in 1994, to 80 in 1995 and down to 30 in 1996.

## 5.5 Indonesia

The shark fishery in Indonesia is primarily driven by the export market for fin. The targeting of carcharhinids sharks such as the white and black tip reef shark appears to have a long history in Indonesia. Recently there has been an increase in the capture of deep-sea sharks for liver oil and squalene. The most valuable fin is white-spotted guitarfish. Shark carcasses are dumped after their fins have been removed. This appears to be particularly true in more remote areas where less demand for the large amounts of flesh caught. Shark carcasses do appear in markets, although they generally sell for low prices. Shark meat is not particularly appreciated for domestic consumption but it is eaten, mainly dried, by the ordinary people. Shark meat is usually processed into dry-salted or boiled-salted commodities. The research Institute for Fish Technology in Jakarta explored different methods of shark utilization, such as processing it into commodities including *abon* (shredded, spiced and dried), *dendeng* (spiced-dried satay), fish balls and sausage.

Indonesia has different trading systems for various elasmobranch products. This reflects their different values and end markets. The shark fins are the most valuable product and they are destined for overseas market. Some fins are consumed domestically, particularly in Chinese restaurants, but this is likely to be insignificant relative to the large amounts exported. Trade data show that three cities, Jakarta, Surabaya and Ujung Pandang, dominated in the fin exports. There is a hierarchy of buyers ranging from local villagers up to ethnic Chinese, who dominated the export business.

Export statistics show that almost all frozen and fresh shark exported from Indonesia in 1993 were originated from Bitong. Furthermore almost all of these products were export to Taiwan Province of China. Exports of shark meat have only been reported since 1990 when they amounted to only 240 metric tons, valued at US\$108,000. These exports increased substantially to peak at 9,300 metric tons (valued at US\$ 5.6 million) in 1993. Indonesia exports dropped to about 800 metric tons worth US\$ 240,000 in 1996 but in 1997, an increase of 204% was observed with exports of 2,370 metric tons and valued at US\$ 740,000. The export of shark meat are mainly directed to other Asian countries, with the great bulk exported to Taiwan Province of China and People Republic of China and small quantities to Japan, Singapore and Europe (mainly UK). Exports of fresh sharks are mainly directed to Taiwan Province of China and dried shark meat is exported to Hong Kong, Singapore, Malaysia and Japan, while Singapore is the main market for exported of brine shark meat.

Dried shark fin have been exported from Indonesia in large quantities for the last two decades. By the 1980s exports were over 200 tons and rising steadily to a peak of 547 tons

in 1987. In 1993 most dried fins were exported to Hong Kong and Singapore although a far greater price was obtained for those sending to Japan. Many sharks are now being sold to Malaysia and Singapore because they are offering higher prices than Hong Kong.

The price of fin can vary greatly depending upon the degree of processing, species and size. Fully processed fins are sold dried and packaged in supermarkets for US\$ 330/kg (Wibowo & Susanto, 1995). First and second dorsal fins and upper lobe of the caudal fin from the white-spotted guitarfish is the most valuable and sold at around US\$ 88-132/kg. Small blacktip reef shark, grey carpet shark, zebra shark, thresher sharks, angel shark (shark ray) and hammerhead shark fins are less valuable. Prices as low as US\$ 6.00/kg were quoted for blacktip reef shark, and US\$ 31-40/kg for hammerhead fins. Fins from blue, mako, and tiger sharks are also valuable. Sawfish fins are also said to be very expensive. Fins from species such as the nurse shark (*Nebrius ferrugineus*) are worthless. There was a rapid increase in the shark fin prices since the late 1980s.

Only very small amounts of shark products are imported into Indonesia. These include dried fins and fins in brine. No fresh or frozen shark was imported.

## 6. LEGISLATION

Sharks are not specially protected by any specific legislation in the countries of the region, but in the Philippines and Malaysia, some form of protection does exist. In the Philippines, the whale shark is now a protected species under the Fishery Administration (Order 193) since 1998. In Malaysia, six species of sharks have also been listed as protected species under the Marine Recreational Fishing Regulation. Under this regulation, only catch and release fishing is allowed for these species. The Department of Fisheries is preparing to implement the regulation, promulgate under the Fisheries Act 1985, once it is gazetted. The six shark species mentioned are given below.

Scientific name	English name
<i>Chiloscyllium punctatum</i> (Muller & Henle)	Brownhanded bambooshark
<i>Chiloscyllium griseum</i> (Muller & Henle)	Grey bamboo shark
<i>Stegostoma fasciatum</i> (Hermann)	Cat shark, Zebra shark
<i>Atelomycterus marmoratus</i> (Bennett)	Coral catshark, Marble catshark
<i>Heterodontus zebra</i> (Grey)	Zebra bullhead shark
<i>Rhincodon typus</i> (Smith)	Whale shark

Some reasons for their selection are because of their unpopularity as food table and also relative abundance in the inshore waters with exception of whale shark and zebra bullhead shark. These two sharks are great attractive items for the diver and angler, especially the whale shark, which is regarded by many divers as a flagship species among the group. The whale shark, being entirely a filter feeder, eating plankton and very small fish, is especially put on the list due to its docility. The angler fortunate enough to meet this animal might cause unwitting injury because of its harmlessness. The whale shark may be seen in Malaysia coastal waters during the shrimp bloom season (*Acetes sp.*) from November to April.

In 1990, the Government of Malaysia has prohibited the use of 'pukat pari', a type of drift net with mesh size exceeding 25.4 cm, and used for catching sharks and rays to protect marine turtles. The nationwide ban for this large-mesh gillnets partly helps to conserve the breeding stocks of shark, by allowing the larger and more productive females to escape.

Base on the IUCN Red List of Threatened Animals 1996, three shark species reported to occur in Malaysia are classified as endangered. These are black tip shark (*Carcharhinus limbatus*), sandbar shark (*Carcharhinus plumbeus*) and whale shark (*Rhincodon typus*).

In Thailand, 4 pristid sawfishes are now considered to be locally endangered species, followed by 43 threatened species, which especially include two freshwater stingrays, *Himantura chaophraya* and Mekong river endemic *Dasyatis laoensis*. Some of the main threats to the Thai elasmobranchs are due to degradation in the marine environment and overexploitation of some of the fishery resources.

## 7. CONCLUSION

The status of shark populations of this region is still largely unknown. This has been due to low economic emphasis especially placed on this group of fish, which has, up to recent years, occurred mostly as by catch, resulting in their catch and effort data being notably absent or infrequently recorded in most of the fisheries. Over-exploitation of the juveniles and young's of several shark species that utilize the inshore nursery waters in most areas is perhaps a common phenomenon. Specific nursery grounds of nearly all of the shark species found in the region have not been fully identified.

Better data relating to the population status of elasmobranchs and their fisheries, covering the potentially rare or threatened species, need to be obtained through appropriate studies, in order to improve the level of knowledge required for the formulation of fisheries and conservation management objectives and strategies.

The shark fisheries and its markets of many countries in this region are expanding rapidly, even in the absence of management directed specially at these animals. New fisheries are actively being developed, and there is a growing interest in the trade of shark products. Some species, which were previously considered to be common, now no longer appear to be available in some areas such as sawfishes and sawsharks. Shark fisheries if not properly managed can easily collapse, and the shark populations can enter a long-term decline. Without the introduction and implementation of an effective management regime, directed specifically towards their sustainable exploitation, sharks stocks may be depleted, and it would take a considerably longer period to rebuild. If this occurs, the end result would be a long-term loss of an economically precious resource.

Improved data collection on their landing is essential so as to provide more accurate information needed for their management. There is a strong need to improve shark identification amongst the data collectors especially at the taxonomic level. Data on the specific landings of particular species would be the best data, while their collection at the genus level may still be considered as good if effected, and would be a vast improvement over the current situation on the data collection.

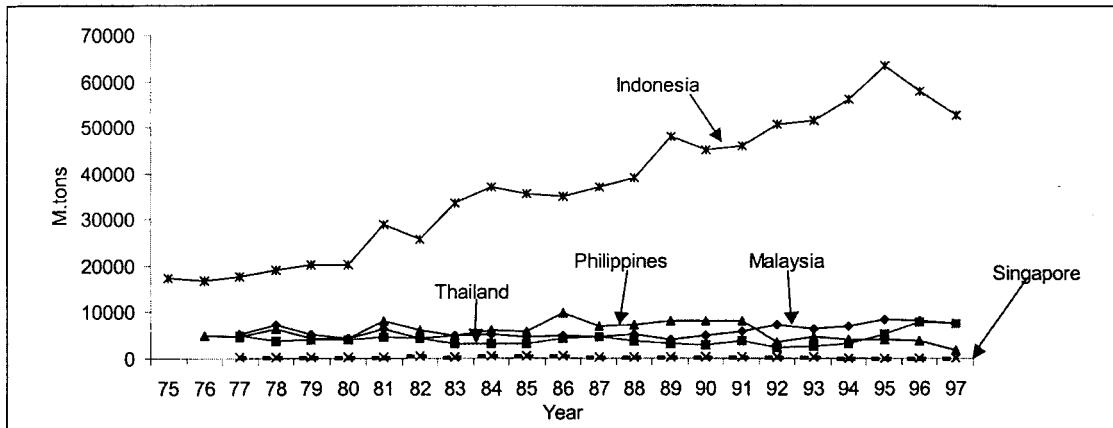


Figure 1. Landings of Sharks in Metric Tons of Indonesia, Philippines, Malaysia, Thailand and Singapore (1975-1997)

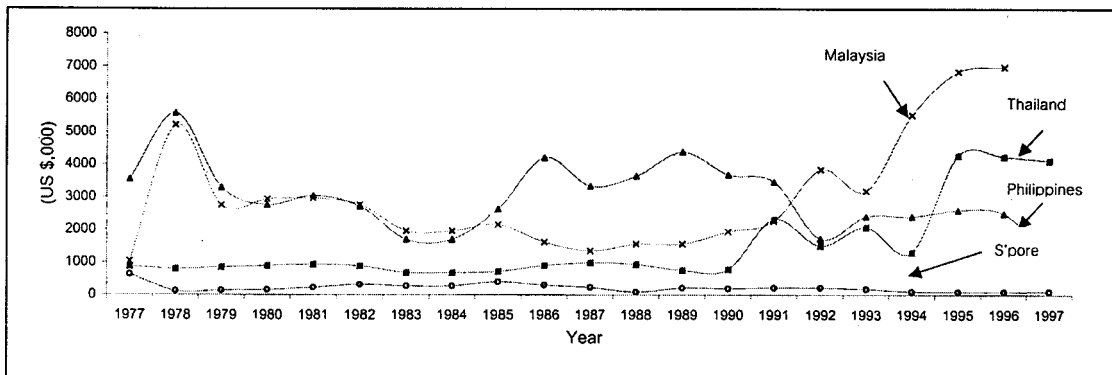


Figure 2. Landings of Sharks in Value (US\$) of Malaysia, Thailand, Philippines and Singapore 1977-1997

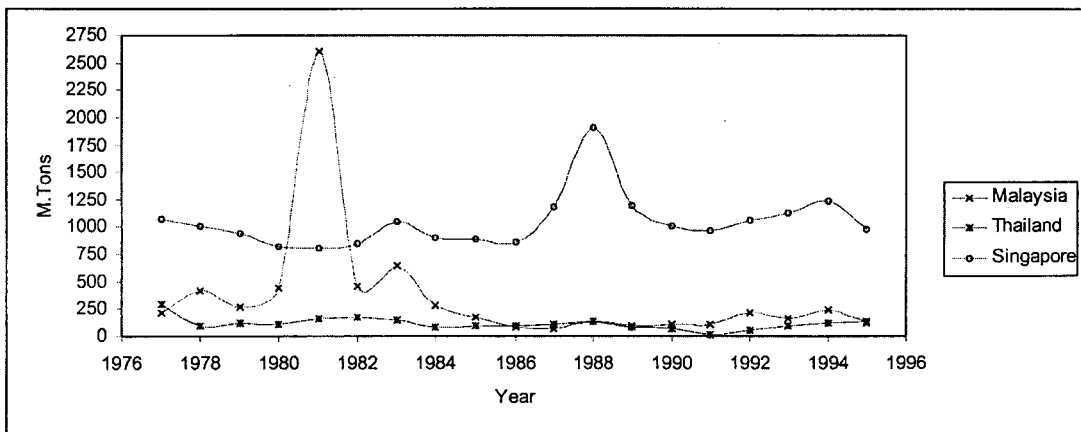


Figure 3. Import of Shark's fin of Malaysia, Thailand and Singapore in Weight (metric tons) from 1977-1995

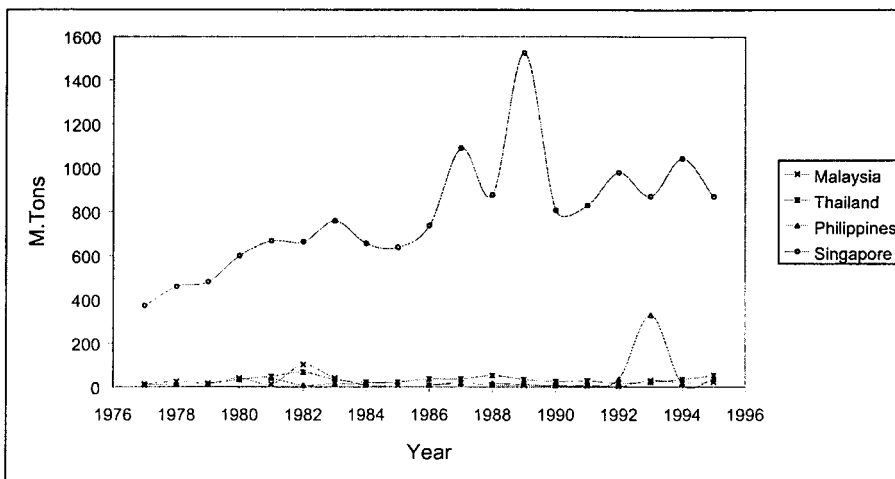


Figure 4. Export of Shark's fin of Malaysia, Thailand, Philippines and Singapore from 1977-1995 in weight (metric tons)

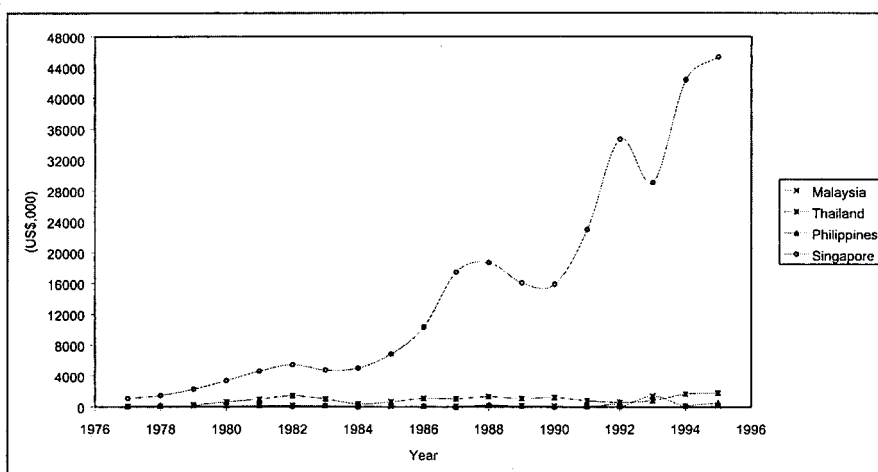


Figure 5. Export of Shark's fin of Malaysia, Thailand, Philippines and Singapore in Value (US\$) from 1977-1995

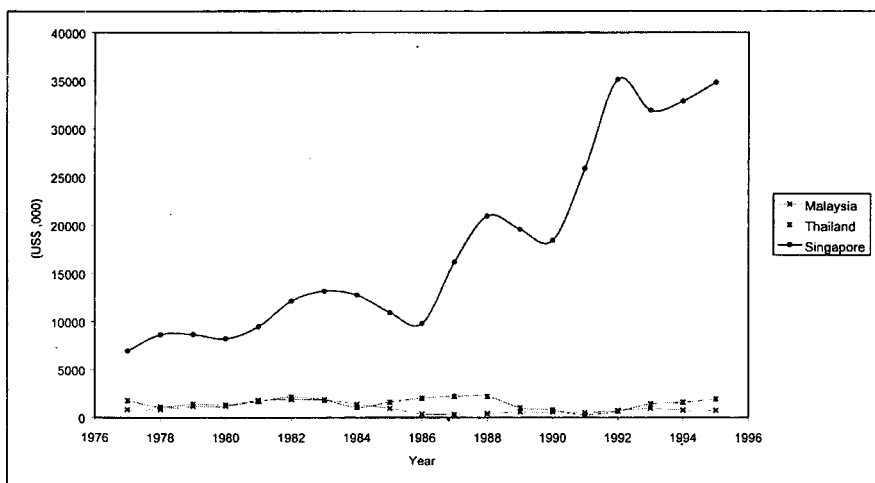


Figure 6. Import of shark's fin of Malaysia, Thailand and Singapore in value (US\$) from 1977-1995

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## SHARK FISHERY IN TAIWAN

*Dah-Wen Shieh*  
*Deputy Administrator*  
*Fisheries Administration, Council of Agriculture,*  
*Executive Yuan, ROC Taiwan*

### 1. THE STATUS OF SHARK FISHERY IN TAIWAN

The development of shark fishery in Taiwan has a long history. It was reported that the global catch of shark is about 800 thousand tons per year. In the past five years, the annual catch of shark in Taiwan from the coastal, offshore and far seas fisheries ranged between 30 to 50 thousand tons, accounting about 7% of the global catch, and ranking as the fifth largest producer in the world following Indonesia, India, Pakistan and Spain.

According to the statistics as published in the Fisheries Yearbook, in the year 2000, Taiwan's catch of shark was 47,741 tons, including 38,447 tons from the far seas fisheries and 9,294 tons from the coastal and offshore fisheries, with a value of some NT\$ 1 billion. It accounts for 3.5% of the total catch of 1,356,295 tons, and 1.1% of the total catch value of NT\$ 91.3 billion. Of the total shark production, 35,873 tons (including imports of 3,178 tons of shark meat) was for domestic consumption and 15,046 tons was exported.

### 2. FISHING METHODS AND SPECIES HARVESTED IN TAIWAN

Most sharks are caught by fishing vessels under the membership of Kaohsiung, Tungkang, Suao, Shinkang and Keelung Fishermen's Associations, and among which sharks caught by fishing vessels of Kaohsiung, Tungkang and Keelung Fishermen's Associations are from far seas operations, and the remaining are from the coastal and offshore areas of Taiwan. Sharks from the far seas fisheries are mainly caught by tuna long liners and trawlers, with Blue Shark, Silky Shark, Scalloped Hammerhead Shark, Shortfin Mako Shark and Thresher Shark as the main species. While in the coastal and offshore fisheries, sharks are mainly caught by long line, trawl, harpoon and set net fisheries, and the main species are Blue Shark, Scalloped Hammerhead Shark, Shortfin Mako Shark, Thresher Shark, Sandbar Shark, Silky Shark, Whale Shark and others.

### 3. PROCESSING AND UTILIZATION OF SHARKS IN TAIWAN

In Taiwan sharks are completely utilized, whether in the form of fresh fish or processed products. Shark products include fresh shark meat and skin, surimi, smoked meat, dried meat, shark liver oil, shark's skin, shark's fin, etc. Sharks caught by coastal and offshore fisheries as well as a small number of sharks caught by far seas fishing vessels, are mainly for domestic consumption. Fresh sharks are consumed as fresh fish or smoked fish, and frozen sharks are processed to fish balls and other cured products. Apart from shark cuisines from shark's meat, skin, fin, stomach and gut, shark's livers are used to extract shark's liver oil, shark's skeleton and cartilage can be used for processing health food, and jaws for handicrafts. In far seas fisheries, sharks are caught by tuna long liners as by-catches, and they are landed at foreign ports and exported in frozen form.

#### 4. RESEARCH AND MANAGEMENT OF SHARKS IN TAIWAN

While noting with care the utilization of shark resources, great attention has been paid by the government in the assessment and management of shark resources and researches on shark related ecology. In addition to such shark related biological and ecological researches conducted by scholars at their own initiatives, since 1995 the government has allocated substantial budgets to support academic institutes and fisheries organizations in conducting series of research programs on shark resources and shark related ecology. They include:

- Stock Assessment and Fishery Management of Deep Sea Thresher Shark in the East Area of Taiwan (1995-1997)
- Stock Assessment of Shark in the Coastal and Offshore Areas of Taiwan (1998-2001)
- Application of Precautionary Approach in Management of the Coastal and Offshore Shark Fishery of Taiwan (2001-2003)
- Investigation of Shark By-catch in Far Seas Fisheries (1995-2000)
- Observers Program for Far Seas Fisheries (2000-2002)
- Investigation and Monitoring of the Utilization of Whale Shark (2000)
- Investigation on the Trade of Whale Shark (2001), and
- Sustainable Utilization and Conservation of Whale Shark (2001-2004)

It is hoped through enhancement of scientific research on shark resources that a database on shark resources can be established for providing the government with basis for the management of sharks.

In response to the increasing concern from the international community on the management of shark fisheries, Taiwan has initiated a series of shark management measures. Scholars, experts and representatives from the fishermen and government have been invited to form Shark Resources Management Working Group, to reach consensus on shark management measures through consultations. Whale shark, which has a characteristic ecological habit and a decreasing trend of stock, was selected as a target for management. To enhance collection of information on the ecological habit of whale shark for future management based on scientific information, in 2001 the government implemented the Reporting Scheme on Whale Shark Catch, requiring fishermen to make immediate report at the time when a whale shark is caught, and non-compliance of the scheme will be subject to penalty accordingly. In 2002, the government is also planning to set up a TAC on whale shark to control the quantity of the catch. At the same time, further researches on whale shark will be conducted, such as implantation of electronic tags on whale sharks for tracking via satellite, to better understand its habitat and migratory route.

