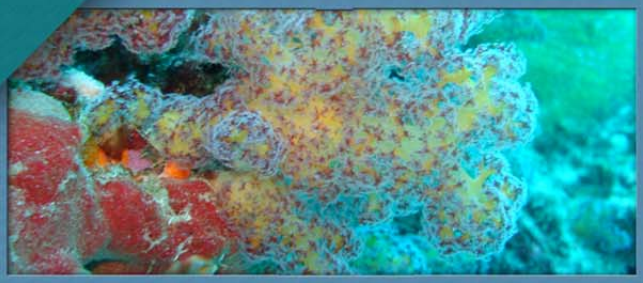
Bay of Bengal Large Marine Ecosystem Project



Report of the Fisheries Statistics Working Group Meeting

19-20 March 2012 • Medan Indonesia

BOBLME-2012-Ecology-04

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TABLE OF CONTETS

1. OPENING OF THE MEETING AND ADOPTION OF THE AGENDA

1 A Workshop on assessing the data and assessment potential on Indian Mackerel (*Rastrelliger kanagurta*), sharks (multiple species) and Hilsa (*Tenuolosa Ilisha*) was held on 19th and 20th of March, 2012 at Medan, Indonesia. The BOBLME Stock Assessment Coordinator, Dr. Rishi Sharma welcomed the participants and wished them well in their work, and their stay at Medan for the next few days.

2 Dr. Sharma reminded the meeting that BOBLME Project is mandated to develop regional fishery assessments for Hilsa, Indian Mackerel, and sharks. As such this meeting was the second one to follow-up on the quality of the data available in the region and for standardized approaches to be used. The focus of the meeting was to follow up on the previous work and addresss the following objectives:

i. To note new developments in fisheries statistics (data gathering, analysis and reporting) in the BOBLME countries, based on updates and reports from BOBLME countries

ii. To review and operationalize recommendations from the Fisheries Statistical WG Meeting April 2010, in view of more recent developments (in the countries and in consideration of FAO-APFIC Stock assessment workshop Myanmar)

iii. To note and discuss the findings, conclusions and recommendations of the recently completed review on fisheries catch and landings statistics

iv. To further familiarize the South Asian BOBLME countries with the Fishery Statistics harmonization efforts of SEAFDEC, i.e. the Regional Guidelines and Framework and to decide on additional information provision (awareness raising) through formal knowledge transfer and to consider expanding these harmonization efforts (or certain elements) to the entire BOBLME.

v. To discuss current constraints faced in the production and update of national statistics; including data collection issues, constraints, and strengthening needs; and to discuss issues pertaining to the production of regional statistics

vi. To consider the creation of an inventory (meta-database) of existing data and information and, to the extent possible, make available data, information and reports on hilsa (Tenualosa ilisha), small pelagics (Rastrelliger kanagurta and associated species), and sharks for stock assessment or review/update of existing assessments.

vii. To draft and agree on a workplan to strengthen data and information collection, storage and management; including digitizing existing hardcopy data

The achievement of these objectives should assist Bay of Bengal countries in improving fisheries data collection systems and making progress towards regional, harmonized approaches that will allow the countries to undertake in future joint resource assessment and management of the fisheries in the Bay.

3 The meeting was opened by Dr. Matius Bagun, one of the head scientists from Fisheries Research in Indonesia (Sumatra province). In his address Dr. Bagun welcomed everyone, focused on the importance of the data harmonization in the region and the peculiarities of issues ate the district level in Indonesia. He highlighted the lack of information on the species and stocks which contribute to the fishery in different parts of the bay. The rest of the meeting was chaired by Dr. Rishi Sharma.

4 The participants of the meeting are listed in Appendix I and the agenda for the Meeting was adopted as presented in Appendix II.

5 Dr. Sharma informed the meeting about the scope of the project, and how far the work has proceeded. The agenda was adopted (Appendix II); and the participants were introduced.

6 The list of documents presented to the meeting is given in Appendix III.

2. COUNTRY OVERVIEWS

2.1. Information Needs for a Defensible Stock Assessment – Dr. Rishi Sharma

7 Dr. Rishi Sharma gave an overview on the BOBLME Project and mandate. Crucial to this are the stock assessment components which are essential to the project success. This is why the meeting and Statistics and data quality is extremely important in the region. Essential elements of data for a stock assessment are CPUE and effort at the resolution that mimics the stock and the life-history of the species. Essential in this would be to stratify catch and effort by gear, sector and country. In this manner fleet catchability could be assessed as well so we could compare effort controls, and a desired outcome in fishery yield.

8 The working group discussed the adequacy (quality) of the data in the various countries. An update was then provided by each country.

2.2. Statistics and data overview in Bay of Bengal (Bangladesh):

9 Bangladesh gave an overview on the sampling design to estimate landings on its species of primary importance, i.e. Hilsa (estimated at ~340000 T). Some issues on not having representative sampling were discussed as well as issues on non-random components of the sampling plan. Catches of mackerel are insignificant, and rays, skates and sharks (~4000 T) are sampled as one group and reported on. Issues on capacity building were brought up as were the issues on BOBLME helping with data reporting and adequacy of the sampling plan.

2.3. Statistics and data overview in Bay of Bengal (Malaysia):

10 Malaysia gave a comprehensive overview of their sampling design to estimate catches. Their focus is primarily on catch and effort by gear. To this effect they use a database of registered vessels which cover all types of crafts, and helps assess the overall effort by operational vessels. The sampling frame is updated every two years, and uses electronic reporting formats which make the system highly efficient.

11 Nonethelss, issues of capacity were identified in the country, as were the issues of large spatial coverage, insufficient samplers, lack of training and supervisison and insufficient funds.

2.4. Statistics and data overview in Bay of Bengal (Maldives):

12 Maldives gave an overview of their sampling plan to estimate catch, which is primarily skipjack and yellowfin tuna. The new catch monitoring system has converted from the direct sampling to a log-book system, though there are some problems of implementing this. Hardly any Indian Mackerel are caught by the fishers, and there are no programs in place to assess landings of other small pelagics or bait-fish currently though there is proposal in place to increase the sampling in these sectors. There has been a shark-fishery ban since 2009. While the tuna sector is sufficiently sampled, issues of increasing sampling coverage to the other sectors needs to be assessed, as well as quality of the data through cross-validation needs to occur. Landings of skipjack have declined since 2007, and yellowfin percent of overall catch has increased (though yellowfin landings have also declined since 2007). Effort

is being currently redirected to yellowfin as there is more valuable export market for yellowfin.

2.5. Statistics and data overview in Bay of Bengal (Myanmar):

13 Myanmar gave an overview of where the resource is utilized, namely on the Rakhine and Tainintharyi coasts. The Hilsa fishery overview was given, and the landings of hilsa relative to other sectors was shown (4.2 Million T). The Hilsa fishery is approximately 1% of overall landings. Effort by motorized and non-motorized boats, and inland and offshore vessels was known, though the small scale sector is poorly sampled. Issues of capacity were discussed as far as the budget, manpower and training are concerned. There is a lack of knowledge of sustainable fisheries by the government based management plans, and cooperation amongst all sectors needs to occur to improve the quality of the data. Building capacity within Myanmar with the help of external agencies like FAO and BOBLME would be the looked upon favorably in Myanmar.

14 In the case of sharks, not much is known as sharks are not off-loaded through regular channels.

2.6. Statistics and data overview in Bay of Bengal (India):

15 India has a very comprehensive database on assessment and studies performed on all sectors from the 1950's. There is a large area covered in the fisheries (8118 kms of coastline), with 197,528 boats (72,370 mechanized and 72,961 motorized). 1331 landing centers are present on the coast that sample the catch for overall landings. There has been a 6 fold increase in marine capture production in India from the 1950's to the present day (3.22 and 5.07 Million T in the marine and inland sectors respectively).

16 Indian Mackerel and Hilsa landings are high within the Indian EEZ, and amost all Hilsa landings occur in the Bay of Bengal area, and about 50% of Mackerel occur in the BOB Region, as well. In the case of sharks almost 10% of the total global landings comes from India (110 species) and a significant amount of this could be coming out of the Bay of Bengal area.

17 Currently India is focusing on integrating the multiple source of information from the various differential agencies collecting the data. In addition the newer technologies like GIS and samples for the fishery sectors into a database to estimate inland and marine sector landings is the current focus as well as providing welfare programs for fishers and post-harvest processing facilities.

18 Other areas of primary importance are developing a database of registered vessels in India, Vessel Monitoring system, biometric identification of fishers, identifying all the fisher cooperatives in India, and strengthening the statistics unit is of utmost importance.

19 The system of estimating catches in both marine and inland sectors is a stratified multi-stage sampling methodology, and is routinely updated on the sampling frames, though census surveys are conducted only once every 10 years.

