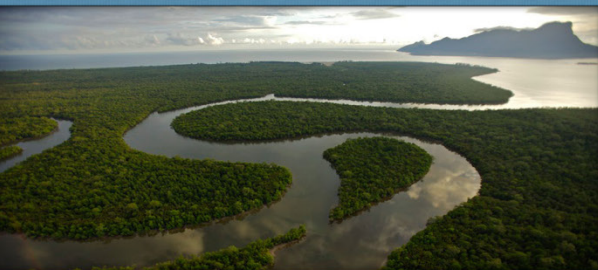
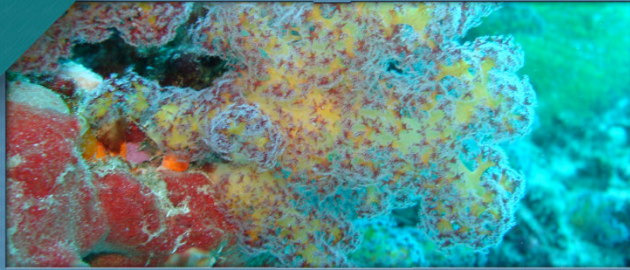




# Bay of Bengal Large Marine Ecosystem Project



Report of the  
**Training course on Seagrass Conservation and Monitoring in  
Myanmar Coastal Zone**  
26 April – 3 May 2013 • Mawlamyine University Myanmar

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BOBLME contract: LOA/RAP/2013/21

For bibliographic purposes, please reference this publication as:

BOBLME (2013) Report of the training course on Seagrass Conservation and Monitoring in Myanmar Coastal Zone, 26 April – 3 May 2013, Mawlamyine University Myanmar. BOBLME-2013-Ecology-02





# **Completion Report of Training Course on Seagrass Conservation and Monitoring in Myanmar Coastal Zone**

**(26<sup>th</sup> April to 3<sup>rd</sup> May 2013)**

**U-Soe Htun<sup>1</sup>, Anchana Prathep<sup>2</sup> & Zau Lunn<sup>3</sup>**

**<sup>1</sup> Marine Science Department, Mawlamyine University, Myanmar**

**<sup>2</sup> Department of Biology, Prince of Songkla University, Thailand**

**<sup>3</sup> Fauna & Flora International, Myanmar Programme, Myanmar**

## **Abstract**

As part of a collaboration of the Fauna and Flora International with Mawlamyine University, Myanmar, supported by the Bay of Bengal large Marine Ecosystem (BOBLME Project, a training course on seagrass conservation and monitoring in the Myanmar coastal zone was conducted at Mawlamyine University, Myanmar, from 26 to 28 April 2013, with field practice at Ngapali Beach (Thandwe), Rakhine State from 29 April to 3 May 2013. Trainers from the Department of Marine Science, Mawlamyine University, and Department of Biology, Prince of Songkla University (Thailand) carried out theoretical and practical training to 20 trainees from government departments, universities and Non-Government Organisations on seagrass conservation and monitoring methods and marine conservation in general. Seagrasses in the study area were considered relatively pristine, and the training made a contribution to improved understanding of seagrass biodiversity and ecology and their important ecosystem services value. The training was also an opportunity for enhanced research collaboration between the universities from both countries. The course identified a need for further capacity development to set up a seagrass monitoring network in Myanmar.

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## Acronyms

ASEAN	Association of Southeast Asian Nations
BANCA	Biodiversity and Nature Conservation Association
BOBLME	Bay of Bengal Large Marine Ecosystem
FAO	Food and Agriculture Organisation
FFI	Fauna and Flora International
ICLARM	International Centre for Living Aquatic Resources Management
IMT-GT	Integrated Multidisciplinary & Transboundary research for Global Transformation
MOECAF	Ministry of Environmental Conservation and Forestry
MPA	Marine Protected Area
MSAM	Marine Science Association, Myanmar
NGO	Non-Governmental Organisation
PSU	Prince of Songkla University
GIS	Geographical Information System

