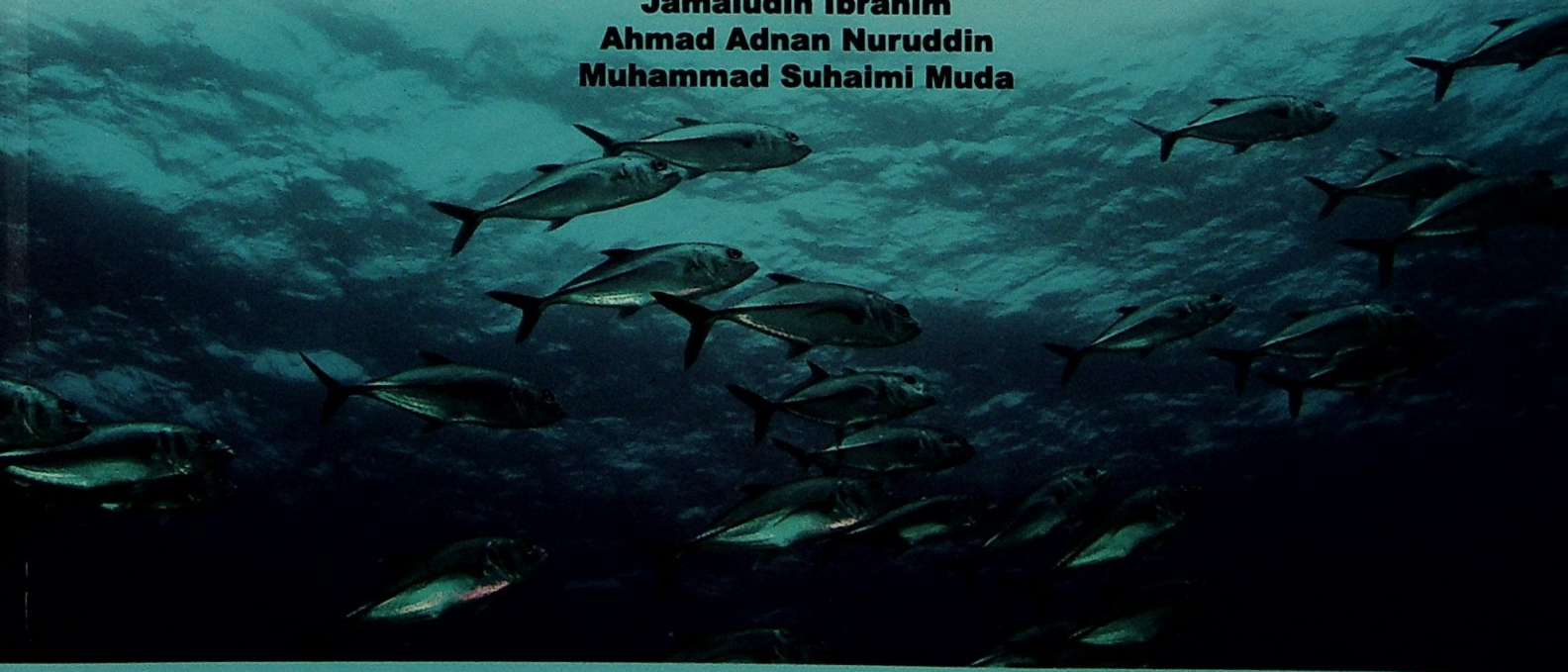
ISBN 971-91126-26-4
SEAFDEC MFRDMD RM/16
October 2005

Report of the Technical Working Group Meeting on the Identification of Indicators for Sustainable Development and Management of Capture Fisheries in the ASEAN Region

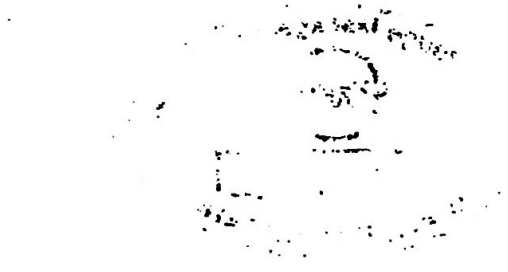
KUALA LUMPUR, MALAYSIA
8 – 9 NOVEMBER 2004

Edited by:

Rosidi Ali
Jamaludin Ibrahim
Ahmad Adnan Nuruddin
Muhammad Suhaimi Muda



Marine Fishery Resources Development and Management Department
Southeast Asian Fisheries Development Center



Report of the Technical Working Group Meeting on The Identification of Indicators for Sustainable Development and Management of Capture Fisheries in the ASEAN Region

Kuala Lumpur, Malaysia
8-9 November 2004

Edited by:

Rosidi Ali
Jamaludin Ibrahim
Ahmad Adnan Nuruddin
Muhamad Suhaimi Muda

Marine Fishery Resources Development and Management Department
Southeast Asian Fisheries Development Centre

October 2005

Sitting from right: Ms. Pouchaman Wongsanga, Dr. Yoshinobu Konishi, Dr. Yahuhisa Kato, Mr. Raja Mohammad Noordin, Mrs. Ranimah Haji Abd. Wahab and Mrs. Dyah Retnowati

Second row from right: Mr. Jamaludin Ibrahim, Mrs. Chee Phaik Ean, Ms. Ratanawalee Phoonsawat, Mr. Duto Nugroho, Mr. Rosidi Ali, Mr. Abu Talib, Mr. Touch Bunthang, Mr. Win Myint Maung and Mr. Noel C.Barut

Perpustakaan Negara Malaysia Cataloguing-in-Publication Data

Report of the technical working group meeting on the identification of indicators for sustainable development and management of capture fisheries in the ASEAN region, Kuala Lumpur, Malaysia, 8-9 November 2004 / edited by Rosidi Ali, Jamaludin Ibrahim.
ISBN 983-9114-20-4
1. Sustainable fisheries--Asia, Southeastern. 2. Fishery management--Asia, Southeastern. 3. Fisherics--Asia, Southeastern. I. Rosidi Ali. II. Jamaludin Ibrahim.
639.20959

Bibliography citation:
Rosidi, A., Jamaludin, I., Ahmad Adnan, N. and Muhammad-Suhaimi, M. (editors).2005
Report of the Technical Working Group on the Identification of Indicators for Sustainable Development and Management of Capture Fisheries in the ASEAN Region, Penang,Malaysia, 1-3 August 2005.

Marine Fishery Resources Development and Management Department (MFRDMD)
Southeast Asian Fisheries Development Center (SEAFDEC)
Taman Perikanan Chendering, 21080 Kuala Terengganu,Malaysia
Tel: +609-6163150 Fax: +609-6175136
www.mfrdmd.org.my

CONTENTS

		Page
I.	ADOPTED REPORT OF TECHNICAL WORKING GROUP MEETING (TWGM)	
	LIST OF ANNEXES STATED IN THE ADOPTED REPORT OF TWGM	
II.	ANNEX 1 – LIST OF PARTICIPANTS	8 – 10
III.	ANNEX 2 – OPENING ADDRESS SPEECH	11
IV.	ANNEX 3 – ADOPTED AGENDA OF TWGM	12
V.	ANNEX 4 – OVERVIEW OF THE PILOT PROJECTS	13 – 15
VI.	ANNEX 5 – PROGRESS AND ACHIEVEMENTS MADE IN PILOT PROJECT	
	ANNEX 5a – Brunei Darussalam	16 – 18
	ANNEX 5b (1) – Cambodia (Paper 1 – Proposal for Pilot Study)	19 – 23
	ANNEX 5b (2) – Cambodia (Paper 2 – Status of Capture Fisheries in Cambodia)	24 – 31
	ANNEX 5c – Indonesia	32 – 34
	ANNEX 5d – Malaysia	35 – 41
	ANNEX 5e (1) – Myanmar (Full Paper)	42 – 48
	ANNEX 5e (2) – Myanmar (Paper Presented In Powerpoint)	49 – 52
	ANNEX 5f – Philippines	53 – 54
	ANNEX 5g –	55 – 58
VII.	ANNEX 6 – REVISED WORK PLAN	
	ANNEX 6a – Brunei Darussalam	59
	ANNEX 6b – Indonesia	61
	ANNEX 6c – Malaysia	63
	ANNEX 6d – Philippines	65
	ANNEX 6e – Thailand	66
	ANNEX 6f – MFRDMD	67

REPORT OF THE TECHNICAL WORKING GROUP MEETING ON THE IDENTIFICATION OF INDICATORS FOR THE SUSTAINABLE DEVELOPMENT AND MANAGEMENT OF CAPTURE FISHERIES IN THE ASEAN REGION

I. INTRODUCTION

1. The Technical Working Group Meeting (TWGM) on The Identification of Indicators for the Sustainable Development and Management of Capture Fisheries in the ASEAN Region was organized by the SEAFDEC Marine Fishery Resources Development and Management Department (MFRDMD) in Kuala Lumpur, Malaysia from 8 to 9 November 2004.

2. The Meeting was attended by delegates from the participating countries namely Brunei Darussalam, Cambodia, Indonesia, Malaysia, Myanmar, the Philippines and Thailand. Representatives from SEAFDEC Secretariat and MFRDMD also attended the meeting. The list of participants appears as Annex 1.

3. The objectives of the Meeting are to evaluate the achievements in the plan of action for the year 2004, revise the plan of action for the year 2005 and to discuss work plan and strategies for preparing the regional guidelines on the use of indicators.

II. OPENING OF THE MEETING

4. The Chief of SEAFDEC-MFRDMD, Mr. Raja Mohammad Noordin Raja Omar, welcomed the participants and declared the meeting open. He also introduced the new Regional Project Leader Mr. Rosidi Ali, who was appointed in that post in July 2004. His opening address appears as Annex 2.

III. ADOPTION OF THE AGENDA

5. The Agenda of the meeting was adopted with the inclusion of a presentation on the Overview of the Project by the Regional Project Leader, but excluding the Vietnamese presentation. The adopted Agenda appears as Annex 3.

IV. OVERVIEW OF THE PROJECT

6. The Regional Project Leader presented an overview of the project as shown in Annex 4. The Meeting was reminded that in fisheries management it is important for stakeholders to understand the use of simple indicators in enhancing co-management and compliance. SEAFDEC will act only as a catalyst for participating countries to implement the pilot projects that would be operated under a cost-sharing basis.

7. The outcomes from pilot projects will be used for the formulation of the Regional Guidelines. Indicators such as catch per unit effort (CPUE) and mean size of fish, which have being identified in the present pilot projects are not new to this region as most of them have been applied but not in a systematic way. The use of indicators should be integrated into the national fisheries management system so that they can contribute to decision-making.

V. THE STATUS OF THE IMPLEMENTATION OF THE PILOT PROJECTS & THE WORK PLAN 2004 AND REVISING THE WORK PLAN

8. The Meeting was informed of the progress and achievements made in the pilot projects in participating countries (Annex 5). In general, CPUE is still one of the common indicators used to monitor the status and trend of multi-species fisheries like the demersal fisheries. However CPUE as an indicator for pelagic and inland fisheries should be used with caution.

9. The use of MSY as one of the indicators must be made with caution as this may be suitable for single species fisheries. In practice, it is difficult to achieve this target reference point, therefore monitoring of trend may be more practical.

10. The consultation with stakeholders is important to obtain fishers' experiences on the state of the resource and a better compliance to management measures.

11. The use of indicators should be incorporated into fisheries management particularly to address the issue of excess capacity.

12. The information for the indicators used in the pilot projects should utilize existing data when available in addition to the data to be collected. The important outcome from pilot projects implemented is the development and usage of simple indicators that are easily understood and accepted by stakeholders.

13. With regard to information on CPUE, standardization of data within the short project duration is important for specific localities.

14. In the selection of biological and socio-economic indicators it is important to have clear objectives on the usage of these indicators for fisheries development and management.

15. The revised Work Plans of participating countries appear in Annex 6.

VI. WORK PLAN AND STRATEGIES FOR PREPARATION OF THE REGIONAL GUIDELINES ON USE OF INDICATORS FOR THE SUSTAINABLE DEVELOPMENT AND MANAGEMENT OF CAPTURE FISHERIES IN THE ASEAN REGION

16. The meeting took note of the presented guidelines draft which was formulated from the outcomes of the working group discussion during the Second (2nd) RTC. The meeting then made the modifications for the drafting of the Regional Guidelines reflecting the experiences from pilot projects in the participating countries, with the consent of the participants.

17. The Meeting agreed on the recommended framework for the guidelines as shown below:

1. Executive summary (to be prepared by MFRDMD)
2. Introduction (to be prepared by MFRDMD)

   Note: *Regional guidelines for fisheries management already used but this one for practical use of indicators*
3. Definition of indicator (include categories of indicators)
4. How to develop indicators
   - 4.1 Objectives and targets
   - 4.2 Data collection (to include standardization), analysis and interpretation
   - 4.3 Examples of indicators (including methodology for pelagic, demersal and inland fisheries)
5. Use of indicators (in planning, communication, monitoring & evaluation of management performance)
6. Stakeholder consultation and participation
7. Development of national system to use indicators (include linkage between data for indicators and national statistical system)
8. Follow-up actions (to promote use of guidelines and to include HRD and capacity building)
9. Annex to include
   - o Glossary
   - o Definition of stakeholders

18. The Meeting agreed that members of the Core Group are the Technical Project Officers from participating countries. MFRDMD is to seek views from Vietnam on their participation in the Core Group.

19. The Meeting agreed that members of the Core Group will prepare the first draft of the Regional Guidelines according to the agreed framework. The Meeting proposed that the members of the Core Group should refer to the following documents in the preparation of the Guidelines:

- Conclusions & Recommendations of the Second RTC
- Outcome of this meeting
- Output from pilot projects (including new pilot projects by Cambodia and Myanmar).
- Regional Guidelines (RCCRF) for Fisheries Management

20. The Meeting also proposed the work schedule for the completion of the guidelines which is shown below:

No.	*Activities*	*Deadline*
1	MFRDMD to extend contract with appropriate TOR	December 2004
2	Drafting of guidelines by members of Core Group (excluding Executive Summary and Introduction)	Dec. 2004 to April 2005
3	Compilation of first draft by MFRDMD	May 2005
4	Meeting of Core Group (to discuss first draft)	June 2005
5	Third RTC	September 2005
6	Publication of Regional Guidelines	November 2005
7	Submission to PCM, FCG and Council	2006

VII. ADOPTION OF REPORT

21. The report was adopted.

VIII. CLOSING OF THE MEETING

22. In his Closing Remarks, Dr. Yoshinobu Konishi, the Deputy Chief of SEAFDEC-MFRDMD thanked the participants, representatives of the SEAFDEC Secretariat and MFRDMD for the active participation and contribution to the Meeting. He expressed appreciation to the meeting secretariat for their effort in making the Meeting a success. He then declared the Meeting closed.

Annex 1

LIST OF PARTICIPANTS

BRUNEI DARUSSALAM

Ranimah Haji Abd Wahab (Mrs.)
Senior Fisheries Officer

Fisheries Department
Ministry of Industry & Primary Resources
Jalan Menteri Besar, Berakas
BB3910, Brunei Darussalam
Tel: (673) 2-772788
Fax: (673) 2-770065
e-mail: bruneifisheries@brunet.bn
ranimah_wahab@fisheries.gov.bn

CAMBODIA

Mr. Touch Bunthang (Mr.)
Fishery Biologist
Inland Fishery Research and
Development Institute

Department of Fisheries
#186 Norodom Blvd
P.O.Box 582, Phnom Penh
Cambodia
Tel: (855) 23-221486
Fax: (855) 23-221485
e-mail: bunthangtouch@hotmail.com

INDONESIA

Dyah Retnowati (Mrs.)
Head of Sub Directorate Data
and Statistic

Directorate General of Capture Fisheries
Ministry of Marine Affairs and Fisheries
Jl. Harsono RM No3 Gedung B
Ragunan-Pasar Minggu
Jakarta 12550, Indonesia
Tel: (62) 21-7827254
Fax: (62) 21-7827254
e-mail: dgcfstat@indosat.net.id

Duto Nugroho (Mr.)
Staff of Research on Capture Fisheries

Research Center for Capture Fisheries
Agency for Marine Fisheries Research
Jl. Pasir Putih 1, Ancol Timur
Jakarta 14430, Indonesia
Tel: (62) 21-64711940
Fax: (62) 21-6402640
e-mail: dutonugroho@telkom.net

MALAYSIA

Abu Talib Ahmad (Mr.)
Head of Fisheries Resource Section

Fisheries Research Institute
11960 Batu Maung
Penang, Malaysia
Tel: (60) 4-6263925
Fax: (60) 4-6262210
e-mail: abutalib@fri.gov.my
abutalib01@yahoo.com

Chee Phaik Ean (Ms.)
Senior Research Officer

Fisheries Research Institute
11960 Batu Maung
Penang, Malaysia
Tel: (60) 4-6263925
Fax: (60) 4-6262210
e-mail: phaikean@hotmail.com

MYANMAR

Win Myint Maung (Mr.)
Deputy Director of Ayeyarwaddy Division

Department of Fisheries, Pathein
Department of Livestock and Fisheries
Ayeyarwaddy Division
Myanmar
Tel: (95) 42-24258 / 24257
Fax: (95) 1-228258
e-mail: DOF@mptmail.net.mm

PHILIPPINES

Noel C. Barut (Mr.)
Chief of Marine Fisheries Research Division

OIC, National Fisheries Research &
Development Institute
940 Quezon Avenue, Quezon City
Philippines
Tel: (63) 2-3725063 / 3736336
Fax: (63) 2-3725063
e-mail: nbarut@nfrdi-da.gov.ph
noel_c_barut@yahoo.com

THAILAND

Ratanawalee Phoonsawat (Ms.)
Fisheries Biologist

Upper Gulf Marine Fisheries Research and
Development Center
49 Soi Phrarachveriyaporn 16
Bangpheung Sub-district
Phrapradaeng District, Samutprakan
10130 Thailand
Tel: (66) 2-8167636 to 8 ext.13
Fax: (66) 2-8167634
e-mail: ratvaree@yahoo.com

SOUTHEAST ASIAN FISHERIES DEVELOPMENT CENTER

Secretariat

Yasuhisa Kato (Dr.)
Special Advisor

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

Pouchamarn Wongsanga (Ms.)
Information Program Coordinator

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

Marine Fishery Resources Development And Management Department

Raja Mohammad Noordin Raja Omar (Mr.)
Chief

SEAFDEC - MFRDMD
Fisheries Garden, Chendering
21080 Kuala Terengganu
Terengganu, Malaysia
Tel: (60) 9-6163150
Fax: (60) 9-6175136 / 6174042
e-mail: rnoordin@hotmail.com
rnoordin@mfrdmd.org.my

Yoshinobu Konishi (Dr.)
Deputy Chief

SEAFDEC - MFRDMD
Fisheries Garden, Chendering
21080 Kuala Terengganu
Terengganu, Malaysia
Tel: (60) 9-6163150
Fax: (60) 9-6175136 / 6174042
e-mail: ykoni@mfrdmd.org.my

Rosidi Ali (Mr.)
Special Departmental Coordinator

SEAFDEC - MFRDMD
Fisheries Garden, Chendering
21080 Kuala Terengganu
Terengganu, Malaysia
Tel: (60) 9-6163150
Fax: (60) 9-6175136 / 6174042
e-mail: rosidi@mfrdmd.org.my

Jamaludin Bin Ibrahim (Mr.)
Division Head
Information and Training

SEAFDEC - MFRDMD
Fisheries Garden, Chendering
21080 Kuala Terengganu
Terengganu, Malaysia
Tel: (60) 9-6163150
Fax: (60) 9-6175136 / 6174042
e-mail: jamaluddin@mfrdmd.org.my

Secretariat of the Meeting

Sayed Sahabudin Sayed Alwi (Mr.) e-mail: ssahabuddin@mfrdmd.org.my

Muhamad Nor Azam Lajin (Mr.) e-mail: azam@mfrdmd.org.my

Nadzri Seman (Mr.) e-mail: nadzri@mfrdmd.org.my

Zahari Bin Ismail (Mr.) e-mail: zahari@mfrdmd.org.my

Aznan Hj Zainal (Mr.) e-mail: aznan@mfrdmd.org.my

Muhammad Suhaimi Bin Muda (Mr.) e-mail: suhaimi@mfrdmd.org.my

Jafrizah Binti Ab Razak (Ms.) e-mail: jafrizah@mfrdmd.org.my

Nordin A. Rahman (Mr.)