20 There is a need to train fishers on importance of data collection, as well as there is a shortage of manpower to cover the area, and adequate training is not provided to the samplers. Finally, there is a time-lag on when the data is collected and finally reported. The government is trying to address these short-comings.

2.7. Statistics and data overview in Bay of Bengal (Indonesia):

21 Indonesia gave an overview of the sampling design program that was started in 1973 and has been changed once since then (though newer programs are constantly initiated). Coverage includes landing sites and fishing villages at different levels of sampling. While

landing sites is census based, the villages are interview based samples enumerated through the officers at the district level. In addition a log-book program was initiated in 2010.

22 Mackerel is one of the primary species landed in fishery area 571 and 572, west and north of Sumatra (regions of interest to BOBLME). Indonesia is the largest producer of sharks in the world (10% with 105 species caught). There are issues of shark species identification at the landing sites in Indonesia.

23 Other issues include a large area that is not sampled adequately; there are insufficient enumerators, lack of supervision, and lack of training and insufficient funds for implementation.

2.8. Statistics and data overview in Bay of Bengal (Sri Lanka):

24 Sri Lanka gave a comprehensive overview of their fisheries and sampling plan to estimate catch. There is a focus to increase production (2011 at 445,000 T) as current nutrition levels are half of what the protein needs are per individual (60 gms/day).

25 Fishery data is collected at different levels (MFAR for aggregating and compiling the statistics, NARA for large pelagic fish, and Ceylon Fisheries Harbor corporations for foreign vessels). In addition, CFHC collects data on exports, while department of fisheries maintains information on vessel registry.

26 Integration across the different departments and a common database for use in the different areas was implemented recently with help from FAO and IOTC. Increased sampling in the carios sectors will also occur. This centralized database will cover biological data that is sampled for pelagics, organize and report this over time.

27 There are still issues that stem from the lack of capacity and funds available for sampling the fisheries. In addition there is a lack of trained officers and facilities especially North and East of the country, the sampling guidelines, formats and procedures need to be updated, and there is insufficient knowledge for data analysis.

2.9. Statistics and data overview in Bay of Bengal (Thailand):

28 Thailand gave a comprehensive overview of their sampling plan. Production has declined in recent years (3.3 Million T in 2009); about half of this comes from the marine sector (1.66 Million T with 653,189 T coming from the Andaman Sea area of the Bay of Bengal).

29 Shark catches are declining from Indian ocean (1,229 T in 2009). Hilsa is non-existent and Indian mackerel catches are around 17,122 T for the Andaman Sea areas.

30 Thailand suffers from the following issues: - i) Different Species composition between FSARG and MFRDB depend on objective of the surveys, species classification skill and biological knowledge, ii) small sample size effect to reliability of total estimated, iii) Low cooperation from fishers on routine surveys, iv) insufficient data enumerators, v) enumerators are transferred regularly between provinces and there is poor continuity of sampling projects, and vi) poor integration across agencies.

31 Identified needs are primarily in capacity building and include the following: i) Need more appropriate support in term of budget/human resources/material, ii) Training for increasing the capacity of the samplers and the analyzers, iii) Streamlining data processes such as inputing through a centralized database, and iv) integration across agencies. Some improvement is occurring on the above activities.

3. SEAFDEC OVERVIEW AND ACTIVITIES SINCE 2010

32 In 2010, BOBLME held a workshop with the objective of standardizing statsitics data of aquatic species, including the three focal species so that assessment models could be developed for transboundary resources in the region.

33 The following were priority areas for improving capture fisheries statistics in SE Asia, namely i) The methods developed should be useful and serve as guide for the establishment, and improvement of fishery statistics; ii) Share experiences in the implementation of the guidelines with other countries involved in project; iii) Identify minimum requirements for collecting fishery statistics; iv) support policy-making, planning and management of fisheries in the Bay; and v) Emphasize the collection of statistics from small-scale fisheries.

34 The role of BOBLME would work with SEAFDEC is establishing some of these above identified guidelines for BOBLEM focal species, i.e. focus on fisheries and data collection systems on each of the focal species.

35 With regard to data harmonization, the following areas should be considered in strengthening of data collection by BOBLME: i) The development of minimum requirements for data collection based on identified objectives, ii) Quality standards of data should be defined, iii) minimum requirements should be established for reporting of statistics and information under BOBLME, and iv) fisheries statistics at national level should be include data from foreign vessels fishing in the territorial waters and EEZ of BOBLME countries. This could be done with collaborative approaches with SEAFDEC, IOTC and FAO, and integrated from a bottom up strategy within countries to an international level.

36 Since 2010, SEAFDEC has established guidelines for data collection in SE Asia, set up training initiatives for collection and identification of species level data, harmonized data through common standards for reporting and exchanging data, and laid guidelines for improving the data information baselines. SEAFDEC will continue to work on collaborative partnerships in the region, and build capacity for better collection and standardization of data for the region.

4. SUMMARY OF THE REVIEW OF STATISTICAL SYSTEMS CONDUCTED BY BOBLME IN 2011

37 This study presented was “a review on the collection of catch/landings statistics for hilsa and Indian mackerel (small pelagics) in BOBLME countries (national and decentralized levels), covering also value of catch, cost of fishing, and contribution to economy (socio-economic information)”, as defined in the terms of reference (Annex 1). Considering the BOBLME, this study should provide supporting information that can be used in the context of “Collaborative Regional Fishery Assessments and Management Plans” for selected key trans-boundary species through the development of regional and sub-regional management plans and harmonization of data collection and standardization. The methodology used was to assess the data collection systems are usually designed to cover the whole fisheries sector, albeit possible difficulties in achieving this for specific sub-sectors (e.g. small-scale fisheries, inland fisheries, etc.). Specifc details of the study are attached in the complete draft report in Appendix VI.

5. STATISTICS WORKING GROUP RECOMMENDATIONS AND WORKPLAN

38 The 2012 meeting made progress on each of the items identified above, and on a species context identified the fisheries and existing state of landing and effort data, and discussed projects and areas for improvement by species (Appendix V on Improving data from a

species context). While the data still needs to be assessed for quality and coverage, some elements for future joint resource assessment and management in the Bay of Bengal may be possible. We expand in detail the progress since 2010 and the main limitations below.

5.1. Progress after the first BOBLME Statistics Working Group Meeting in 2010

39 While much was said about improving things on reporting and directing species related catch and effort for Hilsa, Indian Mackerel and Sharks, back in 2010, the reality is that countries are already over-burdened with current reporting and activities, and there has been little progress made since the last meeting to implement an significant changes.

40 Despite that, some countries have expressed a strong commitment for change.

- Myanmar is dedicated to making a change in how it does business, and Sri Lanka has made a concerted effort to report data on small pelagic fish.
- Other countries like India are also coming up with innovative ways (GIS) to estimate inland catches, and are trying to resolve parallel systems discrepancies in data reported.
- Other countries are also making a concerted effort to make substantial changes, are recognizing deficiencies identified in the BOBLME Draft Report on statistical systems within the countries, and are willing to try small scale feasibility studies to assess uncertainties in the system and correct it for current deficiencies.

5.2. Capacity building

41 There is a strong need for capacity building to support the implementation of the FIP process and the development of Fishery Management Plans on Hilsa, Mackerel and Sharks in the region. There is also concern in many countries with regards to sustainable human resources (fisheries scientists and managers) for understanding the data needs and systems and the stock assessment needs from the data.

Recommend

- *Encouraging exchange of regional transnational knowledge and sharing in management planning processes for transboundary fisheries, and/or fisheries with similar characteristics*
- *Regional Centre of excellence e.g. FAO APFIC, IOTC and others, (SEAFDEC) to help facilitate/implement catch sampling programs and issues for the region.*
- *Create a regional and national pool of experts that would facilitate development of sampling plans and reporting systems*
- *Strengthen the knowledge of decision makers*
- *Build more effective fisher cooperatives within the sector for reporting with incentives*
- *Governments to initiate capacity building at the appropriate level, and inclusive of many stakeholder groups- Pool in international experts to help in this endeavour.*
- ***Sampling design workshops to address shortages in capacity will be conducted by BOBLME in the countries over the year (Myanmar and Bangladesh will have a more involved approach than other countries).***

5.3. Small Scale fisheries

42 Small scale fisheries are the primary fishing method for both Hilsa and Indian Mackerel. The landings from these sectors are large covering close to 50% of the catch from certain countries in the region. However, the sampling from these fisheries is low (coverage), and the reliability is questionable, as often interview based methods are used. There is a need to get better information from this sector to improve the management in the region.