## 1. Introduction

Seagrasses are marine flowering plants that form an important coastal habitat worldwide. They often occur in vast meadows which provide nurseries, shelter and food for a variety of commercially, recreationally and ecologically important species. Twelve genera and 60 species have been reported worldwide (Short et al., 2007). There are 16 species from Southeast Asia (Fortes, 1990), 12 of which are reported in Thailand (Lewmanomont et al., 1996); and 7 species recently reported from the Myeik Archipelago, Myanmar (Nova et al., 2009). The trans-boundary habitat of the Andaman Sea could bring an interesting research question in terms of biodiversity and genetic connectivity, which would be additional useful information for conservation and management.

Seagrasses are known to support many endangered species such as turtles and dugongs (Nakaoka and Aioi, 1999; Nakanishi et al., 2006; Adulyanukosol and Poovachiranon 2006). The ecological roles of seagrasses are very important. They filter estuarine and coastal waters of nutrients, contaminants and sediments and are closely linked to other communities such as coral reefs and mangroves (Nybakken, 2001). Moreover, they provide habitats for a wide variety of marine organisms (Nakaoka and Toyohara, 2000; Kwak and Klumpp, 2004). The relatively high rate of primary production in seagrasses drives detritus-based food chains which helps to support many of these organisms (Adam and King, 1995). Recently, there have been scientific publications by Thai scientists, namely, Tuntiprapas et al. (2008), Prathep et al. (2008), Rattnachot et al. (2008), which mainly carried out monitoring and assessment of ecosystem services of seagrasses. In addition, it is worth noting that there has been little focus on the plants themselves especially on genetics, which are important for conservation and management. We have taken on seagrass monitoring using the SeagrassNet protocol also in the Andaman Sea in Trang and Satun provinces and recently published our results in the Gulf of Thailand (Prathep et al., 2010).

Based on this information and considering the importance of seagrass on conservation of marine organisms, the Bay of Bengal Large Marine Ecosystem (BOBLME) decided to support seagrass conservation and monitoring training relevant government departments, Universities and local NGOs for effective marine conservation to maintain sustainable fisheries in Myanmar. Fauna and Flora International (FFI) has a Memorandum of Understanding (MoU) with the Ministry of Environmental Conservation and Forestry (MOECF), Myanmar for a "COLLABORATIVE PROGRAM TO SUPPORT THE CONSERVATION OF BIODIVERSITY IN MYANMAR". In the scope of collaboration of the MoU, capacity building of relevant stakeholders is included and in response to this fact, FFI accepted to facilitate this training in Myanmar. Therefore, the Food and Agriculture Organization of the United Nations ("FAO") and Fauna & Flora International, Myanmar Office, signed a Letter of Agreement for the provision of services relating to organizing and conducting a training course on seagrass conservation and monitoring in Myanmar.

After that, responsible persons from FFI Myanmar programme negotiated with Administration Board members from Mawlamyine University to agree on how to conduct a nine days training programme on seagrass monitoring and management at the Mawlamyine University, Myanmar and in the field at Rakhine State in collaboration with FFI, Mawlamyine University and Prince of Songkla University. After completion of negotiation, Mawlamyine University and FFI and Prince of Songkla University and FFI signed separate LoAs for successful implementation of seagrass training in Myanmar.

The overall outcome would be strengthened capacity among researchers and government officers to monitor and manage sea grass habitats, developed collaboration and improved coordination among researchers in Thailand and Myanmar.

## 2. Training

### 2.1. Logistics arrangement

FFI-Myanmar programme submitted to the Ministry of Education through Mawlamyine University for issuing acceptance of the training on 26<sup>th</sup> April to 3<sup>rd</sup> May 2013. FFI-Cambridge facilitated to get funding in time for the training. FFI arranged to transfer funding to Mawlamyine University and Prince of Songkla University for preparation of the training, arrange essential documents for trainers from PSU to travel to in Myanmar in time, logistics arrangement for the training and ad hoc requirement of training in the training period.

