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Bay of Bengal Large Marine Ecosystem Project

BOBLME – Stock assessment course

7 October, 2011
Yangon, Myanmar

Final report

Rishi Sharma
1. Background

FAO APFIC has noted numerous times that there is a need to build capacity in the region as the current level of training and assessment is lacking within the countries in the BOBLME region. Similar comments have been made by SEAFDEC and other entities operating in the Asia Pacific Region that there is a need to train and retain people to learn the basic know how of stock assessment and to collect and maintain data from the various assessment programs in the region. As a result, BOBLME has created a position of the Stock Assessment Coordinator who will develop the stock assessment models and programs for subcomponent 2.3 in the mandate of BOBLME, as well as train scientists and academics with current state of the knowledge techniques to be applied in the region. This is the first of many courses that will be held in the region to train fisheries officers, researchers and academics from the various countries on the newer stock assessment techniques.

2. Introduction

The course was held at Department of Fisheries office in Yangon, Myanmar on October 7th, 2011. The course covered numerous elements of stock assessment and ecosystem approaches to fisheries assessments (agenda Appendix I). The introduction was made by Dr Rudolph Hermes, and the course was taught by Dr Rishi Sharma after the group photograph was taken.

Objective

The objectives of the course were three fold:

a) To convey the basic understanding of data collection programs and their use
b) To demonstrate how these could be used in an assessment
c) To convey basic interactions of fish within an ecosystem.

Approach

The course was run in the format of lectures followed by examples. Five lectures were covered on the following:

1. Ecosystems and biomes where fish interact with the region they reside, and how the feed on areas that have high primary production (as an attribute of oceanic features, tidal mixing or upwelling patterns)
2. Life history and how these factors are important in understanding the population dynamics
3. Sampling design and collection of catch and effort data
4. Basics of stock assessment
5. Spawner and recruit

These lectures were followed by an exercise to understand how difficult it may be to estimate optimal spawning stock size that is the basis of all management in the region, and an interactive game was played between the participants and evaluated how well they performed in managing a fishery to optimal yield.

3. Workshop effectiveness

A survey was designed for feedback after the course (Appendix III). The course was developed to build capacity in stock assessment knowledge in the region and this workshop presented some basics of stock assessment and their value. In order to understand if it was useful to the audience a survey was developed that would address the utility of the material presented and whether the
course should be modified somewhat. In essential parts of the lectures presented it would be useful to have a participant with local language and strong English skills who could convey all information to the participants.

4. Workshop feedback

There was a huge interest in the course (30+ participants attended)

1. The participants want more such courses to build on their technical skills.
2. They appreciated the material a lot.
3. They would bring their data for analysis in a lab-setting in subsequent courses.
4. All 30+ (28 individuals filled the survey) individuals were from academia, research or fisheries officers (none from assessment backgrounds).
5. All would attend more such courses if held in the future.
6. Game based learning was the best for class participation as opposed to a lecturing environment.
7. Practical computer labs would be useful and support this learning was the general consensus.

5. Future courses

Course presentation material in pdf’s was handed to the participants for making their understanding clearer. Based on the feedback, future courses will be held in the region again covering similar material in greater depth.
# Appendix I  Course outline (agenda)

## 7 October 2011

<table>
<thead>
<tr>
<th>Time</th>
<th>Objective</th>
<th>Remarks</th>
</tr>
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<tbody>
<tr>
<td>08:30-09:00</td>
<td>Registration</td>
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<tr>
<td>09:00-09:15</td>
<td>Opening speech by U Khin Ko Lay, Director General, Department of Fisheries</td>
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<tr>
<td>09:15-09:30</td>
<td>Welcome Remarks delivered by Dr Rudolf Hermes, Chief Technical Advisor, BOBLME Project</td>
<td></td>
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<tr>
<td>09:30-09:45</td>
<td>Self-introduction by all participants</td>
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<tr>
<td>09:45-10:00</td>
<td>Group Photo session</td>
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<tr>
<td>10:00-10:30</td>
<td>Coffee Break</td>
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<tr>
<td>10:30-11:30</td>
<td>Fisheries Statistics and Assessment Lecture by Fisheries Statistics Expert</td>
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<td>11:30-12:00</td>
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<tr>
<td>12:00-13:00</td>
<td>Lunch</td>
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<tr>
<td>13:00-14:00</td>
<td>Fisheries Statistics and Assessment Lecture by Fisheries Statistics Expert</td>
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<td>14:00-14:30</td>
<td>Fisheries Statistics and Assessment Lecture by Fisheries Statistics Expert</td>
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<td>14:30-15:00</td>
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<tr>
<td>15:00-16:00</td>
<td>Fisheries Statistics and Assessment Lecture by Fisheries Statistics Expert</td>
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<td>16:00-16:30</td>
<td>Closing remarks by U Khin Ko Lay Director General, Department of Fisheries, Myanmar</td>
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**Appendix II  List of participants**