Recommend

- *Explore alternative ways of reporting of catch from small-scale fisheries, including GIS based methods, direct report of catch and effort data from Fishermen Cooperatives or alternative groups, or any other suitable arrangements.*
- *Implement mechanisms to check the reliability and increased coverage of this sector*
- *Explore mechanisms to improve reporting of data from small-scale fisheries in each country such as systems granting preferential access to gear licenses, auction halls, fuel, or other commodities to vessel owners or communities that report complete datasets; including estimates of funds required to implement the activities identified in each country.*
- ***Feasibility studies to addess these shortages in the small scale sector will be conducted in all Bay of Bengal countries. For. Eg. A possible approach would be a fuel-subsidy approach for fishers to bring their data to be sampled at certain locations in countries for the small scale sector, in return for fuel at lower prices.***

5.4. Quality Control of the Data

43 Numerous countries incorporate algorithms for estimates without any cross-checking or calibration procedures for the overall estimates. Cross checks need to be in the database or through external direct sampling programs to validate the results.

Recommend

- *Direct sampling methods to calibrate the data reported*
- *Cross-checks in alternate reporting (include import-export data, and also include fish markets and processors) systems to be developed.*
- *Automated QA/QC routines in the database for overall estimates.*
- ***In Malaysia and Thailand, where electronic databases are used regularly, approaches like the electronic data tabulatin through Iphone/ipads or electronic pens (CAPTURX) technologies will be tested to improve the reporting time-line.***

5.5. Feasibility Studies on Data Systems

44 To improve the data reported on species levels an approach of small scale feasibility studies to improve/verify the information was suggested.

Recommend

- ***Direct sampling methods to verify interview based methods will be conducted in Indoneisa, Thailand, Maldives and Bangladesh.***
- ***Catch, biological sampling and effort estimation through observer programs at sea, field sampling at ports will be tested in Indonesia and Maldives***

- ***Calibrating log-book methods with direct samples will be tested in Maldives, Indonesia, and India.***
- *Sampling individual processing plants or fish markets for biological sampling and species composition.*
- *Assessing under-reported catches through sampling fishing markets, etc.*

5.6. Governance/Implementation

45 From the top down, there is a need for a higher level educational commitment focusing on politicians and civil society. Communication of science for decision-making is a critical aspect of this. From the bottom up a strong co-management process will give a much more effective plan and is likely to assure higher buy-in by fishers, and stakeholders alike for collecting and reporting the correct information.

Recommend

- *Improve management participation through local authorities and co-management*
- *Encourage awareness in the senior positions on sampling and reporting correct data along with transfer of capacity to newer individuals entering those positions*
- ***BOBLME can create a draft document for importance of data for higher level dignitaries.***

5.7. Ecosystem Approach to Fisheries Management

46 Sampling plans need to ensure that management actions deal with all at-risk species (e.g. vulnerable target and non-target species, and endangered threatened and protected (ETP) species).

Recommend

- ***Collect spatial coverage of catch and effort on a particular sector (eg. Sharks in India)***
- *Report bycatch across different gears associated with target catch in industrial fisheries.*

5.8. Basic Data Compilation

47 A template on basic fishery and catch sampling data was passed out with the expectation that the countries would populate this back in 2010 (Appendix V) at the Fisheries Assessment Working Group (FAWG). While some data was populated back then, it is still missing a lot of characteristics and a request has been made to each country to provide this kind of information in an organized manner, and preferably electronic.

Recommend

- ***Complete basic data needs on each country and species (Hilsa, Mackerel and Sharks). (Individuals are identified below)***
- ***Praewpan - Thailand***
- ***Zaki-Malaysia***
- ***Jayasooriya and Prabath-Sri Lanka***
- ***Raufiyya and Shafa-Maldives***
- ***Diding and Riana-Indonesia***
- ***Dr Chowdhury and Rakesh-India***
- ***DrYahia Mahmud, Dr. Haroon and Dr. Anis Rahman-Bangladesh***
- ***MrTint Swe& Ms. Thet Suwinn-Myanmar***

Data will be compiled and electronically tabulated by the 20th of May, 2012.

Tentatively next meeting in June to August, 2012 to follow up on the time series data and the quality.

Data will only be used within the context of this group.

6. ADOPTION OF THE REPORT

48 The Report of the second meeting of the BOBLME Statistics Working Group in Medan, Indonesia was adopted by email on 19th April, 2012.

Appendix I LIST OF PARTICIPANTS

BOBLME Fisheries Statistic Working Group, 19-20 March 12, Medan, Indonesia

BANGLADESH	**INDIA**
1.Dr Yahia Mahmud Chief Scientific Officer (Director) Bangladesh Fisheries Research Institute (BFRI) Mymensingh 2201 Bangladesh Business Phone: +8809162710 Mobile Phone: +8801712566134 Fax: +8809166559 E-mail : yahiamahmud@yahoo.com	2.Mr.Rakesh Maurya Department of Animal Husbandry, Dairying & Fisheries, Ministry of Agriculture, Government of India BD/847, Sarojini Nagar, New Delhi 110001, India Business Phone: 233 896 06 Mobile Phone: +91 987 142 0019 E-mail: rakeshiss@gmail.com
INDIA	**INDONESIA**
3.Dr Debasish Chaudhuri Staff of Data and Fisheries Statistic Q.No.6, Block-207, Sector-1, Pushp Vihar New Delhi – 110017 Business Phone: 230 702 79 Mobile Phone: +98 1061 5905 Fax: +91 112 307 0279 E-mail: trgdebasish@yahoo.com	4.Ms Riana Handayani Data and Statistic of Capture Fisheries –MMAF Jakarta, Indonesia Business Phone: 081 310 435 882 Mobile Phone: - E-mail: daya139@yahoo.co.id
INDONESIA	
5.Mr Syahrial Provincial Fisheries Office of North Sumatra Sumatera Utara, Indoenesia Business Phone: 085 216 873 022	6.Dr Matius Bangun (Mr) Head Division, North Sumatra Provincial Fisheries Office Sumatera Utara, Indonesia Business Phone: 081 361 668 333 Mobile Phone: - E-mail: mt.bangun@gmail.com
7.Mr Ir Nursal Ahmad Provincial Fisheries Office of Riau Riau, Indonesia Business Phone: 801 175 5857	8. Ms Yuni Novriani Provincial Fisheries Office of West Sumatera Sumatera Barat, Indonesia Business Phone: 082 169 873 066 E-mail: unovo4@yahoo.com
9.Mr Diding Sudira Efendi Data and Statistic of Capture Fisheries –MMAF Jakarta, Indonesia Business Phone: 081 187 7025	10.Ms Mereta Nirmalanti Pusdatin, MMAF Jakarta, Indonesia Business Phone: 081 586 114 001
11.Mr Hemat Sirat Provincial Fisheries Office of North Sumatra Sumatera Utara, Indonesia Business Phone: 081 362 448 900	12.Mr Fairus S.Pi Provincial Fisheries Office of Aceh Banda Aceh, Indonesia Business Phone: 085 371 013 658

MALAYSIA	
13.Mr Mohammad Faisal Bin Md Saleh Research Officer SEAFDEC-MFRDMD Kuala Terengganu, Malaysia Business Phone: +609 617 5940 Fax no: + 609 617 5136 E-mail: mohd_faisal@seafdec.org.my amdfaizal@gmail.com	14.Mr Zaki Bin Hj Mokri Head of Fisheries Data Collection Section Department of Fisheries Malaysia 3rd floor, Tower Block, 4G2, Wisma Thani, Percinct 4 62628 Putrajaya, Malaysia Business Phone: + 603 887 040 01 Fax no: +603 888 924 98 E-mail: zaki@dof.gov.my
MALDIVES	
15.Ms Shafana Rasheed Economist Marine Research Center, Ministry of Fisheries and Agriculture Maldives Business Phone: + 96 033 050 38 Fax no: +96 033 211 68 E-mail: shafana.rasheed@fishagri.gov.mv	16.Ms Raufiyya Abdulla Senior Statistical Officer Ministry of Fisheries and Agriculature Fisheries Management Agency Velaanaage 7th Fllor, Ameer Ahmed Magu, Maldives Business Phone: +960 330 5035 Fax no: +960 332 1168 E-mail: raufiyya.abdulla@fishagri.gov.mv
MYANMAR	
17.Mr Tint Swe Deputy Director, Department of Fisheries Myanmar E-mail: dof.tintswe@gmail.com	18. Ms That Su Win Department of Fisheries Myanmar
SRI LANKA	
19.Mr J.A.D.B. Jayasooriya Statistician Ministry of Fisheries and Aquatic Resources Sri Lanka Business Phone: +940 112 813 67 Fax no: +940 112 813 67 E-mail: b.jayasooriya@yahoo.com	20.Mr R.P. Prabath Krishantha Jayasinghe Research Officer National Aquatic Resources Resear and Development Agency (NARA) Crow Island Colombo 15, Sri Lanka Business Phone: +941 125 210 00-6 Mobile phone: +947 144 157 88 Fax no: +941 125 219 14 E-mail: prabath_jayasinghe@yahoo.com
THAILAND	
21.Ms Praewpan Kongprakhon Statistician Fisheries Statistics Analysis and Research Group, Information Technology Center Department of Fisheries, Kaset-Klang, Chatuchak, Bangkok , Thailand Business Phone: +66 257 98208 Mobile phone: +66 814 545 092 Fax no: +66 294 06 536 E-mail: praewpank@yahoo.com	22.Ms Marina Wiyasilpa Statistician Fisheries Statistics Analysis and Research Group, Information Technology Center Department of Fisheries, 50 Preedakannasut Building, Kaset Klang, Chatuchak, Bangkok, Thailand Business Phone: +66 257 98208 Mobile phone: +66 896 932 532 Fax no: +66 294 06 536 E-mail: marina54.dof@gmail.com
SEAFDEC	
23.Ms Woraluk Meesomwat Fishing Ground Information Scientist SEAFDEC, P.O Box 97, Phrasamutchedi, Samutprakan 10290, Thailand Business Phone: +66 242 561 44 Mobile Phone: +66 813 605 995 Fax no: +66 242 561 10 E-mail: woraluk@seafdec.org	24.Ms Saivason Klinsukhon Information Officer SEAFDEC, P.O Box 97, Phrasamutchedi, Samutprakan 10290, Thailand Business Phone: +66 294 063 26 Mobile Phone: +66 818 479 265 Fax no: +66 294 063 36 E-mail: saivason@seafdec.org

