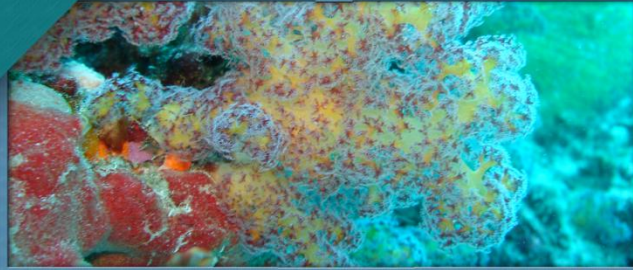




Bay of Bengal Large Marine Ecosystem Project



Report of the
Training in database and spatial analysis for Marine Protected
Areas staff in Indonesia's BOBLME region
30 June-4 July 2015 • Medan, Indonesia

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Food and Agriculture
Organization of the
United Nations



Final report

Training in Database and Spatial Analysis for Marine Protected Areas staff in Indonesia's BOBLME region

Date	June 30 – July 4 2015
Location	Medan, North Sumatra Province, Indonesia
Implementing agency	Ministry of Marine Affairs and Fisheries
Hosting agency	Directorate of Marine and Aquatic Resources Conservation Directorate General of Marine, Coasts, and Small Islands - MMAF

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Acronyms used

BOBLME	Bay of Bengal Large Marine Ecosystem
FAO	Food and Agriculture Organization
GIS	Geographic Information System
GPS	Global Positioning System
MARXAN	software designed to aid systematic reserve design on conservation planning
MMAF	Ministry of Marine Affairs and Fisheries
MPA	Marine Protected Areas
RAM	Random Access Memory
WCS	World Conservation Society

Final report

Training in database and spatial analysis for Marine Protected Area staff in Indonesia's region of the Bay of Bengal Large Marine Ecosystem (BOBLME)

1. Introduction

The training was organized and implemented by the Directorate of Marine and Aquatic Resources Conservation, Directorate General of Marine, Coasts, and Small Islands Affairs of the Ministry of Marine Affairs and Fisheries, and supported by the Bay of Bengal Large Marine Ecosystem (BOBLME) Project of the Food and Agriculture Organization of the United Nations (FAO).

The training was held June 30 to July 4, 2015 in Medan, North Sumatra Province. Grand Swiss Bell Hotel in Medan was used as the training venue for in class sessions, while the field exercise was conducted in Kampong Nipah village, Serdang Berdagai District, North Sumatera Province.

2. Target participants

There were 25 participants who joined the training; these represented various government agencies that are involved in the management of national or district MPAs within Indonesia's BOBLME area as follows:

1. Bina Bahari MPA, Aceh Besar District, Nanggroe Aceh Darussalam Province
2. Aceh Jaya MPA, Aceh Jaya District, Nanggroe Aceh Darussalam Province
3. Pulau Pisisi MPA, Simeuleu District, Nanggroe Aceh Darussalam Province
4. Pesisir Timur Pulau Weh MPA, Sabang District, Nanggroe Aceh Darussalam Province
5. District MPA of Padang Pariaman, West Sumatera Province
6. Taman Pulau Kecil Kota Padang MPA, Padang city, West Sumatera Province
7. Pulau Ujung, Pulau Tengah and Pulau Angso MPA, Pariaman city, West Sumatera Province
8. Pulau Penyau MPA, Pesisir Selatan District, West Sumatera Province
9. North Nias MPA, North Nias District, North Sumatera Province
10. Central Tapanuli MPA, Central Tapanuli District, North Sumatera Province
11. Serdang Bedagai MPA, Serdang Bedagai District, North Sumatera Province
12. Training centre for Marine and Fisheries, Agency for Human Resources Development of Marine and Fisheries - MMAF
13. Pulau Pieh National MPA, Pekanbaru National MPA Management Unit - MMAF
14. Padang Technical Unit for Management of Marine and Coastal Resources – MMAF
15. North Sumatera Province Marine and Fisheries Office
16. Directorate of Fish Resources, DG of Capture Fisheries

Names of the participants are provided in **Appendix I**.

The 25 training participants have already met participant minimum requirements which include:

- Minimum education background of diploma-4 or bachelor (although lower education level could be accepted if deemed eligible by training organizer/trainer).

- Have duty and function on management of aquatic, coasts and small islands conservation area.
- Had participated in basic training on aquatic, coasts and small islands conservation area management
- Minimum age of 23 years old.
- Good physical and mental condition.
- Having ability to create and deliver presentation.
- Conversant with word and data processing software such as MS Word and MS Excel.
- Having minimum one year work experience.
- Be able to articulate his/her opinion and concept clearly.
- Participants are expected to bring laptop with minimum specification RAM memory 2 GB, Intel Pentium 4, hard disk 20 Gb, Operating System Windows XP/7.

3. Rationale for the training

The Bay of Bengal Area is bordered by eight countries which include Maldives, India, Sri Lanka, Bangladesh, Myanmar, Thailand, Indonesia and Malaysia. About 400 million people who live on the area are dependent on its resources for food, livelihood and security. Unfortunately, the sustainability of the coastal populations' livelihoods in the future is threatened by high population growth, fish stocks overexploitation, and habitat degradation. Recognizing this, the eight countries materialized their commitments to improve the lives of coastal populations as well as the regional management of the area through the Bay of Bengal Large Marine Ecosystem (BOBLME) Project. In Indonesia, the BOBLME Project covers four provinces namely Aceh, North Sumatra, West Sumatra and Riau Province. There are currently 16 Marine Protected Areas (MPA) at national and local level (district or provincial) that are located within the boundaries of the BOBLME in Sumatra, Indonesia, extending to a total 4,083.66 km². In 2014, these MPAs are contributing to the 16.4 million hectares of MPAs out of 20 million hectares that has been targeted to be established in 2020. Besides targeting 20 million hectares of MPAs by 2020, Indonesia also focuses on how to manage these MPAs effectively so that they can provide economic benefits to the community as well as ensuring the sustainability of the environment. However, Indonesia is facing challenges to manage these MPAs effectively due to limited human resource and technical capacity, not to mention insufficient funding.