To strengthen the collection of shark statistics in the far seas fisheries, serving as a basis for stock assessment and fisheries management, collection of shark catch data for the far seas fisheries has been conducted by the Overseas Fisheries Development Council, under the commission of the government. A column has been added to the log sheet of far seas tuna long line fishery for shark catches, and captains are required to accurately fill in their shark catches. In 2001 the government started to implement observers programs, assigning onboard observers to record the shark by-catch of far seas fishing vessels. In addition, writing boards with pictures of common shark by-catches were printed and published, to let fishermen better identify various shark species. Education programs on shark utilization were also provided to fishermen, to promote full use of shark instead of the practice of finning and discarding the carcass.

## **5. OUTLOOK**

There are many species of shark in the world, with different ecological habits and reproduction rates. Sharks are important fishery resources in the world, serving as important sources of animal protein, food supply and income to fishermen. Therefore, the conservation and management measures on sharks should be focused on areas where shark stocks have been proven by scientific research as declining as well as endangered shark species, rather than on those shark species whose resources have not been evidencing to have a declining trend. There are, in fact, very few countries in the world exercising management on their shark fisheries. Noting the growing concerns by the international community on controlling shark catching, FAO has adopted the International Plan of Action for the Conservation and Management of Sharks (hereinafter referred to as IPOA- SHARKS), calling upon states to adopt management measures on their directed shark fishery or on those fisheries with abundant shark by-catches, to ensure conservation of sharks and their sustainable utilization. The IPOA- SHARKS provides an excellent guidance to states for managing their shark fisheries. Although Taiwan is not a member of the United Nations, based on the spirit of responsible fisheries, and as a responsible member of the international community, we are willing to follow such fisheries management measures internationally adopted and manage our shark fishery. We are also willing to share our experiences in shark research, resources management and utilization with other countries. Furthermore, based on the IPOA-SHARKS, in 2002 our government plans to draft a national plan of action for implementation, to ensure sustainability of shark resources.



## GENERAL INFORMATION ON CITES WITH RESPECT TO FISHERIES

*Choomjet Karnjanakesorn*  
*Department of Fisheries, Thailand*

### 1. INTRODUCTION

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) was concluded in 1973 and entered into force on 1 July 1975. It now has more than 150 countries as contracting parties. The treaty was developed in response to concerns about the potential detrimental effects on species' survival of high levels of international trade in wild animals and plants. It establishes the international legal framework for the prevention of trade in endangered species and for an effective regulation of trade in certain other species.

The fundamental principle of the Convention is to govern the species to be listed in various Appendices on the basis of the different levels of threat posed by international trade and detail appropriate levels of trade regulation. The three Appendices to the Convention form the basis for implementation of the treaty. Appendices I, II, and III establish different levels of trade restriction. For species listed in Appendix I, trade is banned. For those listed in Appendix II trade is possible only with certifications and permits. Appendix III listings are voluntary by countries that are seeking international support in controlling trade in species of concern to them.

When the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) was prepared in the early 1960s and adopted in Washington, D.C. in 1973, it obviously appeared that marine species subject to commercial fisheries were not fully covered. A small number of marine species were included in Appendices I and II particularly marine mammals (such as whales, cetaceans) and sea turtles. A few marine fish species were included in CITES appendices such as coelacanth which still had a commercial value but not subject to a commercial fishery.

The concept to list commercially exploited marine fish species in the CITES appendices emerged in the early 1990s. This has undoubtedly resulted from the attempt of some NGOs, concerned by the exploitation of the marine resources, which use the CITES forum to express their philosophies and views on the marine resources management principles practiced by the world communities and the various international organizations such as FAO and so on. They have been able to persuade a few governments to support their views and to submit several amendment proposals, although not with the success they expected. Currently, FAO in collaboration with CITES is preparing the criteria for listing commercially exploited aquatic species into CITES.

This paper reviews the current issues of CITES with respect to fisheries, in order for ASEAN countries to find their positions for the Twelfth meeting of the Conference of the Parties to CITES (COP 12) between 3-15 November 2002, Santiago, Chile.

## 2. MARINE SPECIES IN CITES LIST

As mentioned earlier, apart from marine mammal species and marine turtle species, there are also many other marine species listed in the CITES Appendices. At the eighth meeting of the Conference of the Parties to CITES (COP 8, Kyoto 1992), Sweden proposed to enlist Atlantic Blue Fin Tuna partly in Appendix I and partly in Appendix II. The proposal had been withdrawn with a commitment by the International Commission for the Conservation of the Atlantic Tuna (ICCAT) to take appropriate measures to manage tuna stock. The proposal has been resubmitted again by Kenya at COP 9 (Fort Lauderdale, 1994) but withdrawn subsequently. At COP 10 (Harare, 1997), USA proposed the inclusion in Appendix I of all Pristiformes but it was rejected. In addition, USA also proposed the establishment of working groups on marine fish species but it was also rejected. However, the proposal of Germany and USA to include all Acipensiformes (Sturgeon) in Appendix II was accepted by consensus. This was supported by the largest caviar producers. At COP 11 (Nairobi, 2000) the proposals listing three shark species in Appendices I or II by Australia, the United Kingdom, and USA were also rejected. Nevertheless the United Kingdom requested to include Basking Shark (*Cetorhinus maximus*) in Appendix III and it entered into force on 13 September 2000. Apart from animals, dead or alive, which are, by definition subject to the provisions of Article V of the Convention on the regulation of trade in specimens of species included in Appendix III, the United Kingdom asked that fins and parts of fins only be subject to CITES controls, as made possible by Article I para. (b) (ii). It should be noted that CITES does not cover the trade of specimens of Appendix III species taken in international waters.

To date, marine species listed in CITES Appendices include all stony corals in Appendix II (COP 5, Buenos Aires 1985) except the black coral which listed in Appendix II at COP 3 (New Delhi, 1981) and Giant Clams (Tridacnidae) listed in Appendix II at COP 4 (Gaborone, 1983). In addition, Queen Conch (*Strombus gigas*) was also included in Appendix II at COP 9 (Fort Lauderdale, 1994).

## 3. CURRENT ISSUES OF CITES REGARDING FISHERIES

Currently, there are several issues of CITES with respect to fisheries. They include the proposal to dawn listing whale species, trade and the proposal to dawn listing marine turtles, the proposal to enlist shark species, the interpretation and implementation of Article III, IV and V relating to introduction from the sea, trade in freshwater turtles and tortoises to and in Southeast Asia, trade in seahorses and other members of the Syngnathidae, movement of sample crocodylian skin, and so on. However, the conservation and management of sharks generates concerns for ASEAN countries. Therefore, the shark issues will be carefully examined.

The conservation of sharks was internationally acknowledged through the adoption of CITES Resolution Conf. 9.17 in 1994. That concern was not diminished with the FAO adopting the International Plans of Action on Conservation and Management of Sharks (IPOA-Sharks) in 1999. The recently revised World Conservation Union (IUCN) Red List (IUCN 2000) now has 79 sharks listed as ranging from 'critically endangered' through to 'lower risk near threatened', following the appraisal of just 10 percent of the taxa.

At the Ministerial meeting on Fisheries in March 1999, the FAO Committee on Fisheries (COFI) endorsed plans of action to reduce by-catch of seabirds, conserve sharks, and

manage fishing fleet capacity. These voluntary plans of action will be implemented through national plans of action developed by FAO members States. The plan of action for sharks is directly related to CITES through Conf. 9.17, Decision 10.73 and Decision 10.74, while the two other issues are crucial to international conservation efforts.

### **The International Plan of Action for Conservation and Management of Sharks**

The current state of knowledge of sharks and the practices employed in shark fisheries cause problems in the conservation and management of sharks. There is a general lack of available data on catch, effort, landings and trade, as well as limited information on the biological parameters of many species and on their identification. CITES has played a pivotal role in the collection of biological and trade data related to sharks. Resolution Conf. 9.17 urged the Parties to submit to the Secretariat all available information concerning the trade and biological status of sharks and directed the Animals Committee to review such information, summarize the biological and trade status of sharks subject to international trade, and prepare a discussion paper before COP 10. It also requested that FAO and other international fisheries management organizations establish programs to collect biological and trade data on shark species, and requested all nations utilizing and trading specimens of shark species to co-operate with FAO and other international fisheries management organizations. The resolution also requested all nations to assist developing States in the collection of species-specific data.

At COP 10, the Conference further directed the Parties to work towards the effective implementation of Resolution Conf. 9.17 by collaborating with FAO and other international fisheries management organizations, to improve methods to identify, record, and report landings of sharks, by species, that are landed as directed catch or as a by-catch. The Parties were also encouraged to initiate management of shark fisheries at the national level and to establish international and/or regional bodies to co-ordinate management of shark fisheries throughout the geographic range of species, to ensure that international trade is not detrimental to the long-term survival of shark populations. The improve statistics on trade in sharks and shark parts and derivatives.

In response to the increased concern about the expanding catches and their potential negative impacts on shark populations, a proposal was made at the twenty-second session of the FAO COFI, in March 1997, that FAO organize an expert consultation to develop guidelines leading to a plan of action. As a result, the International Plan of Action for Conservation and Management of Sharks (IPOA-SHARKS) was developed. The CITES Animals Committee participated in the development of the IPOA-SHARKS. The voluntary IPOA-SHARKS calls upon States to adopt a national plan of action for conservation and management of shark stocks (shark plan) if their vessels conduct directed fisheries for sharks or if their vessels regularly catch sharks in non-directed fisheries. States should strive to have a shark plan in place by the COFI session in 2001. States should conduct a regular assessment of the status of shark stocks subject to fishing, to determine whether there is a need to develop a shark plan. The shark plan should aim to ensure that shark catches from directed and non-directed fisheries are sustainable, that unutilized incidental catches of sharks are minimized, that waste and discards from shark catches are minimized, that improved species-specific catch and landings data and monitoring of sharks is facilitated, and that the identification and reporting of species-specific biological and trade data is facilitated.

The FAO will support States in the implementation of the IPOA-SHARKS, including the preparation of shark plans and will provide in-country technical assistance projects. The major activities planned by FAO to implement the IPOA-SHARKS include:

- a) Improving quality of shark landings data;
- b) Improving data on shark trade;
- c) Identification of elasmobranch species;
- d) Assessment of shark stocks; and
- e) Management of sharks.

CITES has played an important role in highlighting the need to improve data collection related to sharks and shark management and can continue to assist in the implementation of the IPOA-SHARKS.

Resolution 9.17 was repealed at the 11<sup>th</sup> Conference of the Parties, but actions regarding monitoring the implementation of the IPOA-Sharks and improving international records of trade in shark products were addressed in Decision 11.94 and 11.151. Decision 11.94 addressed the maintenance of liaison between the Secretary of the FAO and the Chairman of the CITES Animals Committee, in order to monitor the implementation of the IPOA-Sharks. The results of this liaison are reported regularly to meetings of the Animals Committee, and the Chairman of the Animals Committee is report at the 12<sup>th</sup> Conference of the Parties (COP 12) regarding progress on implementation on the IPOAs. Decision 11.151 instructed the CITES Secretariat to maintain liaison with the World Customs Organization, to promote the establishment and use of specific headings within the Harmonized System of Standard Tariff Classifications, to discriminate between shark meat, fins, leather, cartilage and other products.

During the past year, two Parties have taken action on shark by listing two shark species on CITES Appendix III. Australia has listed *Carcharodon carcharias* (Great White Shark) and the United Kingdom has listed *Cetorhinus maximus* (Basking Shark). These listings require the respective Parties to issue CITES permits to allow trade and all other Parties trading in the species to issue a Certificate of Origin (stating where the specimens come from). The certificates of origin are reported to the Secretariat each year in the Parties' annual reports, enabling a trail to be built up of where exports of species are coming from and where they are going. This will assist Australia and the United Kingdom to regulate trade in specimens and enable all Parties to gain a greater understanding of trade in the species and any parts or derivatives of the species.

The IPOA-Shark is voluntary and has relevance to States that have, as part of their Exclusive Economic Zones (EEZ), waters in which sharks are caught, as well as to States whose vessels catch sharks on the high seas. All States whose vessels conduct directed shark fisheries or regularly take sharks in non-directed fisheries are encouraged by COFI to adopt a National Plan of Action for the Conservation and Management of Shark Stocks (NPOA-Sharks). The IPOA-Shark directs that such shark-plans should, inter alia, aim to ensure that catch of all species of shark from directed and non-directed fisheries are sustainable, and encourages States to have a NPOA-Sharks prepared by the 24<sup>th</sup> COFI session held in February 2001.

To be fully effective the conservation and management of shark requires action from all States with active shark fisheries. Progress with the development of NPOA-Sharks has been



very slow with the majority of Parties to FAO. Twenty-nine of the 113 States that report shark landings to the FAO reported progress with IPOA implementation at the 24<sup>th</sup> Session of COFI. Only 5 of the 29 States have Shark Assessment Reports or NPOAs available for public consultation and review. Of these, only two States (the United State of America and Japan) have adopted a NPOA-Sharks. Australia's draft NPOA-Sharks, based upon its comprehensive Shark Assessment Report, is to be released later this year. Forty-seven FAO member countries indicated that they would not be preparing NPOA-Sharks.

#### **4. CONCLUSION AND DISCUSSION**

At COP 12 (November 3-15, 2002, Santiago, Chile) there are five proposals to list sharks and other commercial marine fish species on CITES Appendix II pursuant to Article II of the Convention. ASEAN countries should examine these proposals carefully whether they meet the criteria set forth by the Resolution Conf. 9.24 in accordance with Article II. With regard to enlist shark species, there are two key questions (i) Is a CITES listing the most effective way to manage and conserve the target shark population, and (ii) What other mechanisms would be appropriate. In this connection, progress with the development of NPOA-Sharks among ASEAN countries will be examined, and SEAFDEC will provide assistance in this matter.



## OUTCOMES OF THE RECENT MEETING ON CITES WITH RESPECT TO SHARKS ISSUES

*Fautina Ida Harjanti*  
*CITES Management Authority*

### 1. WORKING DOCUMENT AND PROPOSAL REGARDING SHARKS IN THE NEXT 12<sup>th</sup> MEETING OF THE CONFERENCE OF PARTIES TO CITES (COP 12)

There have several documents on conservation on sharks for consideration by COP 12<sup>th</sup> CITES. Australian document discuss the problems of the development and implementation of National Plan of Action for the Conservation and Management of Sharks Stocks (NPOA-Sharks) which should have been adopted prior to the COFI (FAO Committee of Fisheries) 24<sup>th</sup> session held in 2001 by countries whose vessels take sharks in non directed fisheries. It is noted that there is significant lack of progress with the development and implementation of NPOA-Sharks, therefore a resolution concerning conservation and management of sharks, emphasizing the role of CITES in implementation of the IPOA-Sharks. Ecuador also proposed similar resolution concerning conservation of and trade in sharks.

The Philippines and India also propose the inclusion of the Whale shark (*Rhincodon typus*) on Appendix II CITES. A proposal to include Whale shark was first presented by the USA at COP 11, but was rejected. Based on the analysis of the CITES Secretariat, the Philippines and India proposal provide additional information on national fisheries and conservation measures and on national and international trade.

### 2. SYNERGY AND COOPERATION BETWEEN CITES AND FAO REGARDING SHARKS

Synergy and cooperation between CITES and FAO was proposed by Japan, whereas FAO collaboration with CITES through a Memorandum of Understanding was proposed by USA. During the CITES Asian Regional Meeting in Mongolia, Japan presented the document of the proposal as mentioned above. The documents cope with important issues on the respective laws of FAO, on the regional fisheries management organization (RFMO), and on CITES for conservation of fisheries resources. They also inform that the draft resolution highlights that MOU between FAO and CITES should be developed to include provisions regulating future FAO involvement. FAO should be involved in the scientific evaluation of the proposals for listing and down listing exploited aquatic resources. On the draft resolution propose by Japan, it is also specified that CITES Secretariat has to work with FAO on drafting the MOU by establishing a framework for cooperation between the two organizations. It also affirms that FAO and mandated RFMOs are the appropriate intergovernmental bodies responsible for fisheries and fisheries management.

During this Asian Regional Meeting on CITES, CITES Secretariat confirmed that it was already collaborating with FAO, and representatives of two organizations met to discuss the conclusion of MOU. The conclusion of MOU will take a certain time and it is appropriate

to approve a Decision at COP, which instruct the Secretariat or Standing Committee to conclude the MOU.

### **3. REPORT ON THE SECOND MEETING OF THE ASEAN EXPERT GROUP ON CITES RELATED TO SHARKS**

The second meeting of the ASEAN Expert Group on CITES was held on 6-8 August in Kuala Lumpur – Malaysia. During this meeting, it was noted that the report from the Animal Committee members from Asian region, regarding the Biological and Trade Status of Sharks, mentioned that the Chairman of the Animal Committee (in accordance to the provision of Decision 11.94) liaised with FAO regarding IPOA-Sharks. Until the Animal Committee 18, it was apparent that little progress has been made in development of the IPOA-Sharks and that the number of the Parties that have been implemented National Plan of Action remained very limited. The voluntary nature of the IPOA-Sharks was considered to be the reason for this unsatisfactory progress. The report also mentioned that the AC recommended that CITES Authorities of Parties should be encouraged to obtain information on the IPOA-Sharks implementation from their national fisheries departments and report progress to the AC.

To comment this report, Malaysia informed that the FAO has formulated a Code of Practice for Responsible Fisheries where issue on sharks is addressed. Malaysia also informed that the Southeast Asian Fisheries Development Center (SEAFDEC) has made efforts to regionalize the use of Code. The meeting agreed that many of the regional efforts on shark conservation should be highlighted to CITES.

Regarding shark conservation, the meeting recalled that the SOM of the 23<sup>rd</sup> AMAF in October 2001 has agreed that the management of commercial fisheries, including shark, should come under the preview of FAO and the Code of Conduct for Responsible Fisheries and not CITES. The Meeting therefore agreed that matters relating to shark and marine species be taken up by FAO and not through listing on CITES. The meeting also noted that Philippines, together with India, have proposed the listing of shark species under Appendix II at the COP 12. Therefore, the meeting requested the chairman to convey to the Philippines the above decision and urge them to reconsider their proposal.

**ELASMOBRANCHS AND THE FAO  
AN IGO'S ACTIVITIES IN SUPPORT OF MANAGEMENT  
AND CONSERVATION OF SHARKS AND RAYS**

*Ross Shotton  
Marine Resources Service  
Fisheries Department, FAO  
Via delle Terme di Caracalla, 00100 Rome, Italy  
ross.shotton@fao.org*

**1. INTRODUCTION**

The Fisheries Department of the Food and Agriculture Organization is the lead technical agency for fisheries-related issues for the United Nations system. In this regard the mandate of FAO's Fisheries Department commonly abuts that of the United Nations Environmental Program and that of the International Maritime Organization.

FAO's major fisheries program aims at promoting sustainable development of fisheries and food security. To do this, the Fisheries Department's activities in Fishery Resources, Fishery Policy, Fishery Industries and Fishery Information focus on three medium-term objectives:

- i. Promotion of responsible fisheries sector management with priority on the implementation of the **Code of Conduct for Responsible Fisheries**, particularly with regard to excess fishing capacity and the 'institutional' strengthening of fisheries organizations.
- ii. Promotion of increased contribution of responsible fisheries and aquaculture to world food supplies and food security. The Department focuses on reduction of waste in fisheries (particularly discards) and aquaculture and support is given to aquaculture as well as protection and rehabilitation of the marine environment.
- iii. Global monitoring and strategic analysis of fisheries, with priority given to development of databases and analysis of information and publication of the State of World Fisheries and Aquaculture (SOFIA) and related information basis such as **Fisheries Global Information System (FIGIS)**, **Fisheries Resources Monitoring (FIRMs)** and partnership involvement in web sites such as the **UN Atlas of the Sea**.

Thus, while FAO has a general mandate for marine living resources, elasmobranchs is in fact just one part of that general responsibility.

In 1994, the Ninth Conference of Contracting Parties of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) adopted a Resolution on the Biological and Trade Status of Sharks (Conf. 9.17), requesting inter alia that (a) FAO and other international fisheries management organisations establish programmes to collect and assemble the necessary biological and trade data on shark species; and (b) all nations utilising and trading specimens of species to co-operate with FAO and other international fisheries management organisations.

This request was the precursor to discussions at FAO's Twenty-second Session of its Committee on Fisheries (COFI), which met in Rome in 1997. Many delegations expressed the view that conservation and effective management of shark populations merited further examination. It was suggested that FAO organize, in collaboration with Japan and the United States using extra-budgetary funds, an expert consultation to develop and propose guidelines leading to a plan of action to be submitted to the next Session of COFI. Japan and the United States then undertook the organization of such a meeting in collaboration with FAO. On a parallel track, the Committee also called on regional fishery management bodies and, where appropriate, other competent organizations or arrangements, to explore mechanisms for all aspects of shark conservation and management.

Thus, an International Plan of Action for Conservation and Management of Sharks (IPOA-SHARKS) was developed through the meeting of a *Technical Working Group on the Conservation and Management of Sharks* that was held in Tokyo in April 1998 and a subsequent *Consultation on Management of Fishing Capacity, Shark Fisheries and Incidental Catch of Seabirds in Longline Fisheries* held in Rome in October of the same year. The International Plan of Action for Sharks was adopted by the 23<sup>rd</sup> session of COFI when it organized in Rome in 1999 with essentially no debate or discussion other than to note that the implementation of the plans of action for Conservation and Management of Sharks should be pursued as high priority.

## 2. THE INTERNATIONAL PLAN OF ACTION FOR SHARKS

One of the first things to note about the 'IPOA - Sharks' is that it is not only about sharks - or even elasmobranchs, but strictly speaking, about the chondrichthyans<sup>1</sup>. And although some argued that there was nothing wrong with using the technically correct term, as is apparent, they did not prevail. The full text for the IPOA is given in Appendix I. A suggestion for the contents of a shark management plan is also given.

There are several important things to note about the IPOA in regards to its effectiveness. First, its implementation is voluntary. Second, from the perspective of those who drafted it, the Plan addresses all fisheries management regimes where elasmobranchs are harvested. Third, the Plan of Action notes that "FAO will as, and to the extent directed by its Conference, and as part of its Regular Programme activities, support States in the implementation of the IPOA-SHARKS, including the preparation of Shark-plans". FAO has noted that it believes that the action on the Plan of Action should be reviewed not less than every four years.