BOBLME RCU	
25.Dr Rishi Sharma Stock Assessment Coordinator Bay of Bengal Large Marine Ecosystem Project(BOBLME) 77 Moo 7 Vichit, Muang, Phuket 83000 Thailand Business Phone: +66 76 391 861 Mobile Phone: +66 85 480 3989 Fax no: +66 76 391 864 E-mail: rishi.sharma@boblme.org	26.Ms Orawan Klinhual Finance Assistant Bay of Bengal Large Marine Ecosystem Project(BOBLME) 77 Moo 7 Vichit, Muang, Phuket 83000 Thailand Business Phone: +66 76 391 861 Mobile Phone: +66 87 417 6790 Fax no: +66 76 391 864 E-mail: orawan.klinhual@boblme.org
Resource Person	**BOBLME Indonesia NC**
27.Dr Miguel Herrera (Mr) IOTC Secretariat PO Box 1011, 2nd Floor, Le Chantier Mall, Victoria, Mahé Seychelles Business Phone: +248 422 5494 E-mail: miguel.herrera@iotc.org	28.Mr Hary Christijanto Deputy Director for Directorate of Fisheries Resources Directorate General of Capture Fisheries Ministry of Marine Affairs and Fisheries Business Phone: +622 134 530 08 E-mail: sdidjpt@gmail.com
FAO - INDONESIA	
29. Ms Oemi Praptantyo A-FAOR (Administration) FAO Indonesia E-mail: Oemi.Praptantyo@fao.org	30.Ms Elfrida Sitorus A-FAOR (Administration) FAO Indonesia E-mail: Elfrida.Sitorus@fao.org

Appendix II Agenda of Statistics WG Meeting

Fisheries Statistical Working Group

Medan, Indonesia, March 19th & 20th, 2012.

Programme- Day 1 March 19th

9.00	Registration
9.05	Ice breaking/Self introduction
9.10	Welcome Address & Introduction to Assessment Workshop from BOBLME- Dr. Rishi Sharma Address Head of Maritime Affairs and Provincial Fisheries of North Sumatra Province, Mr. H. Zulkarnain.
9.30	Country Assessment on Statistics: Paper and Status in Bangladesh Lead:
9:45	Country Assessment on Statistics: Paper and Status in Malaysia Lead:
10.15	Country Assessment on Statistics: Paper and Status in Maldives Lead:
10.30	Country Assessment on Statistics: Paper and Status in Myanmar Lead:
10.45	Country Assessment on Statistics: Paper and Status in India Lead:
11.00	Tea break
11:15	Country Assessment on Statistics: Paper and Status in Indonesia Lead:
11:30	Country Assessment on Statistics: Paper and Status in Sri Lanka Lead:
11:45	Country Assessment on Statistics: Paper and Status in Thailand Lead:
12:00	Lunch
13:00	Report of the Fisheries Statistical Working Group April 2010 (SEAFDEC) +

	Standardization and harmonization efforts by SEAFDEC (SEAFDEC)
14:00	Report on BOBLME Statistical Systems Update-Dr. Sharma for Dr. Stoberrup
15:00	Break
15:30	Discussion on Report Findings
16:30	Work Group Break Up-Questions/Objectives/Wrap for Day and next day plan

Programme- Day 2 March 20th,2012…

9.00	Work Group sessions
10.00	Work Groups Reports
11.00	Break
11.15	Plenary-Workshop Recommendations from WG
12:00	Elaboration of workplan for activities to be carried out in countries and identification of actions for BOBLME Strategic Action Programme
13.00	Lunch
14.00	Draft Recommendations- Dr. Sharma
15.00	Short and Long term strategies-Finalize Recommendations/ Establish Workplan
15:15	Wrap Up- Concluding Remarks
15.30	End

Appendix III LIST OF DOCUMENTS PRESENTED TO THE MEETING

Presenter	Title
Dr. Rishi Sharma	Overview of the BOBLME Project for the Statistics WG Meeting
Dr. Yahia Mahmud	Country Report: Bangladesh
Dr. ZAKI MOKRI	Country Report: Malaysia
Ms. Shafana Rasheed	Country Report: Maldives
Mr. Tint Swe	Country Report: Myanmar
Dr. Chowdhury	Country Report: India
Mr. Diding and Ms.Riana	Country Report: Indonesia
Dr. Jayasooriya and Mr. Prabath	Country Report: Sri Lanka
MS. Marina Wiyasilpa	Country Report: Thailand
Ms. Saivason Klinsukhon	Conclusions and Recommendations of BOBLE Fishery Statistics WG in 2010
Ms. Saivason Klinsukhon	Efforts of SEAFDEC in Improving Fisheries Statsisticsand Information in SE Asian Region
Dr. Rishi Sharma (for Dr. Stoberrup)	Overview of the Country Data Systems

APPENDIX IV: BASIC DATA INFORMATION

Country:

Species:

Data category	Component	Relevant information available (please complete)
Fishery definitions	Describe the main national fisheries catching the species. Fishing method (gear) Fishing season (months). Fishery area (main region/habitat of each fishery). Size/power of vessels operating in fishery. Main ports of operation.	
Catch	Recent total annual catch (mt) of species. (include an indicative estimate if reliable statistics are not available).	
	Time series of total catch estimates Years with data. Source of data (survey, logsheet, market, census, etc). Reliability of data. Allocation of catch among fisheries and/or fishing gears. Reference documents.	
	Allocation of catch among fisheries and/or fishing gears. Seasonality of catch (by fishery).	
Fishing effort	Number of vessels by fishery (recent and available time-series of data). Detailed fishing effort data (days fished, length of nets, etc) by fishery. Include source of data, reliability of data, data problems.	

CPUE trends	Describe and reference any studies that provide CPUE indices for individual fisheries.	
Biological studies	Describe any national research undertaken or planned for the species, including: Age and growth. Maximum age estimates. Length and/or age sampling of the catch (by fishery). Length/age at maturity. Timing of spawning season. Length-weight relationship. Movement information (tagging). Quantitative stock assessments. Other relevant research surveys, programmes. (Please include the name of the principal scientist responsible and any available references).	
Other relevant information		

Appendix IV Questions and Responses on Species Basis Improvements/Suggestions

Group I: HILSA

What Small scale projects can you implement in each country to improve quality of data?

Bangladesh: Landing sampling should be strengthened: catch survey may be conducted for improving the quality of data

Myanmar: same as Bangladesh and also Hilsa resource survey need

India: Pilot survey through catch and complete enumeration for improving the quality of data

Thailand: same as Bangladesh, Spotting survey for complete enumeration

What small scale fisheries incentives do you work on to improve reporting?

- Some incentives like supporting loan for purchasing fishing gear/ boats may be implemented for covering the losses of fisherman.
- Some insurance scheme may be implemented for boats and fisherman

How do we build capacity in the region? Building challenges, trainings and plans-Suggest methods

- Short term training courses may be given to fisherman for awareness to give the data willingness
- Logistic support may be provided to staff
- Some financial benefits may be given to staffs for completing the specific task assigned
- Training on statistical technique to staffs
- Workshops to be conducted at regional , national , country level to share the knowledge and experience

How do we standardize data reporting for the project?

- Simple format may be designed for filling the data by the fisherman and also by the staffs
- Formats should also be comparable to the other countries including IOTC, SEAFDEC, etc.
- Compiling the data on monthly basis
- Cross checked the data by asking the submission of quarterly/half yearly basis.
- Publishing the report as annually for reference
- Some common indicators may be designed for international comparison in terms of size, weight, age, etc.
- cross checked and share the data with relevant agencies
- Coverage and sample size for survey should be same as possible for international comparison to reduce the gaps like sampling errors, errors in estimation of the indicators

How do we build QA/QC checks in the systems (cross validation issues)?