In order to achieve these goals, it is imperative that government officials, MPA managers and scientists have access to up to date as well as reliable spatial and non-spatial data and information of marine and coastal resources. These kinds of data and information are needed by the decision makers to perform dynamic decision making process and policy intervention at the national and local levels that would bring significant conservation impact. Additionally, reliable and accurate spatial data analysis allows the decision makers to take appropriate decision making and policy intervention which benefit not only for the sustainability of marine and coastal resources management, but also for improving the welfare of coastal community living surrounding the MPAs.

However, there are some challenges that have been faced by the Indonesia government in achieving the said goals. These challenges include inaccurate and inconsistent MPA coordinates between document and GIS based map, limited human resources and their technical capacity in GIS data analysis, poor spatial data quality, as well as unavailability of map in MPA proposal document.

Recognizing this, it is deemed necessary to have capacity development scheme in BOBLME area in Indonesia that will improve and strengthen technical capacity of MPA staffs, particularly on

collecting and managing data and information as well as conducting spatial analysis to be used for effective management of the MPAs. Further, this training would help MPA staffs to understand the mechanism of MPA zoning and build management plan according to Minister of Marine Affairs and Fisheries Regulation number 30 year 2010 and number 17 year 2008.

4. Training objectives

In general, the training project objective is to improve and strengthen technical capacity of MPA staffs in collecting and managing data and information of marine conservation as well as conducting data spatial analysis. Specifically, the training objectives are as follows:

- a. Have thorough understanding on basic concept of Geographic Information System (GIS), and be able to use GIS for MPA planning and management.
- b. Be able to design and organize an accurate and reliable MPA spatial database.
- c. Be able to conduct brief analysis on ecological gap and habitat representation of MPA.
- d. Have thorough understanding on basic concept of MARXAN as a tool to make management prioritization in MPA (boundary and zoning).
- e. Be able to conduct MPA conservation planning using MARXAN

5. Training design

The five days course consists of facilitation skills training as well as technical training in database and spatial analysis through incorporating theory into practice via background presentation, monitoring, ground rules, concept and methodology, field practical exercise, hands on exercise, and evaluation. Following are the basic descriptions:

- a. Opening

Mr Agus Dermawan, Director of Marine and Aquatic Resources Conservation, DG of Marine, Coasts and Small Islands, MMAF opened the training and gave opening remark (Figure 1).



Figure 1 Training opening ceremony

b. Background presentation

This session intended to setting up the scene, as it provided participants with backgrounds and importance of the training to the management of MPA in Indonesia's BOBLME areas. For this purpose, two resource persons, namely Mr Rudolf Hermes from BOBLME Project – FAO and Ms Erni Widjajanti (Deputy Director of Fisheries Resources Management at Territorial and Archipelagic Waters) gave background presentations to the training participants. Specifically, Mr Rudolf Hermes introduced regional context of BOBLME and the development of BOBLME MPA atlas to the participants (Figure 2), while Ms Widjajanti's presentation on BOBLME Project support to the management of MPAs in Indonesia's BOBLME area was presented before the closing ceremony.



Figure 2 Background presentation from resource person (Mr Rudolf Hermes)

c. Monitoring

Pre- and post-test administered at the beginning and at the end of the training. Pre- or post-test is a pair test to measure the change of participants' knowledge as a direct result of the training.

d. Ground rules

To create a good atmosphere of training as well as to engage participants' involvement to all training sessions, participants as facilitated by trainers agreed and established a set of ground rules. The ground rules cover (1) silent mode for mobile phone, (2) no texting in class, (3) active participation, (4) be punctual, and (5) fine applied for any violation.

e. Concept and methodology

Concept and methodology on spatial database were provided to the participants at the beginning of each training topic through presentation lectures. The lectures were designed in more understandable/comprehensible form so that the materials can be communicated in a way that could easily perceived by the participants. It also allowed discussion forum to provide participants with opportunity to clarify issues with the trainers as well as to engage in two-way communication between trainees and trainers.

f. Field exercise

The field exercise aimed to provide trainees with field data collection, and to familiarize trainees with GPS as one of the field equipment in collecting and recording field data. The exercise was also designed to introduce trainees with basic methods of GPS data collection, and field data upload, as well as making simple maps of the collected data using GIS software. The field exercise was

conducted in Nagalawan village, Serdang Bedagai District, North Sumatera Province, about 2 hours by bus from the training venue.

g. Hands-on exercise

The hands-on exercise intended to familiarize participants with the Arc-GIS software. A hands-on learning environment is deemed effective in training with equipment or software like GIS, since it can give trainees a better feel for the training material and software at hand as well as stimulate participants' learning experience. In this exercise, participants worked independently at their own pace using his/her own personal laptop to apply the GIS concept and methodology in Arc-GIS software. Trainer gave the concept and methodology of each training topic as well as led demonstrations prior to the exercise. Training instructors also were on hand to answer questions and discuss issues as well as difficulties that faced by the participants. Participants were also asked to volunteer themselves to lead hands-on demonstration in front of the class as seen in Figure 3.



Figure 3 One of the participants leads a demonstration during hands-on exercise

h. Evaluation

The training implementation was evaluated using evaluation survey which was distributed to the participants at the end of the training. It mainly assessed participants' perception to the overall training process.