### **Progress with Implementation**

When will it be known if the IPOA has been successful, at least in stimulating management action that would not have otherwise occurred? This is proving a difficult question to confidently answer. First, several countries that have formally implemented IPOA-Sharks would, no doubt, have addressed the pressing conservation needs of sharks in their national waters no matter what. Second, my impression is that, in response to the FAO initiative, many countries have declared that an IPOA-sharks will be, or is being, implemented, but

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<sup>1</sup> i.e. the cartilaginous fishes.

from the information that FAO receives, it is impossible to determine how much effective action is, or has been, undertaken. In this regard, probably the best measure of national commitment would be an indication of the *extra* means (funds and human resources) that have been committed to shark conservation and their management.

At this point in the implementation of the programme, it is evident that the IPOA has stimulated many countries to address the issue of shark conservation in their waters. Appendix II provides a brief indication of FAO's knowledge of the situation in many member countries.

### 3. FAO ACTIVITIES ON THE UTILIZATION OF SHARKS<sup>2</sup>

As a consequence of the need to collect more information on biological and trade data on shark species FAO has produced various technical studies on the utilization of sharks and other cartilaginous fish. The most recent publication by the Fish Utilization and Marketing Service (FIU) updates the FAO/UNCTAD/GATT report "Shark utilization and marketing"<sup>3</sup>. The new technical report<sup>4</sup> provides a comprehensive and timely report on trade in shark products and identifies regional and global trends in demand and supply. It consists of a world overview, selected country reports and various Appendixes that have mainly been written by external experts.

Ms. Sei Poh Chen (Malaysia) is the author of Appendix II of the report, which focuses on individual countries, their commercially important shark species and their utilization. In Appendix III Mr. Hooi Kok Kuang (Singapore) analyses non-food uses of sharks as cartilage and liver oil. The studies covered under Appendix IV are country and regional analyses: Mr. Hooi Kok Kuang wrote on Hong Kong, Ms. Sei Poh Chen on Singapore and Malaysia, Mr. R.A.M. Varma (India) on India, INFOYU on China, Mr. Santiago Caro Ros of INFOPESCA on Latin America, Mr. Massimo Spagnolo (Italy) on the Mediterranean and Mr. O. Abobarin, Mr. O.K.L. Drammieh and Mr. M. Njie on Gambia and Ghana.

The Ninth Conference of CITES in 1994 passed a resolution (Conf. 9.17) calling for the establishment of a programme for the monitoring of shark production and trade. And, the ICCAT SCRS Shark Working Group Sub-Committee, at its meeting on by-catch in February 1996, identified as a priority the issue of collection of basic data on shark catch (whether kept or discarded). There is a substantial trade in dried shark fin tissue in many parts of the world and it is currently poorly known if this trade is endangering any species of shark. Accurate information on trade in shark fin is especially problematic in that dried fins in markets cannot easily be identified as to the species from which they came, a problem compounded by the ease with which this product can be transported to other markets. In order to address these issues (and to implement the FAO Code of Conduct, which calls for the conservation of biological diversity and the sustainable use of its component species), the FAO is implementing a project funded by the Government of Japan titled, "Sustainable Contribution of Fisheries to Food Security".

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<sup>2</sup> FAO contact Helga Josupeit

<sup>3</sup> R. Kreuzer, R. and R. Ahmed 1978 Shark utilization and marketing. FAO, Rome. 178pp.

<sup>4</sup> Vannuccini, S. 1999. Shark utilization, marketing and trade. *FAO Fish. Tech. Pap.* No. 389. Rome, FAO. 470p.

#### 4. DNA STUDIES ON SHARK FIN SPECIES IDENTIFICATION<sup>5</sup>

A component of the programme funded by the Government of Japan has been to evaluate the efficacy of molecular techniques to identify shark species using dried fin tissue as means of monitoring this trade. Such the information could provide a means to assess the species composition of shark-fin fisheries and their potential impacts on endangered sharks. Five genetic laboratories from around the world agreed to participate in the study. Each laboratory was provided with known samples of blood, muscle, liver, and dried fin from several individual sharks from several different species and developed molecular techniques to differentiate species. Following the development of laboratory protocols for species identification, each laboratory was sent unknown samples of dried fin tissue for analysis. The cost and technical requirements of the techniques used by the different laboratories were evaluated as to their appropriateness for a global programme on molecular analysis of shark fisheries. The results of this programme are to be documented.

#### 5. CASE STUDIES ON MANAGEMENT OF ELASMOBRANCH FISHERIES<sup>6</sup>

As part of the follow-up activities arising from the COFI interest in elasmobranch conservation, FI undertook the preparation of a number of case studies describing how these fisheries are managed in different management jurisdictions. To facilitate comparability, authors were asked to follow, as much as possible, a similar format in their reports.

The objective of the Case Studies was to describe elasmobranch management practices within the context of respective national fisheries administrations. For most case studies, one can simultaneously learn of related national management practices including the management objective setting and subsequent fisheries policy formulation, evaluation and selection processes, how fisheries data and catch statistics systems are run, stock assessment procedures, if any, and the role and manner of enforcement of fisheries regulations in the context of the national fisheries laws. This context setting has been done as it was felt it was essential for understanding the fisheries sectors' circumstances in which the respective management regimes operate. Only in this way would the challenges that exist for elasmobranch management be fully appreciated.

Despite this report's size (920pp) its is not without deficiencies. A particular failure has been the gaps in its geographical balance. This arose for two reasons; first, for many major global areas, there is no management of elasmobranch resources. The reasons are varied. In some cases it is because of national indifference, in others, institutional incapacity, either lack of technical skills, funds for management, or human resources. Second, a common reason, and one which provides the greatest difficulty in surmounting, is that while the need for effective elasmobranch management is well appreciated by many fisheries departments, they are faced with exigencies, if not crises, of greater management priority. Thus, the neglect that management of elasmobranchs suffers, and was the motivation for preparing this report, is often regretted, not least by those responsible for their management.

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<sup>5</sup> FAO contact is Devin Bartley, FIRI <devin.bartley@fao.org>

<sup>6</sup> Shotton, R. 1999. Case Studies on the Management of Elasmobranch Fisheries. FAO. Tech. Rep. No. 378. 920pp.



Another report result was the documentation of the sad neglect that management of elasmobranchs receives, not only in regions where competition for management resources can be expected to be fierce, but also in many areas where levels of economic prosperity are such that little, or no, valid reasons exist for the neglect of the husbandry of resources which so many states have claimed under the aegis of the Law of the Sea and extension of national jurisdictions. In these regions, the failure to manage what are national patrimonies must be seen more as an issue of national values rather than one of scarcity of resources. Despite the criticism by some of the authors of their national elasmobranch management accounts, many reports show that the challenges in many management regimes have been fully recognized and resolutely tackled. And, the professionalism of some of the management practices documented in this volume is truly impressive.

A theme that dominates all papers is the dissatisfaction with the quality of elasmobranch catch data, both in identifying the species that are caught, and the amount of catch and landings - usually not the same thing because of unreported discards. While in some cases, aggregation of species data is a consequence of lack of suitable species identification keys, more commonly it is the result of lack of motivation to ensure that resources (funds and staff) are available to accurately identify the elasmobranch catch composition, but not always. In several chapters it is noted that national regulations have been changed to ensure that the fins and other body parts remain attached to the carcasses to enable identification of the shark, a task that outside of using DNA techniques becomes almost impossible once the fins are separated from the body. Aggregation of the data for catches of different fish species is a curse not only for shark fisheries but also for the skates and rays where the market provides little price differential between species and thus little motivation for fishermen to separate their catch by species.

The Northeast Atlantic is represented by an omnibus account that, as the authors, Pawson and Vince note, is not matched by the commitment to active management in the area, primarily the remit of the European Union. Two detailed accounts of regional management in the Maritimes of Canada and the Southwest US complement the Northeast Atlantic study. Two studies are available for the western Caribbean; a regional account of the CARICOM area which underlines the difficulty of shared stock management in an area that is only now marshalling the resources needed even for basic domestic management requirements. The second study for this region is from Guatemala.

The management of two skate fisheries in the Atlantic are described, one in the northwest and the other in the southwest, both recently begun. The Newfoundland fishery, prompted by the search for new resources, is prosecuted in the area of one of the oldest and most famous fisheries of the world, that of the cod fisheries, now collapsed. In contrast, industrial fisheries in the Falkland Islands/Malvinas region have been prosecuted for just over two decades. While the Falklands Island fishery is managed from Britain, the administration of both these fisheries is in strong contrast to the situation for skate in the European Union area. The South Atlantic is further represented, in the east by a study from South Africa and in the west by one from Uruguay that focuses on a specific elasmobranch group - *Cazón* (*Galeorhinus galeus*) - the soupfin shark.

East Africa, the Red Sea and the Persian Gulf, despite their abundance of elasmobranchs, along with West Africa, remain unaddressed by the report. More success has been had slightly to the east where accounts have been obtained from the Seychelles and the Maldives. In the former, the effect of eco-tourism in causing the closure of the shark fishery, at least

officially, is still to be revealed whereas in the Maldives a fascinating account is provided of how the tourism sector has been considered a major factor in formulation of national shark management plans. These two studies are complemented by those from India and Sri Lanka, both important elasmobranch-fishing nations, but with the more conventional goal of feeding national populations.

There are three excellent reports on national shark fishery management from Australia and the study from New Zealand provides an interesting complement. Readers interested in shared-stock management should be interested (and depressed) by the considerable evidence for the movement of sharks between these two countries despite their separation - at a minimum 1200 miles! And, readers will get some idea of how New Zealand's Quota Management System is being applied to such an interesting group taken primarily as a by-catch fishery. The north Pacific is represented by Japan and Fiji offers a Pacific comparison to the small-island-state fisheries in the Indian Ocean. Again, shark fins and by-catches from foreign fishing ventures that target tuna figure prominently but with management complicated by traditional indigenous rights and management practices and eco-tourism concerns.

Three accounts are given for the west coast of the Americas; that for British Columbia echoes the accounts of many of the others in emphasizing the role that shark livers, or more accurately, their vitamin A content, have played in development of these fisheries, in addition to the importance of shark liver oil for its role as an illuminant, lubricant and oil base for paints. Following the US account, a further contribution (in Spanish) describes the fishery in Ecuador. The chapter from Ecuador contains an extensive photographic record of small-scale shark fisheries handling practices that should interest those whose association with this group of fishes and related fishing practices gets no closer than the printed page. There are in addition regional accounts - for soupfin shark (*Galeorhinus galeus*) in a global context and of the ways a regional tuna commission handles elasmobranchs. An account of the roles of NGOs that are involved in this issue is included and finally an account is given of the deplorable state of global catch statistics relating to the chondrichthyans.

## 6. FIRM/SIDP ELASMOBRANCHES SPECIES IDENTIFICATION PUBLICATIONS<sup>7</sup>

### 6.1 FAO Species Catalogue for Fisheries Purposes

#### 6.1.1 *Sharks of the world*

A revision of "Sharks of the World" is under preparation, the new catalogue describes about 480 species, in contrast to the 1984 catalogue which described about 350 species - a 37% increase. Due to problems encountered in resolving taxonomic issues, distribution started in 2001 with Volume II dealing with Bullhead, Mackerel and Carpet sharks. The manuscript of volume I should be ready at the end of 2002 for a publication in 2003 and volume III is expected for a release in 2003-2004. This substantially differs from the original plan for reasons mentioned above.

#### 6.1.2 *Batoids of the World*

The new Catalogue of Batoids of the World was launched at a meeting that was organised by FAO and hosted at the Museum d'Histoire Naturelle in Paris in March 2002, with the

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<sup>7</sup> <michel.lamboeuf@fao.org>

editors: Dr. L.V.J Compagno, Shark Research Centre, South African Museum, (South Africa); Dr. Peter R. Last, CSIRO Marine Research, Hobart (Australia); Dr. John D. McEachran, Department of Wildlife and Fisheries Sciences, Texas A&M University College Station, (USA); and Dr. Bernard Seret, Museum National d'Histoire Naturelle, Paris, (France). The purpose of the meeting was to discuss the content, format and organisation of the volumes, review the list of species, standardise the collection of information on Batoids characteristics and allocate coordinators and authors to the various volumes. Batoids comprise approximately 630 species of electric rays, sawfishes, guitarfishes, skates, and rays. They represent about 60% of the cartilaginous fishes but are less known than sharks, as the group lacks the public notoriety of sharks.

Anthropogenetic activities have placed many species at risk, as they compete for inshore coastal habitats with humans and other taxa and are vulnerable to new fishery technologies. It is critical to further improve our knowledge of the taxonomy and systematics of Batoids before they suffer further decline and to insure their future survival.

The catalogue will have 5 volumes and will include 626 species, of which 84 are new and yet undescribed. Cybium has accepted to dedicate a special issue to the description of all new species of Batoids. A tentative timetable was put forward for the production of the various volumes.

Volumes	Species groups	Volume coordinator
I (2004)	Pristoids through to Zanobatoid,	L.V.J. Compagno
II (2005)	Torpenoids,	L.V.J. Compagno
III (2007)	Rays,	J. E. McEachran
IV (2009)	Stingrays	B. Seret
V (2009)	River Stingrays through to Mantas	P. Last

The Catalogue of Batoids of the World is a major undertaking to both consolidate and reinterpret available knowledge, and to conduct original research to further resolve taxonomic issues and systematic relationships within the group. This involves extensive travel of the volumes editors to study specimen in the various museums during the first two years. FAO is committed to coordinate the project using its own resources, mainly personnel and limited funds, but it cannot cover all budget needs and is seeking external funding in the range of \$500,000 to bring about the project during the entire period.

## 6.2 Field Guides

Two Guides of Elasmobranches are in preparation, they mainly aim at providing a quick identification guide in B5 format to persons involved in fisheries work. They include a species identification key, species drawings with a brief descriptions including two or three species per page. The printing of **Elasmobranches of the Red Sea** is financed by Japan. The preparation and printing of **Elasmobranches of the Mediterranean** is financed by the COPEMED project.

## **7. FROM STRATEGY TO ACTION - SOME THINGS THAT OUGHT TO BE DONE**

### **7.1 Some Institutional Observations**

Several people have noted that when there is a problem at the national level with articulation and implementation of a national plan for the management of elasmobranchs, there is often a similar management problem with other sectors, e.g. if the collection of catch and effort for shark fisheries is weak, then often this is the same for pelagic or crustacean fisheries. Likewise, if no regular stock assessment is undertaken of elasmobranch resources, then this too may be the case for other much more valuable and important fisheries. A valid organizational question is, if management is weak for other more important sectors, why should priority be given to sharks.

Such a perspective is difficult to rebut, and although I agree with many aspects of this argument, there are some points worth noting.

- i. Shark populations are under threat especially many of the smaller and often poorly known stocks that are taken as by-catch. Vulnerable stocks may disappear, harvested to commercial or biological extinction, completely unbeknown to management authorities.
- ii. How elasmobranch statistics are handled may be a good indicator as to how the statistics for other fishery sectors are being handled - that is a warning sign that a department does not know what is happening with its fishery resources.
- iii. Environmental NGOs and CITIES are not going to go away! ENGOs who have detected the crises that exists for many shark resources, or at least the lack of information on the status of these stocks and their fisheries, are well funded, highly motivated and characterized by considerable staying power. No minister should ignore their ability to take conservation issues across commercial sectors. If one's department has not been conscience in preventing the extirpation of an elasmobranch resource, such organizations may well take their publicity campaigns to, e.g. the tourist sector.

### **7.2 Some Institutional Considerations**

Several of my colleagues have questioned the logic of national fisheries administrations implementing an IPOA-sharks, arguing that usually, if there is a problem with the management sharks usually there are management deficiencies with other sectors that invariably are much more important, e.g. shrimp. For example, if the elasmobranchs data are bad, then so probably are the data for other stock units.

There is a compelling logic to such assertions. But there are several counter arguments that should not be neglected. First, many shark stocks are vulnerable to extreme reduction in stock size because of the characteristics of their population biology - i.e. their longevity, vulnerability to capture, low fecundity and late maturity. Further, many species are taken as by-catch and little has been recorded about their capture, much less documentation of CPUE trends and other indicators of their abundance. These species may disappear without notice. This is not the case for species such as shrimp.

Second, even if there is little domestic pressure to manage fisheries to maintain or improve marine bio-diversity, there are international pressures. Environmental NGOs (ENGOS) are acutely aware of the vulnerable status of many elasmobranch resources. These ENGOS are well funded, persistent and capable of switching where they apply pressure from one commercial sector (e.g. fisheries) to another, e.g. the tourism sector. Which is the most important sector in SEAFDEC countries?

## **International Plan of Action for Conservation and Management of Sharks**

### **Introduction**

1. For centuries artisanal fishermen have conducted fishing for sharks sustainably in coastal waters, and some still do. However, during recent decades modern technology in combination with access to distant markets have an increase in effort and yield of shark catches, as well as an expansion of the areas fished.
2. There is concern over the increase of shark catches and the consequences this has for the populations of some shark species in several areas of the world's oceans. This is because sharks often have a close stock-recruitment relationship, long recovery times in response to over-fishing (low biological productivity because of late sexual maturity; few offspring, albeit with low natural mortality) and complex spatial structures (size/sex segregation and seasonal migration).
3. The current state of knowledge of sharks and the practices employed in shark fisheries cause problems in the conservation and management of sharks due to lack of available catch, effort, landings and trade data, as well as limited information on the biological parameters of many species and their identification. In order to improve knowledge on the state of shark stocks and facilitate the collection of the necessary information, adequate funds are required for research and management.
4. The prevailing view is that it is necessary to better manage directed shark catches and certain multi-species fisheries in which sharks constitute a significant by-catch. In some cases the need for management may be urgent.
5. A few countries have specific management plans for their shark catches and their plans include control of access, technical measures including strategies for reduction of shark by-catches and support for full use of sharks. However, given the wide-ranging distribution of sharks, including on the high seas, and the long migration of many species, it is increasingly important to have international cooperation and coordination of shark management plans. At the present time there are few international management mechanisms effectively addressing the capture of sharks.
6. The Inter-American Tropical Tuna Commission, the International Council for the Exploration of the Sea, the International Commission for the Conservation of Atlantic Tunas, the Northwest Atlantic Fisheries Organization, the Sub-regional Fisheries Commission of West African States, the Latin American Organization for Fishery Development, the Indian Ocean Tuna Commission, the Commission for the Conservation of Southern Bluefin Tuna and the Oceanic Fisheries Programme of the Pacific Community have initiated efforts encouraging member countries to collect information about sharks, and in some cases developed regional databases for the purpose of stock assessment.
7. Noting the increased concern about the expanding catches of sharks and their potential negative impacts on shark populations, a proposal was made at the Twenty-second Session of the FAO Committee on Fisheries (COFI) in March 1997 that FAO organize an

expert consultation, using extra-budgetary funds, to develop Guidelines leading to a Plan of Action to be submitted at the next Session of the Committee aimed at improved conservation and management of sharks.

8. This International Plan of Action for Conservation and Management of Sharks (IPOA-SHARKS) has been developed through the meeting of the Technical Working Group on the Conservation and Management of Sharks in Tokyo from 23 to 27 April 1998 and the Consultation on Management of Fishing Capacity, Shark Fisheries and Incidental Catch of Seabirds in Longline Fisheries held in Rome from 26 to 30 October 1998 and its preparatory meeting held in Rome from 22 to 24 July 1998.

9. The IPOA-SHARKS consists of the nature and scope, principles, objective and procedures for implementation (including attachments) specified in this document.

### **Nature and Scope**

10. The IPOA-SHARKS is voluntary. It has been elaborated within the framework of the Code of Conduct for Responsible Fisheries as envisaged by Article 2 (d). The provisions of Article 3 of the Code of Conduct apply to the interpretation and application of this document and its relationship with other international instruments. All concerned States are encouraged to implement it.

11. For the purposes of this document, the term "shark" is taken to include all species of sharks, skates, rays and chimaeras (Class Chondrichthyes), and the term "shark catch" is taken to include directed, by-catch, commercial, recreational and other forms of taking sharks.

12. The IPOA-SHARKS encompasses both target and non-target catches.

### **Guiding Principles**

13. States that contribute to fishing mortality on a species or stock should participate in its management.

14. Sustaining stocks. Management and conservation strategies should aim to keep total fishing mortality for each stock within sustainable levels by applying the precautionary approach.

15. Nutritional and socio-economic considerations. Management and conservation objectives and strategies should recognize that in some low-income food-deficit regions and/or countries, shark catches are a traditional and important source of food, employment and/or income. Such catches should be managed on a sustainable basis to provide a continued source of food, employment and income to local communities.

### **Objective**

16. The objective of the IPOA-SHARKS is to ensure the conservation and management of sharks and their long-term sustainable use.