### 2.2. Training activities

#### ***Mawlamyine University, Mawlamyine, Mon State***

Opening ceremony was conducted at Mawlamyine University on 26<sup>th</sup> April 2013 (Agenda of opening ceremony is shown in **Appendix I** and Figure 1). The opening ceremony was attended by 196 participants including Mon State government officials, staff from Mawlamyine University and 20 trainees (trainees names are shown in **Appendix II**).

Theory training was given at Mawlamyine University from 26<sup>th</sup> to 29<sup>th</sup> April by trainers from PSU and Marine Science Department (trainer's names are shown in **Appendix III**). The daily agenda of the training is shown in **Appendix IV** and Figure 2). Trainees studied in the Marine Science laboratory on seagrass species (Figure 3). Training syllabus is shown in **Appendix V**.

#### ***Ngapali, Thandwe, Rakhine State***

Practical training was done in Ngapali Beach (Thandwe), Rakhine State from 29<sup>th</sup> April to 3<sup>rd</sup> May (Figure 4). Trainees were trained on snorkeling, seagrass identification and monitoring at 4 sites in the field namely Kywe Thout Bay, Jake Taw Bay, Andrew Bay, Maung Shwe Lay Bay (Locations are shown in Figure 5). Closing ceremony was done at Ngapali Beach on 3<sup>rd</sup> May 2013 (Figure 6).

## 3. Result

### 3.1. Logistics arrangement

FFI could handle logistics arrangement successfully. FFI also organized to transfer SeagrassNet monitoring equipment to Marine Science Department, Mawlamyine University donated from BOBLME through PSU (**Appendix VI**).

### 3.2. Training activities

Training course on seagrass monitoring and management in Myanmar coastal zone was completed successfully. FFI, Mawlamyine University and Prince of Songkla University work collaboratively in the training period. The species found in the training sites are *Enhalus acoroides*, *Halophila beccarii*, *H. decipiens*, *H. ovalis*, *Halodule pinifolia*, *H. uninervis*, *Cymodocea serrulata*, *Thalassia hemprichii* and *Syringodium isoetifolium* (Figure 7).

## 4. Training outcomes

- a. Successfully provide the capacity development programme to the human resources related to conservation of marine environments and biodiversity;
- b. Relevant government departments, universities and local NGOs got fundamental knowledge on how to use HOBOT software for studying seagrass ecology, seagrass identification, conservation and management in Myanmar;

- c. Contribute knowledge pertaining to the important roles of seagrasses in marine ecosystem;
- d. Promote the seagrass conservation program along the coastal areas of Myanmar in future;
- e. Enhance the management of conservation programme for the sustainability of seagrasses;
- f. Record the distribution of species of seagrasses growing at each training site;
- g. Understand how to use snorkeling method for studying of subtidal seagrasses;
- h. Record the comparison in variations of seagrass morphology of different collection sites;
- i. Marine Science Department, Mawlamyine University got full equipment on SeagrassNet kit for future research on seagrass scientifically;
- j. Trainees got knowledge in collaborative working on conservation;
- k. BOBLME, FFI, PSU and Marine Science Department of Mawlamyine University got good relationship for future activities in Myanmar.

## 5. Recommendation and future plans

- a. Carry out more of the capacity development on the seagrass conservation and monitoring a few more times by focusing on the region where there are dense seagrass bed such as Myeik Archipelago, Tanintharyi Region. It is important to provide the knowledge (especially those in Blue carbon and climate change) and increase awareness of seagrass to the local, government and NGOs through a series of workshops.
- b. Setting up a Seagrass monitoring networking in Myanmar through universities and NGOs, having a sharing and discussion networking of their finding and monitoring every two years. This would increase the capacity and knowledge of the seagrass in the country. Knowledge sharing between each region will help strengthen their awareness of marine biodiversity and coastal habitats.
- c. Develop research collaborations within the region, the study on genetic of seagrass, that could provide the important information for further management and policy making such as MPA. This could also increase the awareness of genetic diversity of seagrass in the Bay of Bengal Large Marine Ecosystem (BOBLME). In a smaller scale, only the Meyik Archipelago, it would be interesting to investigate the genetic source and sink of the seagrass or other marine organisms in those islands, it provides the important information for further management and conservation. This area can be used and developed as a marine station and used as a model for further studies on marine related field of the country.
- d. Seagrass and other coastal habitats such as corals and mangrove should be well surveyed, assessed and mapped. This would provide important baseline information for further management, which is very important for the country.