6. Course content and training activities

The five days training covered five topics on database and spatial analysis that comprise of: introduction to GIS and ArcGIS software; enhancing spatial database; geometric correction; introduction to Global Positioning System (GPS); field data input and editing; ecological gap analysis; Marine Protected Area design using MARXAN (Marine Reserve Design using Spatially Explicit Annealing); and introduction to cartography and layout for MPA map. These topics were delivered by three trainers from World Conservation Society – Indonesia Program and Directorate of Marine and Aquatic Resources Conservation (list of trainers is provided in **Appendix I**) through a variety of activities that ranged from presentation lectures, hands-on exercise, field exercise, as well as group presentation. The following shows the content of the training topics, and training activities as implemented by the trainers (details of the training agenda attached as **Appendix II**):

6.1. Day 1: Opening and introduction to Geographic Information System (GIS) concept and software

The first day was a day of introductions which started with opening session that comprised of background presentations from resource persons and introduction of the training programs. The participants were given a brief introduction to the course programs, trainers, as well as covered contents. The introduction was the perfect time for trainers and participants to share expectations and agree on ground rules. Pre-test was also administered at the introduction session.

Further, day 1 covered three topics, namely introduction to GIS and ArcGIS software, collecting and enhancing spatial database, as well as geometric correction and data attribute. In the morning session after opening, participants were provided with lecture on introduction to GIS and ArcGIS software which covered fundamental concepts defining the definition and function of GIS, ArcGIS software, types of spatial data, as well as GIS roles in Marine Protected Area management. Lecture was followed with hands-on exercise to introduce participants with basic function of GIS on ArcMap software that included displaying map, layer and attribute, exploring standard tools, as well as altering map appearance. While on the collecting and enhancing spatial database topic, participants learned about the notions of spatial database as well as enhancement techniques to produce consistent and standard spatial database for Marine Protected Area. Through hands-on exercise, participants practiced spatial database enhancement techniques which included geo-referencing, on screen digitation, as well as projection correction. In addition, in this exercise participants were able to produce thematic layers in ArcGIS such as mangrove extent, land use, as well as road networks and coastal line. Lastly, geometric correction and data attribute topic was lectured to the participants, and then followed with exercise to edit feature and data attributes as well as calculate geometry which would be useful in preparing consistent MPA database.

6.2. Day 2: Introduction to Global Positioning System (GPS)

Day 2 of the course began with the evaluation of previous day (day 1). Participants were asked to evaluate the content and delivery as well as to have a say on the kind of difficulties they experienced during day 1. This allowed participants to discuss issues or problems they faced with the trainers. It also served as input for trainers in enhancing the delivery method for the following day 2. Most of the participant felt that the topic contents, especially projection correction would be very useful for them in evaluating MPA boundaries. In addition, participants suggested for more time in hands-on exercise.

Topics of day 2 were systematic conservation planning, introduction of GPS, and field work data input and editing. Through presentation lecture and discussion, participants were exposed to six important steps of systematic conservation planning in order to achieve good habitat and species representativeness in MPA that contribute to the conservation objectives. Following to the conservation planning was the topic on introduction to GPS, in which participants gained knowledge on GPS as a tool to collect field data during MPA identification survey. Participants also familiarize themselves with handheld GPS features and functions, namely setting and marking waypoint, and tracking (Figure 4).

Further, the field work data input and editing topic was delivered through hands-on exercise. Using ArcMap, participants practiced on how to download and display GPS coordinate data, as well as editing the data. Finally, the last session was spent on preparing the field exercise. Trainers briefed participants regarding field work plan and location. Participants were divided into five groups, with each group under trainer guidance tasked to develop field work planning and data sheet.



Figure 4 Participant practices using GPS to estimate the training room location and altitude

6.3. Day 3: Field exercise

Due to travel safety reason, we changed the field exercise location from Berhala Island to Kampong Nipah village (Figure 5). Kampong Nipah village is a mangrove ecotourism site in Serdang Bedagai district that can be reached through 2 hours travelling by bus from the training venue.



Figure 5 Group photo before field exercise in Kampong Nipah village, Serdang Bedagai district, North Sumatera

Participants were divided into 5 (five) groups with each group accompanied by one trainer/committee and equipped with site map and GPS. Each group was given the same objective which is to conduct MPA identification survey by recording and identifying bio-physical features and socio-economic data from the site. Due to time constraint, each group was allocated only 4 hours (9 am – 1 pm) to collect the data. All groups were able to complete the given tasks. They collected the data through observing distinctive environment features (such as mangrove habitat extent and condition, mangrove species as well as land use/cover), and marked their location coordinates using GPS (Figure 6). Moreover, the socio-economic data such as history of the location, number of

inhabitants, and incomes were collected through semi-structured interview with the local communities (Figure 7).



Figure 6 Participants equipped with GPS and map were collecting field data



Figure 7 Interview with the local community

Following the field exercise, on the afternoon session, all groups worked independently to upload the field data to make a simple report based on their findings. In this session, participants practiced GIS skills they acquired in previous days, specifically download and plotting GPS data as well as on-screen digitization. In addition, all groups were asked to present their field report to the class as depicted in Figure 8. Example of group presentation attached as **Appendix III**.



Figure 8 Group presentation after field exercise

6.4. Day 4: Ecological gap analysis and MPA design using MARXAN

Day 4 covered two topics, namely, ecological gap analysis, and Marine Protected Area design using MARXAN (Marine Reserve Design using Spatially Explicit Annealing). Participants gained knowledge on the importance of ecological gap analysis in evaluating representativeness of species or habitats in the MPA, as well as types and categories of gap analysis. Moreover, during the hands-on exercise using ArcGIS, participants were practicing steps in conducting spatial analysis to evaluate the ecological gap of MPAs in North Sumatera. Regarding to MARXAN, participants were exposed to MARXAN as a tool to aid systematic reserve design on conservation planning. Specifically, through hands-on exercise participants also practiced MPA design analysis using MARXAN software which comprises steps from data preparation to running MARXAN and MARXAN result interpretation.

