Ridge to Reef
Integrated Protected Area
Land and Seascape Management in Tanintharyi

Final Report

Tint Tun
National Consultant

July, 2016
Ridge to Reef: Integrated Protected Area Land and Seascape Management in Tanintharyi

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July, 2016
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<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>DOF</td>
<td>Department of Fisheries</td>
</tr>
<tr>
<td>MONREC</td>
<td>Ministry of Natural Resources and Environmental Conservation</td>
</tr>
<tr>
<td>FD</td>
<td>Forest Department</td>
</tr>
<tr>
<td>FFI</td>
<td>Fauna &amp; Flora International</td>
</tr>
<tr>
<td>SI</td>
<td>Smithsonian Institution</td>
</tr>
<tr>
<td>WCS</td>
<td>Wildlife Conservation Society</td>
</tr>
<tr>
<td>MERN</td>
<td>Myanmar Environmental Rehabilitation Network</td>
</tr>
<tr>
<td>UNDP</td>
<td>United Nations Development Programme</td>
</tr>
<tr>
<td>UNDP CO</td>
<td>United Nations Development Programme Country Office</td>
</tr>
<tr>
<td>GEF</td>
<td>Global Environment Facility</td>
</tr>
<tr>
<td>NC</td>
<td>National Consultant</td>
</tr>
<tr>
<td>IC</td>
<td>International Consultant</td>
</tr>
<tr>
<td>USD</td>
<td>United States Dollar</td>
</tr>
<tr>
<td>PIF</td>
<td>Project Identification Form</td>
</tr>
<tr>
<td>PPG</td>
<td>Project Preparation Grant</td>
</tr>
</tbody>
</table>
1. Introduction

United Nation Development Programme (UNDP) has been closely working with the Ministry of Natural Resources and Environmental Conservation (MONREC) to improve environmental governance in Myanmar. UNDP developed a Project Identification Form (PIF) on “Ridge to Reef: Integrated Protected Area Land and Seascape Management in Tanintharyi” with guidance from MONREC and consultations with relevant line departments, Tanintharyi regional government and partner NGOs. The PIF was submitted to the Global Environmental Facility (GEF) and it was approved by the GEF Secretariat. A Project Preparation Grant (PPG) has been obtained to carry out necessary preparation of a fully-fledged project proposal.

In order to prepare a full-fledged project proposal, UNDP has recruited six short-term consultants (three international consultants and three national consultants) by individual contracts and Dr. Crawford Prentice, an international consultant, led the consultant team.

National Fisheries and Marine Resource Management Specialist (a national consultant; in short, NC2) is an individual contract position for 30 working days during December 2015 to June 2016. However, due to the delay in some of the project preparation activities and to go a field trip to a mangrove area in Myeik District with a national consultant, the NC2 contract has to be extended one month and, therefore, it will be finished at the end of July.

In accord with the contract extension, NC2 has to submit three Deliverables. Two Deliverables (Deliverables 1 and 2) has already been submitted in timely manner. This report is his final report (Deliverable 3).
2. The Project

Salient points of the project are described in Table 1.

Table 1. Facts about the project.