- Pilot survey may be conducted for cross validation of the data
- Comparing the published data with the result of pilot survey
- Comparing the estimation and sampling process to see the % of errors of data reporting
- Third party evaluation of data

GROUP II: Indian Mackerel

What small-scale project can you implement in each country to improve quality of data?

- Conducted training/workshop to improving knowledge and skill on the methodologies of collecting data for local officer;
- Offered equipments facilities *e.g*. computers, software, transportation, etc.;
- Establishment of fisheries cooperative as community-based fisheries to support data collecting and reporting;
- Closely coordinate and communicate among government, fisherman, fisheries association/cooperative and stakeholders;
- Pilot project to study on species identification and catch level in fisheries to support fishery statistics data (*i.e.* owner cooperative was promoted licensing system by government); and
- Encourage and introduce the logbook system to small-scale fisherman.

What small-scale fisheries incentives do you work on to improve reporting?

- Offered allowance/benefit to fisherman could be catch Indian mackerel by government; and
- Special fee in annually for small-scale fisherman.

How do we build capacity in the region? Building challenges, training, and plan suggest methods

- International organizations (*e.g.* BOBLME, FAO, IOTC, SEAFDEC , and others) should be collaboration with the country to conducted the training
- Sharing data information and experiences among Member Countries through regional workshop/consultative;
- Training on stock assessment and methodologies for indian mackerel should be highlighted
- Government, relevant organizations, institutions as well as funding country should provide funding support on the compilation fishery statistics.

How do we standardize data reporting for the project?

- Harmonize and standardize fishery statistics questionnaires as well as streamline reporting data.

How do we build QA/QC checks in the systems (cross validation issues)?

- Establishment of validation system to checking data at district level before submit to the central level; and
- Cross-check data at district level by taking sample data.

Group III : Sharks

What Small scale projects can you implement in each country to improve quality of data?

Recommendation :

- Pilot projects is needed to each country except Maldives (due to the Maldives government regulation not to catch the shark) to identification and estimation of catch by species (shark)
- What small scale fisheries incentives do you work on to improve reporting?

Recommendation :

- Money rewards (eg. fuel and gear subsidy) for providing catch data

How do we build capacity in the region? Building challenges, trainings and plans-Suggest methods

Recommendation :

- Periodical workshop for awareness for stakeholders (fisher, trader, administrator, etc) to understand resource and importance of data, proper recording
- Propose to BOBLME for conducting a training of methodology for two officers from each country so that they can transfer it to the local officer

How do we standardize data reporting for the project?

Recommendation :

- The reporting guidelines (routine data, temporary/scientific data, sampled data) should be prepared by BOBLME expert and local expert

How do we build QA/QC checks in the systems (cross validation issues)?

Recommendation :

The validation

1. consumption data done by other party
2. Export data to the customs
3. Market data
4. Possibly log-book data

APPENDIX VI : RESPONSES ON SUVERYS BY COUNTRIES AND SPECIES

Country: Indonesia

Species: Mackerel

Data category	Component	Relevant information available (please complete)
Fishery definitions	Describe the main national fisheries catching the species. - **Fishing method (gear)** - **Fishing season (months).** - **Fishery area (main region/habitat of each fishery).** - **Size/power of vessels operating in fishery.** - **Main ports of operation.**	- **Gillnet, line** - **Every month** - **East west and West COMA of Sumatera** - **Less than 30 gt.** - **3 main ports**
Catch	Recent total annual catch (mt) of species. (include an indicative estimate if reliable statistics are not available).	2010 Production Volume: Bay of Bengal : 53,745 ton Indonesia : 253,905 ton Total Indonesia : 5,039,446 ton
	Time series of total catch estimates - **Years with data.** - **Source of data (survey, logsheet, market, census, etc).** - **Reliability of data.** - **Allocation of catch among fisheries and/or fishing gears.** - **Reference documents.**	Bay of Bengal 5 GT 5-10 GT Fishing boat 25,262 buah 5,012 buah = 30,274 buah *Marine fishing unit Gillnet Pancing = 41,925 unit 25,446 unit 16,477 unit
	Allocation of catch among fisheries and/or fishing gears. Seasonality of catch (by fishery).	

Fishing effort	Number of vessels by fishery (recent and available time-series of data). Detailed fishing effort data (days fished, length of nets, etc) by fishery. Include source of data, reliability of data, data problems.	
CPUE trends	Describe and reference any studies that provide CPUE indices for individual fisheries.	
Biological studies	Describe any national research undertaken or planned for the species, including: - **Age and growth.** - **Maximum age estimates.** - **Length and/or age sampling of the catch (by fishery).** - **Length/age at maturity.** - **Timing of spawning season.** - **Length-weight relationship.** - **Movement information (tagging).** - **Quantitative stock assessments.** - **Other relevant research surveys, programmes.** (Please include the name of the principal scientist responsible and any available references).	
Other relevant information		

Country: Malaysia

Species: Indian Mackerel

Data category	Component	Relevant information available (please complete)
Fishery definitions	Describe the main national fisheries catching the species. - **Fishing method (gear)** - **Fishing season (months).** - **Fishery area (main region/habitat of each fishery).** - **Size/power of vessels operating in fishery.** - **Main ports of operation.**	- **Purse seines, Trawl & Gill net** - **Do not implement close season** - **Catching area by Zoning** - **Specific vessel size with specific gear type will operate in specific zone** - **Record at each landing port and sites**
Catch	Recent total annual catch (mt) of species. (include an indicative estimate if reliable statistics are not available).	2010 – West Coast of Peninsular Malaysia 33,618 metric tones 2009 - West Coast of Peninsular Malaysia 29,715 metric tones
	Time series of total catch estimates - **Years with data.** - **Source of data (survey, logsheet, market, census, etc).** - **Reliability of data.** - **Allocation of catch among fisheries and/or fishing gears.** - **Reference documents.**	- **Annual fisheries statistical report (every year)** - **Actual data from landing site …… sampling method** - **Accuracy quiet high base on sampling method and data validation on landing site**
	Allocation of catch among fisheries and/or fishing gears. Seasonality of catch (by fishery).	- **By site, by gear, by trip**
Fishing effort	Number of vessels by fishery (recent and available time-series of data).	No of vessel, no of fishermen, CPUE are available in our Annual Fisheries Statistical Report Accuracy quiet light base on Sampling method and data

	Detailed fishing effort data (days fished, length of nets, etc) by fishery. Include source of data, reliability of data, data problems.	validation on landing site
CPUE trends	Describe and reference any studies that provide CPUE indices for individual fisheries.	
Biological studies	Describe any national research undertaken or planned for the species, including: - **Age and growth.** - **Maximum age estimates.** - **Length and/or age sampling of the catch (by fishery).** - **Length/age at maturity.** - **Timing of spawning season.** - **Length-weight relationship.** - **Movement information (tagging).** - **Quantitative stock assessments.** - **Other relevant research surveys, programmes.** (Please include the name of the principal scientist responsible and any available references).	1)SEAFDEC/MFR PMD, KUALA TERENGGM, MALAYSIA Project title: Tagging program for economic Pelagie Species AS &SCS under Japanese Trust Fund The Sampling activities are already done. Now, the data is still analyzed by each country (Indonesia, Thailand, Myanmar, Cambodia, Vietnam, Philippines, Brunei and Malaysia) The finding will be presented on June 2012.
Other relevant information		Report of Southeast Asian State of Fisheries and Aquaculture (SEASOFIA) will be published by SEAFDEC, Thailand on March 2012.

Country: Maldives

Species: Indian Mackerel

Data category	Component	Relevant information available (please complete)
Fishery definitions	Describe the main national fisheries catching the species. - **Fishing method (gear)** - **Fishing season (months).** - **Fishery area (main region/habitat of each fishery).** - **Size/power of vessels operating in fishery.** - **Main ports of operation.**	- **Mainly fixed gill net** - **Mainly used as bait for yellow fin tuna fishery** - **The size varies – no specific size** - **No main pore for operation**
Catch	Recent total annual catch (mt) of species. (include an indicative estimate if reliable statistics are not available).	Not available – it take in a form group 3, so it's very difficult to identify the species - **Assume the catch will be increasing due to the expansion of yellow fin fishery** - **There is no logbook for mackerel**
	Time series of total catch estimates - **Years with data.** - **Source of data (survey, logsheet, market, census, etc).** - **Reliability of data.** - **Allocation of catch among fisheries and/or fishing gears.** - **Reference documents.**	- **The data is available from 2004 (but not as mackerel but as group data which is reef fish average weight of 0.11 kg** - **The skippers are failed to report the data, so the values would be very inaccuracies.**
	Allocation of catch among fisheries and/or fishing gears. Seasonality of catch (by fishery).	