## Implementation

17. The IPOA-SHARKS applies to States in the waters of which sharks are caught by their own or foreign vessels and to States the vessels of which catch sharks on the high seas.
18. States should adopt a national plan of action for conservation and management of shark stocks (Shark-plan) if their vessels conduct directed fisheries for sharks or if their vessels regularly catch sharks in non-directed fisheries. Suggested contents of the Shark-plan are found in Appendix A. When developing a Shark-plan, experience of sub-regional and regional fisheries management organizations should be taken into account, as appropriate.
19. Each State is responsible for developing, implementing and monitoring its Shark-plan.
20. States should strive to have a Shark-plan by the COFI Session in 2001.
21. States should carry out a regular assessment of the status of shark stocks subject to fishing so as to determine if there is a need for development of a shark plan. This assessment should be guided by article 6.13 of the Code of Conduct for Responsible Fisheries. The assessment should be reported as a part of each relevant State's Shark-plan. Suggested contents of a shark assessment report are found in Appendix B. The assessment would necessitate consistent collection of data, including *inter alia* commercial data and data leading to improved species identification and, ultimately, the establishment of abundance indices. Data collected by States should, where appropriate, be made available to, and discussed within the framework of, relevant sub-regional and regional fisheries organizations and FAO. International collaboration on data collection and data sharing systems for stock assessments is particularly important in relation to transboundary, straddling, highly migratory and high seas shark stocks.
22. The Shark-plan should aim to:
  - i. Ensure that shark catches from directed and non-directed fisheries are sustainable;
  - ii. Assess threats to shark populations, determine and protect critical habitats and implement harvesting strategies consistent with the principles of biological sustainability and rational long-term economic use;
  - iii. Identify and provide special attention, in particular to vulnerable or threatened shark stocks;
  - iv. Improve and develop frameworks for establishing and co-ordinating effective consultation involving all stakeholders in research, management and educational initiatives within and between States;
  - v. Minimize unutilized incidental catches of sharks;
  - vi. Contribute to the protection of bio-diversity and ecosystem structure and function;
  - vii. Minimize waste and discards from shark catches in accordance with article 7.2.2.(g) of the Code of Conduct for Responsible Fisheries (for example, requiring the retention of sharks from which fins are removed);
  - viii. Encourage full use of dead sharks;
  - ix. Facilitate improved species-specific catch and landings data and monitoring of shark catches; and



- x. Facilitate the identification and reporting of species-specific biological and trade data.
23. States which implement the Shark-plan should regularly, at least every four years, assess its implementation for the purpose of identifying cost-effective strategies for increasing its effectiveness.
24. States which determine that a Shark-plan is not necessary should review that decision on a regular basis taking into account changes in their fisheries, but as a minimum, data on catches, landings and trade should be collected.
25. States, within the framework of their respective competencies and consistent with international law, should strive to cooperate through regional and sub-regional fisheries organizations or arrangements, and other forms of cooperation, with a view to ensuring the sustainability of shark stocks, including, where appropriate, the development of sub-regional or regional shark plans.
26. Where transboundary, straddling, highly migratory and high seas stocks of sharks are exploited by two or more States, the States concerned should strive to ensure effective conservation and management of the stocks.
27. States should strive to collaborate through FAO and through international arrangements in research, training and the production of information and educational material.
28. States should report on the progress of the assessment, development and implementation of their Shark-plans as part of their biennial reporting to FAO on the Code of Conduct for Responsible Fisheries.

### **Role of FAO**

29. FAO will as, *and to the extent directed by its Conference*<sup>8</sup>, and as part of its Regular Programme activities, support States in the implementation of the IPOA-SHARKS, including the preparation of Shark-plans.
30. FAO will, as and to the extent directed by its Conference, support development and implementation of Shark-plans through specific, in-country technical assistance projects with Regular Programme funds and by use of extra-budgetary funds made available to the Organization for this purpose. FAO will provide a list of experts and a mechanism of technical assistance to countries in connection with development of Shark-plans.
31. FAO will, through COFI, report biennially on the state of progress in the implementation of the IPOA-SHARKS.

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<sup>8</sup> My italics.

## SUGGESTED CONTENTS OF A SHARK-PLAN

### 1. BACKGROUND

When managing fisheries for sharks, it is important to consider that the state of knowledge of sharks and the practices employed in shark catches may cause problems in the conservation and management of sharks, in particular:

- i. Taxonomic problems
- ii. Inadequate available data on catches, effort and landings for sharks
- iii. Difficulties in identifying species after landing
- iv. Insufficient biological and environmental data
- v. Lack of funds for research and management of sharks
- vi. Lack of coordination on the collection of information on transboundary, straddling, highly migratory and high seas stocks of sharks
- vii. Difficulty in achieving shark management goals in multi-species fisheries catching sharks.

### 2. CONTENT OF A "SHARK-PLAN"

The Technical Guidelines on the Conservation and Management of Sharks, under development by FAO, provide technical guidance, both on the development and the implementation of the Shark-plan. Guidance will be provided on:

- Monitoring
- Data collection and analysis
- Research
- Building of human capacity
- Implementation of management measures

The Shark-plan should contain:

- i. *Description of the prevailing state of:*
  - Shark stocks, populations
  - Associated fisheries and,
  - Management framework and its enforcement
- ii. *The objective of the Shark-plan:*
- iii. *Strategies for achieving objectives*

The following are illustrative examples of what could be included:

  - a. Ascertain control over access of fishing vessels to shark stocks
  - b. Decrease fishing effort in any shark where catch is unsustainable
  - c. Improve the utilization of sharks caught
  - d. Improve data collection and monitoring of shark fisheries
  - e. Train all concerned in identification of shark species
  - f. Facilitate and encourage research on little known shark species
  - g. Obtain utilization and trade data on shark species

### 3. SUGGESTED CONTENTS OF A SHARK ASSESSMENT REPORT

A shark assessment report should *inter alia* contain the following information:

- i. Past and present trends for (a) Fishing: directed and non-directed fisheries; all types of fisheries;
- ii. Yield: physical and economic;
- iii. Status of stocks;
- iv. Existing management measures;
- v. Control of access to fishing grounds;
- vi. Technical measures (including by-catch reduction measures, the existence of sanctuaries and closed);
- vii. Monitoring, control and surveillance;
- viii. Effectiveness of management measures;
- ix. Possible modifications of management measures.

**Status of Implementation of Shark IPOAs - As Indicated to FAO**  
February 2002

Current *FAO* Knowledge of Status of Implementation of IPOA-Sharks

As SEAFDEC and ASEAN members will see, this table demonstrates how difficult it is for FAO to monitor what is happening. This information was prepared by FIPL - the Institutional Service of the Fisheries Department.

<i>Country</i>	<i>Shark Plan</i>	<i>Country</i>	<i>Shark Plan</i>
Albania	<i>Expected</i>	Kenya	No Shark plan in place
Argentina	Plan expected	Korea	No Shark Plan in place
Bahamas	Not harvested commercially (?)	Madagascar	<i>Expected</i>
Bangladesh	No shark plan in place and no large scale fisheries target sharks	<b>Malaysia</b>	No specific fisheries targeting sharks
Barbados	No shark plan in place	Marshall Islands	Hopefully soon. Still in development stage
Bhutan	Landlocked	Mauritius	Catch negligible and lack of expertise in the domain
<b>Brunei Darussalam</b>		Mexico	There is a plan in place
Brazil	<i>There is already a shark plan in place</i>	Morocco	No plan is intended
Burkina Faso	Landlocked	Mozambique	No plan is intended
<b>Cambodia</b>	<i>Expected</i>	<b>Myanmar</b>	?
Cameroon	No shark plan in place	Namibia	<i>A Shark plan has been implemented</i>
Canada	Assessment conducted for one stock of sharks	New Zealand	No answer
Cap Verde	<i>Expected</i>	Nicaragua	No plan in place
Chad	Landlocked	Norway	Preparation of plan depends on the availability of funding
Chile	<i>Expected</i>	Oman	
Colombia	<i>Expected</i>	Panama	<i>Expected</i>
Comores	Not expected yet.	Papua New Guinea	<i>Expected</i>
Cook islands	No shark plan in place	Peru	Intended to develop a plan within the work on institutional framework
Cote d'Ivoire	<i>Expected</i>	<b>Philippines</b>	A national workshop will be held in September to formulate such a plan
Cyprus	<i>Expected</i>	Poland	
Denmark	E.U.(see answers of the European Union)*	République démocratique du Congo	<i>Expected after evaluation</i>
Dominican Rep	No plan in place	République du Congo	None in place
Dominica	No targeted shark fishery and no plan in place	Samoa	No sharp plan in place
Egypt		Senegal	A plan is underway

El Salvador	Currently working on a plan formulated specifically for Sharks	Seychelles	<i>Expected</i>
Eritrea	No specific date given for the completion of such a plan	<b>Singapore</b>	?
Germany	E.U.*	South Africa	It is intended to develop such a plan.
Ghana	Unknown when plan will be completed	St Lucia	No assessment yet conducted
Greece	No Shark plan in place	Sudan	
Guatemala	?	Syrian Arab Rep	<i>Intended in near future</i>
Guinea	<i>Expected</i>	Tanzania	No assessment yet conducted yet
Guinea-Bissau	<i>Expected</i>	<b>Thailand</b>	<i>Expected</i>
Guyana	Assistance is needed to develop such a plan	Togo	Might complete such a plan in the future
Haiti	No assessment has been conducted yet	Tonga	No shark plan. The issue has not been discussed yet.
Honduras	No plan in place	Trinidad and Tobago	<i>Expected</i>
India	Need for a shark plan not yet felt	Tunisia	<i>Expected</i>
<b>Indonesia</b>	<i>Expected</i>	Turkey	Has not determined yet whether to develop such a plan
Iran	Started applying closing seasons; no shark plan in place.	Uruguay	No plan in place but the evaluation has been conducted
<b>Japan</b>	?	USA	<i>A plan has been implemented</i>
Jordan		<b>Vietnam</b>	?

\*The E.U. has not sent back his questionnaire



Annex 11

**THE REGIONAL PROPOSAL ON THE IMPLEMENTATION OF  
INTERNATIONAL PLAN OF ACTION FOR THE CONSERVATION AND  
MANAGEMENT OF SHARKS**

*Yasuhisa Kato*  
*SEAFDEC Secretariat*

**1. BACKGROUND**

The International Plan of Action for the Conservation and Management of Sharks (IPOA-SHARKS) was adopted at FAO Committee on Fisheries (COFI) at its Twenty-third session in 1999 and requested by its context that “states should strive to have a *Shark plan* by the COFI session of 2001”. However, only a few countries completed their *Shark plan* by the proposed date. FAO has therefore urged further efforts by the member countries so as to meet the requirements agreed in IPOA-SHARK (Annex 1).

Based on the international concerns on the deterioration of the global environment, international interventions on sustainable fisheries have been greatly promoted by not only fisheries sector but also various stakeholders. Unless fisheries sectors which normally led by the government fisheries related agencies are taking appropriate actions toward achieving sustainable fisheries, it has been clear that non-fisheries sector will start various initiatives including conservation and management of fisheries resources issues. The current initiatives developed by the Convention on International Trade in Endanger Species of Wild Fauna and Flora (CITES) have posed general questions on the linkages between harvest of endanger species and sustainable use of the aquatic resources. Although these two issues should be evaluated at various geographical levels using standardized criteria and appropriate scientific data and information, the international forum do not reach such consensus and outstanding controversial issues are not yet solved.

It is analyzed that the largest problem is the wide and different application of the precautionary approach on the aquatic species. The group that have been tried to hastily promote some fisheries species as endanger species under CITES using narrow concept of precautionary approach and promote regulation of certain fisheries using trade measures. On the other hand, fisheries related agencies including the most of these in ASEAN region, have tried to apply wider concept of precautionary approach and more seriously consider these under sustainable exploitation of fisheries resources. However, due to difficulty to collect sufficient amount of scientific data and information to evaluate the status and trend of fisheries that are exploiting these species, effective conservation and management measures have not yet been taken in the most of the cases. If such situation continues, fisheries sector which can be considered as a minor group in the international forum may eventually be defeated for most of the cases under the increasing thrusts of global environmental concerns. It is therefore important that fisheries related agencies should aware about the issues which can be greatly affected by the interventions by non-fisheries sector, and take pro-active action before negative consequences on sustainable fisheries are prevailed.

With respect to shark species, there has been increasing concerns on the declining shark resources due mainly to the growing demands by the lucrative shark fins market and their

weak biological fecundity to replenish their resources. Since the fisheries sector in the region has greatly enjoyed benefits from shark products, it is proposed that each ASEAN Member Countries should urgently analyze the issues and formulate appropriate “Shark Plan” as proposed in IPOA-SHARK in earlier opportunities.

## **2. REVIEW OF IPOA-SHARK**

IPOA-SHARK is comprehensively formulated both the conservation and management of all shark species both in national and international waters. The issues relevant to the exploitation of sharks in national water are specifically proposed to formulate shark-plan as national plan of actions.

### **2.1 Shark Fisheries in International Waters**

In ASEAN region, fisheries development has been conducted mainly in their national waters, which are attributed to the following factors.

- a) Due to ecological and topographical condition of fishing ground in the most of ASEAN region, their fisheries developments since 1960's have been promoted by trawl type of fisheries in their national water.
- b) There are only few strips of high sea areas in South China Sea. There are no specific fisheries in these areas.
- c) The international tuna fisheries (mainly purse seine) have been developed mainly by the fisheries sector in the Philippines at this moment.
- d) There is no consensus to create a Sub-Regional Fisheries Management Body due mainly to the lack of large-scale regional fisheries.

The by-catch of shark in international waters therefore can be considered as comparatively low level. The management of shark by-catch in these fisheries should be regulated by the appropriate mechanisms set by management frameworks under appropriate regional fisheries organizations in collaboration with the countries concerned.

### **2.2 Shark Fisheries in National Waters**

Considering above specific fisheries in ASEAN region, the issue can be focused on the proposed formulation of National Plan of Action (Shark-Plan).

#### ***a) Millennium Conference***

The regional fisheries common policy was formulated through the adoption of “Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN region” (Annex 2 and 3) at the ASEAN-SEAFDEC Conference on Sustainable Fisheries for Food Security in the New Millennium, ‘Fish for the People’ held in Bangkok in November 2001. Among various commitments made in the regional fisheries common policy, A-1 of the Plan of Action above states “Establish and implement comprehensive policies and innovative fisheries management, such as the decentralization of selected fisheries management functions to local level, the progressive introduction of right-based fisheries management through licensing and community fishing right, the improvement of vessel registration system and the development of supporting legal and institutional frameworks.”



**b) The Code of Conduct for Responsible Fisheries**

IPOA emphasizes that it has to be elaborated within the framework of the Code of Conduct for Responsible Fisheries. The above Resolution 1 states “Formulate regional guidelines to implement the Code of Conduct for Responsible Fisheries, taking into account the specific social, economic, cultural, ecological and institutional contexts and diversity of ASEAN fisheries”. ASEAN/SEAFDEC FCG program on “the Regionalization of the Code of Conduct for Responsible Fisheries” have completed the publication of the regional guidelines on Article 8 - Fishing Operations in 1999, Article 9 - Aquaculture Development in 2001 respectively and under the process of the regional guidelines on Article 7 - Fisheries Management. In the last one in its Article 7.1.1 support “ States and all engaged in fisheries management should, through an appropriate policy, legal and institutional framework, adopt measures for long term conservation and sustainable use of fisheries resources.”

Considering above regional initiatives together with follow up activities will further promote appropriate fisheries management framework in national level. In this connection, it is proposed that elaboration of National Plan of Action on Shark (Shark-Plan) should be under the framework of comprehensive fisheries management and not elaborated separately. Nevertheless, specific requirement on the shark fisheries will be further reviewed. It is therefore proposed that the proposed objective of IPOA especially for Shark-Plan will be modified as follows.

“The objective of Shark-Plan in ASEAN region is to take appropriate actions for the conservation and management of sharks and their long term sustainable use under the comprehensive national fisheries management policies, plan and program.”

**3. SHARK PLAN**

In the most of ASEAN Member Countries have not established and implemented effective fisheries management plan. ASEAN Member Countries will therefore continuously exert their utmost efforts along line with the policy considerations including the regional fisheries common policies adopted at the Millennium Conference and agreed regional guidelines of the Code of Conduct for Responsible Fisheries in order to achieve sustainable fisheries. In addition, it is suggested that the ASEAN Member Countries will take the following actions to understand the status and trend of shark fisheries in order to effectively improve fisheries management on sharks. One of the main constraints not only specific to shark fisheries but very relevant to all fisheries are lack of sufficient data and information. Therefore, a Shark Plan also focuses to effectively collect the data and information to establish appropriate basis on the management.

**3.1 Cooperation with Industry**

The fisheries related agencies in the most of ASEAN Member Countries have not effectively developed the cooperation mechanisms with fisheries industry, especially with commercial fisheries. In this connection, it is suggested that the cooperation mechanisms with large-scale industries especially on the collection of fisheries data and information will be developed. FCG program on “Information Collection for Sustainable Pelagic Fisheries in the South China Sea” using sampling ports can be considered as one of the models to collect required information on shark from the fisheries industries.

### **3.2 Review of Shark Fisheries**

It is suggested that ASEAN Member Countries should investigate the current shark fisheries in the following items to start with:

- a) Whether shark fisheries (as target species) exist or not?
- b) Main fishing gears?
- c) Are there any specific landing sites on shark catch?

### **3.3 Ecological Information on Shark**

The following ecological information can be collected by the ASEAN Member Countries to specify the shark targeted:

- a) Identification of habitat (fishing ground) of main shark species
- b) Major species to be caught in the respective national water.

### **3.4 Use of Shark Catch**

The information on how the harvested shark are used (fin only, body for food or other purposes, leather, liver, etc.) should be collected. The marketing and processing methods at local or factory level should also be understood. The survey on shark fin can be conducted as supplementary method, if it is found that the marketing surveys from the production sites are rather difficult.

### **3.5 Improvement of the Fisheries Statistics**

Based on the above 3, especially identification of major species, data collection by major species, the classification of the statistics using major species by national and regional levels can be considered. FCG program on “Fisheries Statistics” will consider the possible improvement through regional consultation process.

### **3.6 Appropriate Research Work on above**

### **3.7 Incorporation of above actions and other required management measures into the regional guidelines of the Code of Conduct for Responsible Fisheries**

Actions may include the reporting system on the catch of some species that are currently argued as endanger species (e.g. whale and basking sharks) using appropriate awareness building exercises.

## **4. CONCLUSION**

The meeting participants are invited to consider appropriate actions to understand the shark fisheries in the region. Special consideration will be given to the fact that international pressures will be increasingly intense and affect sustainable fisheries, if fisheries sector delay the actions to appropriately understand the issue, in this case, shark, and set the basis for future effective management actions.

## INTRODUCTION ON BY-CATCH OF MARINE TURTLE ISSUE

*Myint Pe*

*The Working Group on Regional Fisheries Policy from Myanmar  
Southeast Asian Fisheries Development Center*

### 1. INTRODUCTION

Turtles are ancient reptiles, which appeared on earth millions of years before humans and are now often endangered or threatened. Marine turtles disperse and migrate over vast distances, often crossing ocean basins, and individual turtle routinely live successively in the territories of numerous sovereign nations, as well as on the high seas.

Sea turtles are highly migratory animals and are known to inhabit the waters of the Southeast Asian region regardless of the geographical and political boundaries. Six species of marine turtle are reported to occur in the territorial waters of Southeast Asian region i.e. the olive ridley (*Lepdochelys olivacea*), the green (*Chelonia mydas*), hawksbill (*Eretmochelys*), loggerhead (*Caretta caretta*), leatherback (*Dermochelys coriacea*) and flatback (*Nator depressus*) turtles.

### 2. BY-CATCH OF MARINE TURTLE IN SHRIMP FISHERY

All life stages of marine turtles are vulnerable to human activities. Human interventions, such as beach armoring, beach nourishment, beach lighting, and beach cleaning, can reduce the survival of eggs and hatchlings on the beaches. The most important human associated source of mortality is incidental capture in shrimp trawls.

Mortality due to escalating incidental captures in coastal and oceanic fisheries constitutes one of the most challenging issues in marine turtle recovery and protection. In recent years, a raising national and international concern is focusing on evaluating the interaction between marine turtle conservation and fisheries in a more systematic and integrated way. The long line fishery, in particular, often results in considerable marine turtle mortality and financial losses (even if not yet clearly assessed), due to lowered productivity on the line for target species.

### 3. ISSUES ON SHRIMP EMBARGO

U.S. law prohibits imports of shrimp products harvested in a way that may be harmful to marine turtles. To avoid an embargo, a country must show that there are specific measures to prevent the incidental catch of these turtles in its shrimp fisheries. The main component of the U.S. sea conservation program is that commercial shrimp boats use a Turtle Excluder Device (TED).

Section 609 of U.S. Public Law 101-102 requires adequate measures to conserve marine turtles with respect to commercial shrimp operations. This was met through the adoption of Turtle Excluder Devices (TEDs). The law was intended to extend the protection given to marine turtles under U.S. regulations, for marine turtles habitats located beyond the U.S. borders.

The top shrimp exporters to the U.S. are India, Indonesia, Thailand, Mexico, Malaysia, Korea, and Japan. Four Asian countries – Thailand, India, Malaysia and Pakistan – have complained against the United States of America for stopping imports of wild caught shrimp into the U.S. market unless the shrimp were caught with nets fitted with TEDs.

#### **4. INFORMATION CONCERNING THE PROBLEMS AND ISSUES IN THE ASEAN MEMBER COUNTRIES**

To obtain information on the problems and issues of the ASEAN Member Countries, the SEAFDEC Secretariat has designed a simple questionnaire on four issues related to marine turtle, as follows:

- 1) Does your country have trade problems in relation to marine turtle by-catch? (shrimp embargo, trade of turtle eggs, etc.)
- 2) Does your country have specific program on marine turtle conservation and management?
- 3) Does your country use Turtle Excluder Devices (TEDs) in shrimp trawl fishery?
- 4) How many marine turtle hatcheries do you have?

The analysis was done based on the feedback from eight ASEAN-SEAFDEC Member Countries excluding Japan, Lao PDR, and Singapore. The results were summarized as follows:

##### **4.1 Trade Problems relation to marine turtle by-catch**

The United States import shrimp embargo against shrimp caught with gear not equipped with means of prevention Marine Turtle catch was unilaterally imposed upon the Southeast Asian countries on the 1<sup>st</sup> May, 1996.

Currently, shrimp fishing practices in the ASEAN Member Countries are still using without TEDs in their nets. For this reason, some member countries, like Thailand, Indonesia and Malaysia, which are the top shrimp exporting country to U.S. have a trade problem in relation to marine turtle by-catch. Other member countries have no trade problem in relation to marine turtle by-catch; because of the small amount of capture shrimp they are exporting, either because their shrimp shipments mostly come from aquaculture or because of the small size of their trawl fisheries.

##### **4.2 Specific Program on marine turtle conservation and management**

Realizing the needs to conserve and to protect the turtle population from further depletion, most of the member countries have Specific Program on marine turtle conservation and management. Most of the country fisheries' agency issued many laws and regulations to protect marine turtle and their habitat. Attempts have been made to promote education, awareness building, as well as conservation campaign programs.. However, problems in the programs still exist in all member countries, such as perturbation of nesting habitats (due to tourism and urban development along the shore line), destruction of foraging habitats (seagrass beds and coral reefs areas) as well as incidental capture of sea turtle from various fishing gears.