Annex 2

Opening Remark

By

Raja Mohammad Noordin Raja Omar
Chief SEAFDEC-MFRDMD

Dr Yoshinobu Konishi – Deputy Chief SEAFDEC-MFRDMD
Dr. Yasuhisa Kato – Special Advisor to SEAFDEC
Dear participants
Ladies and Gentlemen

First I would like to express a very warm welcome to all of you to the Technical Working Group Meeting on the Identification of Indicators for Sustainable Development and Management of Capture Fisheries in the ASEAN Region.

As known, the "Identification of Indicators for Sustainable Development and Management of Capture Fisheries" is one of the projects formulated under the Special 5-Year Program of SEAFDEC to support ASEAN Member Countries in the implementation of the Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region adopted at the Millennium Conference held in November 2001.

SEAFDEC-MFRDMD has been given responsibility to coordinate this regional project. Its main objective is to support and to improve fisheries management in this region through the use of simple, practical, available and cost effective indicators in the formulation of management decision.

To ensure the success of this project, MFRDMD has work closely with SEAFDEC Secretariat and member countries, and has also seek cooperation from international agencies.

Two technical consultations have been held to formulate the work plan to be taken. With five countries participate in the implementation of the pilot projects, I believed this project on its way to the success.

Ladies and Gentlemen,

This meeting has been designed as an immediate follow-up activity, to monitor the achievement of the pilot projects.

I hope that you could make this meeting as a good miles stone, in guiding us to achieve our target.

Without further a do, I would like to declare this meeting open.

Thank you

Annex 3

TECHNICAL WORKING GROUP MEETING ON THE IDENTIFICATION OF INDICATORS FOR THE SUSTAINABLE DEVELOPMENT AND MANAGEMENT OF CAPTURE FISHERIES IN THE ASEAN REGION

PROPOSED AGENDA

8.11.2004:	**Opening of the meeting**	
	0830:	Registration
	0930:	Welcome address by Chief MFRDMD
	0945:	Adoption of Agenda
	1000:	Break
	Session I:	**The status of the implementation of the pilot projects and the Work Plan 2004 and Revising the Work Plan 2005**
	Chairman 1:	Mr. Raja Mohammad Noordin bin Raja Omar
	1030 – 1100:	Presentation by Brunei Darussalam & Discussion
	1100 – 1130:	Presentation by Thailand & Discussion
	1130 – 1200:	Presentation by Indonesia & Discussion
	1200 – 1230:	Presentation by the Philippines & Discussion
	1230 – 1400:	Break
	Chairman 2:	Dr. Yoshinobu Konishi
	1400 – 1430:	Presentation by Malaysia & Discussion
	1430 – 1500:	Presentation by Cambodia & Discussion
	1500 – 1530:	Presentation by Myanmar & Discussion
	1530 – 1600:	Presentation by Vietnam & Discussion
	1600 – 1630:	General Discussion
	1630:	Break
	1900:	Welcome Dinner
9.11.2004	**Session II:**	**Work Plan and Strategies for Preparation of the Regional Guidelines on Use of Indicators for Sustainable Development and Management of Capture Fisheries in the ASEAN Region**
	Chairman 3:	Dr. Yasuhisa Kato
	0900 – 0930:	Reviewing the outcomes of the 2nd RTC (by Ms. Chee Phaik Ean)
	0930 – 1030:	General Discussion
	1030 – 1100:	Break
	Session III:	**Discussion on other issues related to the projects**
	Chairman 4:	Mr. Rosidi Ali
	1100 – 1200:	Capacity Building HRD Etc.
	1200 – 1530:	Break
	1530 – 1630:	Adoption of the report and recommendations
	1630 :	**Closing of the meeting by the Deputy Chief MFRDMD**

Annex 4

OVERVIEW OF THE PILOT PROJECTS

An Overview On Identification of Indicators for Sustainable Development and Management of Capture Fisheries

BY
ROSIDI ALI
SEAFDEC/MFRDMD

INTRODUCTION

- One of the projects formulated under the Special 5-Year Program of SEAFDEC to support ASEAN Member Countries in the implementation of the Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region adopted at the Millennium Conference held in November 2001.
- Lead Department – MFRDMD
- Lead Country – Malaysia
- Duration – 4 years (2002 – 2005)

Definition of Indicator

A performance-based variable, measure or index that provides information on the condition and status of fisheries and fisheries resources.

Source: Regional guideline for Responsible Fisheries Management in Southeast Asia

OBJECTIVES

1. To introduce the use of indicators for fisheries development and management of capture fisheries in the ASEAN region.
2. To prepare regional guideline on the use of indicators for fisheries development and management for capture fisheries in the ASEAN region.
3. To conduct related research on the use of indicators for improved fisheries management.

ACTIVITIES IN 2004

1. The Second Technical Consultations
2. Pilot Projects
3. Technical visits
4. Technical working group meeting

2ND REGIONAL TECHNICAL CONSULTATION (9-11 MARCH, 2004)

OBJECTIVES
1. to discuss, review and evaluate the progress achieved by countries that are implementing pilot projects on the use of indicators,
2. to formulate the plan of action for 2004 / 2005,
3. to discuss the procedures for the identification and selection of indicators for the sustainable development and management of capture fisheries and,
4. to prepare the draft regional guidelines on the use of indicators for improved fisheries management.

OUT PUT:
1. Work plan for 2004 and 2005
2. Draft frame work of the regional guideline

Note: The proceeding has been published in November, 2004

II. PILOT PROJECTS

OBJECTIVES

i. To gain practical experience from projects
ii. As references in formulation the Regional Guideline
iii. To promote stakeholder involvement

- Cost sharing basis

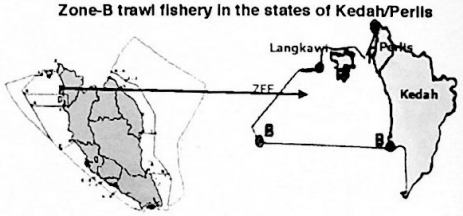
Activities

- 5 projects have been implemented:
  - i. *Malaysia —trawls fisheries*
  - ii. Philippines- ring net fisheries
  - iii. Brunei Darussalam – Trawl fisheries
  - iv. Thailand – Trawl fisheries
  - v. Indonesia – Demersal fisheries (seine net)

Cambodia – will start the project in November, 2004 on Bag net fisheries in Tonle Sap River

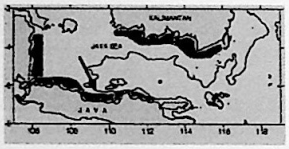
Myanmar is intending to start the project in January, 2005

PILOT PROJECT IN MALAYSIA:
Zone-B trawl fishery in the states of Kedah/Perlis



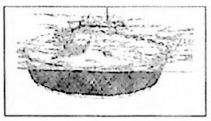
- Started in 2003
- Information on landings and licenced vessel and fishing were collected and socio-economic, environmental and resources surveys were carried out.
- A series of consultations and workshops involving government agencies, researchers, stake holder and NGOs were held to conclude the applicable indicators and references points.

PILOT PROJECT IN INDONESIA:
THE EXPLOITATION OF DEMERSAL FISH RESOURCE IN THE NORTH COAST OF CENTRAL JAVA



- Started in 2003
- The main issues faced by fisheries in this study area were low in productivity and declining yield and relatively over crowded in number of effort.

PILOT PROJECT IN THE PHILIPPINES:
Ring Net Fisheries in Camotes Sea



Started in December 2002

Focuses on small pelagic fishery

Existing data on this fishery are being compiled and new data are being collected under regular sampling

PILOT PROJECT IN THAILAND:

TRAWL FISHERY AT PRAN BURI, PRACHUAB KIRI KHAN PROVINCE

Started in early 2003
Implementaion steps:
Part I Survey the project area
Part II Hold a consultation meeting with the stakeholders
Part III Collect data from OBT by sampling by monthly
Part IV Experiment on enlarge mesh size: for the new condition or alternative condition
Part V Conclusion meeting

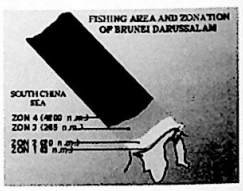
PILOT PROJECT IN BRUNEI DARUSSALAM:
TRAWL FISHERIES

Started in September 2003
Some of the constraints were encountered :

1. lack of knowledge and capable technical staff;
2. misconception and misunderstanding of the stakeholders to the objective of the project

Suggest Solution:

1. Intensive trainings and Consultations
2. PromoteStake holder participation



Trawlers operate in Zones 2 and 3
Trawlable areas cover 4,600 km2 or 12% of EEZ
18 trawlers in zone 2 and 3 in zone 3

TECHNICAL VISITS

Objectives

- To assess the achievements in the implementation of pilot projects.
- To support and give technical assistance in the implementation of the pilot projects.
- To discuss on the future plan of action in the implementation of the pilot project.
- To discuss on the prospectus of the technical working group meeting for formulating the work plan in preparing the regional guidelines on the use of indicators for improved fisheries management in ASEAN region

TECHNICAL VISITS

Two visits had been carried out in 2004:

1. Malaysia – July, 2004
2. Brunei Darussalam – October, 2004

Visits to other pilot projects will be carried out in November, 2004 – Mac, 2005

TECHNICAL WORKING GROUP MEETING

7 – 10 November, 2004

Objectives

- To evaluate the achievements in the plan of action for 2004
- To revise the plan of action for 2005.
- To discuss on preparing the regional guidelines on the use of indicators

WORK PLAN FOR 2005

- Technical visits
- Completing the Pilot projects
- Working group meeting
- Preparing the regional guideline
- Third RTC

Regional Guidelines on the Use of Indicators

- To promote future use of indicators,it is strongly suggested that experiences from pilot studies will be compiled and used as basis for formulation of regional/national guidelines for the use of indicators.
- The guildelines, upon the endorsement of the member countries, will help facilitating the usage of indicators at the national level.
- This will enable the wide implementation of indicators, and require support from the government to ensure achivement in the promotion of sustainable fisheries

CONCLUSION

- Not the end story
- To improve/enhance the present management approaches - not to totally replaced them.
- Is not a new to this region, but need to revise on approaches
- Through learning process
- Need collaborations and technical support

THANK YOU

Annex 5a

PROGRESS AND ACHIEVEMENTS MADE IN PILOT PROJECTS

BRUNEI DARUSSALAM

PROGRESS REPORT OF PILOT PROJECT ON THE USE OF INDICATORS FOR THE SUSTAINABLE DEVELOPMENT IN CAPTURE FISHERIES WITH FOCUS ON THE DEMERSAL TRAWL FISHERY OF BRUNEI DARUSSALAM

Presented by

RANIMAH HJ A. WAHAB
Fisheries Department
Ministry Of Industry And Primary Resources,
Brunei Darussalam

PROJECT TEAM

Members

1. Ranimah Hj A. Wahab (Leader)
2. Hjh Noorizan Hj Abd. Karim
3. Matzaini Hj Juna
4. Mr. El A. Cinco
5. Mohammad Mail

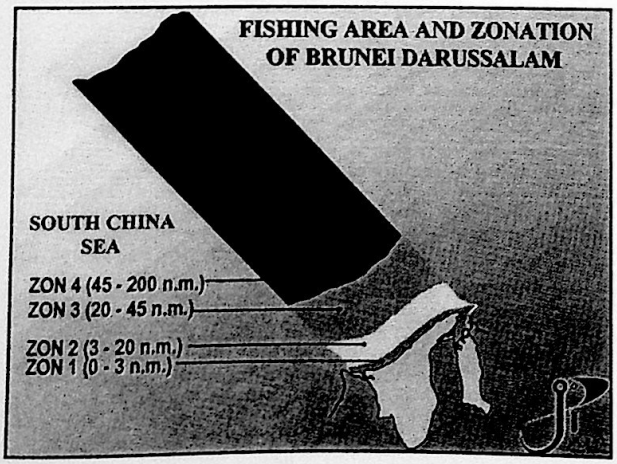
PILOT STUDY: TRAWL FISHERY IN BRUNEI DARUSSALAM

Project initiation: September, 2003

Project duration: one (1) year

LOCATION OF FISHERY

- Trawlers operate in Zones 2 and 3
- Trawlable areas cover 4,600 km^2 or 12% of EEZ
- 18 trawlers in zone 2 and 3 in zone 3



BRIEF DESCRIPTION OF FISHERY

- 26% (3,300 tonnes) of total production from trawlers with 70% discarded at sea
- CPUE declined from 1.12 tons/day in 1995 to 0.64 tons/day in 2001 and further decline to 0.57 tons/day in 2003

BRIEF DESCRIPTION OF FISHERY

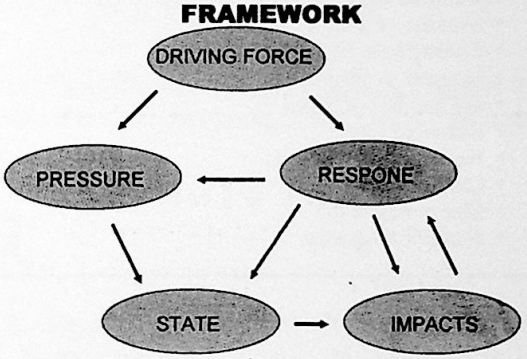
- Production from industrial trawlers in 2002 and 2003 is almost the same although the number of trawlers decreased by 7 in 2003
- Fishing effort (fishing days) increased but catch per boat decreased
- Moratorium on trawlers effective in 2001

FISHING GEAR

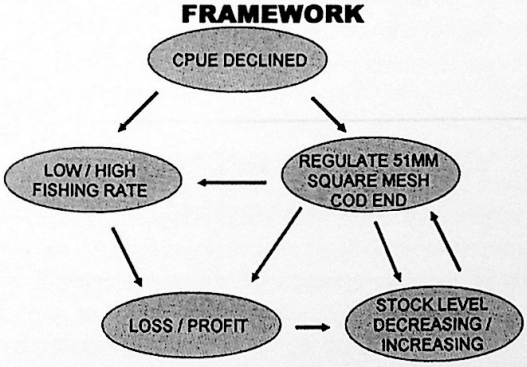
- Bottom Otter trawl
- High opening
- 51 mm square mesh cod end (effective in 2002)

EXAMPLE OF THE INDICATORS FOR THE GUIDELINE FOR BRUNEI DARUSSALAM

PRESSURE – STATE – RESPONE FRAMEWORK



PRESSURE – STATE – RESPONE FRAMEWORK



FIRST STAKEHOLERS COUNSULTATION MEETING

- December 2003
- Vessel operators of trawlers in zone 2 and 3.

FISHERIES MANAGEMENT PLAN

- A directive approach to this project
- Develop the marine fisheries towards the maximum economic yield
- Implement strategies to increase productivity, sustainability and equal sharing among fishers

OBJECTIVES OF THE MANAGEMENT

- Ensure Sustainability
- To increase productivity
- To promote the use of selective and environmental friendly fishing gears
- To protect the nursery and breeding grounds
- To promote equal sharing of harvests

INCLUDED INDICATORS

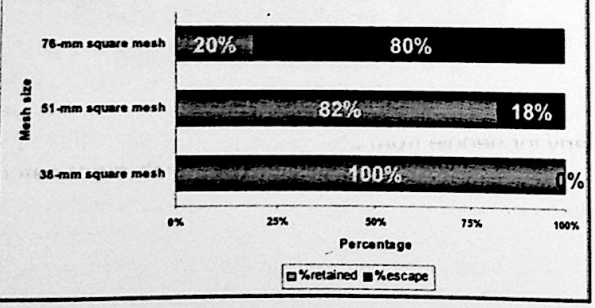
- Landings/catch
- CPUE
- Value of catch
- Number of fishing boats
- Fishing time (fishing days)
- Number of fishers
- GT and HP of boats
- Resource rent
- Net return/Investment
- Catch composition
- Size composition
- Number of species

Study of the impact using 51mm square mesh cod end

- Aiming to reduce the wastages through mesh selectivity.
- By releasing some of the unwanted catch.
- Therefore reduce overexploitation and increase fish production (recruitment of new stock).

Study of the impact using 51mm square mesh cod end

Figure 2. Preliminary results of the square-mesh selectivity study



CONCLUSION

➢ The project is still on going, hence the results of the analysis are just preliminary;

➢ The project requires more time to analyze the data as required.

THANK YOU

FOR YOUR ATTENTION

Annex 5b (1)

CAMBODIA: Paper 1 (Proposal For Pilot Study)

Pilot Study for Indicators Project in Cambodia

Project Name: Fish Consumption and the Tonle Sap River Dai Fishery

Summary:

The life and livelihoods of nearly all Cambodians are closely linked to fisheries and fisheries resources. Fish are sources of essential input into daily life such as fuel, food, medicine and farming. Rural Cambodians obtain their resources from fishing grounds, some of which are close to their home and village, while others are far away requiring extensive time and travel.

In Cambodia, Dai fishery (bag net) is one of the large-scale fisheries which plays an important role in the annual fish supply of rural people and contributes significantly to food security. It was introduced to Cambodia over a hundred years ago, sometime between 1873-89 (Tana 1998).

This fishery operates only in the lower part of the Tonle Sap river about 4 -35 kilometers north of Phnom Penh (Ruusay Keo district) from October to late March. From the previous studies it has been shown that the peak fish catch of the Dai fisheries occurs in December and January 1-6 days before the full moon (lieng et al, 1995).