<table>
<thead>
<tr>
<th>Project Title</th>
<th>Ridge to Reef: Integrated Protected Area Land and Seascape Management in Tanintharyi.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Type</td>
<td>Full sized project</td>
</tr>
<tr>
<td>Type of Trust Fund</td>
<td>GEF Trust Fund</td>
</tr>
<tr>
<td>GEF Project Financing</td>
<td>5,250,000 USD</td>
</tr>
<tr>
<td>Co Financing</td>
<td>16,000,000 USD</td>
</tr>
<tr>
<td>Country</td>
<td>Myanmar</td>
</tr>
<tr>
<td>GEF Project ID</td>
<td>6992</td>
</tr>
<tr>
<td>GEF Agency</td>
<td>UNDP</td>
</tr>
<tr>
<td>GEF Agency Project ID</td>
<td>5427</td>
</tr>
<tr>
<td>Other Executing Partners</td>
<td>Lead national ministry: Ministry of Natural Resources and Environmental Conservation (MONREC)</td>
</tr>
<tr>
<td>Other partners:</td>
<td>Tanintharyi Regional Government,</td>
</tr>
<tr>
<td></td>
<td>Smithsonian Institution (SI),</td>
</tr>
<tr>
<td></td>
<td>Green Economy Green Growth (GEGG) Myanmar Association,</td>
</tr>
<tr>
<td></td>
<td>Fauna and Flora International (FFI).</td>
</tr>
<tr>
<td>GEF Focal Areas</td>
<td>Biodiversity (BD), Land Degradation (LD), Sustainable Forest Management (SFM).</td>
</tr>
<tr>
<td>Project Objectives</td>
<td>Secure long-term protection of Key Biodiversity Areas through integrated planning and management of the protected area land/seascape in Tanintharyi.</td>
</tr>
<tr>
<td>Project Components</td>
<td>1. Integrated land/seascape planning and management in Tanintharyi.</td>
</tr>
<tr>
<td></td>
<td>2: Strengthened management and threat reduction in the target Pas and buffer zones.</td>
</tr>
<tr>
<td></td>
<td>3: Emplacement of the National Biodiversity Survey (NBS) framework.</td>
</tr>
<tr>
<td>Project Duration</td>
<td>72 Months</td>
</tr>
</tbody>
</table>
3. Deliverables

Three key deliverables (including this final report) and a seascape profile were submitted by the National Fisheries and Marine Resource Management Specialist (National Consultant) as described in the following table. Deliverable 2 consists of three reports. Three reports and the seascape profile of the Deliverable 2 have been attached to this report as Appendices.

Table 2. Deliverables submitted by the NC2.

<table>
<thead>
<tr>
<th>Deliverable</th>
<th>Date of Submission</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Inception report</td>
<td>30 Jan 2016</td>
</tr>
<tr>
<td>on Fisheries and Marine Sectors</td>
<td></td>
</tr>
<tr>
<td>Fishery/Marine Stakeholder Groups</td>
<td></td>
</tr>
<tr>
<td>Report III. Assessment of the Policy Framework and Systemic and</td>
<td>15 July 2016</td>
</tr>
<tr>
<td>Institutional Review Related to Sea Use Planning and the Cross-</td>
<td></td>
</tr>
<tr>
<td>Sectoral Planning for Terrestrial and Coastal Management</td>
<td></td>
</tr>
<tr>
<td>Seascape profile</td>
<td>15 July 2016</td>
</tr>
<tr>
<td>3 Final report</td>
<td>25 July 2016</td>
</tr>
</tbody>
</table>

4. Meetings

During the tenure of his consultation service contract, the NC2 attended some of the meetings of the project preparation team with various stakeholders in Nay Pyi Taw, Yangon and Tanintharyi Region and they are described in the following Table 3.

Briefing regarding the project proposal and PPG process were provided by the UNDP team at the meetings with government agencies, NGOs and local communities for better understanding, cooperation and collaboration.