Fishing effort	Number of vessels by fishery (recent and available time-series of data). Detailed fishing effort data (days fished, length of nets, etc) by fishery. Include source of data, reliability of data, data problems.	- **Mainly used as a bait in yellow fin fishery** - **However, both skipjack and yellow fin vessel would be catching mackerel catch**
CPUE trends	Describe and reference any studies that provide CPUE indices for individual fisheries.	CPUE will be inaccuracy
Biological studies	Describe any national research undertaken or planned for the species, including: - **Age and growth.** - **Maximum age estimates.** - **Length and/or age sampling of the catch (by fishery).** - **Length/age at maturity.** - **Timing of spawning season.** - **Length-weight relationship.** - **Movement information (tagging).** - **Quantitative stock assessments.** - **Other relevant research surveys, programmes.** (Please include the name of the principal scientist responsible and any available references).	No biological data
Other relevant information		

Country: Myanmar

Species: Indian Mackerel

Data category	Component	Relevant information available (please complete)
Fishery definitions	Describe the main national fisheries catching the species. - **Fishing method (gear)** - **Fishing season (months).** - **Fishery area (main region/habitat of each fishery).** - **Size/power of vessels operating in fishery.** - **Main ports of operation.**	Some relevant information can be available such as fishing method, fishing season, fishing area, site of vessels and the main landing sites for Indian mackerel species.
Catch	Recent total annual catch (mt) of species. (include an indicative estimate if reliable statistics are not available).	(5000) MT of this species can be caught in annual (estimated)
	Time series of total catch estimates - **Years with data.** - **Source of data (survey, logsheet, market, census, etc).** - **Reliability of data.** - **Allocation of catch among fisheries and/or fishing gears.** - **Reference documents.**	For time series of total catch estimates can be available of the main landing statistics for last 5 years
	Allocation of catch among fisheries and/or fishing gears. Seasonality of catch (by fishery).	By yearly can catch for the Indian mackerel
Fishing effort	Number of vessels by fishery (recent and available time-series of data).	No. of vessels of fishing can be got.

	Detailed fishing effort data (days fished, length of nets, etc) by fishery. Include source of data, reliability of data, data problems.	Detailed fishing effort data could not be available. By landing statistics monthly basis or yearly basis.
CPUE trends	Describe and reference any studies that provide CPUE indices for individual fisheries.	CPUE trends are not development
Biological studies	Describe any national research undertaken or planned for the species, including: - **Age and growth.** - **Maximum age estimates.** - **Length and/or age sampling of the catch (by fishery).** - **Length/age at maturity.** - **Timing of spawning season.** - **Length-weight relationship.** - **Movement information (tagging).** - **Quantitative stock assessments.** - **Other relevant research surveys, programmes.** (Please include the name of the principal scientist responsible and any available references).	Need to do national research and resources survey for this species.
Other relevant information		Need to do more cooperation and coordination in our region

Country: Sri Lanka

Species: Indian Mackerel

Data category	Component	Relevant information available (please complete)
Fishery definitions	Describe the main national fisheries catching the species. - **Fishing method (gear)** - **Fishing season (months).** - **Fishery area (main region/habitat of each fishery).** - **Size/power of vessels operating in fishery.** - **Main ports of operation.**	Small mesh, Gill net (mesh size 2.0 to 4.50 cm.) Beach seine "West Coast & East Coast" East, North FRP, 25-40 HP
Catch	Recent total annual catch (mt) of species. (include an indicative estimate if reliable statistics are not available).	Available but not analyze (analyzed for some region)
	Time series of total catch estimates - **Years with data.** - **Source of data (survey, logsheet, market, census, etc).** - **Reliability of data.** - **Allocation of catch among fisheries and/or fishing gears.** - **Reference documents.**	- **From 2000** - **Sampling through NARA** - **Reliability collected by NARA samples with guidance of research**
	Allocation of catch among fisheries and/or fishing gears. Seasonality of catch (by fishery).	3-5% small pelage North West – June –September East – October - February
Fishing effort	Number of vessels by fishery (recent and available time-series of data).	Not available

	Detailed fishing effort data (days fished, length of nets, etc) by fishery. Include source of data, reliability of data, data problems.	Available for some areas Catch per boat, no. of net pieces with sizes NARA small pelage database
CPUE trends	Describe and reference any studies that provide CPUE indices for individual fisheries.	Not analyze recently
Biological studies	Describe any national research undertaken or planned for the species, including: - **Age and growth.** - **Maximum age estimates.** - **Length and/or age sampling of the catch (by fishery).** - **Length/age at maturity.** - **Timing of spawning season.** - **Length-weight relationship.** - **Movement information (tagging).** - **Quantitative stock assessments.** - **Other relevant research surveys, programmes.** (Please include the name of the principal scientist responsible and any available references).	Monthly length frequency data available Stock Assessment by DNA statistic …… Fernando 2004 Stock Assessment by NDA
Other relevant information		

Country: Thailand

Species: **Indian mackerel**

Data category	Component	Relevant information available (please complete)
Fishery definitions	Describe the main national fisheries catching the species. - Fishing method (gear). - Fishing season (months). - Fishery area (main region/habitat of each fishery). - Size/power of vessels operating in fishery. - Main ports of operation.	 - Purse seine, trawl, and gill nets - Catching every months through out the year - Both sides of fishing area; Gulf of Thailand and Indian Ocean - Mostly over 50 gross tonnage or over 18 meters. - Gulf of Thailand : Pattani and Rayong provinces. - Indian Ocean : Phang-nga, Phuket and Krabi provinces.
Catch	- Recent total annual catch (mt) of species. (include an indicative estimate if reliable statistics are not available).	In 2009, Total = 29,426 mt. - Indian Ocean = 17,122 t. (58.19%) - Gulf of Thailand = 12,304 t. (41.81%)
	- Time series of total catch estimates	- Available
	- Years with data.	- from 2009 backward nearly 30 years
	- Source of data (survey, logsheet, market, census, etc).	- Sample survey
	- Reliability of data.	- Depend on the sample size and quality of raw data - Catch estimation couldn't conduct in each sub-types of purse seine so its just the comprehensive data.
	- Allocation of catch among fisheries and/or fishing gears.	- Purse seine 83.86%, trawls 15.04% and the rest by gill net.
	- Reference documents.	- The marine fisheries statistics base on the sample survey
	Allocation of catch among fisheries and/or fishing gears. Seasonality of catch (by fishery).	 - catch decreasing during periods of closed area and season for purse seine (spawning season for Indo-Pacific mackerel); Gulf of Thailand during 15 Feb.- 15 May, Andaman Sea during 1 Apr. – 30 Jun. After the closing period catch has obviously increasing.

Fishing effort	Number of vessels by fishery (recent and available time-series of data). Detailed fishing effort data (days fished, length of nets, etc) by fishery. Include source of data, reliability of data, data problems.	- In 2009, - Purse seine = 1,206 - Trawl(Otter board trawl and pair trawls) = 3,692 - No. of trips, fishing days, fishing hauls and fishing hours
CPUE trends	Describe and reference any studies that provide CPUE indices for individual fisheries.	- Paper of Andaman Sea Fisheries Research and Development Center (Phuket) : Stock Assessment of Indian Mackerel(*Rastrelliger kanagurta*(Cuvier,1816)) along the Andaman Sea coast of Thailand.
Biological studies	Describe any national research undertaken or planned for the species, including: - Age and growth. - Maximum age estimates. - Length and/or age sampling of the catch (by fishery). - Length/age at maturity. - Timing of spawning season. - Length-weight relationship. - Movement information (tagging). - Quantitative stock assessments. - Other relevant research surveys, programmes. (Please include the name of the principal scientist responsible and any available references).	- The biological data is responsible by MFRDB - Paper of Andaman Sea Fisheries Research and Development Center (Phuket) : Stock Assessment of Indian Mackerel(*Rastrelliger kanagurta*(Cuvier,1816)) along the Andaman Sea coast of Thailand. - Montri Sumontha, Sonthaya Boonsuk, Sampan Panjarat, Thumawasee Jaiyen, and Jariya Ritthisaman
Other relevant information		

Country: Bangladesh

Species: Hilsa

Data category	Component	Relevant information available (please complete)
Fishery definitions	Describe the main national fisheries catching the species. - **Fishing method (gear)** - **Fishing season (months).** - **Fishery area (main region/habitat of each fishery).** - **Size/power of vessels operating in fishery.** - **Main ports of operation.**	- Industrial Trawling : 23 t - Artisanal : 225,302 t - Set bagnet : 0 - Others : 0 } Marine Whole Year
Catch	Recent total annual catch (mt) of species. (include an indicative estimate if reliable statistics are not available).	339,845 Mt. - In-land: 114,520 Mt. - Marine: 225,325 Mt.
	Time series of total catch estimates - **Years with data.** - **Source of data (survey, logsheet, market, census, etc).** - **Reliability of data.** - **Allocation of catch among fisheries and/or fishing gears.** - **Reference documents.**	2010-2011 Fisheries Statistical Yearbook of Bangladesh
	Allocation of catch among fisheries and/or fishing gears. Seasonality of catch (by fishery).	11% whole year
Fishing effort	Number of vessels by fishery (recent and available time-series of data).	Not available