List of participants obtained from feedback forms

<table>
<thead>
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<tr>
<td>U Tint Swe</td>
<td>Kyaw Myint Kyaw</td>
</tr>
<tr>
<td>Tun Klin Aung,</td>
<td>Daw Nei Ile</td>
</tr>
<tr>
<td>Deputy Officer</td>
<td>Branch Clark</td>
</tr>
<tr>
<td>Pyinsalu</td>
<td>Mandalay Division</td>
</tr>
<tr>
<td>Dr Khin My Cho</td>
<td>Myint Myint Sox</td>
</tr>
<tr>
<td>Professor, Head of</td>
<td></td>
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<tr>
<td>Marine Science</td>
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<tr>
<td>Pathein University</td>
<td></td>
</tr>
<tr>
<td>U Sai Kyaw Myint</td>
<td>Mr Win Myint</td>
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<tr>
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<td>Shwe Bo Sicscct</td>
</tr>
<tr>
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<tr>
<td>U Sein Thin</td>
<td>Yin Shein</td>
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<tr>
<td>U Tin Htut</td>
<td>Saw Aung Htue</td>
</tr>
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<td>Shan State Officer</td>
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<tr>
<td>Department of</td>
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</tr>
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<tr>
<td>U Tun Uun Uo</td>
<td>U Yan Linn</td>
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<tr>
<td>Daw Thiri Mama</td>
<td>Win Thein</td>
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<td>Dr Thida Kyaw</td>
<td>U Mye Min Lult</td>
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<td>Omar Myint</td>
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<td>Assistant Fisheries</td>
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<td>Officer</td>
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<td>Shan State</td>
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</table>
Appendix III  

Survey on course in Myanmar

Please answer the questions as to relevance (1 being most irrelevant and 5 being most relevant).

1. What is your role within Department of Fisheries in Myanmar?

2. Did you find this course useful?

3. Would you want another course as a follow up in more depth?

4. Would you want a quantitative course to be the focus?

5. Would computer labs make some of this material easier to understand?

6. What areas in Myanmar would require some analysis?
   1. Inland  2. Marine  2. Both

7. Would you bring your data to analyse in a longer workshop?
   1. Yes  2. No  3. Maybe

8. Is there a need for more workshops and trainings of this sort in Myanmar?
   1. Yes  2. No  3. Maybe

9. What part of the course did you find the most relevant?

10. Other comments
### Appendix IV

**Results tabulated for survey**

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<tr>
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</table>

**Other comments**

- More workshops needed
- More workshops needed in Pop Dynamics
- Very useful course thank you for teaching
- Thank you very much Very useful
- Thank you very much Very useful
- Trainings needed more often by BOBLME and are seldom given
- Thank you BOBLME
- Improves knowledge and understanding of MSY calculation and is very important
- Very interesting and essential for my work
- Very interesting subject and makes fishery stats easy to understand
- Very good training. Thank you. I like it very much on Fishery Stat and population Dynamics
- Good for my country and my job and is very important
- Very good training for my country
Bay of Bengal Large Marine Ecosystem Project