## 6. Report summary after the workshop training

There were 20 participants in the Seagrass Conservation and Monitoring training. The seagrass here is still very pristine and only few researches have been carried out in Myanmar and in the Bay of Bengal region. Thus, capacity building and seagrass monitoring network are very important for this very first few years. Our training module has helped participants to understand the importance of seagrass ecosystem and how to monitor the seagrass species. Information on the roles of seagrass on climate changes was also provided. The training module has assisted participants to be able have some hands on experiences both in the practical and field exercises.

The knowledge on seagrass biodiversity and ecology in Myanmar and also in the East Indian Ocean region is still very limited. These areas are an important link between the Bay of Bengal Large Marine Ecosystems as well as the Indian Ocean. Seagrass is well known for its ecosystem service values, they provide home, food and nursery grounds for various marine organisms as well as the important



coastal water engineering in the shallow coastal zone. Seagrasses also link closely with fishermen livelihood; an important ground for small scale fisheries including crab, sea cucumber, gastropods and others associated fauna.

In the workshop, participants have actively participated, both in the lectures, practical and field exercises and excursions. They showed great interest in the seagrass and their roles in ecosystems as well as their associated fauna and flora. The participants came from various stakeholders, who directly work with seagrass and related habitats. For some of them, this is the first time that they know seagrasses exist. Participants had actively asked questions and answer the questions when being asked. The participants also are interested in snorkelling/diving, which our team together with the FFI staffs had trained the participants how to use the snorkelling gears after the workshop hours, thus they can work comfortably in coastal ecosystems during high tide.

During the field survey, we have learnt that seagrass here is very pristine and most of our participants are very good and keen to learn and observe these precious primary producers in their coastal ecosystems. This could indeed help preserving their seagrasses. The governments and NGOs have an important role to protect the seagrass and coastal habitats because the development shall be coming fast in the next few years. The experiences sharing and lessons learnt from Thailand could be very much useful because they are sharing similar resources, the way of thinking and their backgrounds also could help the understanding and planning become easier.

It is important to note that along this long coastal line and hundreds of islands of Myanmar, there is only one Marine National Park, the Lampi island. Thus, the understanding of biodiversity and distribution of these marine organisms, seagrass, seaweeds, mangroves and corals, are urgently needed for further management and policy making decision.

## 7. Acknowledgements

The authors are grateful to the BOBLME Project for initiating and commissioning this training in Myanmar. Authors also thank Fauna & Flora International (FFI) for facilitating training and account transfer from BOBLME to the training. Authors' thanks also go to Rector and administration Board members of Mawlamyine University for kind permission to conduct training. Last but not least thanks go to staff and colleagues from BOBLME, FFI, Mawlamyine University and Prince of Songkla University for supporting this training.

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## Appendix I Agenda for the opening session



### Agenda for the opening session

#### Mawlamyine University

Training course title: Training course on seagrass conservation and monitoring in Myanmar.