6.5. Day 5: Introduction to cartography and layout for MPA map and closing

Introduction to cartography and map layout was the last topic that was delivered on day 5. Principles in map design, symbol design and colouring, as well as map elements and design were delivered through presentation lecture. Following the lecture, participants utilized thematic layers they produced in day 2 (mangrove, coastline, land use, and MPA boundary) to create a layout of MPA map. At the end of the day 5 session, we administered post-test to the participants to measure how much the participants were able to learn and retain after undergoing five days of training, hands-on exercise, and lectures. Participants through evaluation survey were also given a chance to evaluate the trainers on their competence and skills, as well as to give suggestions on how to improve the training for future groups. The closing activity came in the form of a simple awarding ceremony of certificates of completion to the participants and closing ceremony. Additionally, each participant received a USB thumb drive which contains all files of lecture presentations, training module, and pictures. Dr Ahsanal Kasasiah, Deputy Director for Network, Data and Information of Conservation, Directorate Marine and Aquatic Resources Conservation awarded the certificate to the participants as well as gave the closing remarks to conclude the training (Figures 9 & 10).



Figure 9 Certificate awarding ceremony



Figure 10 Closing ceremony group photo

7. Review of training delivery

In general, the training both in class and field sessions were run seamlessly and complied with the scheduled agenda and allocated time. Regarding the in class session, all training materials were delivered in interactive form and could be understood by all participants. In other words, training contents were delivered in more comprehensible and interactive form, so that it could be communicated in a way that could easily be perceived by the participants as well as to engage active participation from the participants. For example, during hands-on exercise participants were asked to volunteer to lead hands-on demonstration (under trainer supervision and guidance) which was deemed effective to trigger participant involvement in the training. Moreover, discussion forum during presentation lecture and group discussions which was enthusiastically joined by the participants were also successful in engaging active participation. The successful delivering of training contents in understandable and engaging form was acknowledged by the participants in the training evaluation surveys. In the evaluation surveys, majority of the participants enjoyed the

contents delivery method, and perceived that it was delivered well in understandable manner and related to their daily works. In the same way, field exercise was also run smoothly and was participated by all participants. All participants were enthusiastic and could work well as a team to complete all the assigned tasks. Based on our observation during the field exercise, all participants enjoyed and were familiar to work in the field and competent to accomplish the given tasks. This indicates that the participant minimum criteria that were sent out together with training invitation were effective to ensure the training would be attended by the targeted participants (MPA staff or manager).

Regarding the participants, all the registered participants are either working or have duty and function on management of MPA in their respective districts. This indicates that the minimum criteria for participants are effective to ensure the training attended by the targeted participants. Although we set minimum requirements for the participants, their educational background and age become the determinant factor in training pace, especially during hands-on exercise. Participants with education background in geography or who had experience in GIS were faster in grasping the concept and training materials, thus they tended to be fast in completing the hands-on exercise. On the other hand, participants who never had experience in mapping or GIS needed more efforts and time as well as guidance from trainers in understanding the concept and completing the hands-on exercise. Similarly, age also affected participants in either understanding concepts or follow the hands-on exercise. Younger participants (age between 25 – 40 years old) were likely to be faster in responding and follow trainers' guidance during hands-on exercise compared to their older compatriots (>40 years old). Under certain circumstances, older participants with previous knowledge in GIS were likely to be faster in following guidance during hands-on exercise. However, in general, all participants despite their age and backgrounds had a good ability to grasp the concepts and methodologies as well as to keep up with the training pace and completed all the given tasks during the hands-on exercise.

Further, the allocated time for the training event was five days which consisted of four days for in class session and one day for field exercise. The allocated time is considered a bit short compared to the materials and contents that should be delivered. Consequently, sometimes it made an impression that the trainers were in a rush in delivering the materials. One of our efforts to effectively use the allocated time was to maintain the discipline to be in time for participants, trainers, and committee. Application of fines was also deemed effective to keep the discipline among all personnel involved in the training. The training, especially hands-on exercise, was dependent on equipment especially laptop. Although it was required for the participants to bring personal laptop with minimum specification, the laptops that had been brought by the participants had different specifications not to mention operating system. This posed a challenge during hands-on exercise since specification of a computer affects its speed or performance in executing a process in ArcGIS software.

8. Comparison of pre-tests and post-tests, and training evaluation results

We administered pre-test on the introduction session on day 1, and post-test as well as training evaluation survey before the closing ceremony on the last day (day 5). The tests were focused on the course contents, and provided us with participants' knowledge on GIS related topics before and after the course. In order to measure the change of participant' knowledge as a direct result of the training, participants were required to write their names on both tests sheet. The tests results indicated that there was an increase on the level of understanding of each participant within the five days of lectures, hands-on exercise and field activity. Pre- and post-test average marks showed an increase of 31.2 points from 51.2 to 82.4. Out of 25 participants, 10 participants got perfect score (100) and 6 participants got 80 on their post-tests (**Appendix IV**). A post-test result of a participant is shown in Figure 11.