BOBLME – Stock assessment course
24 and 25 November, 2011
Phuket, Thailand

Final report

Rishi Sharma
1. Background

FAO APFIC has noted numerous times that there is a need to build capacity in the region as the current level of training and assessment is lacking within the countries in the BOBLME region. Similar comments have been made by SEAFDEC and other entities operating in the Asia Pacific Region that there is a need to train and retain people to learn the basic know how of stock assessment and to collect and maintain data from the various assessment programs in the region. As a result, BOBLME has created a position of the Stock Assessment Coordinator who will develop the stock assessment models and programs for subcomponent 2.3 in the mandate of BOBLME, as well as train scientists and academicians with current state of the knowledge techniques to be applied in the region. This is the second of many courses that will be held in the region to train fisheries officers, researchers and academics from the various countries on the newer stock assessment techniques.

2. Introduction

The course was held at Andaman Sea Fisheries Research and Development Center in Phuket, Thailand on November 24th and 25th, 2011. The course covered numerous elements of stock assessment and ecosystem approaches to fisheries assessments. The introduction was made by Ms Praulai Nootmorn, National Coordinator for Thailand for the BOBLME Project, and the course was taught by Dr Rishi Sharma after the group photograph was taken.

Objective
The objectives of the course were three fold:
   a) To convey the basic understanding of data collection programs and their use
   b) To demonstrate how these could be used in an assessment through Population dynamic models.
   c) To convey basic interactions of fish within an ecosystem.

Approach
The course was run in the format of lectures followed by examples. Seven lectures were covered on the following:
   1. Ecosystems and biomes where fish interact with the region they reside, and how the feed on areas that have high primary production (as an attribute of oceanic features, tidal mixing or upwelling patterns).
   2. Life history and how these factors are important in understanding the population dynamics.
   3. Sampling design and collection of catch and effort data.
   5. Climate Forcing and the effects on ecosystems
   6. Spawner and recruit

These lectures were followed by an exercise to understand how difficult it may be to estimate optimal spawning stock size that is the basis of all management in the region, and an interactive game was played between the participants and evaluated how well they performed in managing a fishery to optimal yield.

A short quiz or exam was given to the participants on the second day to test their understanding of the material presented over the two days (Appendix III). These were graded by their partners and evaluated.
3. Workshop effectiveness

The quiz demonstrated that most people understood the material (between 50-90% of questions were answered correctly depending on the individual). A survey was designed for feedback after the course (Appendix II). The course was developed to build capacity in stock assessment knowledge in the region and this workshop presented some basics of stock assessment and their value. In order to understand if it was useful to the audience a survey was developed that would address the utility of the material presented and whether the course should be modified somewhat. In essential parts of the lectures presented it would be useful to have a participant with local language and strong English skills who could convey all information to the participants. Results of the survey were given in Appendix IV.

4. Workshop feedback

There was a huge interest in the course (35 participants attended)

1. The participants want more such courses to build on their technical skills (95% of participants said yes for more training).
2. They appreciated the material a lot.
3. They would bring their data for analysis in a lab-setting in subsequent courses.
4. All 33 individuals were from biologists, research or fisheries officers.
5. All would attend more such courses if held in the future.
6. Game based learning was the best for class participation as opposed to a lecturing environment.
7. Practical computer labs would be useful and support this learning was the general consensus.

5. Future courses

Course presentation material in print-outs were handed to the participants for making their understanding clearer. Based on the feedback, future courses will be held in the region again covering similar material in greater depth. The focus would be on advanced stock assessment techniques and will require computers and a computer lab for training.
### Appendix I  List of participants