	Detailed fishing effort data (days fished, length of nets, etc) by fishery. Include source of data, reliability of data, data problems.	
CPUE trends	Describe and reference any studies that provide CPUE indices for individual fisheries.	Not available
Biological studies	Describe any national research undertaken or planned for the species, including: - **Age and growth.** - **Maximum age estimates.** - **Length and/or age sampling of the catch (by fishery).** - **Length/age at maturity.** - **Timing of spawning season.** - **Length-weight relationship.** - **Movement information (tagging).** - **Quantitative stock assessments.** - **Other relevant research surveys, programmes.** (Please include the name of the principal scientist responsible and any available references).	BFRI has a regular research program to study along the line Dr.Md.Anisur Rahman Senior Scientific Officer BFRI, Chandpur 3602
Other relevant information		

Country: India

Species: Hilsa

Data category	Component	Relevant information available (please complete)
Fishery definitions	Describe the main national fisheries catching the species. - **Fishing method (gear)** - **Fishing season (months).** - **Fishery area (main region/habitat of each fishery).** - **Size/power of vessels operating in fishery.** - **Main ports of operation.**	Trawling, Hooks, etc Ban period : 15th April – 31st May East Coast 15th June – 31st July West coast
Catch	Recent total annual catch (mt) of species. (include an indicative estimate if reliable statistics are not available).	Marine: 17,607 Inland: 12,461/30,068 Mt. } 2009
	Time series of total catch estimates - **Years with data.** - **Source of data (survey, logsheet, market, census, etc).** - **Reliability of data.** - **Allocation of catch among fisheries and/or fishing gears.** - **Reference documents.**	- 2004 onwards (probably) - Survey - Yes - FSI survey report
	Allocation of catch among fisheries and/or fishing gears. Seasonality of catch (by fishery).	Whole Year (Excluding Ban period)

Fishing effort	Number of vessels by fishery (recent and available time-series of data). Detailed fishing effort data (days fished, length of nets, etc) by fishery. Include source of data, reliability of data, data problems.	Not yet known
CPUE trends	Describe and reference any studies that provide CPUE indices for individual fisheries.	None
Biological studies	Describe any national research undertaken or planned for the species, including: - **Age and growth.** - **Maximum age estimates.** - **Length and/or age sampling of the catch (by fishery).** - **Length/age at maturity.** - **Timing of spawning season.** - **Length-weight relationship.** - **Movement information (tagging).** - **Quantitative stock assessments.** - **Other relevant research surveys, programmes.** (Please include the name of the principal scientist responsible and any available references).	Not yet FDC/FSI
Other relevant information		

Country: Myanmar

Species: Hilsa

Data category	Component	Relevant information available (please complete)
Fishery definitions	Describe the main national fisheries catching the species. - **Fishing method (gear)** - **Fishing season (months).** - **Fishery area (main region/habitat of each fishery).** - **Size/power of vessels operating in fishery.** - **Main ports of operation.**	For the Hilsa fisheries, relevant information can be available such as fishery method, season, area, power of vessels and main part for commercial
Catch	Recent total annual catch (mt) of species. (include an indicative estimate if reliable statistics are not available).	20,000 Metric ton annual catch for Hilsa (Estimated)
	Time series of total catch estimates - **Years with data.** - **Source of data (survey, logsheet, market, census, etc).** - **Reliability of data.** - **Allocation of catch among fisheries and/or fishing gears.** - **Reference documents.**	Source of Data by main landing sites and markets for last 5 years can be available
	Allocation of catch among fisheries and/or fishing gears. Seasonality of catch (by fishery).	Relevant information can be available for fishing gear especially high coastal fisheries. Seasonality of catch for Hilsa are on two season such as September to December and March to May.
Fishing effort	Number of vessels by fishery (recent and available time-series of data).	Be available only for no. of Vessels and fishing days.

	Detailed fishing effort data (days fished, length of nets, etc) by fishery. Include source of data, reliability of data, data problems.	Not available for detailed fishing effort data. Based on Landing data by providing the owners by month and yearly.
CPUE trends	Describe and reference any studies that provide CPUE indices for individual fisheries.	Not development for CPUE trends for Hilsa fisheries
Biological studies	Describe any national research undertaken or planned for the species, including: - **Age and growth.** - **Maximum age estimates.** - **Length and/or age sampling of the catch (by fishery).** - **Length/age at maturity.** - **Timing of spawning season.** - **Length-weight relationship.** - **Movement information (tagging).** - **Quantitative stock assessments.** - **Other relevant research surveys, programmes.** (Please include the name of the principal scientist responsible and any available references).	Need to do a resources survey for Hilsa in Myanmar
Other relevant information		Need to do more cooperation and coordination in our region.

Country: Thailand

Species: Hilsa

Catch is unavailable in individual specie for Thailand fisheries statistics routine data. The quantity has been found very rare for many long previous years therefore it has reported including in other marine fishes.

Country: India

Species: Shark

Data category	Component	Relevant information available (please complete)
Fishery definitions	Describe the main national fisheries catching the species. - **Fishing method (gear)** - **Fishing season (months).** - **Fishery area (main region/habitat of each fishery).** - **Size/power of vessels operating in fishery.** - **Main ports of operation.**	- **Trawling, Hooks, etc** - **Ban period: 15 April – 31 May – East coast** **15 June – 31 July - West coast** - **Other period is available for fishing**
Catch	Recent total annual catch (mt) of species. (include an indicative estimate if reliable statistics are not available).	Shark crap (shark, Rays) – 61,871 Mt. in 2010
	Time series of total catch estimates - **Years with data.** - **Source of data (survey, logsheet, market, census, etc).** - **Reliability of data.** - **Allocation of catch among fisheries and/or fishing gears.** - **Reference documents.**	- **10 years data available for 2009 it is 73,284 MT. for Shark (Shark, Rays)** - **Regular Survey** - **Reliability not calculated** - **Report by State government FSI report/CMFRI report**
	Allocation of catch among	

	fisheries and/or fishing gears. Seasonality of catch (by fishery).	 N/A
Fishing effort	Number of vessels by fishery (recent and available time-series of data). Detailed fishing effort data (days fished, length of nets, etc) by fishery. Include source of data, reliability of data, data problems.	N/A
CPUE trends	Describe and reference any studies that provide CPUE indices for individual fisheries.	N/A
Biological studies	Describe any national research undertaken or planned for the species, including: - **Age and growth.** - **Maximum age estimates.** - **Length and/or age sampling of the catch (by fishery).** - **Length/age at maturity.** - **Timing of spawning season.** - **Length-weight relationship.** - **Movement information (tagging).** - **Quantitative stock assessments.** - **Other relevant research surveys, programmes.** (Please include the name of the principal scientist responsible and any available references).	Not yet Studies are require probably by FSI/ICAR Under BOBLME

Other relevant information		

Country: Indonesia

Species: Shark

Data category	Component	Relevant information available (please complete)
Fishery definitions	Describe the main national fisheries catching the species. - **Fishing method (gear)** - **Fishing season (months).** - **Fishery area (main region/habitat of each fishery).** - **Size/power of vessels operating in fishery.** - **Main ports of operation.**	- **Fishing method (gear): Tuna Longline Drift Gill Net** - **Fishing Season (Month): August – September** - **Fishery area: Indian Ocean and South …Sea** - **Size of Vessel: 20-100 GT** - **Main port: Cilacap, Tj.Luar, Palabuhan Ratu**
Catch	Recent total annual catch (mt) of species. (include an indicative estimate if reliable statistics are not available).	Year 2010: 46,153 t (Shark)
	Time series of total catch estimates - **Years with data.** - **Source of data (survey, logsheet, market, census, etc).** - **Reliability of data.** - **Allocation of catch among fisheries and/or fishing gears.** - **Reference documents.**	- **Available** - **Total enumeration in fishing port**
	Allocation of catch among fisheries and/or fishing gears. Seasonality of catch (by fishery).	Not available

Fishing effort	Number of vessels by fishery (recent and available time-series of data). Detailed fishing effort data (days fished, length of nets, etc) by fishery. Include source of data, reliability of data, data problems.	Only number of vessel for total fishery
CPUE trends	Describe and reference any studies that provide CPUE indices for individual fisheries.	Not available yet
Biological studies	Describe any national research undertaken or planned for the species, including: - **Age and growth.** - **Maximum age estimates.** - **Length and/or age sampling of the catch (by fishery).** - **Length/age at maturity.** - **Timing of spawning season.** - **Length-weight relationship.** - **Movement information (tagging).** - **Quantitative stock assessments.** - **Other relevant research surveys, programmes.** (Please include the name of the principal scientist responsible and any available references).	Dr.Dharmadi (Scientist at Research Center for Fisheries Management and conservation in collabavation with CSIRD/ACIAR
Other relevant information		