At present, Brunei Darussalam has seven Conservation and Management Programs, all these having been just start in 2000. Cambodia has two programs and also a collaborative program

with NGOs such as WWF, SEASTAR and CITES. Thailand conducted marine turtle conservation program since 1971. Marine Turtle Conservation Station at Mun-Nai Island in the Gulf of Thailand has been established as a pilot project under the Queen's Project. Vietnam has on-going marine turtle conservation and management program since 1990. At present, there are two Marine National Parks and nine Natural Sanctuaries in Vietnam for turtle conservation and management. Other member countries, like the Philippines, or Malaysia, also have on-going programs on marine turtle conservation and management.

### **4.3 Using Turtle Excluder Devices (TEDs) in shrimp trawl fishery**

TED are panels of large mesh webbing or metal grids, inserted into the funnel-shaped shrimp nets. As the nets are dragged along the bottom, shrimp and other small animal pass through the TED into the cod end of the net, the narrow bag at the end of the funnel where the catch is collected. Marine turtles, sharks, and fish too large to get through the panel are deflected out and escape.

TEDs have been required for most of U.S. shrimp trawlers since 1989. Foreign vessels were required to reduce turtle mortality to levels comparable to the U.S. shrimp fleet as of 1<sup>st</sup> May 1991 under a provision of the Endangered Species Act (P.L 101 – 162, section 609) passed by congress in 1989.

The U.S. shrimp embargo posed a serious threat to the livelihood of the fishermen of the Southeast Asian Region. National governments in the region view the threat in various way but always seriously. Through SEAFDEC, the Council Directors' approval was given for the urgent consideration of practical designs of additional shrimp trawling gears, thus defecting the U.S. import ban by effecting the release and potential conservation of marine turtle.

A series of TEDs experiments were conducted in many ASEAN Member Countries and the results were disseminated to the fishermen and fisheries officers in the region. Although most of the responsible fisheries officers and some fishers in this region acknowledged and understood well the use of TEDs in shrimp trawl nets as a necessity for marine turtle conservation, almost all the member countries still do not use TEDs in their trawl fisheries. Even Thailand and Indonesia, the leading countries in fisheries in the region, are still not successful in using systematically TED in their trawl fisheries. Although some countries, like Thailand, Malaysia, and Philippines, have good extension service and technology in TEDs, most of their fishers are still refusing to use TED in their nets, due to difficulties in trawling, the fear for reduced catch, and to avoid additional operation cost. The other member countries still face a lack of technology, insufficient extension service, combined with inadequate training and awareness in using TEDs in their trawl fishery.

### **4.4 Marine Turtle Hatcheries**

Realizing the needs to conserve and to protect the turtle population from further depletion, coupled by awareness and concern from the relevant authorities, the public and the non-governmental organizations, are giving much attention effort on turtle conservation, especially focused on one stage: the nesting and release of eggs on the beach.

As a result, management programs were orientated toward the establishment of turtle hatcheries. Hatchery operation as a conservation technique is now practiced in many member countries.

Currently, there is one hatchery in Brunei Darussalam, 8 hatcheries in Malaysia, 9 hatcheries in Myanmar, 12 hatcheries in Philippines, 20 main hatcheries and many small hatcheries in Thailand, two Turtle and Marine Hatchery Center in Vietnam, and 2 hatcheries in Indonesia. Only Cambodia has currently no hatchery.

## 5. CONCLUSION

- It is obvious that no single approach can be successfully emulated in every country of Southeast Asian Region to promote effective and successful marine turtle conservation. Each strategy must be unique to each country as various internal and external factors contribute toward determining the best conservation approach. However, turtle conservation should continue to involve the local communities and the government with the facilitation of NGOs. A close and functional working relationship of NGOs with the stakeholders, especially the local government and communities is a requisite for the success of turtle conservation in the region;
- In general, the development of TEDs has been successfully and effectively conducted by SEAFDEC/TD and introducing to fishermen in ASEAN Member Countries. However, it was found that the fishermen were very reluctant to use the TEDs for the following reasons.
  - a) In some part of the region such as the Gulf of Thailand, the populations of sea turtles were already reduced and a catch of turtle cannot be anticipated;
  - b) Heavy devices are sometimes dangerous to handle on board and in the water;
  - c) Fear for reducing of catch; and
  - d) Try to avoid from additional operation cost.
- Most of the ASEAN Member Countries have established national or regional conservation programs to protect marine turtles and habitats. However, some of these programs are under national jurisdiction and there is a need for greater regional cooperation to coordinate the conservation and management activities and to provide an overall picture of the stock, breeding behaviour and migratory patterns. Also, all member countries are needed to start a comprehensive research or study on turtle population, especially for the factor related to the reduction of turtle population, such as impact of fisheries, impact by collecting turtle eggs, and non-fisheries factor.

## SHRIMP EMBARGO AND TED IMPOSITION

*Waraporn Prompoj  
Department of Fisheries, Thailand*

### 1. BACKGROUND

#### 1.1 How did it happen?

##### ***1.1.1 Shrimp Embargo for the 14 Caribbean countries in 1991***

Back in 1991, the U.S. government imposed Public Law 101-162 Section 609 to Caribbean countries, concerned that shrimp harvested with inadequate technology may adversely affect certain sea turtle species. Nations may not be allowed to export shrimp to the United States unless they can provide the evidence subjected to their criteria of the U.S. government as were to issue the U.S. congress by May 1991. The three criteria or guidelines are as follows:

- i) the harvesting nation has to have evidence of the adoption of a regulatory program governing the incidental catch of sea turtles in comparable to the U.S.;
- ii) the average rate of that incidental catch by the vessels of the harvesting nation is comparable to the average rate of incidental catch of sea turtles by the U.S.; and
- iii) the particular fishing environment of the harvesting nation does not pose a threat of the incidental catch of such sea turtles in the course of such a harvesting.

These guidelines were to provide the means to protect or reduce incidental catch of sea turtles. The most favorable means is to impose the use of Turtle Excluder Device or TED to the shrimp trawls and similar shrimp gears.

Such an imposition for the 14 Caribbean countries could not be valid immediately in the first year of the imposition in 1991. Some exceptions and/or flexibility were applied. There were considerations in many aspects such as the use of TED in various fishing gears and types of boat. It is noticeable that this imposed law was in an effect in 1994.

This allowed three-year delay, within the TEDs had to be equipped in all fishing vessels by May 1994 in the 14 Caribbean countries.

##### ***1.1.2 Shrimp Embargo for 56 countries in 1996***

After the TED imposition for the Caribbean countries, Earth Island took U.S. government to the Court of International Trade or CIT in 1995. It was regarding that the U.S. government did not take full action in performing the Public Law regarding the sea turtle conservation. At the same time, Earth Island claimed that such Public Law should be imposed to the 56 coastal countries where sea turtles inhabit along the same three guidelines being applied to the Caribbean region.

CIT complied the propose of the Earth Island which affect the 56 countries in having sea turtle conservation otherwise the exportation of wild caught shrimp to the U.S. was to be embargoed. The cultured shrimp and/or products were required to be certified by the

exporter together with the government. Such certification was in effect since May 1, 1996. However, the other 42 countries, excluding the 14 Caribbean countries, were required by the U.S. State Department to submit detail information or regulatory laws or programs of sea turtle conservation in their nations by April 1, 1996. Such submission, if compiled with the U.S. to appeal to the CIT. If the U.S. were to win in the court, such countries were to be delisted out from the U.S. shrimp embargoed countries.

Regarding the deadline for the shrimp embargo on May 1, 1996, applied to these additional 42 coastal countries including the ASEAN members, the notification by the U.S. government had been done only for a few months. This was considered relatively unfair when compared to those in the Caribbean region where the three years delay has been applied to impose the use of TEDs.

***The U.S. government appealed the CIT for one-year extension of the Shrimp Embargo***

However, there was an attempt by the U.S. government to appeal the court for a one-year extension of the deadline of shrimp embargo from May 1, 1996 to May 1, 1997. Such appeal for an extension was linked to the underlying reasons:

- i) The rush implementation of shrimp embargo may negatively affect to the U.S. shrimp importers as well as workers in related industries.
- ii) The rush imposition of TEDs use to the other 42 countries may affect such countries to surge against the use of TEDs, which, in turn, could bring to unsuccessful conservation or protection of sea turtle.
- iii) The rush implementation may also affect the State Department of the U.S. being unable to efficiently investigate.

As of the appeal of an extension, CIT did not accept the request of the one-year delay of the worldwide TED imposition according to the U.S. Public Law. However, on April 30, 1996 as of the requirements set by section 609 of P.L. 101-162, the U.S. State Department certified 36 nations for continued export of shrimp to the United States. These countries were as followings:

- a) The 13 nations meeting the U.S. standard requirement that commercial shrimp boats use TEDs to prevent the accidental catch of sea turtles in shrimp trawls. These nations were: Belize, Colombia, Costa Rica, Ecuador, El Salvador, Guatemala, Guyana, Mexico, Indonesia, Nicaragua, Panama, Trinidad and Tobago, and Venezuela.
- b) The 23 nations which were certified as having fishing environments that do not pose a danger to sea turtles.

b-1) 15 nations have shrimping grounds only in cold waters where there is no risk of taking sea turtles. They are: Argentina, Netherlands, New Zealand, Norway, Russia, Sweden, United Kingdom, and Uruguay.

b-2) 8 nations only harvest shrimp using manual rather than mechanical means to retrieve nets and thus do not adversely affect sea turtles: the Bahamas, Brunei, the Dominican Republic, Haiti, Jamaica, Oman, Peru, and Sri Lanka.



### ***U.S. Shrimp Embargo since May 1, 1996***

The remaining 20 nations were the countries being shrimp embargoed since May 1, 1996. Most of these countries were in the Asian region.

#### ***1.1.3 U.S. Shrimp Embargo and the Impacts to Asian Countries***

The values of shrimp trade for more than hundred thousands U.S. dollars had been lost as of the shrimp embargo since May 1, 1996.

- a) As the U.S. Public Law, 101 – 162, were imposed to be followed; very large numbers of shrimp trawlers or similar shrimping gears in ASEAN region were subjected to the imposition of the TED installation by May 1, 1996. Budget needed to be expended, which, in turn, affected the investment cost of fishermen.
- b) Earth Island won the Court of International on the TED imposition of the U.S. Public Law to other coastal countries. It was forecasted at that time that other issues concerning trade and environment could be easily raised and debate initiated by NGOs. This was true, as by the second quarter of 1996, another NGO group, led by Mangrove Action Project (MAP), ran a campaign against developing countries such as the ASEAN for the mismanagement of the mangrove converted into shrimp farms. They ran an aggressive campaign at the United Nations Commission on Sustainable Development Conference in New York City in April both in 1996 and 1997. Moreover, MAP together with other 30 NGOs, also focused their campaign against shrimp culture, focusing on ASEAN and Latin American countries at the World Aquaculture Conference 1977 at Seattle in the U.S.

## **1.2 ASEAN Action to the Shrimp Embargo**

### ***1.2.1 ASEAN Steps***

#### ***1.2.1.1 SEAFDEC Meeting on April 9, 1996 - Chiang Mai, Thailand***

From the Special Meeting in SEAFDEC Council at Chiang Mai on April 9, 1996, there was a consensus that all ASEAN countries, plus Japan, were to provide information concerning i) Sea Turtle Conservation , ii) The Use of TEDs, and iii) Shrimp Production and Export to the U.S.. Such information was sent to and gathered by Thailand and to be presented in the ASEAN Fisheries Working Group on April 23, 1996 in Singapore.

#### ***1.2.1.2 ASEAN Meeting on April 23, 1996 - Singapore***

ASEAN Information on Sea Turtle Conservation, TEDs, Use and Shrimp Production, and Trade of each country was presented at the ASEAN Fisheries Working Group on April 23, 1996. The summary of data of ASEAN countries such as Brunei, Indonesia, Philippines, Singapore and Thailand including Japan are identified as followed. (Remark: No information was sent by Vietnam).

a) *Existing Situation*

a-1) Sea Turtle Conservation Program

Six species of sea turtle are found in the ASEAN region; while all the ASEAN countries and Japan have many pieces of legislation applied on sea turtle conservation for six decades (see Table 1). Malaysia and Thailand had the laws since early 1937 and 1947, respectively. Japan started to have laws since early 1980's. Moreover, most nations signed as the party of CITES within which the sea turtles are already being protected.

With their awareness of the environment issues, sea turtle conservation has been practiced by legislation and stocking programs conducted by most of the ASEAN countries. These focus on conservation but also sea turtle population replenishing.

a-2) TED Application

Most ASEAN countries comment that TED should not be used in ASEAN region as it is known that incidental catch of sea turtle by trawlers is significantly low and/or negligible. If it was to be imposed, the study and/or experiment should be a prime requirement. Indonesia is the only one country using similar device as TED, that so-called FED (Fish Excluder Device) since 1983. Concerning the acceptance of its application with the Indonesia fishing, FED/TED is very heavy and causes much difficulty in trawling operations, and Indonesia has been looking for the way to have less heavy and easier device to operate.

a-3) ASEAN Marine Shrimp Production

ASEAN countries are very well recognized as major shrimp producers in the world. Shrimp and the products from ASEAN and Japan are exported to all regions, where USA is one of the major importing countries. The average volume of shrimp export from ASEAN and Japan to the US during 1990-1995 was as high as 80,482 metric tons (excluding Vietnam and Indonesia) with the values of 859 million US dollars. (Table 2).

Considering ASEAN shrimp fisheries, small scale shrimp fisheries have been much greater operated than the larger scale. The shrimp producers of three major ASEAN countries as Indonesia, Philippines, and Thailand have small shrimp trawlers as high as 80-90% whereas the large scale are only 10-20 %. Shrimp Trawlers in Brunei are all small scale (see Table 3).

b) *Rationalization*

b-1) Sea Turtle Conservation vs. TED Imposition

As far as the Conservation is concerned, in the ASEAN region and Japan, tremendous amounts of effort have been carried out on the conservation since 1930s (i.e. Malaysia since 1937 and Thailand since 1947). In most of the ASEAN countries, at least 3 pieces of laws have been already in place (see Table 1). Malaysia has as many as 19 pieces of legislation being imposed for their sea turtle conservation or protection. The Philippines has applied 9 pieces of law. Thailand,

Indonesia and Brunei impose 3-4 pieces of law. Obviously, it is quite fair to say that ASEAN countries as well as Japan, for more than half of a century, have taken great awareness and concerns in the endanger species conservation. The effort in environmental concerns has been focused not only on the legislation but also on the replenishment of sea turtle population in the world. Multi-millions of baby turtles have been released back to the sea in the past three decades. Malaysia and Thailand, for instance have released million of sea turtles since the 1960s. Moreover, certain areas in ASEAN waters were also demarcated as sanctuary areas and/or nesting grounds. In addition, the CITES, the most respected international/global conservation law, have already been adopted by most ASEAN countries; therefore covering the conservation of any endangered species.

b-2) Is TED the Only Way?

By May 1996, US government was willing to aggressively impose another 42 countries (excluding 14 Caribbean countries) to use TED as a way to “protect or conserve” sea turtle by the US Public Law. Interestingly the alienate device is quickly imposed to be used in the countries where fishermen are not familiar and/or experienced with it before. It is interesting to note that this device was first imposed in the 14 Caribbean countries where there is far more important populations of sea turtles, compared to the ASEAN waters. The incidental catch in the two regions, in turn, is certainly much different. The rationalization of the TED imposition in the Caribbean region and in the ASEAN waters in particular is, thus, questionable.

The suitability of TED application is mostly related to the size of the shrimp fisheries in the Caribbean and ASEAN regions. Shrimp trawlers in the Caribbean are mainly large scale, whereas shrimp trawlers in ASEAN region are mostly small scale (see Table 3). With the two distinctive scales of shrimp fisheries, logistically, the TED application or installation to the Caribbean and ASEAN countries should not be different. However, the trawler sizes of the two regions have not been taken into account. In this regard, TED to be used in ASEAN region, thus, seems doubtful as of their effectiveness of the application with the shrimp trawlers. Questions can be asked whether is heavy, bulky, and costly. Investment cost also could be higher due to its additional weight on the trawls while operating which affect to the fuel cost. In technical point of view could also be determined that the size of TED (i.e. 1-1.5 meter in width) will not be suitable to the cod end of the trawl nets (i.e. 0.8 meter in width) of small scale shrimp fisheries for its operation. Unlike the Caribbean case, which had a three year delay before the imposition to experiment on the adequacy of TED use, the TED imposition in others countries, such as the ASEAN, will be applied after only few months' notification.

In short, it is clear that the situation of the TED imposition for the 42 countries, including the ASEAN, has been treated unfairly and inappropriately. “Would TED be the only way?” is the big question! In addition, why should the ASEAN countries and their neighbors, such as Japan, to have TED imposed is such a short notice. Once again, TED use is originated from the west with long experimental task. To be fair for the use in the East, where environmental conditions are much different, appropriate experiment should be done in order to meet an acceptance technically, economically, and socially.

### b-3) Extent of Compliance

So far, most of the ASEAN countries have not agreed to comply with the US Public Law. Most countries do not want to use TED, except Indonesia who has already used similar device for more than 10 years and has already been certified. Brunei has also been certified since this country still operates shrimp harvesting manually. Though 36 out of 56 countries have already been certified for continued export of shrimp to the U.S., the other 20 countries that are main shrimp exporters are still being embargoed. The concern that the U.S. will face very soon is the decline of shrimp supply from the major 20 shrimp exporting countries banned to their markets.

#### ***1.2.2 ASEAN Common Stand***

The ASEAN meeting in Singapore at the SOM-AMAF on April 20, 1996, agreed that the U.S. shrimp embargo resulting from the requirement for the Turtle Excluder Device (TED) was a serious one. As such, there was a need for the ASEAN to adopt a common stand on the issue. The meeting requested the ASEAN secretariat to urgently make representation to the U.S. government, and bring the issue to the attention of the ASEAN Economic Ministers (AEM) and the ASEAN Committee in Geneva, as well as make representations at the appropriate forum as the embargo was inconsistent with the principles of the World Trade Organization.

The ASEAN Secretariat suggested that the ASEAN member countries should also concurrently inform their respective Ambassadors in Washington so that they could also make representation, either individually or as a group, to the U.S. Government on the shrimp embargo issue.

The meeting endorsed the following recommendations of the Sectoral Working Group on Fisheries concerning the shrimp embargo.

That the ASEAN Secretariat urgently appeal to the U.S. Government to Delist the ASEAN member countries from the impending shrimp embargo in view of the following:

- i) All ASEAN countries already have extensive sea turtle conservation programs.
- ii) Legislation had been enacted in ASEAN for more than a half of a century for the protection of sea turtle.
- iii) All ASEAN countries were signatories to CITES, under which there was provision for the protection and conservation of sea turtles.
- iv) The applicability of TED in ASEAN waters was questionable as it was relatively new in this region. The records of incidental catch of sea turtle by trawlers were found to be minimal.
- v) Most trawlers in the region were fish trawlers and shrimp were not the main target of such trawlers. As such the effect of such trawlers on sea turtle's life could be different from trawlers in the Caribbean region which were used solely for catching shrimp.

- 2) Those ASEAN member countries offered to carry out joint studies and programs with the U.S. on sea turtle conservation and management, with Thailand as the ASEAN coordinator. Such studies and programs could also involve non-government fisheries institutions and the private sectors.
- 3) That the ASEAN Secretariat makes representation at the appropriate for a regarding the U.S. shrimp embargo in view of the inconsistency with WTO principles.
- 4) That Thailand initiates discussion with other countries, which would be affected by the U.S. shrimp embargo to request them to make active representation to the U.S. Government on the issue.
- 5) That ASEAN member countries attending the upcoming APEC Fisheries Working Meeting in Chile in May 1996 state the ASEAN position on this matter.

### **1.3 APEC Forum Inputs**

During the 7<sup>th</sup> APEC Fisheries Working held in Chile between May 28-31, 1996, many countries brought up the issue on TED imposition and shrimp Embargo by the US in the special session.

#### ***1.3.1 Thailand as the ASEAN representation presented that***

- The appropriateness of the TED use in ASEAN waters has not been scientifically proved. Also, in a technical point of view, legal imposition of TED will not be practical since there is a lack of scientific data to support such use.
- The ASEAN viewed that TEDs are not the only way or the most efficient device to conserve sea turtle. Besides incidental catches in ASEAN countries are very minimal.
- There should be the study on the efficiency between the U.S. and the ASEAN and/or Asia Pacific Countries where U.S. embargo shrimps exists.

#### ***1.3.2 Eleven out of the eighteen countries in APEC forum, namely Japan, China, Indonesia, Malaysia, Taiwan, the Philippines, Australia, Mexico, Brunei, Hong Kong, and Thailand, concurrently commented the U.S.'s action that:***

- Technical data on the TED use has not been adequate for the shrimp embargoed countries.
- The approach being taken by the U.S. is considered as non-tariff barrier and Unilateral. The imposition of TED stems from "US Public Law" to "other countries".
- It is not a normal international embargo, which usually allows negotiation and/or bargaining to such affected countries.

**1.3.3 U.S. representative expressed their concerns and stated that this matter is complicate issue, which they are in the difficult situation.**

**1.3.4 Chile, as the host country for APEC forum, stated that WTO should be an appropriate forum for the case.**

**1.3.5 Thai representative was unofficially informed by Canadian representative that some U.S. representatives would like Thailand and other ASEAN member countries bring this issue to WTO. It is because the outcome from WTO will have the U.S. administrative make consultation with the congress and/or the court in more careful manner.**

**1.3.6 The 7<sup>th</sup> APEC Meeting report concluded the case as follows:**

“ASEAN strong opposition against TEDs as the only conservation measure for as turtles. Many members expressed their disapproval over the embargo on wild caught shrimp product entering the U.S. market”.

## **1.4 Other Affected Countries Inputs**

Some affect countries from the impact of the US shrimp embargo express their interest to Thailand, as ASEAN representative, on the possibility of action in WTO. The first two countries are as follows:

### **1.4.1 Australia**

Following the APEC Fisheries Meeting in May 1996, Australia, by the representative from Commonwealth Department of Primary Industries and Energy, Canberra, has contacted Thailand and expressed their interest to join Thailand in exploring the possibility of action in WTO as well as seeking the view of other countries. Australia stated as:

“...If other affected countries intend to take WTO action, Australia would give serious consideration to joining such action.”