During the peak period in January, fish production by the Dai fisheries is very important to the people that live in uplands areas since they use the fish from the Dai to make their annual supply of fish paste, fish sours, fermented fish, and smoked fish.

Rationale:

Freshwater fisheries in Cambodia used to have reputation for large production. Bardach (1969) considered that Chevey and Le Poulain underestimated the fish catch and gave a total catch of 147,000 tons in 1939. The University of Michigan (1975) made on indirect evaluation based on average fish yield per hectare for the overall inundate area and on the fish consumption per capita during year 1970. Their estimation ranged from 125,000 to 160,000 tons/year for the total freshwater fish in Cambodia, of which 50,000 to 80,000 tons came from the Great Lake.

While the study by the MRC/DoF/ Danida Project Management of Freshwater Capture fisheries estimated the annual production of 300,000 to 400,000 tons (Ahmed et al., 1998) in that the production from the Dai Fisheries has significantly contributed to the total catch. The Dai Fisheries has been randomly studied since 1995 by the project. Species composition, size and catch has been totally estimated. However, Dai row #2 has not specifically been done yet. This row is considered as the best row in catching fish and remarkably contribute as the source of supplying fresh fish to the people, particularly for people from the upland areas. Also this row is well-known in catching large size fish especially the brood stocks and endangered species such giant catch fish and giant barb. Therefore the study of the species size and composition, caught in this row and when these species are caught will be very useful in recommending policy to the Department of Fisheries to manage its fisheries. Also it is important to understand about how much fresh fish caught in this row has been seasonally supplied to the people for consumption. All these results may be critical for weighing whether to suspend the fisheries in the peak migration of brood stocks and endangered species in this row for conservation purpose or to continue operating this row as usual so that fish supply from this row is still available to the rural people.

Goal:

The goal of this proposal is to recheck the total catch and its species composition and conduct survey on fish consumption in the Dai Fisheries row #2.

Objective:

- To research the total catch in the Dai Fishery number 2 and recheck the monthly species composition, species size (length frequency) and catch.
- To identify what endangered species are, caught by the Dais in this row.
- To describe how the fish have been processed for a year round consumptions.
- To research fish consumption for this fishery by people from upland and lowland areas.

Output

The study will produce the following outputs:

- The total of fish caught, species composition, fish size (length frequency) by species in Dai row #2.
- Fish consumption/person for people who come and buy the fish from row # 2.

Roles and Responsibilities

1. Project Manager Mr. Ing Try Deputy Director of Department of Fisheries.

The project Manager will be responsible for report writing.

2. Correspondence:

Mr. Ngor Pengbun
#186, Presh Norodom Blvd., P.O Box 582 Phnom Penh, Cambodia
IFRIC@bigpond.com.kh/pengbun27@hotmail.com
Telephone:(855-23) 723 275/ (855-11) 714 789
Facsimile: (855-23) 427 048

Mr. Touch Bunthang
#186, Presh Norodom Blvd.P.O Box 582 Phnom Penh,Cambodia
ifredi@online.com.kh/bunthangtouch@hotmail.com
Telephone:(855-16) 878 281
Facsimile: (855-23) 427 048

3. Data collector:

Four data collectors will be selected for the data collection of the Dai Fishery in row 2a, 2b, 2c and 2d in Russay Keo district, Phnom Penh.

Draft Budget for Pilot Database Project

Incentive Salary:

This proposal seeks an incentive salary for counterpart from The Department of Fisheries. The team leader will be paid for the duration of the project action, but data collectors will be paid for the duration working in project.

Details	SEAFDEC					Department of Fisheries (DoF)
	No person	No of days	Duration (months)	Unit price	Total	
A-Personnel #						
Team leader	1		16	$200	$3,200	
Data collector	4		5	$100	$2,000	
1	**Sub-total A**				**$5,200**	
B-Equipment						
One set of computer						DoF
Printer and print cartridge						DoF
Stationery						DoF
Measuring board	4			$5	$20	
Scales (2 big and 2 small)	4			$7	$28	
2	**Sub-total B**				**$48**	
C-Consumable						
Proceeding report				$1,000	$1,000	
3	**Sub-total C**				**$1000**	
D-Transportation						
Per diem allowance for team leader to check data collector	1	4	5	$20	$400	
Rent 2 motorbikes for 4 data collector	2		5	$50	$500	
Rent boat	4		5	$20	$400	
4	*Sub- Total D*				**$1,300**	

Details	SEAFDEC					Department of Fisheries (DoF)
	No person	No of days	Duration (months)	Unit price	Total	
E-Training /Workshops						
Trainer (by team leader)	2	4(two times)		$30	$240	
Trainee	4	4(two times)		$15	$240	
Miscellaneous				$60	$60	
5	Sub- Total E				**$540**	
F- Miscellaneous				$500	$500	
6	*Sub- Total F*				$500	
G- Database Development					$500	
7	*Sub- Total G*				**$500**	
H- Services						
Electricity						DoF
Telephone						DoF
Fax						DoF
E-mail						DoF
Photocopy						DoF
Grand total =1+2+3+4+5+6+7				$9,068.00		

1. Action plan for project

	2004							2005								
	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Design form																
Survey																
Collect data																
Enter data																
Report writing																
Edit/Publish																

CAMBODIA: Paper 2

The Status of Capture Fisheries in Cambodia

by
Touch Bunthang

I. Introduction

Cambodia fisheries is an important sub-sector of agriculture which plays a significant role in nutrition, employment, foreign exchange earnings and food security. With a total area of 181,035 km2, the Tonle Sap floodplain occupies a roughly maximum size between 10,000 – 15,000 km2. Together with the Mekong Rivers and its tributaries, the freshwater capture fisheries production was 300,000 – 400,000 tons per year, making Cambodia the 4th highest in the world after China, India and Bangladesh (van Zalinge, 2002)

Prior to the 1970s, Cambodia's fish production density was regarded high of up to 20 tonnes/km2. This reflected in a Cambodian proverb saying that "where there is water, there is fish". Inland capture fisheries are more significantly important to Cambodian people than marine fisheries. Catch figures showed that 80% of fish production came from inland fisheries. However, freshwater fisheries productivity has been declining dramatically due to the population growth, resulting in pressure on the natural resources and their ecosystems. A number of human activities are believed to be the factors behind the decline of the resource, for instance, the use of illegal fishing gears and fishing practices, encroachment on inundated forest for rice cultivation, hunting and energy resources.

From 1970-75, fisheries management suffered seriously from the rebel armies who occupied many parts of fishing lots. Consequently, many fishing areas were abandoned and fishing activities was neglected.

From 1975-79, the communist Khmer Rouge took over the power and typical collective management was commonplace throughout Cambodia. Hence, there was no private sector, but public property. Fishing activities were carried out under a direct order of local authorities in the form of small scale fishing.

After 1979, according to (Thay, 2001), the fisheries resources and exploitation have been managed in different arrangements, which can be summarized as below:

- Public fishing area (1979-82): The country was just left by the Pol Pot regime and people could fish freely in all fishing domains (public fishing areas). Fisheries management in the country had not yet been organized and Department of Fisheries was not yet re-established.
- Solidarity groups (1982-89): The Department of Fisheries was organized and the fisheries resources and exploitation were managed through solidarity groups or Krom Samaki in Khmer language.
- Fishing Lot auction (1989-98): The fisheries law had been re-enacted. The basis of this law was a modification and upgrading law from 1965. Since then, the fishing activities were divided into three categories, the large scale fisheries (commercial), middle scale fisheries and family fisheries (subsistence).

In recent years, a new version of fisheries law has been amended under the technical support of foreign experts in order to adjust the situation of the present fishing practices. A sub-decree on fishing community has also been issued lately to fulfill the need when the fishing community is being introduced within the fishing villagers.

The purpose of this paper is to give an over view of present status of Cambodian capture fisheries with special reference to inland fisheries and its socioeconomic impact on the present and future policy-decision making.

II. Status of capture fisheries

1. Large-scale fisheries

1.1 Fishing Lots (Loh Nessart):

In Cambodia, fishing lots are the largest freshwater fishing industries as well as fishing gears in term of fishing area, catch and production cost. Fishing lots are concession auctioned by stakeholders or bidders. These lots are given to the bidders, who offer the highest price, the exclusive rights in exploiting them over a two-year period. It is one of the Government instruments to generate revenues from fisheries resources.

At present time, fishing lot is the only unique system found in Cambodia. In 2001, there are 167 fishing lots covering an area of 852,900 hectares, which comprises of lakes, sand bank and riverine fishing lots. Fishing lots are allowed to operate in the open fishing season from October to May when river water recedes gradually to its lowest level in the dry season (Nov – April) and fish schools follow the water level from the inundated forest and floodplain back to the main rivers. Commercial fish species, known as "black fish" or latitudinal migratory species are caught by this type of fishing lots. The dominant species are snake head fish (Channa micropeltes and Channa striata).

1.2 Dai lots (Loh Dai):

Dai is a kind of bag-net or stationary trawl net positioned across the river to capture fish migrating downstream. The legal set-up of Dai is like that of fishing lot, but instead of a piece of land and water, an anchoring portion of river is auctioned. Dai lots are tent to be much cheaper on average of input cost than fishing lots. Most of the auctioned Dai locations are along the Tonle Sap river, in which in the present biennial term 63 Dai lots (38 in Kandal province and 25 in Phnom Penh) are operated from October through March (Nao et al., 2000).

The less commercial fish species known as "white fish" or longitudinal migratory species move out of the submerged forest and land around the Great Lake into the lake itself when the flood recedes. They then migrate via the Tonle Sap to the Mekong River. More than half of the catch in open fishing season is made in January – the peak migration occurs within one to six days before the full moon. The bulk of the catch consists of small "white fish" species especially trey riel (Henicorhynchus spp.). They are processed into fish paste (Prahoc), fish sauce or salted and dried fish.

There are another 13 freshwater lobster bag-net fishing lots (Dai Bangkong) designing to catch freshwater shrimp (Macrobracium) that migrate down to the spawning grounds of brackish water at the last part of Mekong River in Vietnam. Dai Bangkong is located in Prey Veng province of the Mekong Delta.

2. Middle scale fisheries:

Middle scale fisheries must also be operated with license. Various type of fishing gears are determined by fisheries law in term of size, length and catch capacity. The size is generally smaller than that of large scale fishing gear, but bigger than that of family fishing gear. This type of fisheries can take place in an open access fishing grounds outside the area of fishing lots.

Middle scale fisheries are very widespread and fish caught from this type are more than the large-scale fisheries in total, but less than the family and rice field fisheries (see Table 1). As research work is limited, about 40 gear types are being monitored, although quite a few more are being used in many parts of the country.

The most common gears used in Cambodia as well as in the Mekong River, the Tonle Sap River and the Great Lake are seine nets, small river trawl nets, beach seines, gillnets, traps, cast nets, scoop nets, hooks and lines and brush-parks...etc. Apart from the fishing lots, these kinds of fishing gears are operated by full and part-time fishers in all accessible freshwater fishing areas.

As Middle scale fishers use mobile gears and their fishing grounds are often changed, fish caught varies from a low economic value to the high economic value species.

After 20th October 2000, the government policy for improving food security and poverty reduction of the Cambodia people, was reform of fisheries management. All the medium-scale fisheries do not need to pay tax.

3. Small scale or family fisheries and rice field fisheries

Small scale fisheries (subsistence or family fisheries) are allowed to take place without license all year round in the open access and only in the closed fishing season (June – September) in the fishing lot areas. Similar to that of middle scale fishing gears, small scale fishing gears are namely almost the same, but just smaller in size and length as defined by fisheries law. However it is banned in the protected areas of fish sanctuaries. Productions from middle scale fishers are almost just enough to support the daily food, as the size, length and effectiveness of fishing gears are very limited. Although the daily catch of each family is relatively low, the number of small scale fishers increases over time. About 4.19 million people live in 51 fishing districts in 8 provinces (5 province around the Tonle Sap Great Lake, Kampong Cham, Kandal and Phnom Penh) in which 2.3 million people live in fishing dependent communes (Ahmed et al., 1998). This number is believed to increase sharply in the last 5 years. Consequently, production from small scale fisheries was estimated in between 115,000 to 140,000 tons per year (see Table 1).

Rice field fisheries refer to the production of fish caught from rice fields as the result of floodplains which brought along fish to inundated areas. As survey on rice field fisheries has never been done, the method of estimation was adapted from that in Thailand, while in Cambodia, one hectare of rice field was assumed to have 25 – 26 kg fish. With the approximate 1.8 million hectares of rice field, the annual production may be within the range of 45,000 – 110,000 tones (see Table 1).

Table 1. Range of the annual inland water catch in the years from 1994 to 1997
Annual catch range (tons)

No.	*Type of Fisheries*	*Production (tons)*
1	Large scale fisheries	
	- Fishing Lot[1]	30,000 - 60,000
	- Dai (bag-nets) [2]	15,000 - 20,000
2	Middle scale fisheries [3]	85,000 - 100,000
3	Family fisheries [3]	115,000 - 140.000
4	Rice field fisheries [4]	45, 000 - 110,000
	Total	290,000 - 430,000

1. Range reflects uncertainty in actual catch levels.
2. Range shows approx. minimum and maximum values in 1994- 98
3. Based on socio-economic survey data extrapolated to entire country.
4. Approx. 1.8 million ha x likely range of fish yield: 25 - 26kg/ha

Source: Deap et al., 1998; Ahmed et al.1998

III. Management of capture fisheries

1. Biological objectives

The reversal of the Tonle Sap river flow normally takes place in July and as a result water depth increases greatly. The average water level in the Great Lake is about one meter in April and increases to over 9m at the peak of the floods (Mekong Secretariat 1993). The surface areas of lake and river expand 3-5 times in size, covering the belt of flood forest, degraded forest and wetlands surrounding the lake and river. Fish migrating upstream invade these inundated areas for feeding and reproduction. Biological productivity is at a peak in this period. In September/ October, a second flow reversal occurs and the Tonle Sap River starts flowing once more from the Great Lake to the Mekong River. As the water level decreases, fish migrate back to lake and river. At this time, some of the large scale fisheries using the filtering devices, such barrier traps, lake fences, traps (lob nor) and the Dai fisheries start operating.

The Mekong systems are rich of biodiversity, particularly fish species. More than one thousand fish species were caught from the Mekong Rivers, in which more than 500 species were caught in the Cambodia Mekong River (Rainboth W.J, 1996). However, only less than 100 species have been caught and recorded around the Tonle Sap and Great Lake by large and medium scales fishing gears. Nao et al., (1996) stated that there were approximately 280 fish species from the main rivers and floodplains of Mekong River gaining access to the productive floodplain (see Table 2)

Table 2. Area of floodplains and other water resources

Type of floodplain and Water resources	Area 1985/87 (ha)	Area1992/93 (ha)
Permanent water (river, lake, pond, etc.)	567,100	411,100
Flooded forest	795,400	370,100
Flooded secondary forest	28,200	259,800
Flooded grassland	80,800	84,900
Flooded rice field (receding& floating rice field)	17,500	29,300
Seasonally flooded crop fields	366,800	529,900
Swamp	12,200	1,400
Total	1,868,000	1,687,000

Source: Ahmed et al., 1996

2. Economic

2.1. Economic Importance

Fisheries in Cambodia play not only a key role in national economy, but also a vital role in feeding millions of poor people who could not afford to buy protein from other sources. Poor people depend on accessibility (access to fishing grounds), availability (fish is available everywhere) and the cheap price.

Although fish consumption per capita per year was calculated by different experts at different time, place and method, ranging from 13.5kg (Csavas, 1994) to 86.8 kg (Ahmed et al., 1998), the MRC/ DoF socio-economic survey of 4.2 million in central Cambodia estimated that average fish consumption was 67kg/person per year.

The Agricultural sector is the mainstay of Cambodian economy, contributing 75% to employment, 45% of GDP and exporting (JICA, 1997). Base on the data of DOF's fish price calculated by So Nam et al., (1999), the fisheries contribution to GDP is 5.4%. While the calculation of van Zalinge et al., (1999) and Ahmed et al., (1998) based on the MRC project data found the contribution of fisheries sector was from 8.8% to10.3% of GDP.

Report of the Ministry of Planning, National Institute of Statistics showed that from 1995 to 1999 (see Table 3), agricultural sector contribute about 41% of GDP (GDP by economic activity with constant 1993 price) in which fisheries represents from 8.6% in 1995 to 10.5% in 1999 (ADB, 2001).

Table 3. Gross Domestic Product by Economic Activity (constant 1993 price)

Economic Activity	1995		1996		1997		1998		1999	
GDP	Riel	%	Riel	%	Riel	%	Riel	%	Riel	%
Agriculture	2,812	41.7	2,874	40.4	3,039	41.2	3,115	41.5	3,162	40.1
Fisheries	582	8.6	630	8.9	679	9.2	716	9.5	830	10.5
Unit =billion Riel										

Source: National Accounts of Cambodia, Ministry of Planning, NIS (adapted from Sina L., 2002)

3. Social objectives and description of fishing community

Social objective in fisheries has become the core issue recently in Cambodian social conflicts when different stakeholders competes the same fisheries resources. These stakeholders consist of large scale fishers (minor) who have money and power and the poor middle scale/small scale fishers who represent the majority. Large scale fishers pay high price license and occupy the large and rich fishing grounds. While other 2 types of fishers who pay little fee of less grade license/free of tax are able to access to limited fishing grounds. When the daily catch gradually decline and fisher population grows steadily, the conflicts in competition of resources are inevitable.

Conflicts in fisheries refer to complaints, contention or violence among all types of resource users, including powerful armed forces behind any group or individual stakeholders (Peter D., et al., 1999). Except the large scale fishers, other 2 types of fishers usually live together in a concentrated places or villages that are often called the "fishing community".

However the term "Fishing community", according to Ly S., (2002), refers to a combination of many fishing families/fishing villages in a given geographic area where their major livelihood depend on fishing. Fishing community also refers to a large group of families or villagers who live in places considered as fishing commune (sometimes it is called fishing district) regardless of their jobs. Therefore, within the fishing commune there are always fishing households and non-fishing households.

The idea of community based management has been initiated and discussed since the early 1990s among NGOs and FAO projects, for example, the FAO project phase I in 1994 on the participatory natural resource management in the Tonle Sap region.

Apart form that, the creation of fishing community has also been mentioned and advised by many foreign technical advisors to the fisheries department as a part of contribution to poverty reduction policy of the government.

Consequently, the creation of fishing community has come to light after 2 remarkable events emerged in 2000. The first event was a serious conflict in November, 1999 between local fishing villagers and the owners of fishing lot No. 7 and 8 in Battambang province. The conflict became unsolvable when villagers' customary access fishing grounds were confiscated by fishing lot owners. In a series of new confrontations in January 2000, a fisherman (villager) was shot and wounded (and was later amputated) and others were arrested or threatened to be shot to death. The incident further escalated in the same month, prompting the intervention from the deputy prime minister, but it was still in vain.