Date: 26.4.2013

Venue: Room No. 15, Mawlamyine University

Time: 9:00 to 10:30

08:30-09:00	Registration	
09:00-10:00	Opening speech by Chief Minister of Mon State	
	Opening remarks by Regional Education Minister of Mon State	
	Opening remarks by Rector of Mawlamyine University	
	Photo session	
10:00-10:30	Coffee break	

**Appendix II List of trainees**

<b>Sr.</b>	<b>Name</b>	<b>Designation</b>	<b>Department</b>
1	Aung Aung Aye	Demonstrator	Dept. of Marine Science, Mawlamyine University
2	Myo Min Tun	Demonstrator	Dept. of Marine Science, Mawlamyine University
3	Aung Myo Hsan	Demonstrator	Dept. of Marine Science, Mawlamyine University
4	Myat Thu	Demonstrator	Dept. of Marine Science, Mawlamyine University
5	Min Oo	Lecturer	Dept. of Marine Science, Patheingyi University
6	Khin Maung Naing	Assistant Lecturer	Dept. of Marine Science, Patheingyi University
7	Hein Zar Htwe	Demonstrator	Dept. of Marine Science, Myeik University
8	Kyaw Thura	Demonstrator	Dept. of Marine Science, Myeik University
9	Hla Toe		Myanmar Navy Hydrographic Centre
10	Aye Tun Naing		Myanmar Navy Hydrographic Centre
11	L.K.C. Yun	Ranger	Nature and Wildlife Conservation Division, Forest Department
12	Sai Wunna Kyi	Ranger	Nature and Wildlife Conservation Division, Forest Department
13	Zaw Htun	Deputy Township Officer	Department of Fisheries
14	Kyaw Htun Nyo	Assistant Township Officer	Department of Fisheries
15	Soe Thiha	member	Biodiversity and Nature Conservation Association (BANCA)
16	Nyein Chan	member	Biodiversity and Nature Conservation Association (BANCA)
17	Theingi	member	Marine Science Association, Myanmar (MSAM)
18	Soe Tint Aung	member	Marine Science Association, Myanmar (MSAM)
19	Antt Maung	staff	Fauna & Flora International (FFI), Myanmar
20	Salai Mon Nyi Nyi Lin	staff	Fauna & Flora International (FFI), Myanmar

### Appendix III List of trainers

Sr.	Name	Designation	Department
1	Dr Htay Aung	Rector	Mawlamyine University
2	U Soe Htun	Professor and Head	Dept. of Marine Science, Mawlamyine University
3	Anchana Prathep	Associate Professor	Department of Biology, Prince of Songkla University
4	Ekkalak Rattanachot	Instructor	Department of Biology, Prince of Songkla University
5	Piyalap Tuntiprapas	Instructor	Centre of Excellence for Biodiversity of Peninsular Thailand, Faculty of Science, Prince of Songkla University.

## Appendix IV Agenda for the training



### Mawlamyine University

Training course title: Training course on seagrass conservation and monitoring in Myanmar.

Duration: 26.4.2013 to 4.5.2013

Venue: Mawlamyine University (Theory Training)

Ngapali Beach, Thandwe (Practical training)

Day	Date	AM (9:00-12:00)	Lunch (12:00-13:00)	PM (13:00-16:00)	
1	25.4.2013	Resource persons and trainees arrive to Yangon and travel to Mawlamyine University			
2	26.4.2013	Opening ceremony (9:00 to 10:30) Introduce the seagrass biodiversity and its importance		Introduce Seagrass monitoring program	
3	27.4.2013	Introduce equipment and procedure in the monitoring		Data collections and inputs	
4	28.4.2013	Hand on exercise		Move to the field for field survey	
5	29.4.2013	Traveling to Thandwe, a demonstration site			
6	30.4.2013	Field set up and specimen collection (low tide) station 1		Work on the data	
7	1.5.2013	Field set up and specimen collection (low tide) station 2		Work on the data	
8	2.5.2013	Field set up and specimen collection (low tide) station 3		Work on the data	
9	3.5.2013	Wrap up the data and closing ceremony in the morning Traveling back to Yangon and Mawlamyine			
10	4.5.2013	Resource persons leave to Prince of Songkla University, Thailand			



## Appendix V Training syllabus outline

### 1. What are seagrasses?

- 1.1 What are seagrasses?
- 1.2 Where are seagrasses and what are important to seagrass?
- 1.3 How many seagrass species worldwide and SE Asian – emphasize on Myanmar and Thailand and Myeik Archipelago?
- 1.4 Why seagrasses?