In this regard, Australian representatives are discussing options with their Department of Foreign Affairs and Trades (DFAT).

### **1.4.2 Taiwan**

In early July 1996, Taiwan representative from Taipei Economic and Trade Office, Bangkok showed the intention to explore Thailand and/or ASEAN action towards the US shrimp embargo issue. Taiwan has also shared their information of sea turtle conservation program as:

- i) Trawlers both for fish and shrimp do not occur in the area of sea turtle habitat.
- ii) In Taiwan, trawlers primarily aim to catch fish and shrimp are only taken by catch. Moreover, in fishing areas where the number of fish and shrimp is this proportional, many fishes will escape along with the sea turtles once the TEDs are installed.
- iii) Taiwan considers that the installment of TED is not necessary, they are making considerable effort to ensue that sea turtles are properly protected. Moreover, Taiwan expressed that the core issue of the US to protect sea turtle habitats through international cooperation, rather than to “the mandatory set-up of TEDs”.

- iv) In traditional Chinese culture, the sea turtle is valued as a symbol of long life and good fortune. Thus, traditionally Chinese fishermen have helped out sea turtles to return to the ocean and the release of them on this way is thought to be blessed.

### **1.5 U.S. Requested ASEAN Countries to have the Convention for the Protection and Conservation of Sea Turtle signed with the U.S.**

In 1996, each ASEAN country had been approached by the U.S. Embassy in the country to consider the draft of an Inter-American Convention for the Protection and Conservation of Sea Turtle. This draft was suggested by the US Embassy to be a model for the Convention to be signed with the U.S. However, none of the ASEAN countries agreed to sign such Convention on Sea Turtle Protection and Conservation with the U.S.

### **1.6 MOU on ASEAN Sea turtle Conservation and Protection**

All ASEAN countries have their own sea turtle conservation programs for more than six decades. However, due to problems facing ASEAN from the U.S. shrimp embargo related to sea turtle conservation, the ASEAN has realized that a joint ASEAN unified approach to management, protection and conservation of all species of sea turtle and their habitats is important. Nine ASEAN countries, therefore, have agreed on signing a Memorandum of Understanding (MOU) on ASEAN Sea Turtle Conservation and Protection. This agreement was made on September 12, 1997 in Bangkok during the SOM-AMF Meeting. The objectives of the MOU are to promote the protection, conservation, replenishing and recovery of sea turtles and of the habitats based on the best available scientific evidence, taking into account the environmental, socio-economic and cultural characteristics of all the ASEAN countries. In the MOU, proposed mechanism, coordinators, a technical expert working group, co-ordination, and linkages among the ASEAN. Malaysia has been assigned to be the lead country to implement the program.

## **2. THAILAND APPROACH**

### **2.1 Bilateral Negotiation**

Prior to May 1, 1996, Thailand Department of Fisheries had negotiated with the U.S. Embassy regarding to the shrimp embargo in term of the reason and delay of the embargo. During June-July, 1996, Thailand made a negotiation to the U.S. government that:

- (i) The gill net can be considered as non-mechanical device in shrimp fisheries which it has been accepted. Therefore, shrimp harvested by gillnet could be exported to the U.S.
- (ii) Though TED has not been imposed in Thailand, voluntary TED use was proposed to the U.S., the request having also been accepted. Therefore, shrimp harvested by voluntary TED use with the shrimp trawlers can be exported to the U.S.
- (iii) Some U.S. fishing gears such as Barred Beam Trawl, Pusher-head Trawl, and Wing Net are identified to be fishing gears that are not harmful to sea turtle. In this regard, Thailand has proposed three small fishing gears used for shrimp fisheries i.e. Beam Trawl, and Push Net which are similar to those gears of the US for the consideration. The result was that Push Net had been accepted as fishing gears not harmful to the sea turtle.

Moreover, Thailand had a Technical Mission to the U.S. and Mexico in August 1996 to discuss with TED specialists of the U.S. government as well as to see how various kinds of TED work. Moreover, the Thai Mission went to visit Mexico to see how the Mexican TEDs work.

## **2.2 Experiment on the TED Use in ASEAN Waters**

As clearly stated that without experiment on TEDs use in ASEAN, the suitability and application of TED in the region is still questionable. Thailand, as the ASEAN representative, initiates the experiment on TED use in ASEAN waters. Such task involves the cooperation between the Thailand Department of Fisheries and the Southeast Asian Fisheries Development Center (SEAFDEC).

In June – July, 1996, TED prototypes were purchased and shipped from the US TED manufacturer. These prototypes are Super shooter, Anthony Weedless. Hooped TED is assembled by Thai fisheries officers since it is no longer used and/or produced in the US. At present, the experiment has been conducted by using these various TED types starting in Thai waters and being scheduled for other ASEAN water as well.

In addition to the experiment on those U.S. TED prototypes, the Thai Department of Fisheries in cooperation with Kasetsart University, has developed the “Thai TED” with the purpose for a better suitability and applicability to the local use. This Thai TED, called Thai Turtle Free Device or TTFD has also been used in the experiment.

The preliminary result shows that though the most efficient TED types have been used in the experiment, the escapement rate of aquatic species is still high. It is also important to note that not any single sea turtle was found through the course of the experiment.

After the TTFD experiment, Thailand had reproduced 100 pieces of TTFD given to Thai shrimp fishermen at the same time of the workshop being held on the TTFD experimental use in Songkhla, Thailand at the end of September 1996. At that workshop, ASEAN representative were invited to join.

## **2.3 Application of TTFD and Thailand being delisted out from the shrimp embargoed countries**

As a result the first set of TTFD use in Thai waters for 100 pieces and more in later date. Though some difficulties and inefficiency occur during the shrimp-trawling operation, the U.S. government has sent representative from the Embassy to certify the use of TTFD. Thailand thus has been delisted from the countries being shrimp-embargoed since November 9, 1996.

## **3. THAILAND AND THE CO-COMPLIANCE COUNTRIES TOOK THE U.S. TO THE WTO DISPUTE**

### **3.1 The Dispute**

Though Thailand has already been certified to continue the export of captured shrimp to the U.S., the effort to take the US to the World Trade Organization was supported by Thailand.



Thailand and the co-complainants (i.e. India, Pakistan, and Malaysia) claim that the embargo on import of shrimps and shrimp products imposed by the U.S. pursuant to section 609 of Public Law 101-162 and the “Guidelines of Determining Comparability of Foreign Programs for the Protection of Turtles in Shrimp Trawl Fishing Operations” issued thereunder is inconsistent with U.S. obligations under the 1994 General Agreement on Tariffs and Trade (“GATT”). Specially, the embargo is inconsistent with U.S. obligations under GATT Article I: 1, XI: 1 and XIII: 1. Such claims mentioned above could be elaborated as follows:

**Article XI: 1** provides for general elimination of quantitative restrictions on imports and exports. The scope of Article XI: 1 is comprehensive applying to all measures instituted or maintained by a contracting party prohibiting or restricting the import, export or sale for export of products other than measures that take the form of duties, taxes or other charges.

The U.S. embargo on imports of shrimps and shrimp products pursuant to section 609 violates Article XI: 1 of the GATT. The embargo constitutes a prohibition or restriction on the import of shrimps and shrimp products from Thailand. Furthermore, the embargo clearly is not in the nature of “duties, taxes or other charges”.

**Article XIII: 1** provides that no prohibition or restriction shall be applied by any contracting party on the import of any product of the territory of any other contracting party or on the export of any product destined for the territory of any other contracting party, unless the import of the like product of all third countries is similarly prohibited or restricted.

The shrimp embargo is inconsistent with Article XIII: 1 of the GATT. The embargo restricts the import of shrimps and shrimp products from countries such as Thailand, which have not been certified, while like product from other countries, which have been certified, may be imported freely into the U.S.

**Article I: 1** of the GATT provides in pertinent part that, with respect to all rules and formalities in connection with import and export, any advantages, favor, privilege or immunity granted by any contracting party to any product originating in or destined for any other country shall be accorded immediately and unconditionally to the like product originating in or destined for the territories of all other contracting parties.

The shrimp embargo is inconsistent with the most-favored-nation (“MFN”) principle embodied by Article I: 1 for the same reasons, that the shrimp embargo is a violation of Article XIII: 1 – physically identical shrimps and shrimps products from different nations are being treated differently by the US upon import based solely on the method of harvest and the policies of the foreign government, under whose jurisdiction the shrimps are harvested. Shrimps and shrimp products from some shrimp harvesting nations are denied entry into the US, while similar products from other nations are permitted.

### **3.2 The Result**

The dispute of this case was conducted for 14 months by having consultations first, and secondly, panel discussions. Thailand and the co-complainant countries finally were ruled by WTO to win the case in April 1998. However, the U.S. appealed the case to WTO, and it lost the case to Thailand and the Co-complainant in October 1998. The U.S. had to improve the practice of the TED imposition using U.S. Public Law. The U.S. also had to announce

the condition of enforcement worldwide. So far, there was public hearing in this regard. The Convention on Sea Turtle Conservation Protection between U.S. and ASEAN Countries has been taken into consideration.

## REVIEW OF ASEAN MARINE TURTLE CONSERVATION AND MANAGEMENT PROGRAM

*Kamarruddin Ibrahim<sup>1</sup> and Ibrahim Saleh<sup>2</sup>*

1. Turtle and Marine Ecosystem Center (TUMEC), Department of Fisheries Malaysia, 23050 Rantau Abang, Dungun, Terengganu, Malaysia
2. Marine Fishery Resources Development and Management Department, Southeast Asian Fisheries Development Center (SEAFDEC), 21080 Chendering, Kuala Terengganu, Malaysia

### 1. INTRODUCTION

Marine turtles have a long and ancient history. They arose in a period of more than 100 million years ago during the rise and reign of the dinosaurs. These ancient mariners have survived and flourished the oceans up until recent times. However, their numbers are now dramatically reduced to the point that all seven extant species are categorised by the World Conservation Union (IUCN) as either endangered or threatened on a global basis. Two of these animals, i.e., the hawksbill turtle (*Eretmochelys imbricata*) and the leatherback turtle (*Dermochelys coriacea*) are now on list of the 'critically endangered' animals, meaning that they will become extinct in a very near future if the present pressures remain. Many populations are already extinct, leaving only a few are unaffected.

Aside from natural mortality, there is no doubt that human interference is one of the major root causes of the decimation of turtle species and the declines of their populations. The human-associated impacts work at every stage of turtles' life cycle ranging from the loss of their critical habitats, turtle and egg harvest, to mortality due to irresponsible fishing practices. Pollutants and non-biodegradable waste also harm them. In addition, an inappropriate management acts to fasten the declining process.

Conservation and management of turtles in the Southeast Asian region have been attempted in almost all countries at varying degree of the implementation and progresses. Recent years saw an increase of awareness and concern about tackling turtle issues at regional level. This paper presents a brief overview of the population status and threats, and an update of the programs and initiatives that are in place in the Southeast Asian region.

### 2. POPULATION STATUS

Currently, there are seven recognised marine turtle species in the world. Most species have circumglobal and subtropical or tropical distributions. Except the species of Kemp's ridley turtle (*Lepidochelys kempi*) which is endemic to Mexico, the other five species of marine turtles have been recorded in the Southeast Asian region. The greens (*Chelonia mydas*), leatherbacks (*Dermochelys coriacea*), hawksbills (*Eretmochelys imbricata*), olive ridleys (*Lepidochelys olivacea*), and loggerheads (*Caretta*) all are reported to nest on selected beaches of the Southeast Asian countries. The flatback turtle (*Natator depressus*) which the species is endemic to Australia is also reported to occur in eastern Indonesia.

Green turtles are widely distributed throughout the region. The highest concentration of green turtle population is found in Northern Borneo covering the area of Sabah, Southern Philippines, and Northern Kalimantan (Limpus, 2002). There are many small nesting populations scattered all over the region such as in Terengganu (Malaysia) and Pangumbahan (Indonesia), where information about their sizes is available. However, there are also many breeding populations where nesting numbers have not been quantified. Declines in all populations of green turtles in the region have been documented in many reports. However, the one in Sabah, Malaysia has recently stabilised (Basintal & Lakim, 1994; Limpus, 1995; Basintal, 2002).

For the leatherbacks, the area that runs from north western Irian Jaya out into the Solomon Islands is the last remaining stronghold nesting population of this species in the region (Limpus, 2002). Leatherbacks are also found to nest in small numbers in the other parts of Indonesia, Myanmar, Cambodia, Thailand, Vietnam, Philippines and Malaysia. The nesting population of leatherbacks in Terengganu, Malaysia used to be large in 1950s (about 10,000 nests) and it has dramatically declined to only 21 nests in 2001. Nesting trends of all populations show a decline at varying rates.

Hawksbill turtles are also widely distributed in the region. However, their numbers are much smaller than the greens. The information about their nesting numbers is deficient in many places where they are reported to nest. Sabah Turtle Islands in Malaysia are considered as one of the most significant hawksbill rookery in the region. These islands host 500-600 nests annually. Substantial harvest of turtles and eggs is one of the main threats to almost all hawksbill populations in the region, leading to their continuous declines. The population of Java Sea, Indonesia has declined by 70% and is linked with the export of shells (bekko) and stuffed turtles to Japan until 1991, increase in human population and coastal development, and egg exploitation (Suganuma *et al.*, 2002). The population of hawksbills in Sabah Turtle Islands is the only one in the region where their numbers are apparently increasing. After 25 years of strong protection, hawksbill nesting has increased more than tenfold since 1969 (Limpus, 1995; Basintal, 2002).

The olive ridleys remain the world's most numerous turtles but they occur outside the Southeast Asian region, particularly in Orissa, India (Limpus, 1995). Within the region, small numbers in the figures of tens of nesting females are reported to nest, mainly in Malaysia, Thailand, Indonesia, and Philippines. Information about nesting numbers is lacking. Like the other species, olive ridley turtles have also declined. The olive ridley population in this region is genetically different from the ridley that nests in India (Limpus, 2002). Therefore, the conservation of olive ridleys in this region should continue even though their numbers are small.

The last two species of turtles are the least occurrence in the region. Loggerheads are obviously found to nest in Australia and Japan. Highest concentration of loggerhead nesting turtles in the world is in Oman. In the Southeast Asian region, there are scattered reports that loggerheads nest in Indonesia (Sulawesi and Ambon), Philippines (Batan Island and Albay), Myanmar, Cambodia and Vietnam. However, their status is poorly documented. The flatback turtles are endemic to the Australian continental shelf and their nesting populations are approximately five to ten thousand females per year. This species is reported to occur in Indonesian water but they do not nest. Most populations have never been monitored (Limpus, 1995).

### 3. THREATS

Marine turtles have suffered severe declines worldwide because of a number of human impacts. Among the threats that marine turtles face, are the intentional harvest, the incidental mortality in fisheries, and the habitat loss and degradation due to development and erosion.

In some countries, marine turtles are hunted for their meat and shells because of the culture and socio-economic reasons. The largest slaughter of green turtles on a global scale occurs within the Australasian region, including Indonesia, Papua New Guinea, Australia, Solomon Islands, Vanuatu, New Caledonia, and Fiji where, an estimate of 100,000 turtles are harvested every year (Limpus, 1995). In Kai Island, Indonesia traditional belief and rituals, known as *adat*, are associated with the hunt of leatherback turtles. *Adat* also prohibits the sale or trade of leatherback meat. The practice has long been in existence and it is estimated that the takes by villagers are approximately 100 turtles in one season (Suarez, 2000). Hard-shelled turtles are taken for traditional feasts, sustenance, and to generate some extra income to villagers. Suarez (2000) reported that a number of 173 greens, 87 hawksbills and 3 olive ridleys were captured in Kai waters during a six-month study. In Indonesia's Aru archipelago, the exploitation of marine turtles remains a major threat. Data derived from field observations and interviews in 1997 and 1998 gave an estimate of over 5,000 green turtles are taken each year by both locals and outsider hunters (Dethmers, 2000). Traditional utilisation of green turtles in Indonesia has taken place for centuries as part of the Balinese culture (Agus, 2002).

The declines of marine turtles have strong linked with long term intentional egg harvest that takes place in almost all countries in the region. Eggs are exploited for consumption or to generate income. The classic example is the dramatic decline of leatherbacks in Terengganu, Malaysia as a result of total egg harvest prior to 1961. As census data on egg production and nesting numbers in Peninsular Malaysia improved since 1984, the proportion of egg harvest can be quantified. Recent figures indicate that the overall egg harvest of all species in the Peninsula is in the region of 40%. The proportion of egg harvest has gradually decreased as the government put emphasis its strong efforts towards total hatchling production. Elsewhere in the region the egg harvest has not been fully quantified because the egg production census data lacks.

Incidental catch in fisheries is widely recognised as a major cause of turtle mortality in the sea. Current information indicates that the major sources of marine turtle mortality by fishing gear worldwide are trawling, pelagic and bottom longlines, gill/entanglement net or entrapment gear, entanglements in buoy or trap lines, and hooks and lines from commercial and recreational fishing (Oravetz, 1999).

Trawls are non-selective and highly efficient gears for catching fish, crustaceans and molluscs of various species. Trawls come in different types and sizes, and are operated in both coastal and offshore waters. Current review of the threats to marine turtles in the USA by the National Research Council (1990) has singled out that shrimp trawling as the most important human-induced mortality to juvenile, sub-adult and adult turtles. Annual mortality of loggerhead and Kemp's ridley turtles by shrimp trawls was estimated about 5,500-55,000. Based on rate of capture documented in the USA, the estimate of annual mortality of marine turtles in shrimp trawls worldwide is around 150,000. A number of mitigating measures has

been recommended. Among the options is the use of excluder devices such as TEDs, reduced tow time, and/or time and area closure.

Pelagic or vertical longlines are used to catch pelagic species such as billfish, tunas, and sharks. These baited longlines are normally deployed along frontal zones with high topographic relief and high biological productivity where turtles also aggregate. In most cases, the animals caught on longlines whether they are hooked or entangled, are subsequently released alive. However, evidence shows that the hook-injured animals subsequently die. Billions of hooks are set in ocean each year. In the U.S. Atlantic Ocean swordfish fishery, a number of 1,218 marine turtles were taken in 1992 (Oravetz, 1999). Likewise, the Western Pacific longline fishery takes an estimate of 2,182 marine turtles each year (Brogan, 2002). A report concluded that more than 20,000 sub-adult loggerheads are hooked annually by the Spanish longline vessels in the eastern Atlantic and in the Mediterranean Sea (Anguilar *et al.*, 1995). Mitigating measures including reduction of fishing effort in the vicinity when marine turtles occur in concentrations, limiting entrants to these fisheries, setting seasonal limits based on turtle distribution, and reducing soak time are options to deal with the longline-turtle interaction.

Gill or entanglement nets also have considerable impact on sea turtles. Two types of gill nets are commonly used in fisheries around the world, namely, the pelagic (deep ocean) drift nets and the coastal gill nest. This indiscriminate type of fishing gear can take non-target species including marine turtles, marine mammals, seabirds and other marine life. Mortality of marine turtles entangled in Chilean gill nets is estimated to be 80% (Frazier and Montero, 1990). Prevention measures are of similar options to the ones recommended for reducing mortality of turtles in longline fishery.

The other threats include coastal development that demolishes important nesting sites. Sand mining and reclamation destroy seagrasses, which are feed for green turtles and dugongs. Light pollution from houses and other buildings disorients hatchlings away from the ocean. Pollution like plastic bags is often mistaken for food, and ingested, blocking their intestines and potentially killing them. In places where tourism flourishes, there are cases of turtle's die due to propeller strikes. Lack of knowledge is another contributing factor adding the list of turtle threats. A case in point is the reduced hatch success of turtle eggs and the zero hatching of leatherback eggs in Malaysia in 2001. Both have strongly been associated with human interference through the practice of artificial incubation.

#### **4. CONSERVATION AND MANAGEMENT**

##### **Research**

A number of government agencies, universities and NGOs are principally involved in research activities in the region. Quite often the intensity and types of research carried out in each country are strongly influenced by the availability of funds. Migration study to gather geographical distribution and the other biological information was first attempted through flipper tagging. Long term tagging programme for adult leatherback turtles was first initiated in Terengganu, Malaysia in 1967. Accumulated tag and recovery data until 1979 resulted in an understanding of geographical distribution of these animals in the South China Sea (Leong and Siow 1980; Chua 1988). Most turtles tagged in Terengganu have been incidentally caught in the waters of Hawaii, Taiwan, China, Japan, Indonesia, and Malaysia

(Sabah and Sarawak). The Philippines recorded most of the recovery data. This prompted the prediction that leatherback turtles that nest in Malaysia returned to their feeding grounds in these countries. Pre-nesting and post-nesting migrations of leatherbacks in the South China Sea seem to coincide with southbound and northbound surface current, respectively. The potential feeding areas for leatherbacks have recently been confirmed by reports that jellyfish season in the Philippines and Indonesia occurs during early months of the year, which also coincides with the off-breeding period of the Malaysian leatherback population.

In general, information regarding local and long-range movements of marine turtles in the region is still lacking. However, recent years saw a growing interest of scientists in the Southeast Asian countries to participate in satellite telemetry studies such as the ones carried out by Liew *et al.* (1995) and the cooperative research initiated by Japan through the SEASTAR 2000 project. Evidence from these studies indicates the green turtles are not residence animals. Instead, they migrate to and from their breeding areas in thousands of kilometres away from their feeding areas. Satellite telemetry has potential in gathering quick information about turtle migration (post-nesting, inter-nesting and routes) as well as identifying feeding areas. Research programme through satellite telemetry should be intensified in the region so as to have a comprehensive idea about turtle geographical distribution and population units, both are crucial for a proper regional conservation. This programme should also include the study of DNA stock identification, the assessment of all sources of turtle mortality, and the identification of key nesting and foraging areas.