Finally, the NGO forum on fishing conflict in Battambang was created in February 2000. The forum was participated by all levels of representatives, including the rival factions, governors, legislators and high ranking officials from the ministry of agriculture, forestry and fisheries.

The second incident was the arrest and jailing of poor fishermen by the fisheries inspectors of Siem Reap province in October 2000. Having heard the complaints from the victim families the prime minister became politically motivated and gave an order to cut and convert many fishing lots (56% of the total fishing lot areas), fired several senior fisheries officials and suspend all fisheries inspectors from Tonle Sap and the Great Lake for 5 months.

A final draft of sub decree on the creation of fishing community was adopted in early 2001, and staff training for the establishment has been under way since then. The sub degree consists of 7 chapters in 22 articles. Its main purpose (chapter I, article 1) is to:

1 – Implement the royal government policy on the sustainable management of fisheries resources.

2 – Make people aware of the importance of fisheries resources.

3 – Legalize and facilitate the local people in creating their own fishing communities in order to help manage, protect and develop sustainable fisheries resources.

4 – Improve the living standard of people, especially the poor.

5 – Decentralize the power and rights to give to the fishing communities.

4. Ecological objectives

The topography of Cambodia is dominated by flat or occasionally lowland plains in the interior of the country, where highlands and mountains along the border surround it. Among the total area land area accounts flow 176 65.2 Km2 (97.31 %), and water area is 4,869.84 Km2 (2.69%) (Nao & Ly S., 1997).

The central and eastern parts of the country are rich of inland water systems. Cambodian Mekong River, which has 500 Km long, its water flows into 4 main branches namely, the Great Lake, the Tonle Sap River, the Lower Cambodian Mekong River and the Bassac River.

The four rivers meet together at Chaktomuk area or in French called "Quarter Bras". According to CNMC (2000) the average water flow into the TS River was just only 11-23% from the Mekong River during wet season, while the Lower Mekong River receives 62-68% and the Bassac River 12-14%. The Great Lake, which is a vast water body in wet season, is connected to the Mekong River by Tonle Sap River. During the wet season (May-October) its surface reaches 900,000-1,400,000 ha, and covers flooded forest and some rice fields. The Cambodian Mekong River, the Tonle Sap River, and the Great Lake have many estuaries surrounding them.

The Mekong River has 6 estuaries and most of them are small rivers and streams. The Tonle Sap totally has 6 streams flow into it, and 32 estuaries in which the water flows in and out every year depend on season. Also, the Great Lake has 10 streams surround it. And finally, there are two streams flowing into the Bassac River (Seng, 1992).

VI. Constraints in the management of capture fisheries

Most countries in South East Asia have had many problems with over fishing, particular in developing countries. And what are happening to the fisheries sector in Cambodia? Does it have any problems in term of fisheries management?

The first problem is thought to be over fishing, particular inland capture fisheries. The Great Lake and the Tonle Sap River are the main freshwater fishing lots in Cambodia, and are believed to be the most productive area of the region, but the current fishing condition is believed to be fully exploited on small size of fish and overexploitation for larger size of fish. Van Zalinge and Nao (1999) hypothesized the state of exploitation of stocks of larger, and small migratory fish species, and showed that large fish and medium sized fish are overexploited, while the small fish are full exploited. Furthermore, Csavas et al., (1994) pointed out that circumstantial evidence shows that inland fisheries of Cambodia are under stress as indicated by the decline of larger size of fish in the catch and reports by fishers and the Department of Fisheries. Also, Castro & Huber, (1992) stated that if the population size is very small, the number of young being boom is also small because there are not many potential parents. The decreasing of fish stocks due to changes of ecosystems within freshwater environment such as habitat degradation.

Secondly, the Department of Fisheries as well as the government lacks of human resource, especially high degree of manpower such as M.Sc and PhD fellows. The number of fishery officers who obtained postgraduate degree was very small compare with lower degree officers. At the present time, there is no a single graduated PhD fellow in the field of fishery or living aquatic science.

Thirdly, the Department of Fisheries also lacks of scientific data. Even there are some data recorded by the DoF, but these are not scientifically reliable data. There was no time series data of fish stocks. Therefore, any stock assessments are really needed to estimate of the fishing effort, the fish landed, and the biological processes and the fishing operations. Other parameters are also needed such as natural mortality and recruitment in order to find out the maximum sustainable yield (MSY) and maximum economic yield (MEY). When these parameters are found, the wise management and allocation of resources will be implemented in a sustainable way for the long use for the next generation to come.

Fourthly, the occurrences of illegal fishing activities and transportation of fishery product have been happening within the whole country. Fishers have fished and transported fisheries products illegally by supporting from high rank officers, and sell them to neighboring countries. Sometimes when local population do not have enough food to support their families, they have do all the things to catch fish to earn little income for their living standard, even they know that they are destructive or illegal activities.

Fifthly, the exiting fisheries law and regulation are very poor. they are not proper tools for scientific -based fisheries management and the allocation of the resources. The law is being dealt with only passive fishery management, witch input controls have been use as management tools such as ban on gears, gear size, closed season, closed areas, etc. Even the law exited since 1987, but its enforcement has been very poor due to the DoF lacks of infrastructure such as patrol boats, and the corruption scandals that have been occurred within the inspective officials for many decades.

Sixthly, there are too many conflicts between resource users and manger, especially when the population of Cambodia increases very fast. People need land to build their houses and establish agricultural farms to support their families, while the government as well as the DoF needs the land for fishing lots or fish sanctuaries. If we use more land as fishing ground/fishing lots and/or fish sanctuaries, people do not have land for settlement and doing their farms, however if all land are used by farmers, people won't have any fish to eat and feed their families anymore.

There also have been many conflicts between the lot's owners and local people on the fishing right and property. Local people want to catch fish around their villages where these areas became fishing lots successfully auctioned by the owners, and these owners do not allow local people to fish within their lots. These matters have been occurred in many provinces of freshwater fishing ground, and there is intervention from high rank politicians, including the Prime Minister.

Seventhly, there has been a problem of too much bureaucratic with the DoF as well as the Ministry of Agriculture, Forestry and Fisheries. In order to deal with something related with fisheries and/or fisheries management and development, there are long complicated procedures for decision-making, and it takes long and long time to reach the decision.

Finally, the Department of Fisheries has faced limitation of national budget and infrastructure deficiency. The DoF does not have enough money to run its administration and also all offices in all provinces. Those offices are very poor and don't have any modern office materials such as computer, photocopy machine, fax, phone etc., except the office of the DoF only.

Therefore, these are the problems and constraints that have occurred within the fisheries sector of Cambodia, and the long term rehabilitation and improvement are required in order to lead the fisheries sector to get into an advance level like in developed countries in order to develop and manage the fisheries into sustainable way.

V. Conclusion

In order to achieve the goal of reform, namely sustainable management of these resources, the Department of Fisheries has been updating the fisheries law, sub-decree and proclamations for use in the present situation. Moreover, the sub-decree on fisheries community was drafted just after the fisheries reform.

With regards to management of the fishing area set aside from the fishing lots, and to avoid conflicts between local fishermen, the Department of Fisheries has worked toward community based fisheries management. This concept is new for the local people and it take the time to make them understand this system for protection and conservation of fisheries resources in their commune. In this case, the government has to provide training for the local fishing community about the advantages of resources for the next generation, and let them to participate in the management activities within their area.

References

Ahmed M., Hap Navy, Ly Vuthy and Marites Tiongco, 1998. Socioeconomic Assessment of Freshwater Caputure Fisheries of Cambodia. Report on a household survey. 185 pages.

ADB, 2000. The Country Economic Review of Cambodia. Homepage address: http://adb.org/Documents/CERs/CAM/default.asp

Castro P., & Huder M., 1992. Marine Biology.

Csavas I., Debas L., Doulman D.J., Petr T.O., & Prado J., 1994. Cambodia Rehabilitation and Development needs of the Fishery Sector. FAO, Rome.

Dirk Lamberts & Tim Sarath, 1997. Base Line Information on the Ecology of the fish and habitats of Flood Area of the Tonle Sap Lake in Seim Reap Province, Cambodia.

Deap L., Ly Sina., & N. P. van Zalinge, Editors. 1998. Catch Statistics of the Cambodian freshwater fisheries. MRC/DoF/Danida Project for the Management of the Freshwater Capture Fisheries of Cambodia. Mekong River Commission, Phnom Penh, Cambodia. 186 p.

Department of Fisheries, MRC/DANDA Project for Management of the Freshwater Capture Fisheries of Cambodia, January 1999. Present Status of Cambodia's Freshwater Capture Fisheries and Management Implication.

Gum, W. 2000. Inland Aquatic Resources and Livelihoods in Cambodia: A guide to the literature, legislation, institutional framework and recommendations. Oxfam GB and NGO Forum on Cambodia, Phnom Penh. Cambodia.

Ing Try, Sao Vansereyvuth, and Thay Somony, 2001. Small Scale Fisheries Management in Cambodia.

Ing Try, 2001. The Current State of Fisheries Management in Tole Sap River.

Ing Try and Kim Sour, 2001. The Present Status of Fisheries Management in the Tonle Sap, Cambodia.

JICA, 1997. The Agricultural Development Study of the Mekong Flooded Area in Cambodia. Draft Final Report. Sayu Consultants Inc.

King, M. 1995. Fisheries Biology, Assessment and Management.

Ly K. H., 1990. A Compiled Theme of Fishery Laws (in Khmer language).

Lieng S., Yim C. and N.P van Zalinge 1995. Bagnet (Dai) Fisheries in Tonle Sap River, Cambodia.

Mekong 1993. Development Plan for Tonle Sap and Chakdomuk. Phase I. Report by ORSTOM and BCEOM for the Mekong Secretariat, Bangkok

Nao Thuok & Ly Sina, 1996. Review of the Fisheries and Aquaculture Sector in Cambodia. Paper prepared for the project: CMB/95/003, Natural Resources –Based Development Strategy for the Tonle Sap Area.

Nao Thuok, 1997. Freshwater Capture Fisheries Management in Cambodia, issues and Constraints.

Lim P., Lek S., Touch S.T. Diversity and Biology of Freshwater Fishes at Great Lake and Tonle Sap River of Cambodia.

Ly Sina, 2002. Cambodia Fisheries Conflicts in the Post War Era and the Creation of Fishing Communities. (Paper submitted to) the Japanese Journal of Regional Fisheries, 2002.

Ly Sina, 2002. The Socioeconomic Issue of Cambodia's Freshwater Fisheries. (Paper accepted to publish in the) Japanese Journal of Regional Fisheries.

Peter Degen and Mong Leng, 1999. Socioeconomic issues: fisheries research activities and "awareness building". Paper prepared for the annual meeting of the DoF, 19-21 January 1999 and was published in "Present status of Cambodia's Freshwater capture fisheries and management implications. p. 25.

Rainboth, W. J. 1996. Fishes of the Cambodia Mekong. FAO species identification field guide for fishery purposes.

So N., and Nao T., 1999. Cambodia Aquaculture Sector Review (1984-1999) and Outline of National Aquaculture Development Plan (2000-2020). A report of Fisheries Department.

Thay, S. 2001. Current perceptions of local fishermen about community fisheries or co-management of fisheries.

Touch, S.T., 1995. Present Status of Fisheries in Cambodia and the Development Action Plans. The Department of Fisheries. Phnom Penh. Cambodia.

Van Zalinge, N. P. & Nao, T. (Eds.) 1999. Present Status of Cambodia's Freshwater Capture Fisheries and Management Implications. Nine presentations given at the Annual Meeting of the Department of Fisheries of the Ministry of Agriculture, Forestry and Fisheries, 19.21 January 1999. Mekong River Commission and the Department of Fisheries, Phnom Penh, Cambodia.

Van Zalinge, N. P., 2002. Status of the Cambodian Inland Capture Fisheries Sector. With special reference to the Tonle Sap Great Lake. Paper prepared for the MRC Fisheries Program, 27 Jan. 2002.

Wayne Gum, 2000. Inland Aquatic Resources and Livelihoods in Cambodia. Oxfam, GB and NGO Forum on Cambodia.

Word Bank, 2001. Cambodia Agricultural Productivity Improvement Project Fisheries Component Identification

Cambodia Paper 3 : Power Point

Annex 5c

THE ACHIEVEMENT OF THE PILOT PROJECT AND THE WORK PLAN 2005 (INDONESIA)

DYAH RETNOWATI

PILOT PROJECT :

THE DEMERSAL FISHERIES IN THE NORTH COAST OF PEKALONGAN, CENTRAL JAVA PROVINCE, INDONESIA

I. INTRODUCTION

For fisheries management purpose, Indonesian marine area is divided into nine marine fisheries management area, i.e. (1) Malacca Strait, (2) South Chine Sea, (3) Java Sea, (4) Makasar Strait and Flores Sea, (5) Banda Sea, (6) Seram Sea and Tomini Bay, (7) Sulawesi Sea and Pacific Ocean, (8) Arafura Sea, and (9) Indian Ocean. Among nine marine fisheries management area, Java Sea has an important role in fisheries development. This area is indicated in an over fishing condition and dominated by small-scale fisheries. About 90% of fishing boats in this area is boats size less than 10 GT.

The stock assessment in Java Sea shows that fish resources have been over exploited. The result of stock assessment was conducted by Ministry of Marine Affairs and Fisheries and Indonesian Science Institute in 2001 is only demersal fisheries that still has an opportunity to be developed in Java Sea. However, its development has to consider carefulness principle because the demersal fishes in this area have been exploited around 89% from MSY in 2001.

Fishers conflict often happened in Java Sea as an impact of over fishing condition. The limited fish resources are fought over by fishers. Some coastal fishers in the north coast of Java exploit demersal fishes and most of them using danish seine. Their productivity tends to decrease and the fishing ground also more and more far from coastal. This condition needs to be investigated and then monitored routinely.

II. PILOT PROJECT IMPLEMENTATION

Pilot project of identification of demersal fisheries indicators in the north coast of Pekalongan conducted for 3 years, i.e. since year 2003 untill 2005. This activity is part of SEAFDEC project, namely "Identification of Indicators for Sustainable Development and Management of Capture Fisheries". This project was formulated under the Special 5 Year Program of SEAFDEC to support ASEAN member countries in the implementation of the Resolution and Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region adopted at the Millennium Conference "Fish for the People" was held from 19 - 24 November 2001 in Bangkok, Thailand.

Indicators are tool that planned to be implemented to monitor the status of demersal fisheries in the north coast of Java. Data collection conducted in Pekalongan through one fishing port, i.e. Pekalongan Fishing Port, and two fish landing sites, i.e. Wonokerto Fish Landing Place and Jambean Fish Landing Place.

Pilot project for seeking data of indicators in Pekalongan started in 2003 by investigated available data in one fishing port and two fish landing sites above.

In 2004, coordination to the Central Java Province Fisheries Office and Pekalongan District Fisheries Office just could be undertaken. Coordination to the Fisheries Offices most be needed since the three landing sites are in the work-area of those offices. In this year, catch and effort data collection is undertaken by Directorate General of Capture Fisheries through cooperation with Pekalongan Fishing Port, Pekalongan District Fisheries Office, Wonokerto Fish Landing Place and Jambean Fish Landing Place, while the biological data conducted by Research Center for Capture Fisheries. Unfortunately, the biological data could not be done by Research Center for Capture Fisheries due to the constraint budget in this office. Data processing in this year is only conducted for catch and effort data, while income data will be processed in the beginning of 2005 since the data collection just finished in the end of year 2004. The stakeholders meeting also planned to be conducted in 2004 after data ready to be informed to the stakeholders and this meeting already conducted in 24 November 2004.

The pilot study is continued in 2005. Activities that will be conducted are grouped to 3 activities, i.e. data collection of secondary data and continuation of catch and effort data, data processing of income data and continuation of processing of catch and effort data, data analysis, and preparation of the pilot project report.

III. STAKEHOLDERS MEETING

Stakeholders meeting was conducted on 24 November 2004 in location of the pilot project i.e. Pekalongan, Central Java Province. The objectives of this meeting are:

- To inform indicators for monitoring fisheries resources and for fisheries management.
- To inform the preliminary result of the pilot project.
- To obtain indicators which are agreed by stakeholders.

The participants of this meeting were central and local government institutions related to fisheries, association of fishermen and fishers who operate the demersal danish seine with local name are cantrang and arad. The details institutions of participants are as follows:

- Directorate General of Capture Fisheries.
- Research Center for Capture Fisheries
- Fisheries and Marine Provincial Office of Central Java
- Pekalongan Fishing Port
- Development Center for Fishing Technology
- Marine and Fisheries District Office of Pekalongan
- Marine and Fisheries City Office of Pekalongan
- Wonokerto Fish Landing Place
- Jambean Fish Landing Place
- Indonesian Fisherman Association of Pekalongan
- Fishers of cantrang and arad in Pekalongan

The result of discussion among participants in this meeting is all participants agreed with type of indicators that are will be used for fisheries management are as follows:

1. Fleet/capacity indicators
    i. Number of boats
    ii. Size of boats / size of engine
    iii. Type and number of fishing gears
    iv. Fishing time
    v. Average age of boats
2. Resource indicators
    i. Landing volume
    ii. Catch per unit effort (CPUE)
    iii. Catch composition
    iv. Species and number of species
    v. Average fish size

3. Social and economics indicators
    i. Landing value
    ii. Number of fishers
    iii. Number of workers related to fisheries in landing places
    iv. Revenue
    v. Fish consumption
    vi. Contribution to government income

IV. THE PRELIMINARY RESULT OF THE PILOT PROJECT

The information of cantrang fisheries obtained from Wonokerto Fish Landing Place and information of arad fisheries obtained from Jambean Fish Landing Place. Meanwhile, in Pekalongan Fishing Port, the data of cantrang and arad caught are mixed together since these fisheries are minority. The majority of landing in Pekalongan Fishing Port are mini purse-seine catches.

From data processing result and analysis the fisheries condition in Pekalongan are different between cantrang and arad fisheries. Number of boats of cantrang and arad in Pekalongan Fishing Port and cantrang in Wonokerto Fish Landing Place as well as arad in Jambean Fish Landing Place tent to decrease in period of 2001 – 2004. The landing volume and the landing value in Pekalongan Fishing Port and Wonokerto Fish Landing Place decreased but in Jambean Fish Landing Place increased, but the average price of fishes in these three places increased. The CPUE of boats in Pekalongan Fishing Port and Wonokerto Fish Landing Place decreased but in Jambean Fish Landing Place increased.

There are 17 species that can be identified from landing of cantrang and arad fishing boats in Pekalongan shing Port, 7 species from cantrang fishing boats in Wonokerto Fish Landing Place and 9 species from arad shing boats in Jambean Fish Landing Place. From Pekalongan Fishing Port can be known that CPUE of 5 species i.e. Pomfret, Eastern little tuna, Mackerel, Squid and Rays decreased in period of 2001 – 2004, as well as unidentified species or that categorized by others. In Wonokerto and Jambean Fish Landing Places, there are 5 species that its CPUE decreased, i.e. Sulphur goatfish, Croacker, Rays, Ponyfishes and Greater lizardfish.