<table>
<thead>
<tr>
<th>Course participants</th>
<th>Course participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mr Udomsin Augsornpaop Fisheries biologist Chumphon Marine Fisheries Research and Development Center (CMDEC) Thailand <a href="mailto:audomsin@yahoo.com">audomsin@yahoo.com</a></td>
<td>Mr Nuntachai Boonjorn Fisheries biologist Chumphon Marine Fisheries Research and Development Center (CMDEC) Thailand <a href="mailto:nuntachai_b@yahoo.com">nuntachai_b@yahoo.com</a></td>
</tr>
<tr>
<td>Mr Sonthaya Boonsuk Senior biologist Satun Marine Fisheries Station, DoF Thailand <a href="mailto:sonthaya_b@hotmail.com">sonthaya_b@hotmail.com</a></td>
<td>Mr Wiwattanan Boonyoung Fisheries biologist UMDEC Thailand <a href="mailto:wiwattanan@hotmail.com">wiwattanan@hotmail.com</a></td>
</tr>
<tr>
<td>Mr Nirun Choosuan Fisheries biologist Eastern Marine Fisheries Research and Development (EMDEC) Thailand <a href="mailto:nirun222@hotmail.com">nirun222@hotmail.com</a></td>
<td>Mr Kanit Chuapun Fisheries biologist UMDEC Thailand <a href="mailto:kanit09@yahoo.com">kanit09@yahoo.com</a></td>
</tr>
<tr>
<td>Mr Watcharapong Chumchuen Fisheries biologist AFTRADI Thailand <a href="mailto:w.chumchuen@gmail.com">w.chumchuen@gmail.com</a></td>
<td>Ms Waraporn Dechboon Fisheries biologist Southern Marine Fisheries Research and Development Center (SMDEC) Thailand <a href="mailto:dechwara@gmail.com">dechwara@gmail.com</a></td>
</tr>
<tr>
<td>Mr Sichon Hoimuk Andaman Sea Fisheries Research and Development Center (AFDEC) Department of Fisheries Thailand <a href="mailto:s.hoimuk@gmail.com">s.hoimuk@gmail.com</a></td>
<td>Mr Pornanan Keereerut Fisheries biologist Andaman Sea Fisheries Research and Development Center (AFDEC) Department of Fisheries Thailand <a href="mailto:nok_duidui@hotmail.com">nok_duidui@hotmail.com</a></td>
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<tr>
<td>Mr Olarn Kenui Fisheries biologist Andaman Sea Fisheries Research and Development Center (AFDEC) Department of Fisheries Thailand <a href="mailto:olarn_bu@hotmail.com">olarn_bu@hotmail.com</a></td>
<td>Mr Udom Khruenaiam Fisheries biologist Eastern Marine Fisheries Research and Development (EMDEC) Thailand <a href="mailto:chud_2004@yahoo.com">chud_2004@yahoo.com</a></td>
</tr>
<tr>
<td>Name</td>
<td>Title</td>
</tr>
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<td>-----------------------------</td>
<td>------------------------------</td>
</tr>
<tr>
<td>Mr. Amnuay Kongprom</td>
<td>Chief</td>
</tr>
<tr>
<td>Mr. Kumpon Loychuen</td>
<td>Chief, Ranong Marine Fisheries Station</td>
</tr>
<tr>
<td>Mr. Prasit Luesrithawornsin</td>
<td>Fisheries biologist</td>
</tr>
<tr>
<td>Mr. Kanokwan Maeroh</td>
<td>Fisheries biologist</td>
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<tr>
<td>Ms. Sampan Panjarat</td>
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<td>Mr. Withaya Panthakit</td>
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<td>Ms. Jinda Petchkamnerd</td>
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<td>Ms. Ratanawalee Phoonsawat</td>
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<td>Khun Supachai Rodpradit</td>
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<tr>
<td>Mr. Rochanrut Rungruang</td>
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<tr>
<td>Mr. Charit SaNga-Ngam</td>
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<td>Ms. Niracha Songkaew</td>
<td>Fisheries Biologist</td>
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<tr>
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<tr>
<td>Mr Thanate Sritakon</td>
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<td>Mr Nanthapol Suksamrarm</td>
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<td>Mr Montri Sumontha</td>
<td>Senior biologist</td>
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<td>Mrs Tassanee Suppapruek</td>
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<td>Ms Suwantana Tossapornpitakkul</td>
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<td>Mr Aekkarat Wingkeaw</td>
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<td>Mr Bundit Yangpolkhan</td>
<td>Fisheries biologist</td>
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<tr>
<td>Dr Rishi Sharma</td>
<td>Stock Assessment Coordinator</td>
</tr>
<tr>
<td>RCU Lecturer</td>
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</tr>
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Appendix II  

Survey on course in Thailand.