Two Districts, Myeik and Kawthaung Districts, were nominated to the Forest Department to select one as project site. Myeik District was selected by the Forest Department and it was informed at a meeting with Forest Department in Nay Pyi Taw on 8 March 2016.
<table>
<thead>
<tr>
<th>Date</th>
<th>Venue</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 Dec 2015</td>
<td>Yangon: UNDP CO</td>
<td>Internal briefing (Project and Workplan)</td>
</tr>
<tr>
<td>7 Dec 2015</td>
<td>Yangon: FFI</td>
<td>1st. Mission coordination meeting</td>
</tr>
<tr>
<td>21 Dec 2015</td>
<td>Yangon: UNDP CO</td>
<td>1st. Mission coordination meeting</td>
</tr>
<tr>
<td>5 Jan 2016</td>
<td>Yangon: FFI</td>
<td>1st. Mission coordination meeting</td>
</tr>
<tr>
<td>18 Jan 2016</td>
<td>Yangon: UNDP CO</td>
<td>Internal meeting &amp; preparation for the 1st. mission</td>
</tr>
<tr>
<td>19 Jan 2016</td>
<td>Yangon: UNDP CO</td>
<td>Internal meeting</td>
</tr>
<tr>
<td>20 Jan 2016</td>
<td>Dawei Town</td>
<td>Meeting with FD &amp; WCS</td>
</tr>
<tr>
<td>21 Jan 2016</td>
<td>Dawei Town</td>
<td>Meeting with Taninthary Region Government (Chief Minister and Minister for Forestry and Mining), DOF &amp; Dawei Research Association</td>
</tr>
<tr>
<td>22 Jan 2016</td>
<td>Myeik Town</td>
<td>Meeting with Myeik University</td>
</tr>
<tr>
<td>23 Jan 2016</td>
<td>Linn Lun village (Thayawhatangyi Island, Kyunsu Township, Myeik District)</td>
<td>Meeting with community</td>
</tr>
<tr>
<td>24 Jan 2016</td>
<td>La Ngann village (Khin Pyay Sone Island, Bokpyin Township, Kawthaung District)</td>
<td>Meeting with community</td>
</tr>
<tr>
<td>25 Jan 2016</td>
<td>Tanintharyi Town (Myeik District)</td>
<td>Meeting with Taninthary Township Forest Department</td>
</tr>
<tr>
<td>27 Jan 2016</td>
<td>Kawthaung Town</td>
<td>Team debriefing meeting at Kawthoung</td>
</tr>
<tr>
<td>28 Jan 2016</td>
<td>Yangon: UNDP CO</td>
<td>Debriefing and discussion on workplan</td>
</tr>
<tr>
<td>2 Mar 2016</td>
<td>Yangon: UNDP CO &amp; FFI</td>
<td>Coordination meeting</td>
</tr>
<tr>
<td>8 Mar 2016</td>
<td>Nay Pyi Taw: FD, DOF</td>
<td>Meeting with FD and DOF</td>
</tr>
<tr>
<td>25 Mar 2016</td>
<td>Yangon: U Tint Tun Home</td>
<td>Coordination meeting with NC1</td>
</tr>
<tr>
<td>27 Mar 2016</td>
<td>Yangon: UNDP CO</td>
<td>Coordination meeting</td>
</tr>
<tr>
<td>29 Mar 2016</td>
<td>Myeik Town: FD, DOF &amp; Myeik University</td>
<td>Biodiversity meetings (Dr. Neil Furrey)</td>
</tr>
<tr>
<td>30 Mar 2016</td>
<td>Yangon: WCS</td>
<td>Biodiversity meetings (Dr. Neil Furrey)</td>
</tr>
<tr>
<td>31 Mar 2016</td>
<td>Yangon: Oikos, FFI &amp; MERN</td>
<td>Biodiversity meetings (Dr. Neil Furrey)</td>
</tr>
<tr>
<td>1 Apr 2016</td>
<td>Yangon: WWF &amp; UNDP</td>
<td>Biodiversity meetings (Dr. Neil Furrey)</td>
</tr>
<tr>
<td>25 Apr 2016</td>
<td>Yangon: UNDP CO</td>
<td>Dawei meeting</td>
</tr>
<tr>
<td>27 Apr 2016</td>
<td>Dawei Town</td>
<td>Coordination meetings with KNU, FD &amp; DOF</td>
</tr>
<tr>
<td>27 May 2016</td>
<td>UNDP CO, WCS</td>
<td>Coordination meeting</td>
</tr>
<tr>
<td>29 May 2016</td>
<td>Panzin village (Kyunsu Township, Myeik District)</td>
<td>Meeting with community</td>
</tr>
<tr>
<td>30 May 2016</td>
<td>Min Khaung Say village (Kyunsu Township, Myeik District)</td>
<td>Meeting with community</td>
</tr>
<tr>
<td>1 June 2016</td>
<td>Diamond Crown Hotel, Dawei Town</td>
<td>Meeting with Taninthary Regional Government (Ministry of Forestry and Mining &amp; Ministry of Karan Ethnic Affair)</td>
</tr>
<tr>
<td>2 June 2016</td>
<td>Don Pale Aw village (Thayawhatangyi Island, Kyunsu Township, Myeik District)</td>
<td>Meeting with community</td>
</tr>
<tr>
<td>3 June 2016</td>
<td>Linn Lun &amp; Pa Raw Wa villages (Thayawhatangyi Island, Kyunsu Township, Myeik District)</td>
<td>Meeting with community</td>
</tr>
</tbody>
</table>
5. The Missions