V. CONCLUSSION

From preliminary result of the pilot project in Pekalongan, Central Java Province can be known that the CPUE of combine cantrang and arad fishing boats in Pekalongan Fishing Port decreased in 4 years period (2001 – 2004), but the CPUE of arad fishing boats in Jambean Fish Landing Place still increased. The income data is still on-going process and could not be presented in this paper.

MALAYSIA

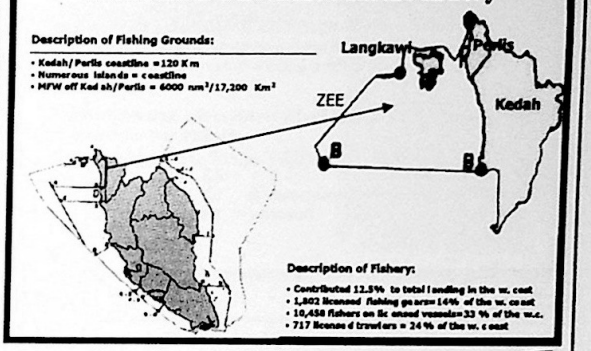
MALAYSIA
Status of the implementation

Pilot Project on the use of indicator for sustainable development and management of Zone B trawl fisheries in the states of Kedah/Perlis

KEDAH & PERLIS: Marine fishery

Description of Fishing Grounds:

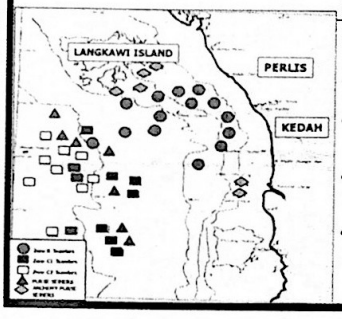
- Kedah/Perlis coastline = 120 K m
- Numerous islands = c oastline
- MFW off Kedah/Perlis = 6000 nm²/17,200 Km²



Description of Fishery:

- Contributed 12.5% to total l anding in the w. coast
- 1,802 licensed fishing gears= 14% of the w. coast
- 10,458 fishers on lic ensed vessels= 33 % of the w.c.
- 717 licensed trawlers = 24 % of the w. c oast

KEDAH & PERLIS: Trawl fishery



Description of Zone B trawl Fishery:

- Fishing ground is > 5 nm from the coastline
- Contributed 47% of landings at t he state
- 231 (Perlis) & 486 (Kedah) licensed trawl gears=40% licensed gears in the states
- 2,956 fishers on licensed trawlers=28% of the fishers in the states
- 717 licensed trawlers = 24% of the w. coast

KEDAH & PERLIS: Zone-B Trawl fishery

Description of Zone-B trawl Fishery:

- Number of vessels:
- Fishing areas
  - Around Paya group of islands
  - Water depth 10 to 55 m
- Status of demersal fish resources
  - Highest catches recorded in 1982
  - Survey results show sharp declined in density (t/km²):

1971	2.56
1981	1.43
1991	0.47
1997	0.21

Work Plan 2003: INDICATOR for Zone-B Trawl fishery in Kedah & Perlis

Activities/ Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1. Planning Stage:	●	●										
1.1 Expert consultation conference			■									
1.2 National Steering Committee					■							
2. Core-group meeting						■						
3. National Expert- group Meeting							■					
4. 1st Stakeholder Consultative Workshop								■				
5. Collecting of new data & data analysis									●	●	●	●

Work Plan 2004: INDICATOR Trawl fisheries in Kedah & Perlis

Activities/ Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1. Data analysis/ review on socio-economic survey	●	●	●	●	●							
2. Data collection on demersal fish resources & Environment parameters				●	●	●						
3. Second National Stakeholder Consultative Workshop							■					
4. Meeting on establishment of indicator for Sustainable Trawl Fisheries in Kedah/Perlis												
5. Meeting for preparation of the draft of Fisheries Management Plan												
6. National workshop with Stakeholder on Management Plan												
7. Presentation of the Draft Management Plan to the DoF												
8. Implementation on Fisheries Management Plan- Present to DoF												

Calculation of Total Score of Indicators

Overall condition for the study area is calculated by summing the scores for all the indicators and dividing by the total number of indicators, where good = 5, fair = 3 and poor = 1

The Zone B of Kedah and Perlis received the following score:

	Kedah	Perlis
1. Vessel & Fishing capacity(1)	1	1
2. Socio-economy(21)	2.3	2.8
3. Environment & Fish resources(9)	1.2	1.2
Average =	1.9 (poor)	2.3 (poor)

Revised Work Plan for 2004: Trawl fisheries in Kedah & Perlis

Activities/ Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1. Data analysis/ review on socio-economic survey	●	●	●	●	●							
2. Data collection on demersal fish resources & Environment parameters				●	●	●						
3. Second National Stakeholder Consultative Workshop							■					
4. Formation of Special Committee to Study proposal from Fishers Association of Kedah: to make Zone B free from trawler										●		
5. Counter Proposal on ways to implement Trawl-free Zone B of Kedah												●
6. Preparation of budget to implement the proposal												●

Revised Work Plan for 2005: Trawl fisheries in Malaysia

Activities/ Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1. Meeting on establishment of Indicator for Sustainable Trawl Fisheries in Kedah/Perlis												
2. Meeting for preparation of the draft of Fisheries Management Plant												
3. National workshop with Stakeholder on Management Plant												
4. Presentation of the Draft Management Plan to the DoF												
5. Implementation on Fisheries Management Plant												

Next Activities

- Taken appropriate management action based upon the situation of the resources and fishing operation monitored by the applied indicator
- Review on the effectiveness and shortcomings of the indicators and improve the indicators and data collection
- Identified effective indicators to be used
- Adoption of the indicators – adopt the same indicators to trawl fishery in the other part of the country

Thank You

Jabatan Perikanan Malaysia

Terima kasih

1. Planning Stage:

1.1 Expert Consultation conference: March 2003

Key conclusion:

- There is excess fishing capacity in coastal area – need to be reduced
- Urgent need to have action program for rehabilitation of the resource
- Encourage the use of indicators for management of the fisheries

1. Planning Stage:

1.2 Formation of National Steering Committee on Management of Coastal Fisheries

The committee:

Chairman: Deputy Director General of Fisheries
Members: DDG of WCF
DDG of FDAM
Dir. Of Research, FRI
MIMA
MOA
Secretary: Technical Project officer (Indicator)

Oversee the implementation of activities:

- Pilot Project on development of indicator for Zone-B trawl fishery in Kedah & Perlis
- Exit Plan for excess fishing capacity in Kedah & Perlis
- Pilot project on co-management (in Kedah & Perlis)

2. Core-group meeting

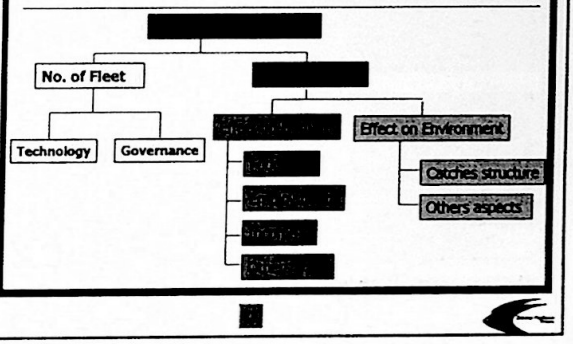
(To prepare for the National Expert Meeting)

- The meeting in June,2003:
  - To prepare scope
  - Framework
  - Criteria
  - Objectives
  - Potential indicators
  - Reference points for trawl fisheries in Kedah &Perlis

Resource & Environment

Output from Core-group Meeting

(Framework for sustainable development & Management of trawl fisheries)

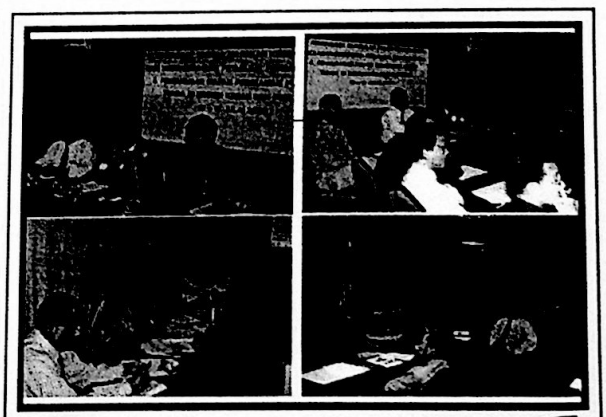


3. National Expert-group Meeting

- review the proposed indicators identified by the Core-group
- prepare for the First Stakeholder Consultative Workshop

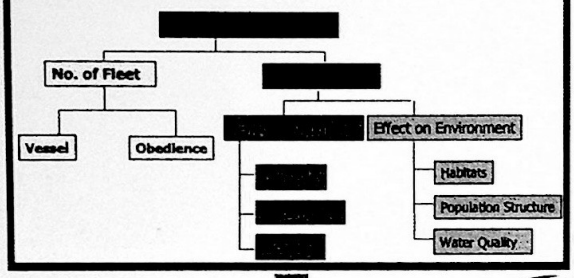
Members (July,2003):

1. MoA
2. MOSTe
3. Research Agencies. (FRI, DoM&G, UUM WFC)
4. DoF
5. DoM&G
6. FDAM (LKIM)
7. MIMA
8. EPU Kedah & Perlis



National Expert-group Meeting in July 2003, Langkawi, Kedah

Output from Expert-group Meeting

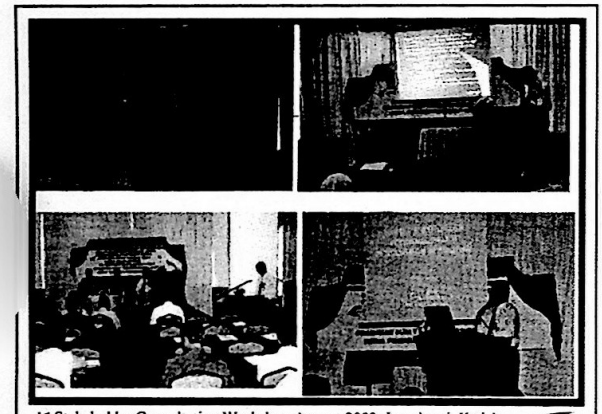


4. First Stakeholder Consultative Workshop

- To identified parameters agreed to be used as potential indicators for sustainable development & management of trawl fisheries in Kedah & Perlis
- Establish the mechanism for data collection, data provider and responsibility

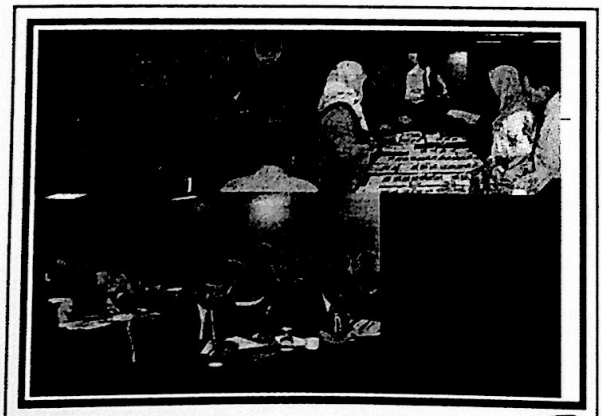
articipants:

0 participants
0% are Stakeholders in
Kedah & Perlis:
- Zone-B trawl fishers
-Shipping & Transportation
-Processors
-Universities
-NGOs



1st Stakeholder Consultative Workshop August 2003, Langkawi, Kedah

5. Second Stakeholders W/shop



Accepted Indicators

Indicators accepted for sustainable development and management of Zone B Trawler in Kedah & Perlis:

1. Vessel & Fishing Capacity
2. Socio-economy of the fishers
3. Environment & Fish Resources

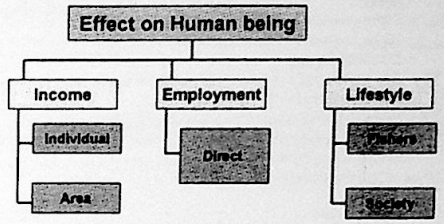
Indicator for Vessel & Fishing Capacity (1)

- OBJ: To sustain fishing capacity at the level that produce sustainable exploitation

Combination of:

- ✓ No. of licensed and illegal Zone B trawlers
- ✓ Tonnage of the Zone B trawlers
- ✓ Horse power of the Zone B trawlers

Indicators for the Socio-economy of the Zone B Trawl fishers

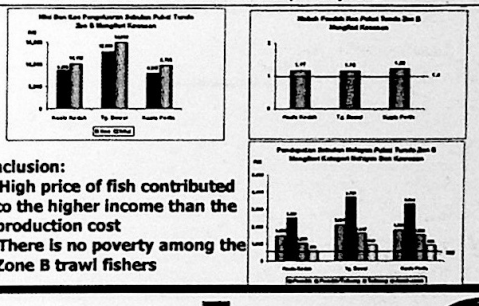


Indicator for Socio-economy of the Fishers (22)

- OBJ: Improve socio-economy wellbeing
  - ✓ Income (3 indicators)
  - ✓ Contribution to the area (3)
  - ✓ Job opportunity (2)
  - ✓ Social status (9)
- OBJ: Improve social level
  - ✓ Social acceptance (5)

Income Indicators

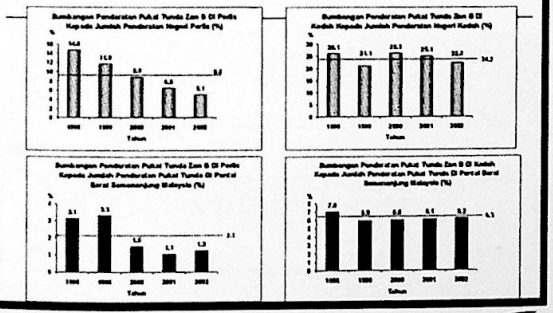
Target: i. Production value & benefit are more that production cost
ii. Income is above the national poverty level



Conclusion:
i). High price of fish contributed to the higher income than the production cost
ii). There is no poverty among the Zone B trawl fishers

Contribution to the Area

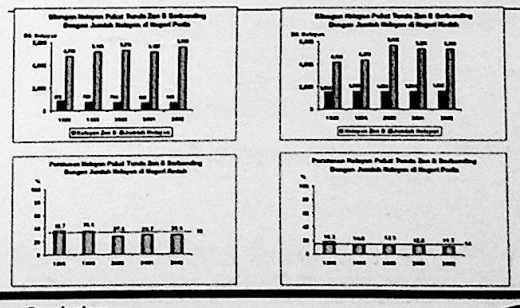
Target: Above than the average contribution for the last 5 years



Conclusion:
Significant reduction on the total landings of the Zone B trawlers

Job Opportunity

Target: Maintain at the average percentage of the last 5 years



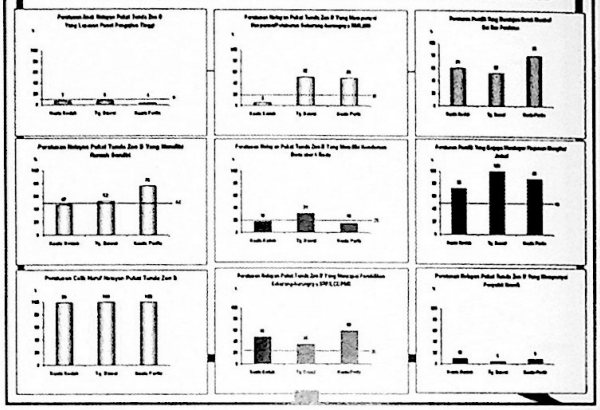
Conclusion:
Reduction on the job opportunity in Zone B trawler

Social Status

Target:
- 50% owned a house
- 20% owned a 4-wheel drive vehicle
- 100% literacy
- 20% at least received education up to secondary school
- 10% graduate children
- 20% with saving/investment of >RM1,000.00
- 50% able to fully repay their fishing loan according to term/schedule.
- <10% with chronic disease

Conclusion:
Zone B trawl fishers in Kedah have lower social status than those in Perlis

Social Status of Zone B Trawlers in Kedah and Perlis States



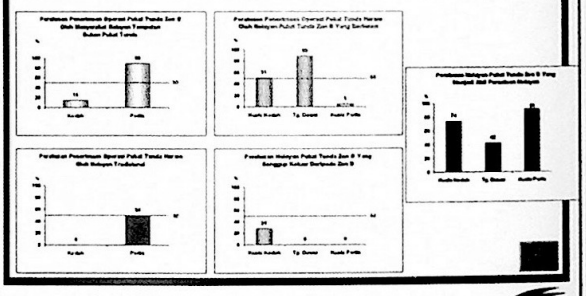
Social Acceptance

Target:
- 50% acceptance

Conclusion:

Kedah State	Perlis State
- Zone B trawler is not accepted by other gears	- Zone B trawler is accepted by other gears
- Illegal Zone B trawler is not accepted by traditional gears	- Illegal Zone B trawler is accepted by traditional gears
- Illegal Zone B trawler is accepted by Zone B Trawler	- Illegal Zone B trawler is not accepted by Zone B trawler
- 28% of the Zone B Trawl Fishers willing to leave the Zone B area	- Zone B trawl fishers want to remain in the Zone B area

Social Acceptance



Indicators for Environment & Fish Resources (9)

- **OBJ: <u>To Maintain biodiversity</u>**
  - ✓ Catch composition
  - ✓ Indicator species
  - ✓ Total biomass/Abundance
- **OBJ: <u>To Reduce overfishing</u>**
  - ✓ Catch rate
  - ✓ Exploitation rate
- **OBJ: <u>To Maintain a healthy fish stock</u>**
  - ✓ Average catch size

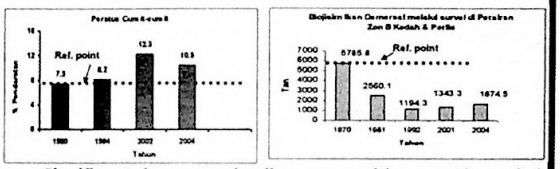
Indicators for Environment & Fish Resources

- OBJ: To maintain a healthy fish stock
  - ✓ Percentage of trash fish in the catch
- OBJ: <u>To maintain the structure of food web</u>
  - ✓ Trophic level
- OBJ: <u>To reduce the effect of trawling</u>
  Benthos composition/abundance

To Maintain Biodiversity

Target:

No changes since trawl started to operate in the area



- Significant changes on landings composition over the period 1970 to 2004

Conclusion:

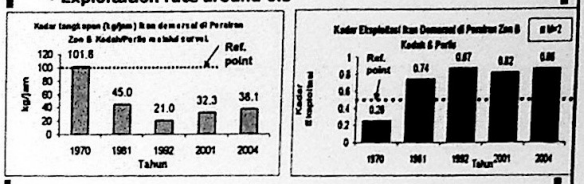
Reduction on biodiversity

-> need management measures to mitigate the situation

To Reduce Overfishing

Target:

- The same catch rate as the catch rate when trawl started to operate in the area
- Exploitation rate around 0.5



Conclusion:

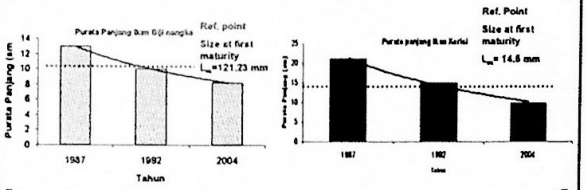
Demersal fish resources have been over-exploited

-> need management measures to mitigate the situation

To Maintain a Healthy Fish Stock

Target:

- Mean size of the caught fish is above the Lm



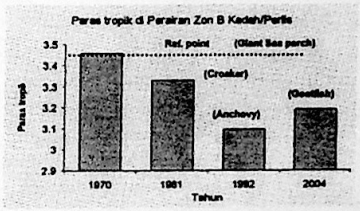
Conclusion:

Fish was caught before reaching maturity stage

To Maintain the Structure of Food Web

Target:

- No changes since trawl started to operate in the area



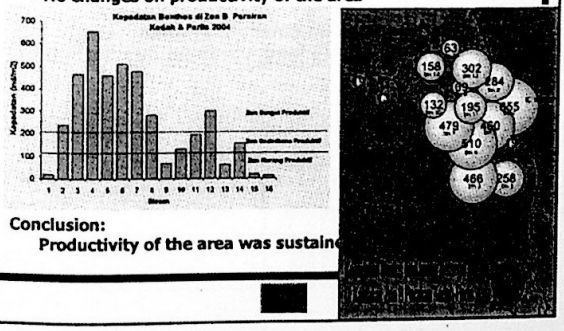
Conclusion:

Reduction on trophic level

To Reduce Effect of Trawling on Benthos

Target:

- No changes on productivity of the area



Conclusion:

Productivity of the area was sustain

Annex 5e (1)

MYANMAR : Proposal For Pilot Study

THE USE OF INDICATORS FOR THE SUSTAINABLE FISHERIES DEVELOPMENT AND MANAGEMENT IN MYANMAR

Win Myint Maung

1. Introduction

The Union of Myanmar is the largest country in mainland South-East Asia, comprising a land area of 676,577sq: kilometers with a population of approximately 53 million in 2004. Myanmar is geographically located in Southeast Asia between latitudes 09° 32' N and 28°31' N and longitudes 92° 10' E and 101° 11' E. It stretches for 936 km from east to west and 2,051 km from north to south. The length of the contiguous frontier is 6,129 km, sharing 1,370 miles with China, 1,370 miles with Thailand, 832 miles with India, 1,687 miles with Bangladesh and 148 miles with Laos respectively.

The fisheries sector plays an important role in contributing to the social and economic development of Myanmar where the people are consumers of rice and fish. Vast sea, abundant natural inland waters, men made reservoirs and different climates promise the most favourable natural conditions for the growth of varied aquatic fauna and flora.

2. Marine Fisheries resources

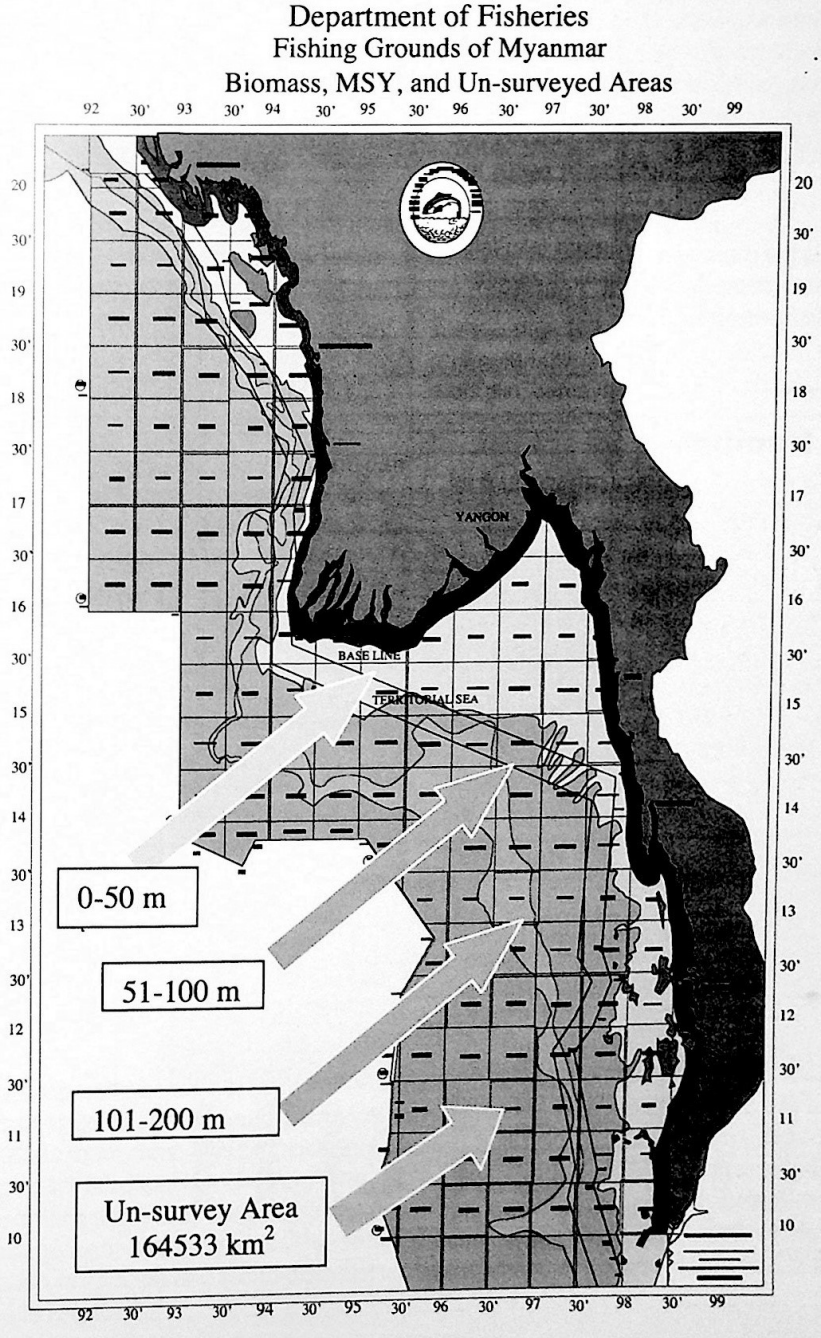
Marine capture fisheries are an important industry of the country. The industry is major contributor to the country's economy in term of employment, foreign exchange earnings and supplies the most needed dietary protein requirements of the population. The length of the coastline from the mouth of Naff River to Kawthoung is approximately 2,832 km. The total swamp area along the coastline, serving as spawning nursery and feeding grounds for aquatic and near shore brackish water fauna is about 0.5 million hectares. The continental shelf covers an area of 228,781 km2 and Exclusive Economic Zone (EEZ) is 486,000 km2. According to the survey results of the marine fishery, it was noted about 1.0 million metric ton of pelagic and 0.75 million metric ton of demersal fish are existing as biomass in Myanmar marine fisheries waters. Out of total biomass, 0.5 million metric ton of pelagic fish and 0.55 million metric ton of demersal fish, altogether 1.05 million metric tons is marked as annual sustainable yield (MSY) out of which 0.93 million metric ton was exploited in 2000-2001. (See table 1 and table 2)

Table 1: Total biomass and MSY in Myanmar marine waters.

Area	Biomass			MSY		
	Demersal	Pelagic	Total	Demersal	Pelagic	Total
Rakhine	0.194	0.175	0.369	0.160	0.087	0.247
Delta (Yangon, Areyarwady, Mon)	0.334	0.505	0.839	0.220	0.252	0.472
Thanintharyi	0.256	0.295	0.551	0.17	0.147	0.317
Total	0.784	0.975	1.759	0.550	0.486	1.036

Table 2: Total biomass and MSY in Myanmar marine waters by depth.

Area	Biomass(tones)			MSY (tones)		
		Depth (m)			Depth (m)	
	0-50	51-100	101-200	0-50	51-100	101-200
Rakhine	14462	46672	3115	120000	38000	2400
Delta (Yangon, Ayeyarwady, Mon)	266864	52061	15311	171600	37400	11000
Thanintharyi	148692	94855	12818	98600	62900	8500
Total	560018	193588	31244	390200	138300	21900



3. Marine Capture Fisheries

Marine capture fisheries can be categorized into two main types' namely coastal or inshore fisheries and deep-sea fisheries.

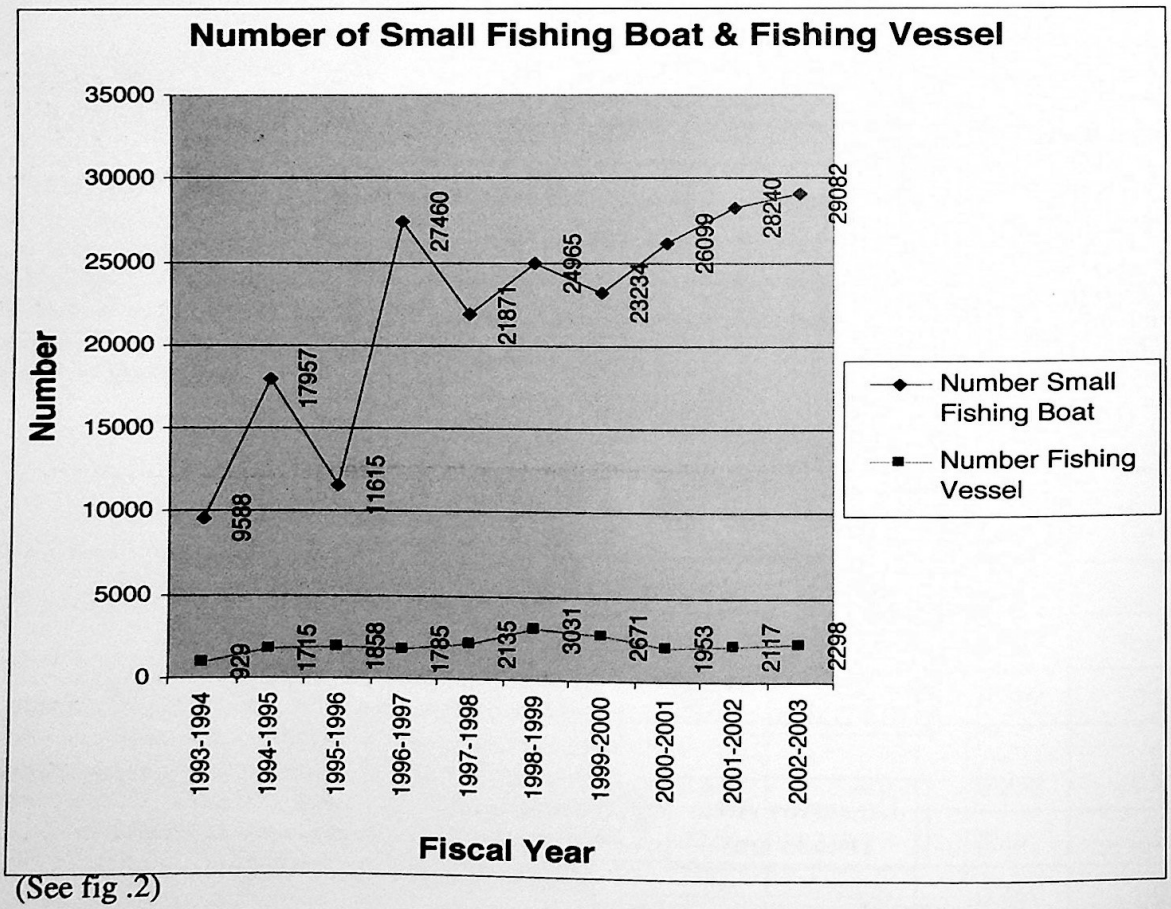
(a) Inshore fishery

Coastal or inshore fisheries, where the fishing vessels operate with in the area from shore line out to 5 nautical miles in the northern area and to 10 nautical miles in the southern area, is an important sub-sector in socio- economic terms. Fishing vessels range from the traditional type to commercial vessels of <30 feet or using engines < 12 HP and operating in zone 1. The fishing season in the inshore fishery is from the first day of April to last day of March in the following year.

(b) Offshore fishery

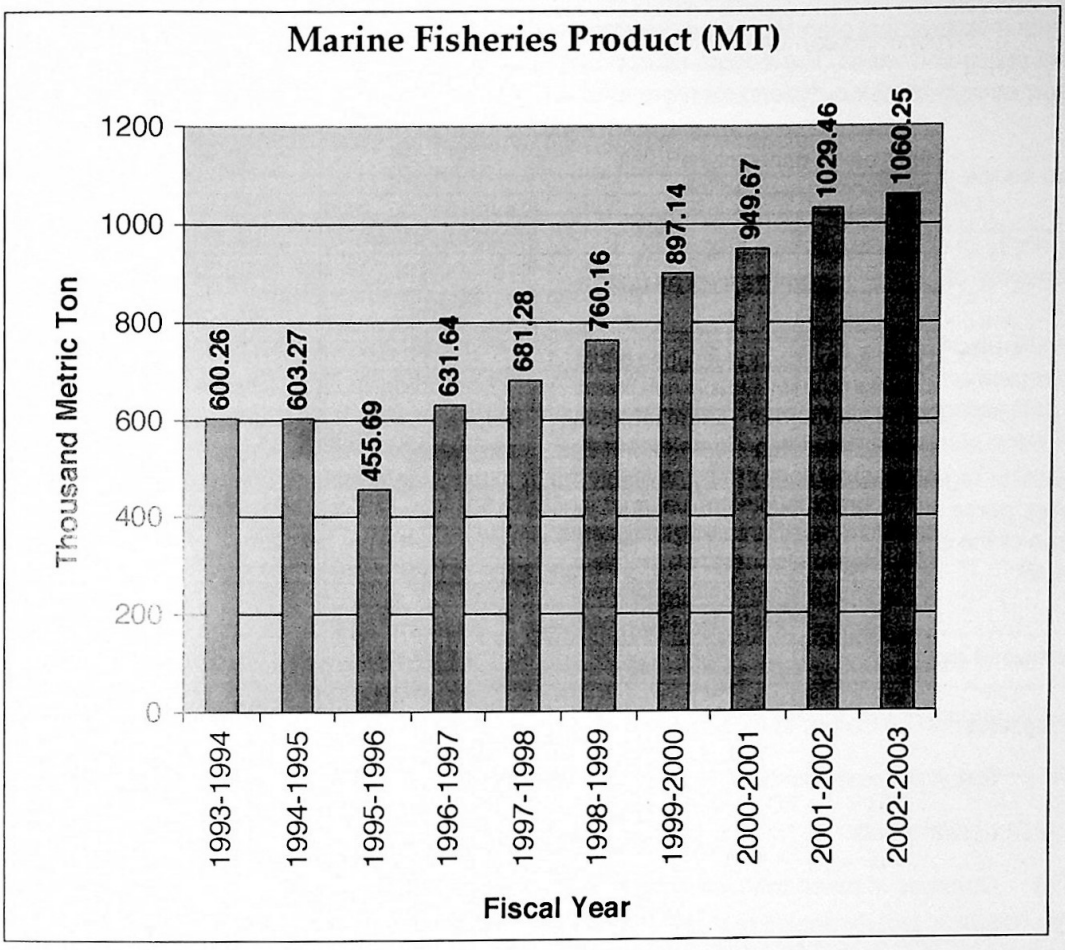
Offshore fisheries means the capture fishery that is being operated by active fishing gears (e.g. trawl nets, purse seine nets, etc.) using fishing vessels > 30 feet in overall length and with engine power >12 HP. The offshore fishery fishing grounds are beyond the outer area of the demarcated inshore fishery areas stretching from 10° 00' N to 20° 00' N. The main fishing gears, used for this fishery are bottom trawl, purse seine, surrounding net, drift net, pole and line, long line and trap. The fishing season in the offshore fishery is from the first day of September to last day of August in the following year.

Trawl is the main gear that contributed substantially towards the total marine production in Myanmar. The greater composition ratio of the fishing gear is trawl that is the most famous method for the modern fishermen and fishing industries.(See fig.1)



(See fig .2)

It can be seen the gradually growth of the marine production 1993 to 2003. (See fig .2)



The management of the fisheries resources by using stock assessment models is not suitable in Myanmar water, because multi-species and non-targeted fisheries nature. Fishes are also harvested by the used of multiple wide range of fishing gear and methods. And also it could not control fishing capacity, over exploitation the resources with sustainable manner. Alternative methodologies for the assessment control of the fisheries resources are urgently required.

The Regional Technical Consultation on the use of indicators or the sustainable development and management of capture fisheries in the ASEAN region meeting held Kuala Terengganu, Malaysia, in September 2002, produced the recommendations and 5 proposals for the pilot projects. And also provide the basic for policy consideration on indicators for sustainable fisheries management. The indicators provide a bridge between the objects and actions.

In the alternative management models using indicators have to be based on communities, stakeholders, NGO's participations to be needed and effective.

4. A proposal for implementation of pilot studies on indicators

This proposal is prepare to assist the fisheries management system development, in particular management for specific fisheries at specific site. Indicators provide supporting information relating to the state, pressure and response of the fisheries resources. This proposal includes the initial project formulation, data collection, analysis and interpretation for pilot studies on indicators. The mechanism for data collection should ideally be contained within routine government statistical collection networks which could incorporate management objectives and action-oriented management requirements. Research support of the collection and verification of data e.g. taxonomic identification of species and standardization of fishing effort, and the collection of biological information on selected species is required.

5. Fisheries management plans

Fisheries management plan should be developed shape and guide management direction basing on clear government policy and vision. The bottom up approach that include stakeholder consultation and participation offer transparency in decision-making for more effective management.

6. A Plan for the pilot study

The priority of selected plan for pilot study are firstly, a community of Ayeyarwady region and secondly a small community of Rakhine region, because these areas are easy to access timely manner.

The DOF also has to establish the project resource personnel who are deeply involvement in this project. And it is urgently needs to provide the training for the resources personnel the methodology to collect the scientific data using indicators.

In Rakhine region, there are many communities that involved in fisheries. The types of fishing method are trawl fishing, purse seine, drift, long line fishing and so on. The level of education in that community is very low. The income of the community is moderate condition, socio that economic conditions of the fisher are above the poverty level.