On the other hand, the anonymous training evaluation assessed participants' perception to the overall training process. It was designed to capture participants' views on following aspects: benefits of the training, time allocation and agenda, usefulness of the training contents, training contents delivery, as well as recommendations to improve the course. **Appendix V** provides the evaluation form completed with summary of the most preferred answer from the participants. The most preferred answer and the additional comments can be summarized as follows:

1. Most of the participants feel the training and its topics was very useful in their field of work, especially to create MPA map that has accurate boundary coordinates.
2. Most of the participants feel that 5 (five) training days were too short because the materials given were too technical and it was their first introduction with GIS. However, there were small portion of the participants feel the course length was adequate.
3. More than half of the participants feel the training time management as well as the schedule was effective and very tight, respectively.
4. Most participants viewed that the training contents delivery was good, understandable and engaging. Example of the evaluation form can be seen on Figure 12.

Some of the most valuable inputs and recommendations include: requests more time on the hands-on exercise, grouping for participants based on their level of knowledge to GIS during hands-on exercise, continuation of training in the future, interest either to have the perception monitoring training for their staff or even to have more in-depth GIS training in their MPAs. In addition, some of the participants also requested to include new contents such as biophysics identification using remote sensing in the future training.

Nama: Voty Rahma S (B) 150

Jawablah beberapa pertanyaan dibawah ini:

1. Menurut anda yang dimaksud dengan "Sistem Informasi Geografis" (SIG) adalah?
Suatu sistem yg terdiri dari informasi keruangan (spasial) / koordinat beserta atributnya (keterangan nilai/inp)

2. Sebutkan beberapa perangkat lunak (software) "decision support system" yang anda ketahui untuk merancang kawasan konservasi perairan yang tangguh?
Mapx dan GIS Analisis dengan bantuan software GIS bisa menggunakan ArcGIS atau QGIS

3. Definisi dari sebuah istilah "GPS" adalah?
Sistem penentuan posisi di permukaan bumi berdasarkan triangulasi dari konstelasi satelit navigasi

4. Sebutkan beberapa metode analisis spasial yang anda ketahui?
Buffering, overlay, join, merge, union, clipping

5. Jika anda diberi tugas untuk merancang sebuah kawasan konservasi perairan baru maka langkah apakah yang sebaiknya anda persiapkan? Mohon anda jelaskan secara lengkap.

1. Mempersiapkan input data keruangan dan atribut (menentukan data)
2. Menentukan batasan wilayah
3. Menentukan Unit Perencanaan
4. Mengkonversi data input tsb untuk digunakan dlm mapx
5. Menentukan konfigurasi mapx
6. Rerunning mapx
7. Melihat hasil mapx dan mengkonversi kelolaan hasil mapx

Diperiapkan oleh: Tim Penyusun, 2015

Figure 11 Post test result of a participant

EVALUASI
PELATIHAN BIMTEK Penguatan Basis Data Spasial dan Analisis Spasial untuk Perencanaan dan Pengelolaan Kawasan Konservasi Perairan
Medan, 30 Juni - 4 Juli 2015

I. EVALUASI SECARA KESELURUHAN

1. Secara keseluruhan pelatihan ini:

a. sangat bermanfaat
 b. bermanfaat
 c. kurang bermanfaat
 d. tidak bermanfaat
 Komentar: *Sangat berguna sekali untuk di terima oleh instansi masing-masing.*

2. Waktu pelaksanaan pelatihan (5 hari):

a. terlalu lama
 b. lama
 c. tepat
 d. singkat
 e. sangat singkat
 Komentar: *waktu lima hari tidak cukup mengingat materi yang sulit*

3. Agenda (pemanfaatan waktu) pelatihan ini:

a. sangat efektif (agenda sangat ketat)
 b. efektif
 c. kurang efektif
 d. tidak efektif (banyak waktu luang yang tidak terisi)
 Komentar: *tidak efektif - baru*

4. Tempat pelaksanaan pelatihan ini:

a. sangat bagus
 b. bagus
 c. kurang bagus
 d. tidak bagus
 Komentar: *lokalitas tenang*

II. EVALUASI KEGIATAN MATERI

5. Cara penyampaian materi pelatihan:

a. sangat baik
 b. baik
 c. kurang baik
 d. tidak baik
 Komentar: *materi dan model di pahami*

6. Topik materi pelatihan yang diberikan:

a. sangat bermanfaat
 b. bermanfaat
 c. kurang bermanfaat
 d. tidak bermanfaat
 Komentar: _____

7. Apakah topik materi pelatihan yang paling anda sukai?

Kerangka

8. Apakah sebaiknya ada materi pelatihan yang perlu ditambahkan?

Materi Perencanaan

III. MASUKAN

Untuk kegiatan ada bimtek lanjutannya

§ Terima kasih untuk umpan-balik dan masukannya §

Figure 12 Example of the evaluation survey

9. Conclusion and recommendations

The training on database and spatial analysis for 25 MPA staff in BOBLME area has been carried out successfully in accordance to the scheduled agenda and allocated time. For the course of five days, three trainers had delivered five topics on database and spatial analysis in interactive and understandable forms through variety of activities that ranged from presentation lectures, hands-on exercise, field exercise, as well as group presentation. All participants were eager and actively participated to follow and complete all the training activities. It was noticed that there was an increase on the level of understanding of each participant within the five days of training which was indicated by increase on the tests average mark. The training evaluation survey shows positive feedbacks, with most of the participants feel the training contents and its delivery method was good and engaging as well as very useful. The main challenge faced by the training was keeping up the training pace during hands-on exercise due to differences in participants' background and laptops' specification.






Based on the reviews and evaluation, we propose some recommendations for the improvement of future training event as follow:






1. In order to improve and maintain MPA personnel skills in database and GIS, it is imperative to conduct GIS training continuously and on-going basis.
2. As acknowledged by the participants, it would be more advantageous for the management of MPA to have more than one personnel that is competent in GIS. Therefore it is essential to distribute the GIS skills among MPA personnel. One way to do this is by conducting training of trainers in GIS, thus the trainers could conduct GIS training and pass on the skills in their respective MPA.