5.1 The First Mission

The First PPG Mission programme to the Tanintharyi Region (Figure 1) was arranged from 20 to 27 January 2016 by the UNDP CO in collaboration with the GEF consultant team, FFI and SI partners and supported by Forest Department, and Tanintharyi Region Government. The mission was lasted from 20 to 27 January 2016.

Mission objectives are -

- To introduce the project / PPG process to key stakeholders at national, regional and local levels to obtain their support and to facilitate PPG consultations, field surveys, baseline information collection and analyses

- To familiarize the PPG team with the targeted project landscapes / seascapes, issues and stakeholders with assistance of key project partners

- To review the geographical and thematic scope of the project and propose demonstration areas to key project partners for confirmation

- To review and discuss project technical components, including the establishment of a multi-sectoral platform for integrated land and seascape management, demonstration site interventions, and project-supported information management platform

- To confirm and approve PPG information needs, workplan and schedule

Meeting with the Government of the Tanintharyi Region is a significant one during the mission. The Chief Minister and Minister for Forestry and Mining met with the mission at their Government office even though they must hand over to the new elected government in April 2016.

Visual observations could be done by the mission in both landscapes and seascapes in the Dawei and two nominated Districts (Myeik and Kawthaung).

Altogether 14 participants from UNDP, Fauna and Flora International (FFI) Myanmar Programme and Smithsonian Institution were involved in the mission. The itinerary of the mission and participants are tabulated in the Table 4 and 5.
Figure 1. Map showing the places visited during the first mission to Tanintharyi Region.
Table 4. Itinerary of the First PPG Mission to Tanintharyi Region.

<table>
<thead>
<tr>
<th>Date</th>
<th>Activity</th>
<th>Mean of Travel</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 Jan 2016</td>
<td>Yangon to Dawei</td>
<td>Air</td>
</tr>
<tr>
<td>21 Jan 2016</td>
<td>Dawei</td>
<td>Car</td>
</tr>
<tr>
<td>22 Jan 2016</td>
<td>Dawei to Myeik</td>
<td>Air</td>
</tr>
<tr>
<td>23 Jan 2016</td>
<td>▪ Myeik to Thayawthatangyi by speed boat</td>
<td>Speed boat</td>
</tr>
<tr>
<td></td>
<td>▪ Thayawthatangyi Island to Nat Tha Mee Ye Twin island</td>
<td></td>
</tr>
<tr>
<td>24 Jan 2016</td>
<td>▪ Nat Tha Mee Ye Twin Island to Langaan village (Khin Pyay</td>
<td>Speed boat</td>
</tr>
<tr>
<td></td>
<td>Sone Island, Bokpyin Township, Kawthaung District)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ Langaan village to Myeik</td>
<td></td>
</tr>
<tr>
<td>25 Jan 2016</td>
<td>▪ Myeik to Tanintharyi Town</td>
<td>Car</td>
</tr>
<tr>
<td></td>
<td>▪ Tanantharyi Town to Bokpyin Town</td>
<td></td>
</tr>
<tr>
<td>26 Jan 2016</td>
<td>▪ Bokpyin to Aung Ba village</td>
<td>Car</td>
</tr>
<tr>
<td></td>
<td>▪ Aung Ba village to Makyone Galet village (Bokpyin Township,</td>
<td>Boat</td>
</tr>
<tr>
<td></td>
<td>Kawthaung District; Lampi Island Marine National Park)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>▪ Makyone Galet village to Aung Ba village</td>
<td>Boat</td>
</tr>
<tr>
<td></td>
<td>▪ Aung Ba village to Kawthaung Town</td>
<td>Car</td>
</tr>
<tr>
<td>27 Jan 2016</td>
<td>Kawthaung to Yangon</td>
<td>Air</td>
</tr>
</tbody>
</table>