Please answer the questions as to relevance (1 being most irrelevant and 5 being most relevant).

1. What is your role within Department of Fisheries in Thailand?


2. Did you find this course useful?


3. Would you want another course as a follow up in more depth?


4. Would you want a quantitative course to be the focus?


5. Would computer labs make some of this material easier to understand?


6. What areas in Thailand would require some analysis?

1. Inland  2. Marine  2. Both

7. Would you bring your data to analyse in a longer workshop?

1. Yes  2. No  3. Maybe

8. Is there a need for more workshops and trainings of this sort in Thailand?

1. Yes  2. No  3. Maybe

9. What part of the course did you find the most relevant?


10. Other comments
Appendix III  Quiz given to participants of the Thailand workshop

Name:

1) What are the four Biomes? For one biome explain the further sub-division into 3 possible habitat types?

2) What are the processes that drive primary production?

3) Write down the logistic equation?

4) What factors determine if a species is r selected?

5) What factors determine a K selected species?

6) If a sampling frame is 30 and we sample fish caught in 10 locations with values of 4, 10, 20, 30, 40, 20, 50, 100, 10, 15 what is the overall catch for the frame?

7) If q=0.001/Boat and CPUE=10 T/Boat, what is the Available Biomass?

8) Why might catchability change?

9) What biotic and abiotic factors affect recruitment?

10) Define growth overfishing?
### Appendix IV  
**Results tabulated for survey:**

<table>
<thead>
<tr>
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<th>OUTCOME</th>
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### Other comments
- Integrate course between oceanography and stock assessment
- More time on pop dynamics in future
- More study on stock and recruit in depth
- More info on stock assessment on reefs
- Please increase font size on handout
- Training on real data from Thailand needed
- Thank you BOBLME
- Take longer time for course and use local Thailand data from people and discuss results of assessment
- Very good course
- More workshops required in Advance pop dynamics. I will bring my data to analyze.
- I want to train about pop dynamics with computer in the future
- Need workshop of stock assessment again
- Need workshop with computer practice
Bay of Bengal Large Marine Ecosystem Project

BOBLME – Stock assessment course
5 and 6 December, 2011
Chandpur, Bangladesh

Final report

Rishi Sharma
1. Background

FAO APFIC has noted numerous times that there is a need to build capacity in the region as the current level of training and assessment is lacking within the countries in the BOBLME region. Similar comments have been made by SEAFDEC and other entities operating in the Asia Pacific Region that there is a need to train and retain people to learn the basic know how of stock assessment and to collect and maintain data from the various assessment programs in the region. As a result, BOBLME has created a position of the Stock Assessment Coordinator who will develop the stock assessment models and programs for subcomponent 2.3 in the mandate of BOBLME, as well as train scientists and academicians with current state of the knowledge techniques to be applied in the region. This is the third of many courses that will be held in the region to train fisheries officers, researchers and academics from the various countries on the newer stock assessment techniques.

2. Introduction

The course was held at Bangladesh Fisheries Research Institute (BFRI) in Chandpur, Dhaka on December 5th and 6th, 2011. The course covered numerous elements of stock assessment and ecosystem approaches to fisheries assessments. The introduction was made by Mr Md. Zaher, Chief Scientific Officer of Chandpur Research Station, BFRI, and the course was taught by Dr Rishi Sharma after the group photograph was taken.

Objective
The objectives of the course were three fold:
   a) To convey the basic understanding of data collection programs and their use
   b) To demonstrate how these could be used in an assessment through population dynamic models.
   c) To convey basic interactions of fish within an ecosystem.