3. Future training event should be conducted in the GIS lab or providing participants with computer that has standard specifications for processing GIS analysis.
4. Future training should conduct Training Need Assessment prior to training implementation. The assessment would help trainers to design training based on the participants' profile and background.






Appendix I List of participants and trainers


Participants		
No.	Name	Institution (in Bahasa)
1.	Lucky Dwi Nanda, S.Si 	<i>BPSPL Padang</i>
2.	Yani Mulia, S.Pi 	<i>Dinas Kelautan dan Perikanan Kab. Aceh Besar</i>
3.	Mustaf, S.Pi 	<i>Dinas Kelautan dan Perikanan Kab. Pesisir Selatan</i>
4.	Adnan Ariadi, A.Pi 	<i>Pusat Pelatihan BPSDMKP</i>

5.	<p>Dina Arya Purnama, S.Si</p> 	<p><i>BPSPL Padang</i></p>
6.	<p>Khumaidi</p> 	<p><i>Dinas Kelautan dan Perikanan Kab. Aceh Jaya</i></p>
7.	<p>Very Hasudungan Sinaga, S.Pi</p> 	<p><i>Dinas Kelautan dan Perikanan Kab. Serdang Bedagai</i></p>
8.	<p>Teruna Terigan SP, MP</p> 	<p><i>Dinas Kelautan dan Perikanan Kab. Serdang Bedagai</i></p>
9.	<p>Arinta Dwi Hapsari, S.Pi</p> 	<p><i>Direktorat Sumberdaya Ikan</i></p>

10.	<p>Deky Rahma Sukarno, S.Kel</p> 	<p><i>Loka KKPN Pekanbaru</i></p>
11	<p>Roy Bary, A.Pi</p> 	<p><i>BPPP Medan</i></p>
12	<p>Zufriwandi Siregar, S.Pi</p> 	<p><i>Dinas Kelautan dan Perikanan Provinsi Sumatera Utara</i></p>
13	<p>Rini Khairidha, S.Pi</p> 	<p><i>Dinas Kelautan dan Perikanan Provinsi Sumatera Utara</i></p>
14	<p>M. Ikramsyah Putra</p> 	<p><i>Dinas Kelautan dan Perikanan Kota Sabang</i></p>

15	<p>Andi Parlindungan Siregar, S.Pi</p> 	<p><i>Dinas Kelautan dan Perikanan Kabupaten Nias Utara</i></p>
16	<p>Sabar Jaya Telaumbanua, S.Pi, M.Si</p> 	<p><i>Dinas Kelautan dan Perikanan Kota Pariaman</i></p>
17	<p>Firman Hamidi R, S.Pi</p> 	<p><i>Dinas Kelautan dan Perikanan Kab.Padang Pariaman</i></p>
18	<p>Farida, S.Sos</p> 	<p><i>Dinas Kelautan dan Perikanan Kota Pariaman</i></p>
19	<p>Titin Sumarni, S.Pi</p> 	<p><i>Dinas Kelautan dan Perikanan Kota Padang</i></p>

20	<p>Riska Eka Putri</p> 	<p><i>Dinas Kelautan dan Perikanan Kota Padang</i></p>
21	<p>Nasrizal, STP</p> 	<p><i>Dinas Kelautan dan Perikanan Kab.Padang Pariaman</i></p>
22	<p>Irwan Lumban Tobing, S.P</p> 	<p><i>Dinas Kelautan dan Perikanan Kab.Tapanuli Tengah</i></p>
23	<p>Ahmad Sopian Marbun, S.Pi</p> 	<p><i>Dinas Kelautan dan Perikanan Kab.Tapanuli Tengah</i></p>
24	<p>Sulfianto, S.Pi</p> 	<p><i>Dinas Kelautan dan Perikanan Kab.Simeule</i></p>

25	Muklis, S.P 	<i>Dinas Kelautan dan Perikanan Kab.Pasaman Barat</i>
Trainers		
No.	Name	Institution
1.	Wen Wen 	Freelance GIS Consultant
2.	Agus Hermansyah 	WCS Indonesia Marine Program
3.	Teguh Satria Gunawan 	Directorate of Marine and Aquatic Resources Conservation

Appendix II Training agenda

Training in database and spatial analysis for MPAS staff in Indonesia's BOBLME area Medan, North Sumatera Province, 30 June – 4 July 2015

Day – 1: 30 June 2015

Time	Activities
08.00 – 08.30	Registration
08.30 – 09.00	Welcome remarks by Head of Marine and Fisheries Office North Sumatera Province, Indonesia
09.00 – 09.30	Opening by Mr Agus Dermawan, Director of Marine and Aquatic Resources Conservation, DG of Marine, Coasts and Small Islands, MMAF, Indonesia
09.30 – 09.45	Presentation by Mrs Erni Widjajanti, Deputy Director of Fisheries Resources Management at Teritorial and Archipelagic Waters
09.45 – 10.15	Presentation by Dr Ahsanal Kasasiah, Deputy Director of Networks, Data and Information of Conservation
10.15 – 10.30	Break
10.30 – 10.45	<ul style="list-style-type: none"> • Participants introduction • Pre-test for trainee
10.45 – 11.15	Introduction of Geographic Information System (GIS) concept
11.15 – 12.15	Introduction of GIS Software (demonstration)
12. 15 – 13.30	Break
13.30 – 14.30	Installation of GIS Software (ArcGIS + Extension)
14.30 – 14.45	Break
14.45 – 15.30	Collecting and strengthening spatial data (GPS, onscreen digitations, etc.)
15.30 – 16.30	Introduction of geometry correction and spatial data attribute for conservation area
16.30 – 17.00	Summary of day-1 training and preparation for day-2 training