7. Selection of indicators

The selection on indicators to be used is –

7-1. Catch per unit effort

7-2. Landing data

7-3. Changes in mean total length

7-4. Changes in catch composition

7-5. The size of spawners (at 50% maturity) or percentages of spawners

7-6. Fishing capacity

8. Catch per Unit Effort

CPUE could be a possible indicator to be considered because it is often used as an index of stock abundance, where some relationship is assumed between the index and the stock size. In addition, it can also be used in monitoring economic efficiency. However, addition data on costs and earnings are needed. A part from that, the use of CPUE or catch rate as an indicator is easier for fishermen to recognize their reduced fish capture in their product quality per unit effort.

CPUE can be calculated directly from the vessel landing, catch is recorded by units of effort. However, generally both catch and fishing effort are recorded separately and CPUE is derived from these data.

Table.3. Catch Data

Data type	Data and information required
Total Catch	■ By species (or species group) ■ By type of gear ■ By area of capture(Fishing ground) In weight; number; number of buskets/bins/boxes; holds (volume)

Table.4. Effort Data

Data type	Data and information required
Fishing Effort (by fishing area)	■ Number of vessels; by size; by type of fishing gear; ■ Number of fishing gear; By type ■ Number of hours in operation (haul, trip, day etc.)

9. Decrease in mean total length

The mean length of fish can be used as an indicator as it can be seen from one of the over exploitation indices on occurrence of the smaller to less smaller sizes of fish caught trough a time period. In addition, fishermen could also observed from the smaller size of fish caught over the period of time. Data and information required to support mean total length indicators are shown in table 5.

Table.5. Mean total length

Data type	Data and information required
Mean total length	■ Sampled fish species, length, weight, catch weight by size grading

10. Changes in percentage of species composition

It is also proposed indicator for consideration in ASEAN region as it indicates impact of fishing on species of catch. In addition, a change in composition the exploited species community can also be an indicator of the overall health if the ecosystem.

Table.6. Species Composition

Data type	Data and information required
Species and size	■ Catch by species in numbers and weight by species (from sampled fish species, number of baskets/ bins/ boxes/ holds by species) ■ Percentage of species composition in catch
Indicator species	■ Indicator species in specific fisheries

Changes in number of species (Changes in bottom biodiversity) may also be used as indicator to develop management action as declining of species diversity and changes of benthic community indicates well-being of habitats and resources that are affected from fishing gear and practices.

Table.7. Changes in Number of species

Data type	Data and information required
Species composition. Species diversity	Number of species of benthic fauna

11. Site of spawners or percentage of spawners in the catch

Changes inside of spawners or percentage of spawners in the catch can also be indicator as it could be observed from declining, greater effort to catch the same smaller amounts of fish, or decline in average size of fish, as sign of required management actions. Toward management action, one step is to determine the size of the spawners that can be caught, as it is scientifically proved that the spawner size or time to reach size as spawners will generally decrease in accordance with the abundance of stock. Size of spawners of commercially import species can be used as an indicator.

Table.8. Size of the spawners

Data type	Data and information required
Size of the spawner	■ Number and size of the spawners caught for commercially important species. ■ Percentage of spawners in catch

12. Data analysis and interpretation

The evaluation of performance of indicators in the fisheries management plan, reference point needs to be established. These can be based on the earliest available baseline data. Information available at the time of implementation of the management plan or measure. The trend of an indicator observed relative to a reference point provides for the assessment of the situation that determines the necessary action to be implemented for sustainable development and management of capture fisheries in Myanmar.

13. Cost of Pilot Project

It is need to negotiate for financial support to the SEAFDEC/MFRDMD Organization.

Proposed Tentative Plan

14. Approval for pilot project proposal was received at the end of October 2004. Due to the time constraint activities for data collection can not be initiated in 2005 as we need to take time to prepare. Two biologists shall be on board of the trawlers to facilitate data collection in the next year. The task of data collection shall be commenced on January 2006. Focal point for the data collection process shall be located at Thabyugyaing, Than Dwe Destrict in Rakhine State. Two biologists shall be on the trawlers and data collection shall be conducted. The two biologists shall be assigned to submit a report in every four months period except June and July at these two months are dedicated as closed season for severe rough sea and natural hazards.

U Khin Maung Win, the Director for the Fisheries Revenue and Supervision shall take responsibility of Project Coordinator and conduct the close supervision in terms of fisheries data collection. U Myint Phe, Assistant Director shall be assigned for responsible supervision of the project. Based on the amount of project fund, the detailed work programme shall be prepared and sent back in nick of time.

15. Conclusion

This proposal hopes to utilize the knowledge and experiences in the identification and use of indicators for the development and management of capture fisheries in Myanmar. The results obtained from the pilot project studies completed will be used for the formulation of the Regional guidelines on the Identification and Use of Indicators for the Sustainable Development and Management of Capture Fisheries in ASEAN region.

Annex 5f

Philippines

Annex 5g

Thailand

MYANMAR

THE USE OF INDICATORS FOR THE SUSTAINABLE FISHERIES DEVELOPMENT & MANAGEMENT IN MYANMAR

Presented by

Win Myint
Department of
Union of Mya

Introduction

- Land area - 676,577 sq.km
- Coast line - 2832 km
- Coastal area - Raknine, Ayeyarw & Tanintharyi
- Continental shelf 228,781 sq.km

CLIMATE

- Southwest Monsoon;
- Rainy Seasons (Mid May to Mid Sept)
- Cold Seasons (Mid Sept to Mid Jan)
- Hot Seasons (Mid Jan to Mid May)

POPULATION

- Over 53 million- annual growth rate 1.184%.
- Mainly consumer of fish
- Par capita consumption rate 26kg/yr(2003)

MARINE FISHERIES

- Marine fisheries water&environment
- coastline - 2832 km ;
- continental shelf - 230,000 sq-km
- Territorial sea; 486,000 sq-km EEZ
- Rakhine coastal region - (740km;367,780sq-km)
- Ayeyarwady delta zone (35,138sq-km)
- Tanintharyi coastal region- 1200km
- Mainland coast; 43,344 sq-km
- Myeik Archipelago (800 islands-34,340)

Marine fisheries resources

Biomass and MSY in Myanmar marine waters.

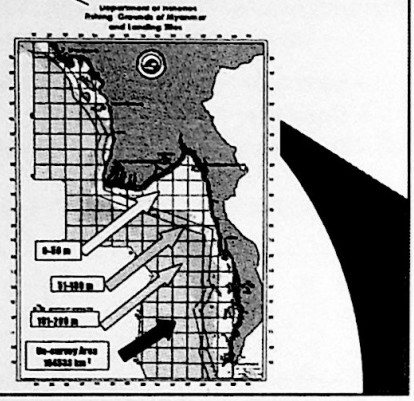
AREA	Biomass			MSY		
	Demersal	Pelagic	Total	Demersal	Pelagic	Total
RAKHINE	0.194	0.175	0.369	0.16	[illegible]	0.247
AYEYARWADY DELTA (Yangon,Areyarwady, Mon)	0.334	0.505	0.839	0.220		[illegible]
THANINTHARYI	0.256	0.295	0.551	0.17	0.1	
TOTAL	0.784	0.975	1.759	0.550	0.48	

Marine fisheries resources

Total biomass and MSY in Myanmar marine waters by depth.

Area	Biomass(tonne)			MSY (tonne)		
	Depth (m)			Depth (m)		
	0-50	51-100	101-200	0-50	[illegible]	101-200
Rakhine	14462	46672	3115	120000		2400
Delta (Yangon, Ayeyarwady, Mon)	266864	52061	15311	171600	3[illegible]	
Thanintharyi	148692	94855	12818	98600	62900	
Total	560018	193588	31244	390200	136300	

Marine fisheries resources



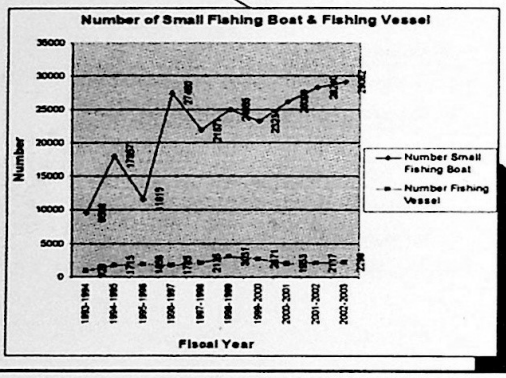
Marine fisheries resources

Marine capture fisheries

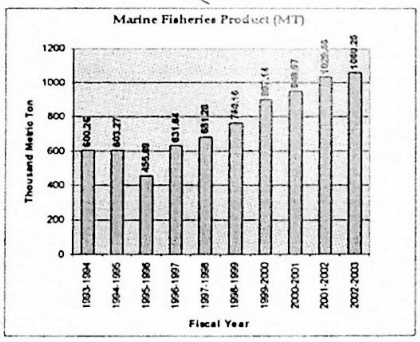
a. In-shore Fishery
   - 5 nautical mile from shore (*Rakhine coast*)
   - 10 nautical mile from shore (*Ayeyarwady & Tanintharyi*)
   - no more 12 h.p engine & 30 Feet length of the boat
   - 12,043 - 12,846 mechanized boats 1999-2000 to 2002-2003
   - 11,191-13253 non mechanized boats 1999-2000 to 2002-2003

b. Off-shore fishery
   - Outer area of inshore to end of EEZ
   - More than 12 H.P engine boat
   - Bottom trawl, Purse seine, Surrounding net, Drift net & Long line.

Marine fisheries resources



Marine fisheries resources



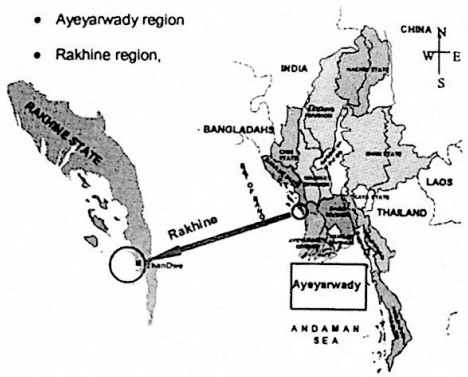
Plan for implementation of pilot studies on indicators

This action plan is prepare to assist the fisheries management system development, in particular management for specific fisheries at specific site. Indicators provide supporting information relating to the state, pressure and response of the fisheries resources. This proposal includes the initial project formulation, data collection, analysis and interpretation for pilot studies on indicators. The mechanism for data collection should be contained within routine government statistical collection network could incorporate management objectives and action-oriented management requirements. Research support of the collection and verification e.g. taxonomic identification of species and standardization of fishing and the collection of biological information on selected species is required

Fisheries management plans

- should be developed shape and guide management direction basing on clear government policy and vision. The bottom up approach should include stakeholder consultation and participation to offer transparency in decision-making for more effective management.

- Ayeyarwady region
- Rakhine region,



Selection of indicators

- Catch per unit effort
- Landing data
- Changes in mean total length
- Changes in catch composition
- The size of spawners (at 50% maturity) or p... ...ges of spawners
- Fishing capacity

Catch per Unit Effort

- could be a possible indicator to be considered
- often used as an index of stock abundance
- where some relationship is assumed between the index and the stock size
- can also be used in monitoring economic ... ...iency
- addition data on costs and earnings are need...
- a part from that, the use of CPUE or catch rate a... indicator is easier for fishermen to recognize thei... fish capture in their product quality per unit effort.
- can be calculated directly from the vessel landing.
- generally both catch and fishing effort are recorded separately and CPUE is derived from these data.

Catch Data

Data type	Data and information required
Total Catch	•By species (or species group) •By type of gear •By area of capture(Fishing ground) In weight; number; number of buskets/b.../boxes;holds (volume)

Effort Data

Data type	Data and information required
Fishing Effort (by fishing area)	•Number of vessels; by size; by type of fishing ge... •Number of fishing gear; By type •Number of hours in operation (haul, trip, day etc.)

Mean total length

Data type	Data and information required
Mean total length	• Sampled fish species, length, weight, catch weight by size grading

Species Composition

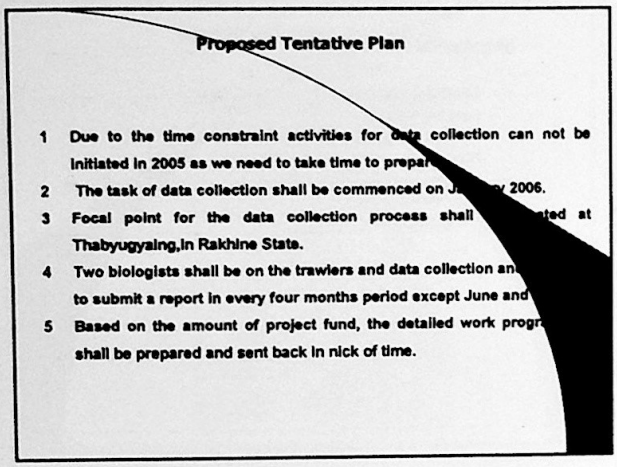
Data type	Data and information required
Species and size	• Catch by species in numbers and weight by species(from sampled fish species, number of bins/ boxes/ holds by species) • Percentage of species composition in catch
Indicator species	• Indicator species in specific fisheries

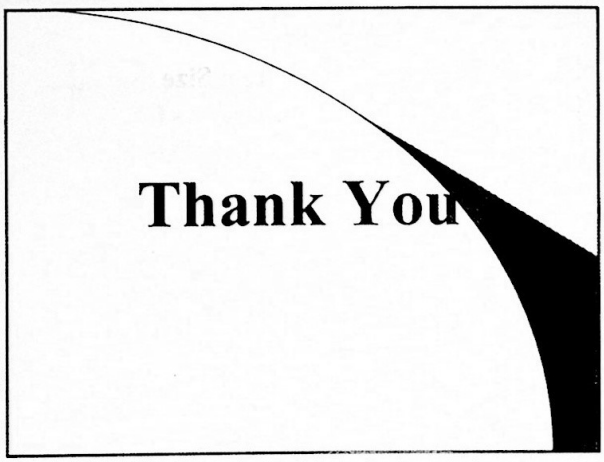
Changes in Number of species

Data type	Data and information required
Species composition. Species diversity	Number of species of benthic fauna

Size of the spawners

Data type	Data and information required
Size of the spawner	•Number and size of the spawners caught for commercially important species. •Percentage of spawners in catch


Proposed Tentative Plan
1 Due to the time constraint activities for data collection can not be initiated in 2005 as we need to take time to prepar
2 The task of data collection shall be commenced on J y 2006.
3 Focal point for the data collection process shall ted at Thabyugyaing,in Rakhine State.
4 Two biologists shall be on the trawlers and data collection an to submit a report in every four months period except June and
5 Based on the amount of project fund, the detailed work progr shall be prepared and sent back in nick of time.


Thank You

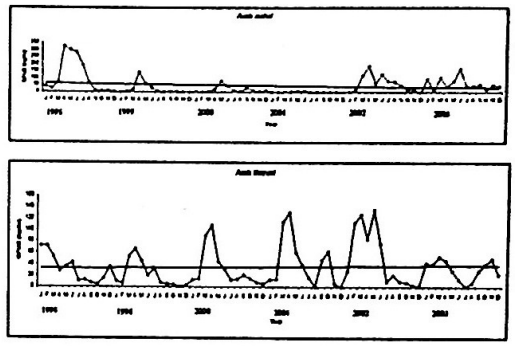
Annex 5f

PHILIPPINES

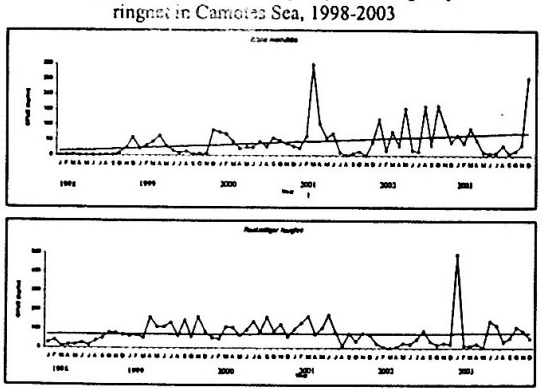
The Use of CPUE, Mean Size and Size of Spawners as Indicators for the Management of Ringnet Fisheries in Camotes Sea

Noel C. Barut (Proj. Leader)
Grace V. Lopez &
Eunice C. Bognot

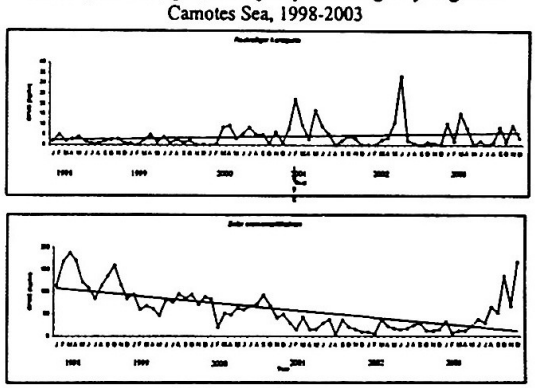
Monthly CPUE (kg/hr) of major species caught by ringnet in Camotes Sea,1998-2003



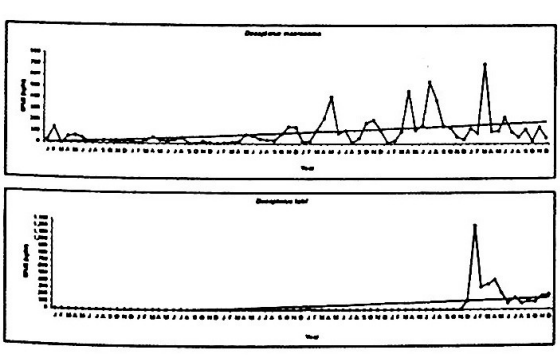
Monthly CPUE (kg/hr) of major species caught by ringnet in Camotes Sea, 1998-2003



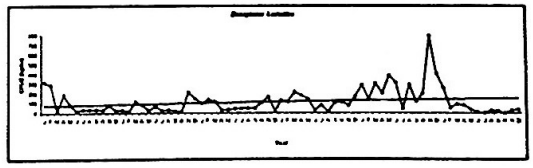
Monthly CPUE (kg/hr) of major species caught by ringnet in Camotes Sea, 1998-2003



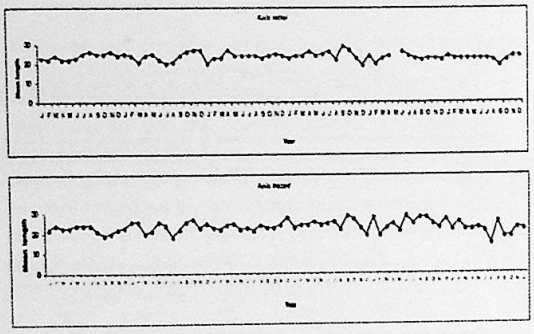
Monthly CPUE (kg/hr) of major species caught by ringnet in Camotes Sea, 1998-2003