### 2. How to identify the species

- 2.1 Key distinguishing features of seagrass;
- 2.2 species complex (*Halophila*), variations (*Halophila ovalis*, *Halodule* tips): Introduce the idea of molecular tools.
- 2.3 What is known and how each species importance?  
Emphasize on reproduction of each species;  
Roles of each species in the ecosystems, if any?
- 2.4 How many species of seagrass in Myeik Archipelago? (Field activities – seagrass bed at Ngapali )

### 3. Seagrass ecosystem and services

- 3.1 Habitat, nursery, food sources (in details-field exercise);
- 3.2 Carbon sequestration;
- 3.3 Habitat connectivity, ecosystem flow (Introduce the idea of genetic connectivity);
- 3.4 What happen here: - Myeik Archipelago (workshop, brain storm);

### 4. Threats to seagrass

- 4.1 Human activities;
- 4.2 Poor knowledge and understanding on seagrasses;
- 4.3 Seagrass and climate changes;
- 4.4 What happen here: - Myeik Archipelago (workshop, brain storm);

### 5. Seagrass monitoring

- 5.1 small scale monitoring (Seagrass Watch, SeagrassNet - Field exercise and workshop training);
- 5.2 GIS mapping;
- 5.3 seagrass assessment;
- 5.4 seagrass monitoring at Myeik Archipelago (workshop, brain storm);

### 6. Communication and outreach

- 6.1 Target stakeholders;
- 6.2 How to increase awareness to each stakeholders at Myeik Archipelago (workshop, brain storm);

## Appendix VI Donation document



I have received the materials (as in the attached list) donated by the Bay of Bangal Large Marine Ecosystem (BOBLME) through Fauna and Flora International (FFI) Myanmar, From Dr. Anchana Prathep, Assistant Professor, Seaweed and Seagrass Research Unit, Department of Biology, Faculty of Science, Prince of Songkla University, HatYai, Songkhla, 90112 Thailand.

Received by:

U. Soe-Htun  
Professor and Head  
Department of Marine Science  
Mawlamyine  
MYANMAR

Handed over by:

Dr. Anchana Prathep,  
Assistant Professor, Seaweed and  
Seagrass Research Unit,  
Department of Biology, Faculty  
of Science,  
Prince of Songkla University,  
HatYai, Songkhla, 90112  
THAILAND

Witness

U Zau Lunn  
Marine and Wetland Conservation Programme Coordinator  
Fauna & Flora International  
Myanmar Programme

27.04.2013 11:30

Seagrass Monitoring Equipments

Seagrass Net Monitoring Kit at Mawlamyine University, Myanmar

Sr.	Item	Number of units
1)	<b>Seagrass Net kit (1 set)</b>	
	1.1 Container	3
	1.2. 50 m measuring tapes	3
	1.3. GPS	1
	1.4. Compass	1
	1.5. SeagrassNet slate boards	2
	1.6. Underwater camera	1
	1.7. Light & temperature data loggers with softwares & data offload device	5
	1.8. Salinity refractometer	1
	1.9. Sediment & biomass cores	1
	1.10. Biomass mesh bags	12
	1.11. Quadrat 50x50 cm (2 Qs) & 25x25 cm (1Q) quadrats	3
	1.12. Ruler	2
	1.13. Seagrass Net standard percentage cover chart, <b>Algae coverage, Seagrass Species (set)</b>	3
2	<b>Diving equipments</b>	
	<b>Snorkelling gears (masks, snorkels and booties =1 set)</b>	5
	<b>Gear bags</b>	3
3	<b>Materials (1 set)</b>	
	- Waterproof data sheets	
	- Zip lock bags	
	- Water proof labels	
	- Pencils	
	- Anchors	
	- Paper bag for drying plants	
	- Scissors	
	- Forceps	
	- Trays	
- A4 papers		