Day – 2: 1 July 2015

Time	Activities
09.00 – 09.30	Day-1 training evaluation
09.30 – 10.30	Introduction to the basic concepts of conservation area designing (in a systematic way)
10.30 – 10.45	Coffee break
10.45 – 12.00	Introduction to the Global Positioning System (GPS)
12.00 – 13.15	Break
13.15 – 14.15	Practice on GPS by trainee

14.15 – 14.45	Input, editing & data field processing (each group will present the results from their data collection in the field + group discussion)
14.45 – 15.00	Break
15.00 – 16.15	Cont: Group discussion
16.15 – 17.00	Preparation for field trip and data collection (each group determines the themes that will be studied, prepare basic maps + questionnaire data collection)
17.00 – 17.30	Summary of day-2 training and preparation for day-3 training

Day – 3: 2 July 2015 (Field Trip)

Day – 4: 3 July 2015

Time	Activities
09.00 – 09.30	Field trip evaluation
09.30 – 10.30	Introduction to cartography and map standard layout for Marine Protected Areas
10.30 – 10.45	Break
10.45 – 12.00	Practice: Cartography and map standard layout for Marine Protected Areas
12.00 – 13.15	Break
13.15 – 14.15	Gap analysis: Spatial analysis for ecological gaps and representativeness of habitat
14.15 – 14.30	Break
14.30 – 16.30	Practice: Spatial analysis for ecological gaps and representativeness of habitat
16.30 – 17.00	Summary of day-4 training and preparation for day-5 training

Day – 5: 4 July 2015

Time	Activities
09.00 – 09.30	Day-4 training evaluation
09.30 – 10.30	Cont: Spatial analysis
10.30 – 10.45	Break
10.45 – 12.00	Applications use of GIS for Planning Conservation Area (divided according to the group as a simulation project GIS application)
12.00 – 13.15	Break
13.15 – 14.00	Cont: Applications use of GIS for Planning Conservation Area
14.00 – 14.15	Break
14.15 – 15.00	Introduction to the MARXAN Software
15.00 – 16.30	Group presentation: Applications use of GIS for Planning Conservation Area

16.30 – 16.45	Post-test for trainee
16.45 – 17.15	Closing by Deputy Director of Networks, Data and Information of Conservation

Appendix III Example of group presentation



Pemanfaatan Kawasan Pesisir
Kampung Nipah Desa Sei Nagalawan
Kec. Perbaungan Kab. Serdang Bedagai
Hotel Grand Swiss – BelHotel Medan, 2 Juli 2015

KELOMPOK 5

Kelompok 5



1. Zufriwandi Siregar
2. Diky Rahma S
3. Titin Sumarni
4. Very Hasudungan
5. Ahmad

TENTOR : MAS AGUS

Deskripsi Lokasi Kegiatan

- Wisata Hutan Mangrove ini terletak di Desa Muara Baimbai Kec. Sei Nagalawan Kab. Deli Serdang
- Jarak tempuh Desa Wisata Mangrove sekitar 1,5 s/d 2 Jam
- Fasilitas Tempat Wisata sudah memadai yang terdiri dari : Kantor, pondok, toilet, musollah, WC umum dan tempat penjualan ikan.
- Desa wisata mangrove ini di kelolah oleh Koperasi Muara Baimbai Ketua Pak Sutrisno

Hasil Pemetaan



Area Mangrove 1
Jenis: Avicennia & Rhizophora
Kerapatan rata-rata: 11 batang/100m²

Vegetasi Pantai

Area Mangrove 2
Jenis: Avicennia & Rhizophora
Kerapatan rata-rata: 40 batang/100m²

Area Mangrove 3
Jenis: Avicennia & Rhizophora
Kerapatan rata-rata: 60 batang/100m²

Lokasi kapal perahu nelayan lokal

Flating ground
Rumahnya penduduk lokal

Sedimentasi yang ditunjukkan karena adanya lumpur dan bebatu putih

Vegetasi Pantai

- Pohon Cemara
- Jeruju
- Ketapang



Hutan mangrove

- Jenis-jenis mangrove yang ditemui Avicenia, Rhizopora, Bruguiera
- Rata-Rata : Tinggi Mangrove mulai dari 8 m (start point)
- Kerapatan 40 - 60 %



Fishing Ground

Daerah Fishing Gorund :

- Nelayan Lokal (One Day Fishing)
- Jenis tangkapan Udang/jaring udang
- Jarak 2 mil laut
- Berangkat Jam 06.00 s/d 10.00 wib
- Hasil tangkapan 5 kg/hari



TERIMA KASIH

Appendix IV Pre-test and post-test results

No.	Name	Pre test	Post test
1	Adnan Ariadi	80	70
2	Ahmad Sopian Marbun	20	100
3	Andi Parlindungan Siregar	40	70
4	Arinta Dwi Hapsari	80	100
5	Deky Rahma S	80	100
6	Dina Arya Purnama	100	100
7	Farida	20	100
8	Firman Hamidi	50	70
9	Irwan Lumban Tobing	20	80
10	Khumaidi	30	90
11	Lucky Dwi Nanda	70	80
12	M. Ikramsyah Putra	30	100
13	Muklis	40	80
14	Mustaf	90	100
15	Nasrizal	40	100
16	Rini Khairidha	80	100
17	Riska Eka Putri	20	80
18	Roy Bary	20	100
19	Sabar Jaya Tel	20	0
20	Sulfianto	60	90
21	Teruna Tarigan	70	70
22	Titin Sumarni	40	80
23	Very Hasudungan Sinaga	60	60
24	Yani Mulia	40	60
25	Zufriwandi Siregar	80	80
Average		51,2	82,4

Appendix V Evaluation forms

Evaluation forms with the participants most preferred answer for each question (in Bahasa).