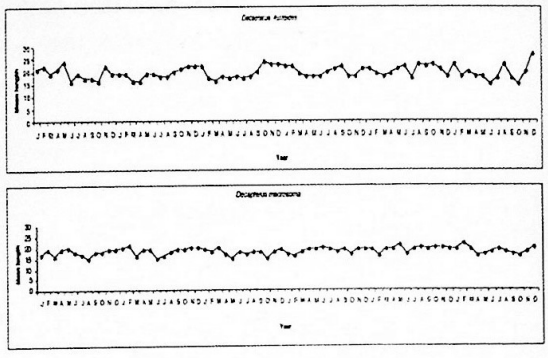
Monthly CPUE (kg/hr) of major species caught by ringnet in Camotes Sea, 1998-2003



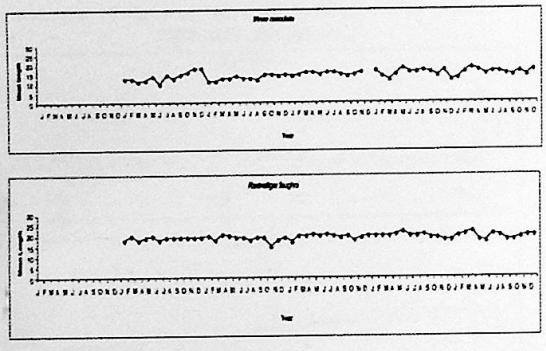
Monthly mean length (cm) of major species caught by ringnet in Camotes Sea, 1998-2003



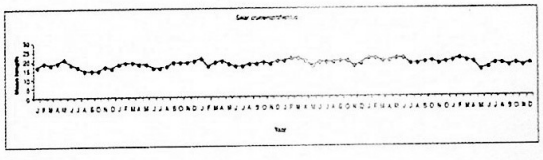
Monthly mean length (cm) of major species caught by ringnet in Camotes Sea, 1998-2003



Monthly mean length (cm) of major species caught by ringnet in Camotes Sea, 1998-2003



Monthly mean length (cm) of major species caught by ringnet in Camotes Sea, 1998-2003



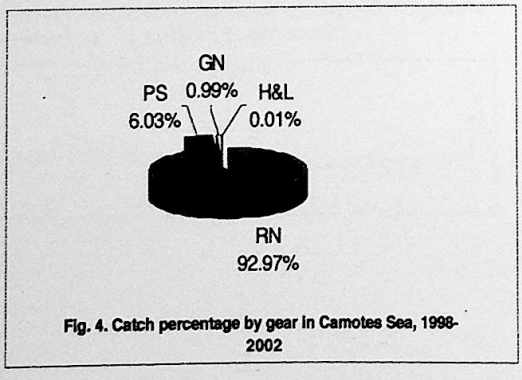


Fig. 4. Catch percentage by gear in Camotes Sea, 1998-2002

Annex 5g

THAILAND

A PILOT PROJECT ON THE USE OF INDICATORS AS A MANAGEMENT TOOL IN FISHERIES MANAGEMENT IN THAILAND

TRAWL FISHERY AT PRAN BURI, PRACHUAB KIRI KHAN PROVINCE

Work Plan of Thailand

Consultation meeting with fishermen

Final report

Promote the use of indicator

Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
2004					2005				

Problems

1. Different in sorted data from fisher year by year, e.g lumping into trash fish group in 1997 and in 2003 is sorting into trash and miscellaneous fish which mainly are true trash fish. These will cause some effects to return that is one of the indicator.

1997	2003	
Trash	Trash + miscl. fish	
1.25 Baht/kg	1 Baht/kg	3-4 Baht/kg

2. All the catches from fishers do not landed at landing site.

Some parts of catches had been sorted and soled or processed by the fishers before landing at the pilot project site. Therefore the selection of the project site is required carefully consideration.

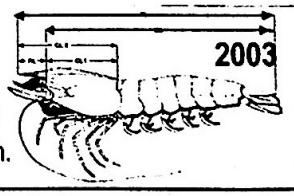
3. Incomparable between previous and present data due to differences in identification levels

e.g. in 1997 result was identified into genus level whereas in 2003 was identified into species level.

1997		2003
Genus	⟶	Species

4. Incomparable between length measurement of shrimp sample due to changes in the method of length measurement

The previous measurement cover the length from end of rostrum to telson. After the introduction from FAO, the total length is measured from the socket of eyes to telson. In this case, the former total length is longer than the present total length.

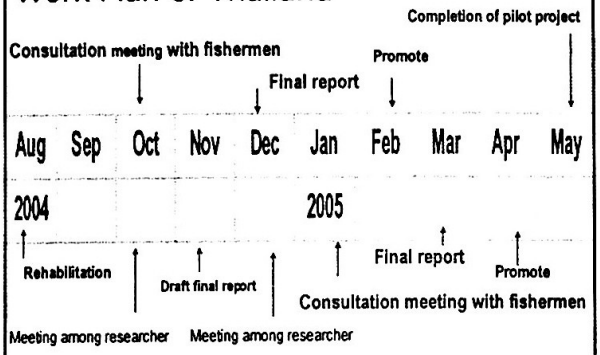


5. Data validation

Data error may occur by the fishing operation or the experiment e.g. fishing boat is out of order, net struck to the sea bottom. Therefore some data should be deleted and marked.

If there is no data validation, the result will not accurate.

Work Plan of Thailand



Existing Data in 1997 and New Data in 2003

Year	1997	2003
Fishing effort (hr/day)	10	13.40
Target species	Shrimp	Shrimp
CPUE (kg/hr)	21.949	19.125
CPUE of economic fish (kg/hr)	13.290	12.632
economic fish : Trash fish (%)	61:39	66:34
CPUE of trash fish (kg/hr)	8.659	6.493
small size economic fish : True trash (%)	35 : 65	32:68
Return (Baht/day)	2,522.23	2,440.55
Total Cost (Baht/day)	2,607.23	
Profit	-84.98	

Indicators

1. Resource indicator
2. Fleet indicator
3. Economic and Social indicator

Indicators

1. Resource indicator

- CPUE
- Catch composition of good and trash fish
- Number of species caught
- Average fish size
- Size of mature fish : Shrimp and Sepia

1997		2003
Pelagic fish	⟷	*Rastrelliger neglectus*
		Megalaspis cordyla
Shrimp: genus level		Shrimp: species level

Indicators

2. Fleet indicator

- Fishing time
- Fishing power

3. Economic and Social indicator

- Income per unit effort
- Cost
- Profit of the fishers
- Price index

Indicator

1. Simple and Easy to understand
2. Complicated and difficult to understand

1. Resource indicators
   - CPUE — simple
   - Catch composition of good and trash fish — complicated
   - Number of species caught — complicated
   - Average fish size — simple
   - Size of mature fish : Shrimp and Sepia — complicated

2. Fleet indicator
- Fishing time — simple
- Fishing power — simple

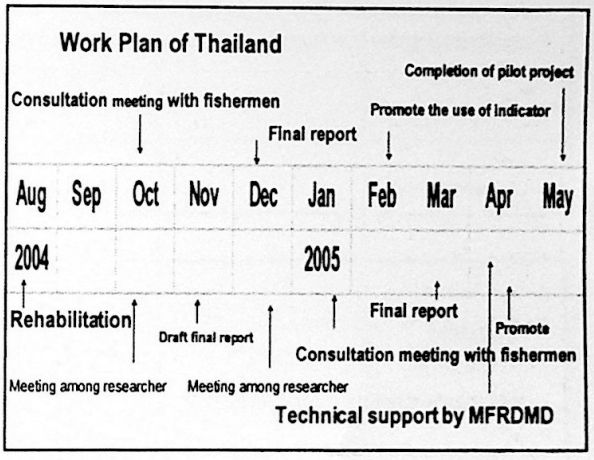
3. Economic and Social indicator
- Income per unit effort — simple
- Cost — simple
- Profit of the fishers — simple
- Price index — complicated

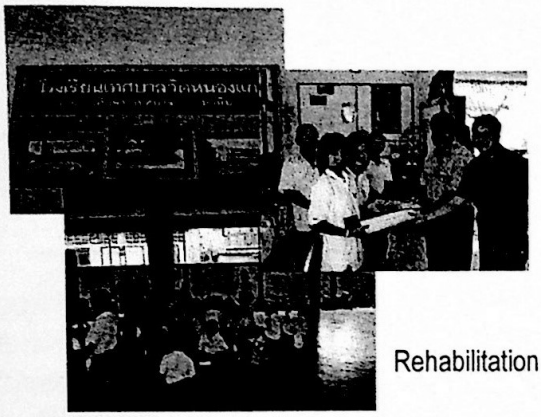
Indicators

With concept of effective use of indicator for fisheries management in the ASEAN regional, The RTC Adopted conclusion and recommendation

Indicator should be use as an effective planning, Communicate, monitoring and evaluation tool in fisheries management.

1. Simple and easy to understand
   to promote the use of indicator to fishermen
2. Complicated and difficult to understand
   use for scientific report





Rehabilitation

Solution

To gain the accurate data collection, the data collectors should have some more detail and inf orm the real time condition, append with the catch data. Any comparisons of Time series data shall be conducted under the intense caution.

Solution

With regard to the landing site selection, any place where the fishers select to landing their whole catch should be considered as the first priority for data collection.

Solution

The standard length measurement should be followed FAO.

The collector should restrict to maintain data gathering process under standard method.

Solution

Training for skillful data collectors and analyzed person as well as increase number of staff to improve data collection and increase capability in analysis and interpretation of the results.

Considering that the study on indicators have already been implemented as pilot basis covering various type of indicators.

To promote future use of indicators,it is strongly suggested that experiences from pilot studies will be compiled and used as basis for formulation of regional/national guidelines for the use of indicators.

The guildelines, upon the endorsement of the member countries, will help facilitating the usage of indicators at the national level. This will enable the wide implementation of indicators inclusing required support from the government to ensure adchivement in the promotion of sustainable fisheries

Indicator

1. Simple and Easy to understand
2. Complicated and difficult to understand

With the view to promote the effective use of indicator for fisheries management in the ASEAN regional, The RTC Adopted conclusion and recommendation

Indicator should be use as an effective planning, Communicate, monitoring and evaluation tool in fisheries management.

Annex 6a

Revised Work Plan

BRUNEI DARUSSALAM: WORK PLAN 2004

Activity	Status in 2003	Implementation in 2004 (Month)	Expected Output	Comments	Progress/ Revised
1. Pilot Project: Trawl fishery	Initiated in September 2003	On-going and to be completed by September 2004.	{Progress report of the pilot project for the period of 2003 (status)	Initiation of the project was delayed due to the re-structure of the Dept. of Fisheries	On going. Anticipate to complete by December, 2004
2. Consultation with the stakeholders	Conducted in December 2003	First meeting will be in April 2004	Response from the stakeholders on the preliminary findings of the project		Re-schedule in November
3. Data collection on catch rates, species composition and catch per unit effort	Implemented since 2003, data analysis on-going	Data collection and analysis until August 2004	Trends of catch rate and size of catches		On going
4. Technical training on the effective use of indicators	None available	Requested June /July 2004	Appreciation on the use of indicators as a tool in fisheries management	Request SEAFDEC to assist in the conduct of training	Technical Visit was made by MFRDMD in October 2004

BRUNEI DARUSSALAM: WORK PLAN 2005

Activity	Status in 2004	Implementation in 2005 (Month)	Expected Output	Comments	Revised
1. Data collection and analysis on catch rates and species composition	On-going	Data collection until June 2005	Trends of catch rate and size of catches		Rescheduled by end of January 2004 (inclusive to complete report writing)
2. Consultation with stakeholders	Meeting to be conducted in April 2004	Meeting to be held in June / July 2005	Presentation of the preliminary findings to stakeholders		Reschedule in February, 2004
3. In-house training in the use of indicators as a tool for fisheries management	Technical training to be conducted in June / July 2004	May 2005	Better understanding in the use of indicators	Assistance from SEAFDEC	Cancel
4. Finalized the report and endorsement from DOF					Mac, 2005

Annex 6b

INDONESIA: WORK PLAN 2004

Activity	Status in 2003	Implementation in 2004 (Month)	Expected Output	Comments	
1. Coordination with Central Java Province Office & Pekalongan District Office		2004	Close cooperation to conduct activities		
2. First Stakeholders Meeting		2004	Understanding of stakeholders on the indicators for monitoring		
3. Strengthening of catch & effort data collection in Pekalongan Fishing Port, Wonokerto & Jambean Landing Site	On-going	2004	More detail data can be collected		
4. Strengthening of biological data collection in Pekalongan Fishing Port, Wonokerto & Jambean Landing Site	On-going	2004	Preliminary biological and ecological status of resource		
5. Collection of income data in Pekalongan District		2004	Seasonal trend on income of fisheries households can be collected		

INDONESIA: WORK PLAN 2005

Activity	Status in 2004	Implementation in 2005 (Month)	Expected Output	Comments
1. Data processing		2005	Data of catch & effort, biology & income	
2. Data analysis		2005	Analysis of condition in Pekalongan	
3. Second Stakeholders Meeting	Conducted	2005	Acceptance of indicators by stakeholders	
4. Preparation of the draft of implementation of indicators for local management plan		2005	Draft of implementation of indicators for local area management	Draft can be prepared if indicators are accepted by stakeholders

MALAYSIA

Work Plan 2003: INDICATOR for Zone-B Trawl fishery in Kedah & Perlis

Activities/ Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1. Planning Stage:	●	●										
1.1 Expert consultation conference			■									
1.2 National Steering Committee					■							
2. Core-group meeting						■						
3. National Expert- group Meeting							■					
4. 1st Stakeholder Consultative Workshop								■				
5. Collecting of new data & data analysis									●	●	●	●

Work Plan 2004: INDICATOR Trawl fisheries in Kedah & Perlis

Activities/ Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1. Data analysis/ review on socio-economic survey	●	●	●	●	●							
2. Data collection on demersal fish resources & Environment parameters				●	●	●						
3. Second National Stakeholder Consultative Workshop							■					
4. Meeting on establishment of indicator for Sustainable Trawl Fisheries in Kedah/Perlis												
5. Meeting for preparation of the draft of Fisheries Management Plant												
6. National workshop with Stakeholder on Management Plant												
7. Presentation of the Draft Management Plan to the DoF												
8. Implementation on Fisheries Management Plant- Present to DoF												

Revised Work Plan for 2004: Trawl fisheries in Kedah & Perlis

Activities/ Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1. Data analysis/ review on socio-economic survey	●	●	●	●	●							
2. Data collection on demersal fish resources & Environment parameters				●	●	●						
3. Second National Stakeholder Consultative Workshop							■					
4. Formation of Special Committee to Study proposal from Fishers Association of Kedah: to make Zone B free from trawler										●		
5. Counter Proposal on ways to implement Trawl-free Zone B of Kedah												●
6. Preparation of budget to implement the proposal												●

Revised Work Plan for 2005: Trawl fisheries in Malaysia

Activities/ Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1. Meeting on establishment of indicator for Sustainable Trawl Fisheries in Kedah/Perlis												
2. Meeting for preparation of the draft of Fisheries Management Plant												
3. National workshop with Stakeholder on Management Plant												
4. Presentation of the Draft Management Plan to the DoF												
5. Implementation on Fisheries Management Plant												

PHILIPPINES:WORKPLAN 2004

Annex 6d

Activity	Status in 2003	Implementation in 2004 (Month)	Expected Output	Comments	Progress/ Revised
Second Regional Technical Consultation		March	Progress report of pilot project for 2002-2003		Accomplished
Field data sampling – Catch rates Data analysis	Implemented since Dec. 2002 Data for 2003 being analyzed	Data collection until June 2004 and probably up to December 2004 Continue analysis of 2003 and 2004 data	Trend of catch rates	Data collection is on-going for catch and effort but not on sex and maturity	Continuing
Review and validation of the suitability of the indicators identified		Literature review, Conduct on-site validation and actual interviews with the fisherfolks	best or suitable indicators identified		Accomplished
Stakeholder consultation, presentation of the results of the project		June 2004	Results validated by the stakeholder based on their observation of the fisheries		Moved to December or January 2005
Analyze economic data collected in 2003 for possible development of economic indicator	Implemented from Jan. 2003 to December 2003	Data analysis and interpretation	Develop economic indicator		On-going

Work Plan for 2005

Activity	Status in 2004	Implementation in 2005 (Month)	Expected Output	Comments	Progress/ Revised
Implement new project on indicators development	New sites/ fishing grounds	January to December	Additional data that could be used in identifying other indicators	However, data collection of catch and effort in Camotes Sea will still be continued	

THAILAND: WORK PLAN 2004-2005

Annex 6e

Activity	Status in 2003	Implementation in 2004 (Month)	Expected Output	Comments	
1. Data analysis	On-going	September 2004	Results on indicators and enlarging of cod-end mesh size	Problems and solutions	
2. Conclusions Meeting with Fishermen	First Consultation was conducted in July 2003	October 2004			
3. Conclusion of Pilot Project			Final Report		
4. Publication of Final Report		December 2004			
5. Promote the conclusions from the Pilot Project to DOF		February 2005	Advisory Report		

Annex 6f

Marine Fishery Resources Development and Management Department (MFRDMD)

Project Title: The Use of Indicators for the Sustainable Development and Management of Capture Fisheries

Work Plan for 2004

Activity	Status in 2003	Implementation in 2004 (Month)	Expected Output	Comments
Second Regional Technical Consultation Publication of Proceedings	(First RTC was conducted in Sept. 2002)	9-11 March 2004 May 2004	Progress reports of pilot projects for period 2002-2003 Publication and information dissemination	a) Problems / constraints / solutions / improvements / training / HRD b) Proposals for follow-up action??
Participation in FAO Fishing Capacity meeting		June 2004	Publicity and information dissemination	Follow-up action from SEAFDEC 26th. PCM
Consultation with National Project Technical Officers	i) Visits to pilot project sites and consultation with stakeholders in: Cebu, the Philippines (Dec. 2002), Pran Buri, Thailand (July 2003). ii) Attended core group and expert group meetings in Pulau Langkawi, Malaysia (March, August 2003). iii) Discussion with National Project Technical Officers in Indonesia.	i) Stakeholder consultation in Malaysia – April 2004. ii) On-site visit to Brunei Darussalam – May 2004 iii) On-site visit to pilot project site in Cebu, the Philippines – May 2004 iv) On-site visit to Pekalongan, Indonesia – June 2004 v) On-site visit to Pran Buri, Thailand – July 2004.	i) Monitoring of process of project development. ii) Monitoring of pilot project implementation. iii) Evaluation of pilot project. iv) Monitoring of pilot project v) Evaluation of pilot project.	a) Problems / constraints / solutions / improvements / training / HRD b) Proposals for follow-up actions
Formation of core group for development of regional guidelines based on framework adopted at Second RTC.		Framework to be reviewed in May 2004. Draft of guidelines to be ready in September 2004.	Revised framework	May need further consultation
Review of draft guidelines	Draft of guidelines.	October 2004.	Revised draft guidelines.	Consultation among core group members.