Table 5. List of participants of the first mission to the Taninthary Region.

a. UNDP

1. Ms. Midori Paxton          Regional Technical Adviser, Biodiversity and Ecosystems, Bangkok Regional Hub
2. U Saw Doh Wah              Programme Analyst, Climate Change Mitigation
3. Daw Aye Moe Moe Khaing     Project Assistant

b. Consultants

1. Dr. Crawford Prentice     International GEF Project Design and Biodiversity Conservation Specialist (IC1)
2. Dr. Michael Green         International Forest Land/seascape Planning and Management Specialist (IC2)
3. U Win Hlaing              National Protected Area Policy, Planning and Management Specialist (NC1)
4. U Tint Tun                National Fisheries and Marine Resource Management Specialist (NC2)
5. Daw Naw Eh Mwee           National Community and Gender Specialist (NC3)

c. SmithsonianInsitutions

1. Ms. Melissa Songer        Conservation Biologist
2. Mr. Stephen Box           Program Coordinator
3. U Aung Myo Chit           Country Coordinator

d. Fauna and Flora International

1. Mr. Frank Momberg         Myanmar Country Programme Director
2. Mr. Mark Grindley         Tanintary Programme Coordinator
3. Mr. Nay Myo Swe           Tanintary Programme Coordinator
5.2 The Second Mission

The second mission is, in fact, baseline data collection in Myeik District (Figure 2) for the project proposal. The mission can be divisible into two parts as there was a break to attend a meeting with Government of Tanintharyi Region in Dawei Town on the 1st of June 2016 (See Table 4).

The first part of the second mission was conducted from 29 and 30 May 2016. An international consultant and all three national consultants took part in the first part (Table 5). They went to two villages (Pan Zin and Min Khaung Say) in mangrove area near Myeik. These villages are situated in Taw Pyar Village Tract in Kyunsu Township of Myeik District. The Department of Fisheries established a crab protected area near the Pan Zin village.

After attending the meeting with Tanintharyi Region Government in Dawei, The survey was continued at three villages (Don Pale Aw, Don Linn Lun and Pa Raw Wah) on the Thayawthatangyi Island. They are constituents of Ye Myit Kyi Village Tract in Kyunsu Township of Myeik District. Two national consultants went to the villages to collect information for the project proposal (Table 5).

Figure 2. Map showing the places in Kyunsu Township, Myeik District, where survey was conducted.
### Table 4. Itinerary of the First PPG Mission to Tanintharyi Region.