### **Regional Cooperation**

The highly migratory in nature of marine turtles as indicated by tagging and satellite telemetry conducted within and outside of the region obviously confirm the need for regional cooperation to ensure effective management. It is fortunate that there are a number of significant programmes and initiatives currently in place in the Southeast Asian region. Among those are the TIHPA (Turtle Island Heritage Protected Areas), SEAFDEC's marine turtle research and conservation network, the Memorandum of Understanding on ASEAN Sea Turtle Conservation and Protection, and the Memorandum of Understanding on the Conservation and Management of Marine Turtles and Their Habitats of the Indian Ocean and Southeast Asia. The latest in the list is the Southeast Asian Sea Turtle Cooperative Research or SEASTAR 2000, a research project involving Japan and a few ASEAN countries. Working on the existing platforms, it is foreseeable that the achievement in the context of regional turtle conservation can be tremendous if the constraints such as lack of financial mechanism are sort out.

## **5. RECOMMENDATIONS**

- Conservation and management of marine turtles to date primarily encircle on nesting beaches and are contradict with the nature of turtles themselves that spend most of their time at sea. This gap needs to be addressed urgently and appropriate actions are taken to redirect efforts that emphasis in-water conservation and management.
- Conservation and management should be knowledge-based efforts. Recent population modeling suggests that conservation of eggs and hatchlings without concurrent conservation of older stages in turtle life cycle may be of limited value. The use of halfway technology should be avoided.



- The integrated management is crucial to marine turtle conservation. It should (i) incorporate coastal management to ensure ecosystem functions and habitat quality are maintained, (ii) integrate across its entire geographical range including local, national, and regional/international levels, and (iii) blend all conservation tools including management measures, research and monitoring, public awareness, education and information, capacity building, community participation, and effective communication. Adopt guidelines provided by a number of established documentation and conservation management plans.

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## REVIEW ON ANTIBIOTIC RESIDUES OF FARMED SHRIMP

*Saadiah binti Ibrahim*

*The Working Group on Regional Fisheries Policy from Malaysia  
Southeast Asian Fisheries Development Center*

### 1. INTRODUCTION

Aquaculture plays an important role for supplying fish production to meet the growing fish demand. This activity has become the fastest growing food activity in the world<sup>1</sup>. The world aquaculture production has increased from some 2 million tons in the beginning of the 60<sup>th</sup> to 34.1 million tons in 1996<sup>2</sup>. Aquaculture products are continue to grow and expected to increase further. It is forecasted that in future, farmed aquatic-animals will be an even more important source of protein foods than they are today.

The last two decades showed the production of farmed shrimp has grown at the phenomenal rate of 20-30% per year. According to Rosenberry (2001), the world's shrimp farmers produced 865,000 MT of whole shrimp in 2000 which shows great increment compared to production in 1999, 642,750 MT<sup>3</sup>. The Asia region is the leading shrimp producer meanwhile the major markets are in the USA, Japan, and Europe. Thailand remains to be the top exporter with volumes just marginally under 250,000 MT in 2000, whereas Indonesia was the world's second largest exporter in value terms in 2000 with sales of just under US\$ 950 million (105,000 MT)<sup>4</sup>.

The continuous productions of shrimp farms through intensive farming system in Taiwan, Thailand, Indonesia and China have raised a question of sustainability. Disease has become the major deterrents for achieving maximum production. In order to overcome this problem, some chemicals and antibiotics are being introduced in shrimp hatchery and farm for prevention and treatment of diseases. However, some of antibiotics are harmful for human and need to be monitored and regulated properly.

Antibiotics such as aristolochia, chloramphenicol, chloroform, colchicine, nitrofurantoin, dimetridazole and metronidazole are drugs that control a wide range of bacteria but are toxic to humans. These antibiotics are forbidden by the European Union (EU) from containing in food products. Meanwhile, these antibiotics are used in some countries to control disease in shrimp, crawfish and bees.

The use of antibiotics for food animals raises two main issues: risks for human health and bacteria resistance acquisition to used antibiotics. Antibiotics residue in the farmed shrimp usually caused by the input of the antibiotics to the animals through feed and bathing treatment. Those antibiotics remain in the tissue of the animal. Recently, the most common prohibited antibiotics found in shrimp are chloramphenicol and nitrofurantoin. The effects of these antibiotics to human are believed to be associated with increasing risk of cancer. However, the effects to human health of the main antibiotics found in cultured shrimps with part per billion (ppb) amounts or less has not yet been studied in detail.

## **2. CURRENT STATUS OF ANTIBIOTIC RESIDUES PROBLEMS OF FARMED SHRIMP IN THE REGION**

A number of recent reports and press releases have raised public concerns about the safety of antibiotic drug usage in aquaculture. As reported by Bangkok Post, on March 14, 2002, the Netherlands informed Thailand's Department of Livestock that trace amounts of nitrofurans were found in chilled/frozen chicken and shrimps and prawns exported from Thailand. Anyway, this is not the first case from Thailand since in November 2001, Thai-made canned sand shrimps were found contaminated with chloramphenicol. According to the European Union's rules, any product contaminated with banned antibiotic is prohibited for use and will be destroyed. There were several cases reported for shrimp shipments from Thailand to EU were rejected due to the presence of nitrofurans in March 2002. At the same time, nitrofurans and chloramphenicol have been detected in prawn shipment from Vietnam to UK. Due to this, exporters were significantly affected given that they are to lose that lot of merchandise and to be liable to pay a 'destruction fee'. Antibiotic residues also found in shrimp from Myanmar, Indonesia and Malaysia were reported by EU.

Therefore, there has been an increasing level of concern over the use of the antibiotics and its continuous use in aquaculture. The US Department of Food and Drug Administration (FDA) has increased its sampling of import shrimps and crawfish, following of Canada and the EU new regulations.

## **3. PRELIMINARY INFORMATION AND ANALYSIS**

According to the *fsainews* (May, 2002), the European Commission has issued three decisions that make it mandatory to test for antibiotic residues in imports of shrimp from Vietnam and Myanmar and on both shrimp and poultry imported from Thailand. These decisions are based on results of recent analysis by Member States of EU on imports of fish and poultry where the presence of nitrofurans residues on shrimps imported from Vietnam and on shrimps and poultry imported from Thailand were detected. Results of tests on shrimps imported from Myanmar revealed the presence of chloramphenicol residues. Previously, on September 19, 2001, the European Commission issued a decision to instruct intensively examines all shipments from Vietnam for antibiotics residue.

Consequently, the EU has closed its doors on imports shrimp from China and part of Southeast Asia due to the presence of chloramphenicol and nitrofurans. Meanwhile, the demand for shrimp from Japan has been reduced due to the economic downturn. The United States is the only destination for surplus production. The shrimp tested positive for chloramphenicol in EU would be allowed to enter the USA because the US Food and Drug Administration permits level up to 5 ppb. The EU does not allow any residues of chloramphenicol in foods, while the United States allows up to 5 ppb and Japan up to 30 ppb. The current emergence of the chloramphenicol issue in Europe is partly due to the standard of "zero tolerance" set for the drug, which is not really based on the scientific research. In addition, only the most sophisticated equipments are able to detect these very small amounts of antibiotic.

Thailand and Vietnam have been implemented many programs in order to solve this problem. Thailand has come out with a guideline of solution for the government and related agencies to tackle the problems in all aspects for long-term and sustainable solutions. For

example, guidelines for Production Aspect and Improvement of Inspection System on Food Products for Export. Similarly, Vietnam has also released many measures in time to implement the policy not to use antibiotics in aquaculture. Early this year, the Prime Minister of Vietnam instructed various levels of officer to take necessary action against illegal chemicals in agriculture fields. As a result of programs and policies implemented so far, Vietnam has shown positive results where the total of 1,231 of shrimp shipment exported to EU, 997 shipments has been examined for antibiotics residue but no trace was found. Thus, on the Sept. 20, 2002, the EU decided to lift its intensive examination of all shrimp shipment from Vietnam for antibiotic residues after about a year of imposition.

It is important for the ASEAN members to know the situation faced by each country on the antibiotic residue issue, in order to come out with appropriate follow-up activities for the region. Antibiotic residue of farmed shrimp become a hot issue discussed among consumers, shrimp producers, shellfish traders, and other related traders. This phenomenon is directly affecting shrimp price at the global market. This issue needs to be tackled at the regional level since many shrimp producer countries come from the Southeast Asian region. Therefore, the questionnaire developed by SEAFDEC was the first approach in order to develop proper program in the future for the region.

Basically, the questionnaire required information on the current situation in each country related to antibiotic residue issue. The lists of questions are as follows:

1. Does your country have some problems with antibiotic residue in aquaculture?
2. What are the common chemicals/antibiotics used by farmers in your country?
3. Are farmers aware that some of chemicals are banned or can be used for limited dosage for aquaculture activities?
4. Do farmers use the chemical according to the recommendation dosage?
5. How many (in terms of %) of the aquaculture farmers practice using antibiotic in their operation out of the total numbers that involved with aquaculture activities?
6. Does your country have monitoring/enforcement mechanism in order to minimize the usage of the chemicals in aquaculture field? How effective is it, so far?
7. Does your country provide any program as alternative for the antibiotic usage, such as "Good Farming Management" program?

The analysis was done based on the feedback from all SEAFDEC member countries and Japan, excluding Indonesia and Lao PDR. Detailed information on feedback questionnaire from all SEAFDEC member countries can be obtained in the REF04a-j.

Antibiotic residue of farmed shrimp is the common problem faced by several countries in Southeast Asia, particularly Thailand and Vietnam. Other countries like Indonesia, Myanmar and Malaysia also face similar problem but not really as serious. Almost 90% of the shrimps produced in Southeast Asia countries are mainly for export. Detention and rejection of the products by imported countries will cause great effect to the shrimp industry in the region.

Based on the feedback questionnaires, the most common antibiotics being used by shrimp farmers in this region are oxytetracycline, nitrofurantoin, and chloramphenicol. Other antibiotics that also being used are tetracycline, sulfamonomethoxine, chlortetracycline, enrofloxacin,

ciprofloxacin, norfloxacin, oxolinic acid, and sulfonimides. Nitrofurans and chloramphenicol are the common antibiotic residues detected by EU in shrimp shipment from Southeast Asian region.

Majority the shrimp farmers in all countries are aware of the banned antibiotics in aquaculture activities. However, some of the farmers, especially small scale farmers and new farmers are not aware of the risks. Thus, dissemination of information on the consequences of using chemicals needs to be intensified among fish and shrimp farmer, drug manufactures and suppliers. Intensive campaign on the carefulness and restricted use of chemicals is also needed for all countries.

In terms of antibiotic usage and recommendation dosage, most farmers follow the instruction recommended, as reported by Malaysia, Brunei, Singapore, Japan and Vietnam. In other countries, some farmers do not follow the instruction recommended. Farmers under supervision or registered with governmental fisheries related agencies usually use the chemicals according to the recommendation dosage. Some farmers in Thailand just rely on the information from feed and chemical suppliers, which sometimes is incorrect. In case of the Philippines, farmers do not follow the recommendation dosage more often, hence has caused mortality and morphological deformities in the host and development of antibiotic-resistant bacterial strains.

Almost all shrimp hatchery operators in the Philippines use antibiotics. In Thailand, most of shrimp farmers are intensive operations and 80% of them use antibiotics in their operation. In 2001, Vietnam had 450,000 ha of shrimp culture (including about 15,000 ha of intensive and semi-intensive farming) and 50% of the intensive-farming stakeholders used antibiotics/chemicals in their culture. Since January 22, 2002, when the Ministry of Fisheries banned ten antibiotics/chemicals, the number of farmers using antibiotic is decreasing in Vietnam. Other countries also reported certain percentages of the total farmers using antibiotic in their operation like Cambodia (70%), Brunei (68% for all types of aquaculture mainly for fish cage culture), Malaysia (10%) and Japan (20%). Important to note, this information is not based on official statistics for this issue.

All countries have their own programs in monitoring the usage of chemicals in aquaculture activities. DOF of Thailand already started implementing the Control and Monitoring Program on the Use of Drugs and Chemicals Agents in Fish Culture since 1997. Farm inspections are also being carried out to ensure that approved operational procedures and standards are properly implemented. This program significantly reduced the chances of rejection by importing countries. The program needs to be reviewed since it was initially targeted for limited antibiotics such as oxolonic acid, oxytetracycline and sulphonamide. Chloramphenicol, nitrofurans and other new drug are not included in the previous monitoring plan. Meanwhile, Vietnam has the monitoring Program Plan on certain substance residues in aquaculture products. The plan does not work well with antibiotic since the sample collection methods and tests are not standardized. In the Philippines, the Bureau of Animal Industry (BAI), through the Animal Feeds Standard Division (AFSD), formulates regulations on chemicals intended for veterinary animals. The Bureau of Fisheries and Aquatic Resource (BFAR) has been authorized to monitor the effect of using antibiotics in shrimp culture by determining the antibiotic residues in shrimp tissues. However, despite all these regulations, the fishpond operators and hatchery owners in the Philippines still continue to use the prohibited chemicals due to lack of effective and cheaper alternative compounds. Malaysia has Feed Act which can control the content of feed and action will be

taken accordingly. Japan has monitoring program by checking the sample of the products before entering to the market.

DOF of each country have developed their respective programs as alternative to antibiotic usage. DOF Thailand is implementing the Code of Conduct for the benefit of Thai shrimp industry in terms of sustainability and food safety. The Code of Conduct for Marine Shrimp Culture Industry of Thailand was agreed and signed by several stakeholders in 1999. One of the activities of the program is to put up operating guidelines and manual procedure on various aspects such as Good Aquaculture Practices or COC at Farm Level, Good Practices for Feed/Drug and Chemical supplies, Good Practices for Harvesting, Marketing and Processing and finally Certification and Labeling for COC shrimp. The aims of this program are to ensure safe and good quality products, in environmental friendly way while being economically viable.

The Philippines has an environment-friendly scheme in shrimp farming. This project is the joint mission Nationwide Technology Transfer Accelerated Project and implements by SEAFDEC-AQD and the Bureau of Fisheries Aquatic Resources (BFAR). DOF Malaysia has introduced guidelines to educate the concept of sustainable aquaculture development such as Guidelines for Good Aquaculture Practices, Code of Practice for Marine Prawn Culture, Code of Practice for Fish Cage Culture, Code of Practice for Cement Tank Culture, and Code of Practice for Fish/Prawn Fry Hatchery. Vietnam is also implementing some programs like Organic Aquaculture and Cleaning/Hygiene Aquaculture, Study on Herbal Drug for treating fishery diseases, Application of GAP and HACCP on aquaculture, and Certifying the clean aquaculture.

In Japan, research and development of vaccination practices has been carried out as alternative to antibiotics. Otherwise, improvement of farming environment is promoted. Brunei Darussalam disseminates the information through seminar and talk on program alternative for antibiotic usage. Likewise, Myanmar encourages the shrimp farmers through demonstrating biomanipulation system. Cambodia does not have any program yet to be implemented for shrimp farmers.

#### **4. CONCLUSION**

Based on Thailand and Vietnam experiences in handling antibiotic residues issue of farmed shrimp, other countries can learn and take necessary action. For example, action being taken by Vietnam Government in dealing with antibiotic residues of farmed shrimp is fast and effective, starting with the clear decision to ban a list of prohibited antibiotics. Listed antibiotics are prohibited in all sub-sectors of fisheries activities as early as seed production, farming, processing and trading. At the same time, information on safe and effective use of chemicals is well disseminated throughout the country. Training courses on shrimp farming and workshops, for processing plant, were organized in collaboration with local authorities and agencies. In addition to the first list of banned chemicals, a new list was made, which about six months after the first list. As a result of mentioned actions being implemented in Vietnam, positive results on antibiotic analysis were revealed for shrimp from Vietnam.

Based on Vietnam and Thailand experience, the region can come out with appropriate programs to ensure that the other countries within this region do not have to face the same difficulties in future. In addition, some of the countries among ASEAN-SEAFDEC member countries are also facing similar problem but not really as a serious issue since their total

shipment are not really in large number. Regional program can come out with Standard Methods for detecting antibiotics residue of aquaculture products with similar standard as imported countries. Other related programs are also needed in order to guarantee that trade of fisheries products from this region are safe and well accepted all over the world.

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## RECENT ISSUES OF SHRIMP IN INDONESIA

*Saadullah Muhdi*  
*Ministry of Marine Affairs and Fisheries*

### 1. BACKGROUND

Indonesia is the largest archipelagic country in the world, however, its share in the world production and export of fish and fisheries products remain very low i.e. 4 % and 3 %. Indonesia's potential coastal area for shrimp is 900,000 hectares and currently only 42 % have been utilized. In addition, there is another potential inland area for shrimp, yet the area was undetermined in the national land use plan.

The structure of shrimp farming in Indonesia is 75 % conducted in traditional way having yield of < 0.5 MT / ha, 15 % is semi-intensive with the yield of 1 – 2 MT/ha, and the rest of 10 % is conducted intensively with the average yield of 3 MT/ ha. Total production of shrimp (cultured and wild catch) in 2000 and 2001 were 243,000 MT and 248,000 MT respectively.

The main species of farmed shrimp are black tiger shrimp (*Penaeus monodon*) contributing 63 % of the total production, white or banana shrimp (*Penaeus merguensis* and *P. indicus*) contributing 19 % of the total production, and the rest *Metapenaeus sp.* Recently, Vannamei and Rostris are new species becoming popular, but still limited companies are commercially farming.

### 2. SHRIMP EXPORT

Shrimp is the main source of the Indonesian export of fisheries products amounting of 60 % the total value. Shrimp export in 2000 and 2001 were 116,187 MT and 126,978 MT amounting of US\$ 1.02 billion and US\$ 0.93 billion respectively. Japan has been the main market (50 %) for Indonesian shrimp export followed by the US (18 %) and EU (15 %). Roughly, the bulk of the shrimp (85 %) are exported in the frozen form, and 10 % in the fresh chilled form and the rest is in the canned form.

Indonesian shrimp export in the first semester in 2002 tends to have slightly decreases. Supply from Indonesia to Japan period January to July 2002 was 5,399 MT, a decrease of 0.22 % compared to those in 2001. Meanwhile, supply of Indonesian shrimp to the US market from January to June 2002 was only 1,779 MT decreasing 9.51 % compared to those in 2001. Indonesia also suffered decreasing shrimp export to the European Union due to antibiotic issue.

### 3. ISSUES RELATED TO TRADE

There is an increasing tendency for some developed countries to impose increasingly stringent non-tariff barriers, particularly on standards of quality and hygiene as well as issues of non trade concerns such as environment, labor, animal welfare, and genetically modified organism (GMO).

## **Chloramphenicol and other Antibiotic Residues**

Chloramphenicol issue is the recent example on how some developed countries are systematically using various non-trade barriers as disguised restriction to trade. Switzerland Veterinary Federal Office (FVO) found chloramphenicol residue (0.07 ppb) on Indonesian shrimp export on September 24, 2001. The EU Council Directive issued in September 2001, requires that all shrimp exported from Asian countries are subject to antibiotic analysis in the port of entry. The EU released EC Decision No. 2001/705EC on 27<sup>th</sup> September 2001, regarding all Indonesia shrimp export have to be checked with Rapid Alert System (RAS) and must be zero tolerance of chloramphenicol in every testing. This policy was soon followed by Canada. On June 14, 2002, the USFDA also announced “FDA Increases Sampling of Imported Shrimp and Crayfish (Crawfish)”, and it will detain and refuse entry to any product in which traces of *chloramphenicol* have been detected. The maximum permissible level for the antibiotic has been lowered for the second time to 0.3 ppb. The previous maximum amounts were 5 ppb and then 1 ppb. In deciding on the level of 0.3 ppb, the US has joined Canada and the EU in establishing what has basically become “an internationally accepted standard”.

The question at stake is whether such measure is imposed solely based on the argument to protect the consumer’s health or otherwise if it is used as a pretext to impose technical barrier to trade that subsequently could become disguised restriction to trade. Up to now, there is no international standard that can be used as reference for establishing zero tolerance.

Moreover, a study released by Dr. JC Hanekamp of the Heidelberg Appeal Nederland Foundation said that the average person would have to eat 40 kg of shrimp a day, every day, for an entire lifetime to reach even a one in a million chance of getting cancer from ingesting foods contaminated by chloramphenicol as high as 10 ppb.

The case of chloramphenicol issue urged some shrimp exporting countries like China and Vietnam to conduct spot testing of the imported foods samples produced by EU and US for their local market. They found some food products produced from the EU and the US were containing chloramphenicol at dose of 0.3 – 0.5 ppb.

From the consumer’s point of view, shrimp intake in the European and American diet is very small compared to those from meat and poultry products. Therefore, all shrimp producing countries are very concern that the zero tolerance imposed by the EU, Canada and the US is not really based on sound scientific justification particularly risk assessment or risk analysis but merely based on “precautionary principles”. *Chloramphenicol* is just one issue and there are some more possible technical barriers to trade related to antibiotic residues.

Based on this phenomenon, Indonesia proposed a discussion paper entitled “The Need of MRL for Chloramphenicol in Shrimp” during The ASEAN Codex Task Force Meeting last May 2002 in Bali and during the 13<sup>th</sup> Meeting of Codex Coordinating for Asia on 16 – 20 September 2002 in Kuala Lumpur. The result this MRL will be further discussed under meetings of the Codex Committee on Residues of Veterinary Drugs in Foods.

## **Environment – Sea Turtle**

The US requires that wild catch shrimp entering the US market must have been harvested in a way causing no harm or threatens turtle species. The US Law (Section 609 of PL 101 – 162) essentially requires that foreign shrimp capture practices to be the same as the ones imposed on US shrimpers by using Turtle Excluder Devices (TEDs) in commercial boats.

This issue could also be challenged by scientific evidence on the existing population of the threatened sea turtle in the shrimp catching area. To response the US requirement of using TEDs, the Government of Indonesia also invited the US mission to conduct inspection on Indonesian shrimpers.

### **4. GOVERNMENT’S EFFORT TO IMPROVE EXPORT PERFORMANCE**

To increase and improve the export performance, the government of Indonesia continuously conducts socialization and extension to all shrimp farmers as well as processors on the ban of using chloramphenicol in their farming practices. Officially, the use of chloramphenicol for treating animals for human consumption was prohibited since 1982. Chloramphenicol is not produced in Indonesia; therefore the control of its distribution right now has been increased by the Agency for Controlling Foods and Drugs.