I. EVALUASI SECARA KESELURUHAN

1. Secara keseluruhan pelatihan ini:

a. sangat bermanfaat	b. bermanfaat	24 participants feel the training is very useful (a. sangat bermanfaat) for them
c. kurang bermanfaat	d. tidak bermanfaat	

Komentar:.....

2. Waktu pelaksanaan pelatihan (5 hari):

a. terlalu lama	b. lama	5 training days were too short for 15 participants.
c. tepat	d. singkat	
e. sangat singkat		

Komentar:.....

3. Agenda (pemanfaatan waktu) pelatihan ini:

a. sangat efektif (agenda sangat ketat)	b. efektif	The training agenda was very tight and effective (a. sangat efektif (agenda sangat ketat)) according to 12 participants.
c. kurang efektif	d. tidak efektif (banyak waktu luang yang tidak terisi)	
e. sangat singkat		

Komentar:.....

4. Tempat pelaksanaan pelatihan ini:

a. sangat bagus	b. bagus	15 participants feel that the training venue was very good and representative (a. sangat bagus)
c. kurang bagus	d. tidak bagus	

Komentar:.....

II. EVALUASI KEGIATAN/MATERI

5. Cara penyampaian materi pelatihan:

a. sangat baik	b. baik	14 participants feel that the contents delivery was good (b. baik)
c. kurang baik	d. tidak baik	

Komentar:.....

6. *Topik materi pelatihan yang diberikan:*

<i>a. sangat bermanfaat</i>	<i>b. bermanfaat</i>	20 participants feel that the training topics were very useful (a. sangat bermanfaat)
<i>c. kurang bermanfaat</i>	<i>d. tidak bermanfaat</i>	

Komentar:.....

7. *Apakah topik materi pelatihan yang paling anda sukai?*

.....

8. *Apakah sebaiknya ada materi pelatihan yang perlu ditambahkan?*

.....

III. MASUKAN

Appendix VI Temporary training certificate

No. Ref. 001/KKJI-BOBLME/VI/2015



SURAT TANDA MENGIKUTI BIMBINGAN TEKNIS
Direktorat Konservasi Kawasan dan Jenis Ikan
Direktorat Jenderal Kelautan, Pesisir dan Pulau-Pulau Kecil
menyatakan bahwa



Nama	: Yanil Mulla, S.Pi
Tempat/Tanggal Lahir	: Banda Aceh / 11 Januari 1971
NIP	: 19710111 200504 1 002
Pangkat/Golongan	: Penata / III/c
Jabatan	: Staff
Instansi	: Dinas Kelautan dan Perikanan Kab. Aceh Besar

Telah Mengikuti

Pelatihan/Bimbingan Teknis (Blmtek) Penguatan Basis Data dan Analisis Spasial Untuk Perencanaan dan Pengelolaan Kawasan Konservasi Perairan yang diselenggarakan oleh Direktorat Konservasi Kawasan dan Jenis Ikan Direktorat Jenderal Kelautan, Pesisir dan Pulau-Pulau Kecil bekerjasama dengan Bay of Bengal LME (BOBLME) dari tanggal 30 Juni s/d 4 Juli 2015 di Swiss Bell Hotel - Medan.

Medan, 4 Juli 2015
An. Direktur Konservasi Kawasan dan Jenis Ikan
Kasubdit Jejaring, Data dan Informasi Konservasi



Dr. Ahsanal Kasasah

Appendix VII Training completion certificate

	BADAN PENGEMBANGAN SUMBERDAYA MANUSIA KELAUTAN DAN PERIKANAN	No. Reg. 004805	
SURAT TANDA TAMAT PENDIDIKAN DAN PELATIHAN NOMOR: /BPSDMKP.03/DL.130/VI/2015			
Kepala Pusat Pelatihan Kelautan dan Perikanan berdasarkan Peraturan Menteri Kelautan dan Perikanan Nomor : PER.09/MEN/2008 tanggal 21 April 2008 menyatakan bahwa :			
	Nama NIP Tempat Tanggal Lahir Pangkat / Golongan Instansi	: Yani Mulia, S.Pi : 19710111 200504 1 002 : Banda Aceh / 11 Januari 1971 : Penata / Ilc : Dinas Kelautan dan Perikanan Kab. Aceh Besar	
<i>LUCUS</i>			
Pada Bimbingan Teknis (Bimtek) Penguatan Basis Data dan Analisis Spasial Untuk Perencanaan dan Pengelolaan Kawasan Konservasi Pesisir yang diselenggarakan oleh Direktorat Konservasi Kawasan dan Jenis Ikan Direktorat Jenderal Kelautan, Pesisir dan Pulau-Pulau Kecil bekerjasama dengan Bay of Bengal LME (BOBLME) dan tanggal 30 Juni s/d 4 Juli 2015 di Swiss Bell Hotel – Medan.			
Direktur Konservasi Kawasan dan Jenis Ikan	 Ir. Agus Dermawan, M.Si NIP. 19600516 198603 1 002	Jakarta, 4 Juli 2015 Kepala Pusat Pelatihan Kelautan dan Perikanan	 Dr. Ir. Santoso, M.Phil NIP. 19660807 198303 1 001



Bangladesh, India, Indonesia, Malaysia, Maldives, Myanmar, Sri Lanka and Thailand are working together through the Bay of Bengal Large Marine Ecosystem (BOBLME) Project to lay the foundations for a coordinated programme of action designed to better 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



Food and Agriculture
Organization of the
United Nations



Norad