<table>
<thead>
<tr>
<th>Date</th>
<th>Activity</th>
<th>Mean of Travel</th>
</tr>
</thead>
<tbody>
<tr>
<td>29 May 2016</td>
<td>▪ Yangon to Myeik Town</td>
<td>Air</td>
</tr>
<tr>
<td></td>
<td>▪ Myeik to Pan Zin village (Kyunsu Township, Myeik District)</td>
<td>Boat</td>
</tr>
<tr>
<td></td>
<td>▪ Pan Zin village to Myeik Town</td>
<td>Boat</td>
</tr>
<tr>
<td>30 May 2016</td>
<td>▪ Myeik to Min Khaung Say village (Kyunsu Township, Myeik District)</td>
<td>Boat</td>
</tr>
<tr>
<td></td>
<td>▪ Min Khaung Say village to Myeik Town</td>
<td>Boat</td>
</tr>
<tr>
<td>31 May 2016</td>
<td>Myeik Town to Dawei Town</td>
<td>Air</td>
</tr>
<tr>
<td>1 June 2016</td>
<td>Dawei Town (attended the meeting with the Tanintharyi Region Government)</td>
<td>-</td>
</tr>
<tr>
<td>2 June 2016</td>
<td>▪ Dawei Town to Myeik Town</td>
<td>Air</td>
</tr>
<tr>
<td></td>
<td>▪ Myeik Town to Don Pale Aw village (Thayawthartangyi island, Kyunsu Township, Myeik District)</td>
<td>Boat</td>
</tr>
<tr>
<td>3 June 2016</td>
<td>▪ Don Pale Aw village to Linn Lun</td>
<td>Boat, Walk</td>
</tr>
<tr>
<td></td>
<td>▪ Linn Lun village to Pa Raw Wah village</td>
<td>Boat</td>
</tr>
<tr>
<td></td>
<td>▪ Pa Raw Wah village to Don Pale Aw village</td>
<td>Walk, Boat</td>
</tr>
<tr>
<td></td>
<td>▪ Don Pale Aw village to Myeik</td>
<td>Boat</td>
</tr>
<tr>
<td>4 June 2016</td>
<td>Myeik</td>
<td>Motorcycle</td>
</tr>
<tr>
<td>5 June 2016</td>
<td>Myeik to Yangon</td>
<td>Air</td>
</tr>
</tbody>
</table>

### Table 5. List of participants of the first mission to the Tanintharyi Region.

<table>
<thead>
<tr>
<th>The 1st Part</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Dr. Michael Green</td>
<td>International Forest Land/landscape Planning and Management Specialist</td>
</tr>
<tr>
<td>2 U Win Hlaing</td>
<td>National Protected Area Policy, Planning and Management Specialist</td>
</tr>
<tr>
<td>3 U Tint Tun</td>
<td>National Fisheries and Marine Resource Management Specialist</td>
</tr>
<tr>
<td>4 Daw Naw Eh Mwee</td>
<td>National Community and Gender Specialist</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>The 2nd Part</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1 U Tint Tun</td>
<td>National Fisheries and Marine Resource Management Specialist</td>
</tr>
<tr>
<td>2 Daw Naw Eh Mwee</td>
<td>National Community and Gender Specialist</td>
</tr>
</tbody>
</table>

### 6. Acknowledgements

The NC2 is very grateful to the UNDP CO for giving him a chance to take part in preparation of a project. Heartfelt thanks are also due to all those helped him in the baseline data collection for the project.
Ridge to Reef: Integrated Protected Area Land and Seascape Management in Tanintharyi

Field-Based Research Report Covering Critical Information Gaps on Fisheries and Marine Sectors

Tint Tun
National Consultant
July, 2016
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1. Introduction

United Nation Development Programme (UNDP) Myanmar has been implementing UNDP Country Programme for 2013-2017 with the aim to promoting local governance, growth and sustainable development with the emphasis on rights-based, gender sensitive, inclusive and equality. This goal will be pursued through three complementary component; Local Governance, Environmental Governance and Disaster Resilience, and Democratic Governance.

UNDP has been closely working with the Ministry of Natural Resources and Environmental Conservation (MONREC) to improve environmental governance in Myanmar. UNDP developed a Project Identification Form (PIF) on “Ridge to Reef: Integrated Protected Area Land and Seascapes Management in Tanintharyi” with guidance from MONREC and consultations with relevant line departments, Tanintharyi regional government and partner NGOs. The Project Identification Form (PIF) was submitted to the Global Environmental Facility (GEF) and it was approved by GEF Secretariat. A Project Preparation Grant (PPG) has been obtained to carry out necessary preparation of a fully-fledged project proposal. In consultation with the Forest Department, Myeik District was chosen as the project site.