Indonesian Regulation Related to the Use of Antibiotic in Aquaculture:

- Circulated Letter of Directorate General of Veterinary No. 1143/IVa on November, 19<sup>th</sup> 1982 regarding trade license and animal drugs circulation (including fish).
- Decree of the Ministry of Agriculture No. 806/Kpts/TN.20/12/94 on December, 15<sup>th</sup> 1994 regarding animal drugs classification (including fish).
- Indonesia National Standard for shrimp artificial feed No. 02-2724-1992, prohibition using antibiotic particularly oxytetracycline and it’s derivate (have been in revision).
- Indonesia National Standard for black tiger shrimp production on farm No. 01-6497-2000, prohibition using chloramphenicol on fish farming.
- Indonesia National Standard for frozen shrimp No. 01-2705-1992, all frozen shrimp must not content oxytetracycline residue and its derivate (have been in revision).
- Indonesia National Standard for fresh shrimp No. 01-2728-1992.
- Circulated Letter of Directorate General of Aquaculture No. 3025/DPB.5/IX.530.D5/X/01 on January, 4<sup>th</sup> 2002 regarding prohibition using chloramphenicol on shrimp farming.
- Decree of the Ministry of Marine Affairs and Fisheries No. KEP.26/MEN/2002 regarding supply, circulation, using and supervision of fish drugs.

Follow-up actions:

- Identifying of the source of antibiotic contamination (whether from farming, handling of post harvest product, processing (freezing) or naturally from the water).
- Producing and disseminating of poster pertaining prohibition of using antibiotic in aquaculture and its impact.
- Socialization of regulation of prohibition using antibiotic during fish farming to regional officials, fish farmers and entrepreneurs (stakeholder).
- Improving skill and knowledge of fish farmers on implementation of good culture practice in fish farming (HACCP implementation on aquaculture).
- Monitoring of antibiotic residue on shrimp products and shrimp feed.

- Certifications of shrimp products to be exported (must be free from chloramphenicol).
- Developing capability of fish testing laboratory or fish inspection quality control.
- Developing supervision of using and distribution of animal prohibited drugs.
- Finding substitute of safe antibiotic for shrimp farming.

Current Result:

Indonesia requested the European Commission to release some detained shrimp cargoes to be retested of chloramphenicol content. For example, in the case of “rejected” shrimp cargoes of PT Laura Indo from South Sumatra Province arriving on 19 July 2002, a retest was conducted using HPLC with the limit of detection up to 0.12 ppb. Among the 18 samples, 14 were not detected containing chloramphenicol and 4 samples were detected containing chloramphenicol between 0.15 – 0.40 ppb.

Meanwhile, recent analysis for chloramphenicol residues on shrimp products and feed conducted by the Indonesian Food and Drug Authority reported that no residues were not detected on the samples.

Table 1. Analysis Report of Antibiotic Residue on Shrimp Product

No.	Species	Source Area	Monitoring Date	Result (ppb)	Remarks
1.	Black Tiger ( <i>P. monodon</i> )	South Sumatera	25/4/2002	ND	Semi intensive aquaculture
2.	Black Tiger ( <i>P. monodon</i> )	South Sumatera	25/4/2002	ND	Semi intensive aquaculture
3.	Black Tiger ( <i>P. monodon</i> )	North Sumatera	29/5/2002	ND	Intensive aquaculture
4.	Black Tiger ( <i>P. monodon</i> )	North Sumatera	29/5/2002	ND	Intensive aquaculture
5.	<i>Vanamei sp</i>	East Java	19/6/2002	ND	Semi intensive aquaculture
6.	Black Tiger ( <i>P. monodon</i> )	East java	03/7/2002	ND	Intensive aquaculture
7.	Black Tiger ( <i>P. monodon</i> )	East java	03/7/2002	ND	Semi intensive aquaculture
8.	Black Tiger ( <i>P. monodon</i> )	Lampung	4/07/2002	ND	Intensive aquaculture
9.	Black Tiger ( <i>P. monodon</i> )	Lampung	4/07/2002	ND	Traditional aquaculture
10.	Black Tiger ( <i>P. monodon</i> )	South Sulawesi	24/07/2002	In process	-
11.	Black Tiger ( <i>P. monodon</i> )	South Sulawesi	24/07/2002	In process	-
12.	Black Tiger ( <i>P. monodon</i> )	West Java	29/8/2002	In process	Traditional aquaculture

ND : Not Detected

Limited Detection 0.1 ppb

Detected by Indonesia Food and Drugs Authority

Table 2. Analysis Report of Antibiotic Residue on Shrimp Feed

No.	Sample Code	Monitoring Date	Test Result (ppb)
1.	Kendi Mas	25/04/2002	ND
2.	Gold Classic 903	29/5/2002	ND
3.	Gold Classic 903	29/5/2002	ND
4.	Supreme 963	29/5/2002	ND
5.	Supreme 964	29/5/2002	ND
6.	SQ 3 B	29/5/2002	ND
7.	SQ 4	29/5/2002	ND
8.	SQ 5	29/5/2002	ND
9.	9003-SP	29/5/2002	ND
10.	9004	29/5/2002	ND
11.	9004-S	29/5/2002	ND
12.	884	30/5/2002	ND
13.	884	30/5/2002	ND
14.	Global 883	07/6/2002	ND
15.	Global 884	07/6/2002	ND
16.	Global 885	07/6/2002	ND
17.	Tata 2	19/6/2002	ND
18.	Marine 999-3	19/6/2002	ND
19.	Pasta V	03/7/2002	ND

ND : Not Detected

Limited Detection 0.1 ppb

Detected by Indonesia Food and Drugs Authority

## 5. PROBLEMS

- Lack of capability for fish inspection quality control to analyze antibiotic residue with 0.1 ppb limited detection.
- Limited availability of instrument for determination of antibiotic (High Performance Liquid Chromatography/HPLC).
- The spread of shrimp aquaculture area and export ports.
- Limited personnel of laboratory analysts, particularly to operate HPLC.

## **SOLUTIONS TO ELIMINATE RESIDUES OF BANNED ANTIBIOTICS/CHEMICALS IN FISHERIES PRODUCTS OF VIETNAM**

*Nguyen Tu Cuong*

*Director of the National Fisheries Inspection and Quality Assurance Centre,  
Vietnam Ministry of Fisheries*

### **1. INTRODUCTION**

#### **1.1. Many countries ban or stipulate maximum residue limits of antibiotics/chemicals in fisheries**

In the EU market, the European Commission issued the Directive no. 96/23/EC dated on April 29<sup>th</sup> 1996, regulating their fisheries exporting countries to control 5 groups of residues of harmful chemicals which are heavy metals, pesticide, mycotoxin, some antibiotics, and growth promoting substances. For antibiotics, the EU banned 10 antibiotics including chloramphenicol and nitrofurans while stipulating a maximum residue limits (MRLs) for 10 others.

In the US market, on May 22<sup>nd</sup> 1997, the U.S. Food & Drug Administration (FDA) promulgated the Act no. 62FR 27947 banning 11 kinds of antibiotics including chloramphenicol and nitrofurans, and stipulating MRLs of 10 others.

Other countries like Canada, Japan or Korea also now have similar regulations.

#### **1.2. The strict control of antibiotics/chemicals in food started on the EU market in early August 2001 when a shrimp salad mixed was detected with chloramphenicol in a restaurant in Austria**

Thenceforth the intensive tests of antibiotics were implemented in all of 15 EU countries. Until now, there are as many as 7 Asian countries, 1 European country and 1 American country were subjected to systematic check for antibiotics by the EU. Switzerland, Canada, the US and Korea applied strict measures to control antibiotics residues.

#### **1.3. The equipment and methods to test antibiotic residues varies amongst the EU member countries since then**

Early 2002, the EU announced the usage of HPLC/MS equipment or GC/MS to check chloramphenicol with limit of detection (Lod) of under 0.3ppb. Until now, some countries have used LC/MS/MS with Lod of 0.1 ppb. Shortly after the EU, Canada announced to lower Lod of test equipment from 2.5 ppb to 0.3 ppb. The US reduced Lod from 5 ppb to 1 ppb and is going to reduce it to 0.3 ppb in the coming time. Korea announced Lod to be 1.5 ppb.

#### **1.4. The treatment rules for antibiotics-contaminated consignments are different in different countries**

Canada and Korea do not allow the imports of those consignments and put the exporters on alert.

USA only allows taking the contaminated consignment out of importing port if another country accepts to import that consignment or the competent authority of exporting country commits to supervise the treatment of the consignment. If no one of two above conditions is met, the consignment will be destroyed. The exporter shall be put on the alert network of FDA.

EU member countries retain all contaminated consignments for destruction and put exporters on alerts network of EU.

## **2. ANTIBIOTICS CONTAMINATIONS PROBLEM IN FISHERIES OF VIETNAM**

### **2.1. Vietnam faced with antibiotics/chemicals issue**

The first shrimp consignment of Vietnam was detected with chloramphenicol residues in September 2001. Right after that, European Commission announced Decision no. 2001/699/EC on checking antibiotics in 100% shrimp consignments originated from Vietnam. In March 2002, a consignment of farmed fishes of Vietnam was detected with Furazolidon. That led the EU to issue Decision no. 2002/250/EC to check antibiotics in 100% farmed fishery products of Vietnam.

The EU Decision on systematic check of antibiotics in 100% consignments of shrimp and fishes of Vietnam made a large impact on the international fishery markets. The US, Canada, Korea, Thailand followed that by announcing to check antibiotics in all imported aquaculture products including the ones from Vietnam.

Vietnam fisheries trade was also affected. The fisheries importers become more worried when they purchased goods. Not only quantity of fisheries exports of Vietnam did narrow but their prices also fall down. The reduction of fisheries exports caused strong impact on aquaculture industry and also on employment, on the life of thousands of fishfolk and farmers.

### **2.2. Solutions for Vietnam**

#### ***2.2.1. Vietnam Government and Ministry of Fisheries confirm that prevention of using antibiotics/chemicals in aquaculture and animals of husbandry is long-term strategy***

Preventing antibiotics/chemicals in food not only settles emerging difficulties in export markets but also protects Vietnamese consumer's health and great contributes to assuring stable development of aquaculture.

#### ***2.2.2. Vietnam has applied the following measures after the first occurrence of antibiotics in fishery products***



### 2.2.2.1. *Improving legislation system*

- The Prime Minister issued an order banning import, production and usage of harmful antibiotics/chemicals in aquaculture and agriculture. The List of harmful antibiotics was promulgated by the Ministry of Fisheries and Ministry of Agriculture and Rural Development.

- The Ministry of Fisheries issued decisions announcing the lists of antibiotics banned in fisheries industry (including 10 kinds of antibiotics banned by EU and 11 kinds banned by the US) together with 10 antibiotics which MRLs needs to be controlled in fisheries; stipulating penalties for infringements. The Ministry of Fisheries also issued guidelines assigning commissions to Local People Committee, central and local authorities controlling the hygiene and safety of fishery production, aquaculture farms and fisheries processing establishments to prevent the above circumstances.

### 2.2.2.2. *Defining causes of antibiotic contamination in aquaculture*

The Government competent authority in controlling fisheries quality, hygiene and safety, the National Fisheries Inspection and Quality Assurance Centre (NAFIQACEN), has carried out 3 campaigns to sample feed, veterinary drugs, chemicals, by catch & farmed fish before and after storage, cleaning agents and disinfectants, processing equipments, antiseptic creams used for hand treatment by workers. Through samples testing, NAFIQACEN defined the cause of antibiotics contamination in fish products to be mainly derived from feed for fish, as veterinary drugs.

### 2.2.2.3. *Working out urgent controlling actions*

a. Firms producing feed for fish must add controlling activities of antibiotics/chemicals to GMP, check antibiotics in all consignments before displaying for sale. They must label on each package of products with phrase "Not contain antibiotics, chemicals banned by Ministry of Fisheries" (Decision no. 01/2002/QD-BTS dated January 22<sup>nd</sup> 2002 of the Fisheries Minister).

The producers of veterinary drugs/chemicals used in aquaculture must stop producing drugs/chemicals for treatment or prevention of fish diseases, which contain banned antibiotics/substances, and were responsible for finding out, detaining and destroying such drugs/chemicals.

b. Fish processing establishments added procedures of antibiotics/chemicals control in materials at receipt to HACCP system. Many establishments purchased ELISA, co-ordinating with farmers to take samples for checking antibiotics in fisheries before harvesting.

c. Suppliers of feed, chemicals, and veterinary drugs are required to provide antibiotics checking results to farmers. The farmers begin to apply hygienic aquaculture models, using only antibiotics, chemicals from the allowed product list in accordance with guidelines of the MOFI and local fisheries extension authorities to treat pond and diseases.

d. The National Fisheries Inspection and Quality Assurance Centre

- Organizing training courses for managers, establishments, fishfolk and other stakeholders about harmfulness of banned antibiotics/chemicals, teaching them the alternative measures.

- Examining regularly and irregularly the execution of HACCP in establishments; taking samples for testing antibiotics in each consignment before exporting.

- Equipping ELISA with Lod of 0.1 ppb to quickly test antibiotics in materials and final products. Positive samples will be confirmatory tested on GC/MS and GC-ICD with Lod of 0.3 ppb. NAFIQACEN is purchasing the supplementary equipments including LC/MS/MS with Lod of 0.01ppb and is periodically sending analysts to update their skill of chemicals and antibiotics detection in the EU member countries and Korea. The NAFIQACEN's laboratories are practicing ISO 17025 to lab management and applying for international recognition.

- Monitoring Plan on certain substances residues in aquaculture animals and aquaculture products has been upgraded and the number of samples to be taken was doubled in comparison with the number imposed by the EU.

- According to the rules by the Ministry of Fisheries, factories which products are being detected with antibiotics by the EU after April 3<sup>rd</sup> 2002 will be temporarily suspended to export to the EU until the control of antibiotics of the factory shows the favourable results.

e. Local examination authority (every coastal province each).

- Examining regularly and irregularly production condition of feed producers and veterinary drugs/ chemicals suppliers. Any doubted products must be sampled for checking test.

- Seizing and destroying any lot of fisheries products detected with antibiotics.

#### 2.2.2.4. *Long-term solutions*

a. Maintaining the measures of Government authorities:

- The legislation dissemination and training courses for stakeholders will be kept continuously.

- Monitoring Plan on certain substances residues in aquaculture animals and aquaculture products is improved with doubled number of samples for testing.

- Improve the legislation on management of import, production and using of antibiotics/chemicals in aquaculture.

- Improving operative ability of control authority and treating severe violation.

b. Studying the alternative program:

- Further study the planning of farms and instructing farmers on organic and extensive aquaculture without using chemicals or antibiotics.

- Increasing the application of herbal drugs as alternatives to antibiotics and instructing on the use of permitted antibiotics, replacing banned ones.

- Applying Good Aquaculture Practices (GAP) in controlling safety aquaculture areas in accordance with HACCP and certifying the hygienic farms.

### **2.3. Some results**

- On April 3<sup>rd</sup> 2002, the European Standing Committee on Food Chain and Animal Health voted to discontinue the systematic check on 100% fisheries consignments from Vietnam based on the results of antibiotics control of Vietnam.

- On September 19<sup>th</sup> 2002, the Canadian Food Inspection Agency (CFIA) announced to stop checking 100% fisheries consignment of Vietnam if those consignments are tested and issued Health Certificate by NAFIQACEN.

- On September 20<sup>th</sup> 2002, the European Union decided to lift its intensive examinations of all shrimp shipments from Vietnam for antibiotics/chemicals residues.

## **3. CONSTRAINTS AND PROPOSALS**

### **3.1 Constraints**

Fisheries exporting countries, including Vietnam, are facing the following difficulties:

- Firstly, the scope of controlling dangers of residues of antibiotics, chemicals is too large and complicated while the controlling authority have difficulties in personnel and equipment capacity.

- Secondly, importing countries have different regulations on analysing equipments and methods as well as Lod of testing equipment. They also continuously change or renew their equipments and apply immediately without giving transition time to exporting countries to adapt to the new analysing equipments and methods.

### **3.2 Proposals**

- SEAFDEC and AFF should request CODEX to build up the standards of analysing methods and Lod of antibiotics analysing equipments.

- SEAFDEC and AFF should recommend exporting countries to officially proclaim equipments and methods of testing antibiotics and give appropriate transition time to exporting countries for adapting if they make any change.

- SEAFDEC and AFF should help ASEAN in technical training of testing harmful substances and application of HACCP in farming sites.



## CLOSING ADDRESS

by  
*Mr. Junichiro Okamoto*  
*SEAFDEC Deputy Secretary-General*

Distinguished delegates of the ASEAN-SEAFDEC Member Countries,  
Representatives of the ASEAN Secretariat and FAO,  
Resource persons,  
Participants, ladies and gentlemen,

After the three long days of active deliberation on issues of fish trade in the ASEAN region, we have now come to the end of the Meeting.

On behalf of SEAFDEC and all delegates of this Meeting, I wish to take this opportunity to express our deepest appreciation to Mr. Lee Yuen Tong, SEAFDEC Alternate Council Director for Singapore for your chairmanship and wisdom in chairing the Meeting. I wish also thank all resource persons for your views and suggestions which greatly contribute to the fruitful deliberation of this Meeting. I must also thank the delegates of all ASEAN and SEAFDEC Member Countries for your active participation and valuable contributions to this Meeting. All of these contributions have proved to be a solid foundation for common fisheries positions in the ASEAN region.

I am certain that the outcome of the Meeting will further contribute to the promotion of sustainable development of fisheries and promotion of fish trade in the ASEAN region. SEAFDEC will exert our utmost efforts to further promote activities under the ASEAN-SEAFDEC collaborative program on fish trade and environment in line with the needs and requirements of the Member Countries.

Lastly, I wish all delegates, participants and observers of this Meeting a safe and pleasant journey home.

With that, ladies and gentlemen, may I now declare this ASEAN-SEAFDEC Regional Meeting on Fish Trade and Environment close. Thank you.



## **Southeast Asian Fisheries Development Center (SEAFDEC)**

### **What is SEAFDEC?**

SEAFDEC is an autonomous intergovernmental body established as a regional treaty organization in 1967 to promote fisheries development in Southeast Asia.

### **Objectives**

SEAFDEC aims specifically to develop fishery potentials in the region through training, research and information services in order to improve food supply through rational utilization of fisheries resources in the region.

### **Functions**

To achieve its objectives the Center has the following functions:

1. To offer training courses, and to organize workshops and seminars, in fishing technology, marine engineering, extension methodology, post-harvest technology, and aquaculture;
2. To conduct research and development in fishing gear technology, fishing ground surveys, post-harvest technology and aquaculture, to examine problems related to the handling of fish at sea and quality control, and to undertake studies on the fisheries resources in the region; and
3. To arrange for the transfer of technology to the countries in the region and to make available the printed and non-printed media, which include the publication of statistical bulletins for the exchange and dissemination related to fisheries and aquaculture development.

### **Membership**

SEAFDEC membership is open to all Southeast Asian Countries. The Member Countries of SEAFDEC at present are Brunei Darussalam, Cambodia, Indonesia, Japan, Lao PDR, Malaysia, Myanmar, the Philippines, Singapore, Thailand and Vietnam.



## **SEAFDEC Addresses**

### **Secretariat**

P.O. Box 1046  
Kasetsart Post Office  
Bangkok 10903  
Thailand  
Tel:(66-2)940-6326 to 9  
Fax: (66-2)940-6336  
E-mail:secretariat@seafdec.org  
<http://www.seafdec.org>

### **Training Department (TD)**

P.O.Box 97  
Phrasamutchedi  
Samut Prakan 10290  
Thailand  
Tel:(66-2)425-6100  
Fax:(66-2)425-6110 to 11  
E-mail:td@seafdec.org  
<http://www.seafdec.org/td>

### **Marine Fisheries Research Department (MFRD)**

2 Perahu Road  
off Lim Chu Kang Road  
Singapore 718915  
Tel: (65)6790-7973  
Fax: (65)6861-3196  
E-mail:mfrdlibr@pacific.net.sg  
<http://www.seafdec.org/mfrd>

### **Aquaculture Department (AQD)**

Tigbauan, Iloilo 5021  
Republic of the Philippines  
Tel:(63-33)335-1009,336-2891  
336-2937,336-2965  
Fax:(63-33)335-1008  
E-mail:aqdchief@aqd.seafdec.org.ph  
<http://www.seafdec.org/aqd>  
<http://www.seafdec.org.ph>

### **Marine Fishery Resources Development and Management Department (MFRDMD)**

Fisheries Garden, Chendering  
21080 Kuala Terengganu  
Malaysia  
Tel: (609)616-3150  
Fax:(609)617-5136  
E-mail:seafdec@po.jaring.my  
<http://www.seafdec.org/mfrdmd>  
<http://agrolink.moa.my/dof/seafdec>



The Southeast Asian Fisheries Development Center (SEAFDEC) is an intergovernmental organization established in December 1967 for the purpose of promoting sustainable fisheries development in the region. Its current Member Countries are Brunei Darussalam, Cambodia, Indonesia, Japan, Lao PDR, Malaysia, Myanmar, the Philippines, Singapore, Thailand and Vietnam.

Representing the Member Countries is the Council of Directors, the policy-making body of SEAFDEC. The chief administrator of SEAFDEC is the Secretary-General whose office, the Secretariat is based in Bangkok, Thailand.

SEAFDEC undertakes research on appropriate fishery technologies, trains fisheries technicians, and disseminates fisheries information. Four Departments were established to pursue the objectives of the Center:

- The **Training Department (TD)** in Samutprakan, Thailand, established in 1967 for marine capture fisheries development;
- The **Marine Fisheries Research Department (MFRD)** in Singapore, established in 1967 for fishery post-harvest technology;
- The **Aquaculture Department (AQD)** in Iloilo, the Philippines, established in 1973 for aquaculture research and development; and
- The **Marine Fishery Resources Development and Management Department (MFRDMD)** in Kuala Terrengganu, Malaysia, established in 1992 for the development and management of the marine fishery resources in the exclusive economic zones (EEZs) of SEAFDEC Member Countries.