27.04.2013 11:30

*(ZAU LUN) (SOE-HTUN)* *Anchana*



## Appendix VII Photographs of activities



Figures (1): Opening ceremony at Mawlamyine University



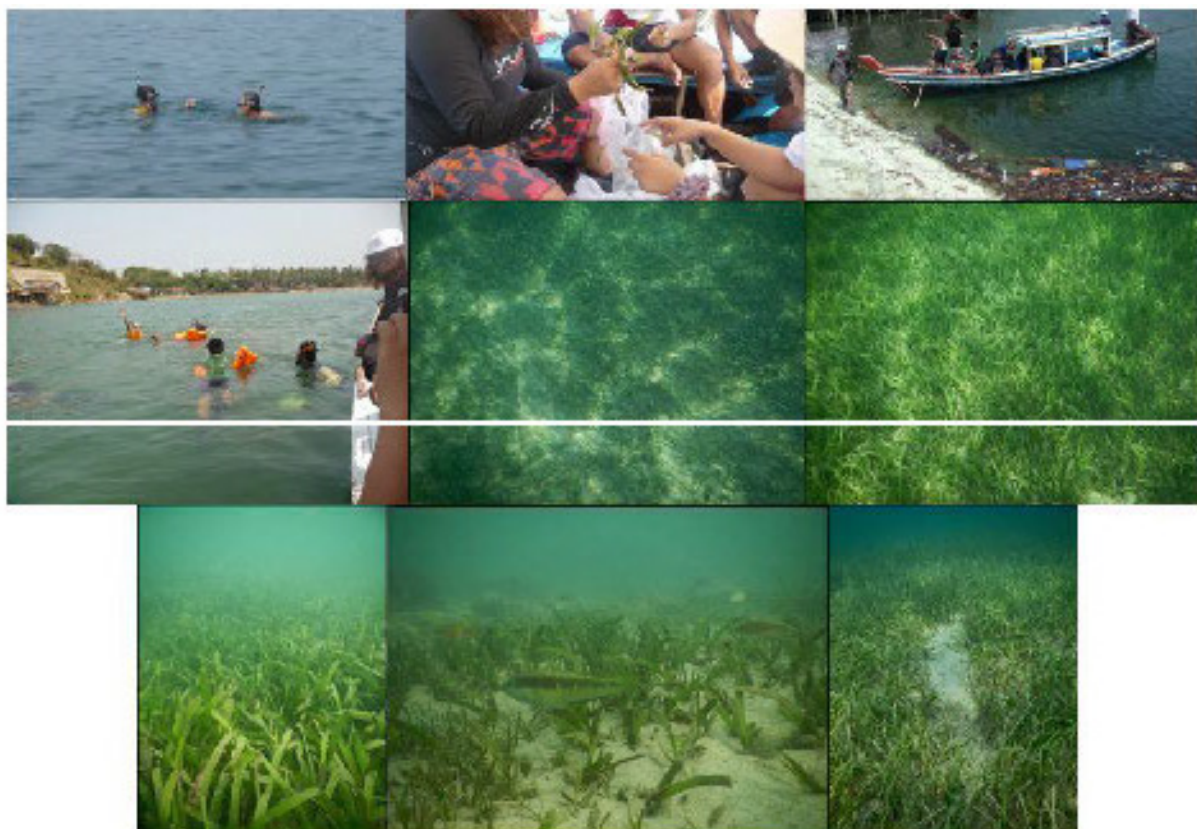
Figures (2): Training at Mawlamyine University



Figures (3): Practical activities in Marine Science Department and Mawlamyine University