Approach
The course was run in the format of lectures followed by examples. Seven lectures were covered on the following:
1. Ecosystems and biomes where fish interact with the region they reside, and how the feed on areas that have high primary production (as an attribute of oceanic features, tidal mixing or upwelling patterns)
2. Life history and how these factors are important in understanding the population dynamics
3. Sampling design and collection of catch and effort data
4. Basics of stock assessment (I and II)
5. Climate forcing and the effects on ecosystems
6. Spawner and Recruit

These lectures were followed by multiple exercises:
1. To understand how difficult it may be to estimate optimal spawning stock size that is the basis of all management in the region, and an interactive game was played between the participants and evaluated how well they performed in managing a fishery to optimal yield.
2. Demonstrate how yield per recruit could be estimated for Hilsa in Bangladesh.
3. Variation in r and K using logistic models and what they mean.
4. Estimation models and uncertainty using VB Length curves and SP Models were also developed in collaborative exercise. Estimation of uncertainty was key in this process.
A short quiz or exam was given to the participants on the second day to test their understanding of the material presented over the two days (Appendix II). Responses were graded by their partners and evaluated. The outcome of this demonstrated that people have some knowledge more capacity building is need.

3. Workshop effectiveness

The quiz demonstrated that most people didn’t understand the material (between 50-60% of questions were answered correctly depending on the individual). A survey was designed for feedback after the course (Appendix I). The course was developed to build capacity in stock assessment knowledge in the region and this workshop presented some basics of stock assessment and their value. In order to understand if it was useful to the audience a survey was developed that would address the utility of the material presented and whether the course should be modified somewhat. Some essential parts of the lectures were presented in the local language by the instructor, i.e. Bengal was used but people would have preferred the lecture notes in Bengali as well. Results of the survey were given in Appendix III.

4. Workshop feedback

There was a huge interest in the course (18 participants attended)
1. The participants want more such courses to build on their technical skills (95% of participants said yes for more training).
2. They appreciated the material a lot.
3. They would bring their data for analysis in a lab-setting in subsequent courses.
4. All 18 individuals were biologists, research or fisheries officers.
5. All would attend more such courses if held in the future.
6. Practical computer labs would be useful and support this learning was the general consensus.

5. Future courses

Course presentation material in print-outs were handed to the participants for making their understanding clearer. One of BFRO staff could possibly translate this material into local language so the material is clearer to the participants. Based on the feedback, future courses will be held in the region again covering similar material in greater depth, and possibly longer duration. The focus would be on advanced stock assessment techniques and will require computers and a computer lab for training.
Appendix I  
Survey on course in Bangladesh

Please answer the questions as to relevance (1 being most irrelevant and 5 being most relevant).

1. What is your role within Department of Fisheries in Bangladesh?

2. Did you find this course useful?

3. Would you want another course as a follow up in more depth?

4. Would you want a quantitative course to be the focus?

5. Would computer labs make some of this material easier to understand?

6. What areas in Bangladesh would require some analysis?
   1. Inland  2. Marine  2. Both

7. Would you bring your data to analyse in a longer workshop?
   1. Yes  2. No  3. Maybe

8. Is there a need for more workshops and trainings of this sort in Bangladesh?
   1. Yes  2. No  3. Maybe

9. What part of the course did you find the most relevant?

10. Other comments
Appendix II  Quiz given to participants of the Bangladesh workshop

Name:

1) What are the four Biomes? For one biome explain the further sub-division into 3 possible habitat types?

2) What are the processes that drive primary production?

3) Write down the logistic equation?

4) What factors determine if a species is r selected?

5) What factors determine a K selected species?

6) If a sampling frame is 30 and we sample fish caught in 10 locations with values of 4, 10, 20, 30, 40, 20, 50, 100, 10, 15 what is the overall catch for the frame?

7) If q=0.001/Boat and CPUE=10 T/Boat, what is the Available Biomass?

8) Why might catchability change?

9) What biotic and abiotic factors affect recruitment?

10) Define growth overfishing?
### Appendix III  
#### Results tabulated for survey:

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<th>Scientist/Researcher</th>
<th>Academia</th>
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<th>Response 2</th>
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<td>Pop Dyna</td>
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#### Other comments
- More time for detailed discussion
- More time for training
- Increase training to one week minimum. Be in Bangla, and lecture sheet in Bangla
- Course should be 4 to 5 days. Should be in Bangla
- More time required for practical use on computers
- Need more workshops and training for longer duration
- Need longer workshop and training
Appendix IV  Pictures of the course
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