Country: Malaysia

Species: Shark

Data category	Component	Relevant information available (please complete)
Fishery definitions	Describe the main national fisheries catching the species. - **Fishing method (gear)** - **Fishing season (months).** - **Fishery area (main region/habitat of each fishery).** - **Size/power of vessels operating in fishery.** - **Main ports of operation.**	Licensed all Fishing Vessel and Gear type - **Trawl net, Purse seines, Hooks and Lines** - **Do not implement close season / all time** - **Catching area by zoning** - **Specific vessel size with specific gear type will operate in specific aone area** - **Every landing site**
Catch	Recent total annual catch (mt) of species. (include an indicative estimate if reliable statistics are not available).	2009 : 1,504 t – west coast Peninsular 2010: 1,233 t Indian Ocean Deadline landing of Shrak
	Time series of total catch estimates - **Years with data.** - **Source of data (survey, logsheet, market, census, etc).** - **Reliability of data.** - **Allocation of catch among fisheries and/or fishing gears.** - **Reference documents.**	- **Annual fisheries statistic report** - **Actual data from landing site using sampling method** - **Accuracy quiet high base on sampling method and data validation on landing** - **Site, vessel 70 ….. above collect 100%** - **Refer to annual report**
	Allocation of catch among fisheries and/or fishing gears. Seasonality of catch (by fishery).	

Fishing effort	Number of vessels by fishery (recent and available time-series of data). Detailed fishing effort data (days fished, length of nets, etc) by fishery. Include source of data, reliability of data, data problems.	Number of vessel, fishermen, CPUE are available in our annual fisheries statistical report.
CPUE trends	Describe and reference any studies that provide CPUE indices for individual fisheries.	Annual fisheries statistical report
Biological studies	Describe any national research undertaken or planned for the species, including: - **Age and growth.** - **Maximum age estimates.** - **Length and/or age sampling of the catch (by fishery).** - **Length/age at maturity.** - **Timing of spawning season.** - **Length-weight relationship.** - **Movement information (tagging).** - **Quantitative stock assessments.** - **Other relevant research surveys, programmes.** (Please include the name of the principal scientist responsible and any available references).	HPOA Shark project (Shark & Ray) Two Landing site in State of Perak - **Yes** - **Yes** - **Yes** - **Yes** - **Yes** - **Yes** - **Yes** - **Yes** - **Yes**

		MFRDMD/SEAFDEC research officer
Other relevant information		

Country: Myanmar

Species: Shark

Data category	Component	Relevant information available (please complete)
Fishery definitions	Describe the main national fisheries catching the species. - **Fishing method (gear)** - **Fishing season (months).** - **Fishery area (main region/habitat of each fishery).** - **Size/power of vessels operating in fishery.** - **Main ports of operation.**	- **Sharks are not popular** - **Sharks landing data are not available**
Catch	Recent total annual catch (mt) of species. (include an indicative estimate if reliable statistics are not available).	Sharks fishing are caught by catch and not targeted species
	Time series of total catch estimates - **Years with data.** - **Source of data (survey, logsheet, market, census, etc).** - **Reliability of data.** - **Allocation of catch among fisheries and/or fishing gears.** - **Reference documents.**	
	Allocation of catch among fisheries and/or fishing gears. Seasonality of catch (by fishery).	
Fishing effort	Number of vessels by fishery (recent and available time-series of data).	Sharks are not species register

	Detailed fishing effort data (days fished, length of nets, etc) by fishery. Include source of data, reliability of data, data problems.	
CPUE trends	Describe and reference any studies that provide CPUE indices for individual fisheries.	
Biological studies	Describe any national research undertaken or planned for the species, including: - **Age and growth.** - **Maximum age estimates.** - **Length and/or age sampling of the catch (by fishery).** - **Length/age at maturity.** - **Timing of spawning season.** - **Length-weight relationship.** - **Movement information (tagging).** - **Quantitative stock assessments.** - **Other relevant research surveys, programmes.** (Please include the name of the principal scientist responsible and any available references).	
Other relevant information		

Country: Thailand

Species: Shark

Data category	Component	Relevant information available (please complete)
Fishery definitions	Describe the main national fisheries catching the species. - **Fishing method (gear)** - **Fishing season (months).** - **Fishery area (main region/habitat of each fishery).** - **Size/power of vessels operating in fishery.** - **Main ports of operation.**	 - **Trawl** - **Reporting in volume by month is available** - **Gulf of Thailand and Indian Ocean** - **> 18 .** - **Not specific, reporting whole areas**
Catch	Recent total annual catch (mt) of species. (include an indicative estimate if reliable statistics are not available).	3,000 MT. in 2009 and 1,200 MT. from Indian Ocean
	Time series of total catch estimates - **Years with data.** - **Source of data (survey, logsheet, market, census, etc).** - **Reliability of data.** - **Allocation of catch among fisheries and/or fishing gears.** - **Reference documents.**	 - **Annual (reporting in month is available)** - **Survey** - **Based on Coverage at 10% sample** - **100% from trawl** - **Available; Thailand fisheries statistic**
	Allocation of catch among fisheries and/or fishing gears. Seasonality of catch (by fishery).	

Fishing effort	Number of vessels by fishery (recent and available time-series of data). Detailed fishing effort data (days fished, length of nets, etc) by fishery. Include source of data, reliability of data, data problems.	Number of Vessels are available in time series No.trip, day, fishing, haul
CPUE trends	Describe and reference any studies that provide CPUE indices for individual fisheries.	CUPE for trawl is available in annual reporting
Biological studies	Describe any national research undertaken or planned for the species, including: - **Age and growth.** - **Maximum age estimates.** - **Length and/or age sampling of the catch (by fishery).** - **Length/age at maturity.** - **Timing of spawning season.** - **Length-weight relationship.** - **Movement information (tagging).** - **Quantitative stock assessments.** - **Other relevant research surveys, programmes.** (Please include the name of the principal scientist responsible and any available references).	
Other relevant information		

Country: Sri Lanka

Species: Shark

Data category	Component	Relevant information available (please complete)
Fishery definitions	Describe the main national fisheries catching the species. - **Fishing method (gear)** - **Fishing season (months).** - **Fishery area (main region/habitat of each fishery).** - **Size/power of vessels operating in fishery.** - **Main ports of operation.**	- **Shark LL** - **Throughout the year** - **South and East Coast Country** - **Over 34 f'.** - **Major Harbors**
Catch	Recent total annual catch (mt) of species. (include an indicative estimate if reliable statistics are not available).	15,000 MT. The production has decline pattern
	Time series of total catch estimates - **Years with data.** - **Source of data (survey, logsheet, market, census, etc).** - **Reliability of data.** - **Allocation of catch among fisheries and/or fishing gears.** - **Reference documents.**	- **Annual data available both survey. Sample and total enumeration** - **2% of overall catch** - **NARA Research**
	Allocation of catch among fisheries and/or fishing gears. Seasonality of catch (by	n/a

	fishery).	Yes
Fishing effort	Number of vessels by fishery (recent and available time-series of data). Detailed fishing effort data (days fished, length of nets, etc) by fishery. Include source of data, reliability of data, data problems.	N/A N/A N/A
CPUE trends	Describe and reference any studies that provide CPUE indices for individual fisheries.	NARA research
Biological studies	Describe any national research undertaken or planned for the species, including: - **Age and growth.** - **Maximum age estimates.** - **Length and/or age sampling of the catch (by fishery).** - **Length/age at maturity.** - **Timing of spawning season.** - **Length-weight relationship.** - **Movement information (tagging).** - **Quantitative stock assessments.** - **Other relevant research surveys, programmes.** (Please include the name of the principal scientist responsible and any available references).	Biological (Shark) over 4 years ago - **To be update** - **Yes** - **Yes** - **Yes** - **Yes** - **No** - **No**

		Marine Biology Division - NARA
Other relevant information		

APPENDIX VII – DRAFT REPORT ON DATA ASSESSMENT SYSTEMS IN BOB COUNTRIES

Review report of the fishery data collection systems of BOBLME member countries by Dr Kim Stobberup at www.boblme.org

Bangladesh, India, Indonesia, Malaysia, Maldives, Myanmar, Sri Lanka and Thailand are working together through the Bay of Bengal Large Marine Ecosystem (BOBLME) Project and to lay the foundations for a coordinated programme of action designed to improve the lives of the coastal populations through improved regional management of the Bay of Bengal environment and its fisheries.

The Food and Agriculture Organization (FAO) is the implementing agency for the BOBLME Project.

The Project is funded principally by the Global Environment Facility (GEF), Norway, the Swedish International Development Cooperation Agency, the FAO, and the National Oceanic and Atmospheric Administration of the USA.

For more information, please visit www.boblme.org