Figures (4): Practical activities in Ngapali, Thandwe, Rakhine State



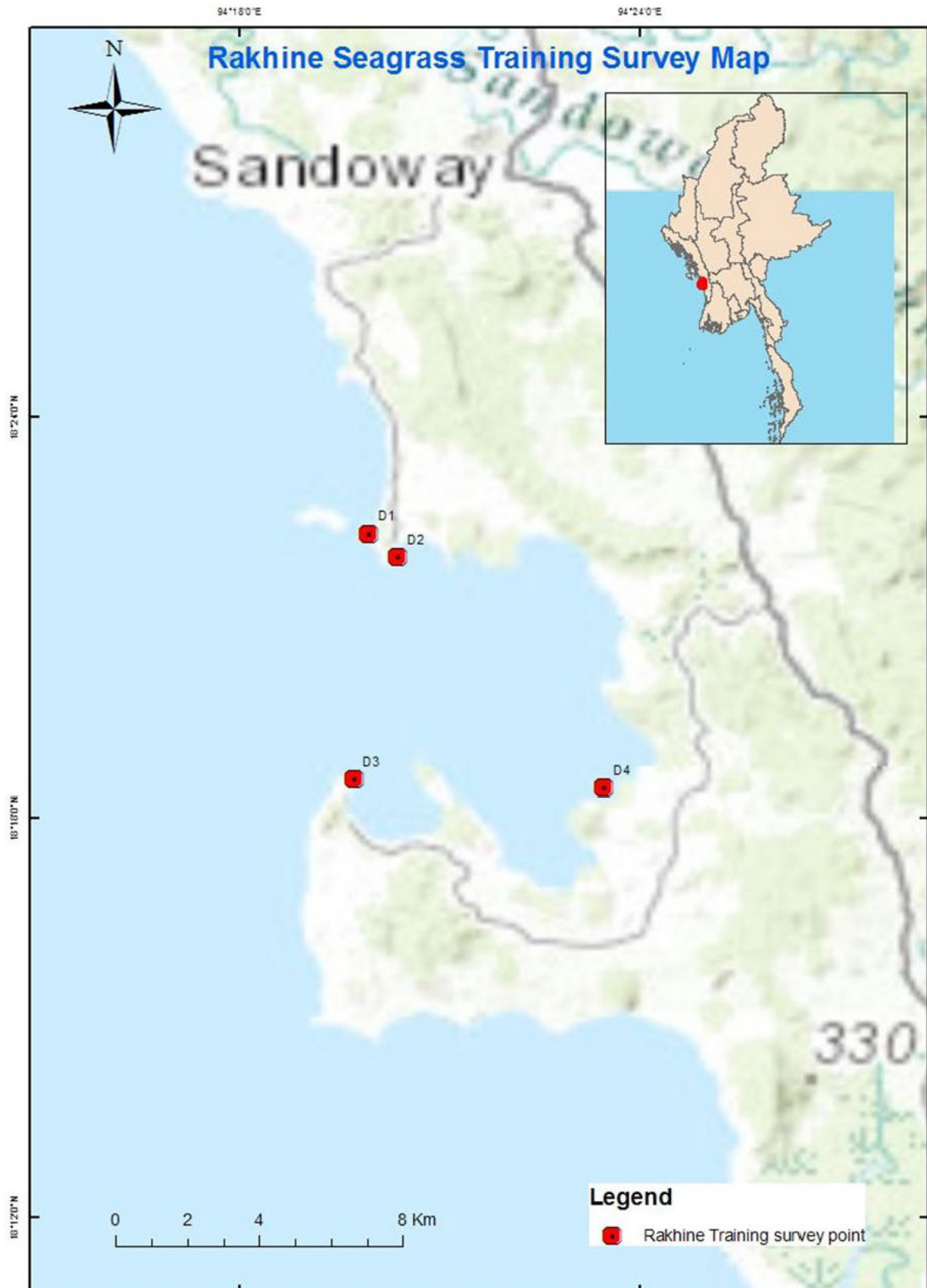


Figure (5): Practical training sites in Ngapali, Thandwe, Rakhine State



Figures (6): Closing ceremony in Ngapali beach, Thandwe, Rakhine State



*Enhalus acoroides*



*Halophila beccarii*



*Halophila decipiens*



*Halophila ovalis*









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.

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