2. Scope of the Report

This is one of the three reports of the national consultant and it is the field-based research report covering critical information gaps on fisheries and marine to biodiversity (including climate change), barriers to integrated land/marine management, developmental context for integrated marine resources management, development of satellite RS and maps of seascapes area conservation and development plans and initiatives affecting the project and baseline information for targeted seascapes. Locally-managed Marine Areas at Thayawthantangyi island has been selected as targeted seascapes of the project.
3. Critical Information Gaps

3.1 Fisheries and Marine Sectors

Bay of Bengal Large Marine Ecosystem (BOBLME) Project has been implemented by eight countries (Indonesia, Malaysia, Thailand, Myanmar, Bangladesh, India, Sri Lanka and Maldives) surrounded the Bay. BOBLME website\(^1\) has uploaded many documents and publications from policy through fishery biology to livelihood at its website.

The Marine Protected Area Atlas of BOBLME is an interactive online database portal storing and providing access to up to date inventory of Marine Protected Areas relevant to the Bay of Bengal Large Marine Ecosystem (BOBLME) to a wider MPA community of practitioner (managers, researcher, policy makers, etc). Other information in this portal includes reports, review, case studies, scientific articles, maps etc. This was an output from the “Status of Marine Protected Area and Fish Refugia in the Bay of Bengal Large Marine Ecosystem” workshop where the major recommendation was to establish a BOBLME MPA learning network to facilitate communication among MPA practitioners and help in the diffusion of innovative practices. The finding and output from the workshop are visualized in this portal and will be a contribution to improved knowledge management for the governance of the marine protected areas in the Bay of Bengal\(^2\).

This is a collaboration project between WorldFish and BOBLME Project funded by FAO. This portal was produced as part of the ongoing UN FAO’s BOBLME Ecosystem Programme which is a regional initiative among the BOBLME countries - Maldives, India, Sri Lanka, Bangladesh, Myanmar, Thailand, Indonesia and Malaysia.

Myanmar fisheries information can be obtained from the Ministry of Agriculture, Livestock and Irrigation\(^3\), Department of Fisheries\(^4\) and Myanmar Fisheries Federation\(^5\) websites. However, most of the information uploaded at their websites mainly concerned with fisheries business, fish landings, export etc.

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\(^1\) http://www.boblme.org
\(^2\) http://boblme.reefbase.org/
\(^3\) www.mali.gov.mm
\(^4\) www.dof.gov.mm
\(^5\) http://www.fishfedmyanmar.com
Scientific fisheries studies have been done by the Department of Fisheries, universities, local non-governmental organizations (LNGO) and international non-governmental organizations (INGO). They have done research or surveys by themselves or in collaboration with specialists, other LNGOs and INGOs covering species specific research to social economic of fishing community. Almost all of the studies conducted by universities are for higher degrees Master and Ph.D. degrees. But, most of the studies conducted by universities are taxonomic studies.

Wildlife Conservation Society (WCS) and Marine Science Association Myanmar (MSAM) have been able to collect over 600 references, including 348 theses, relating to Myanmar’s marine resources that cover an expansive range of taxa and topics\(^6\). Much of the information is not easily accessible since the unpublished reports and theses by masters and PhD students are housed in under-resourced university libraries. In the light of data obtained, general understanding of the marine systems within the Taninthayi Marine Corridor is strongest around Myeik Township as reflected by studies by thesis students. Of the theses collected that had an explicit geographic focus, 37 (13.9\%) were in Myeik Township. This is unsurprising since these three townships are close to Myeik University and include the northern and central islands of the diverse Myeik Archipelago.

Systematic data on fish distribution and population is very limited due to lack of scientific research and expeditions over the past several years. Indeed, until 2013 the Fisheries Department had to rely on a 1979 survey for planning in the Myeik Archipelago. However, a recent survey cruise of Myanmar marine fisheries and oceanography by the ship RV Dr. Fridtjof Nansen has recorded several new marine species and will provide more up to date and comprehensive data\(^7\).

Certain marine fish have been given priority status based on their economic importance and threat level. Reproductive biological studies are important for fisheries management but still need to be done on many economically important species.

Following the ban placed on shark fishing in 2009, catch data on this group of fish is no longer collected by the DoF and historical catch data is difficult to access except for specific


survey data or anecdotal information from fishers. However, several scientific surveys conducted to either monitor the status of Myanmar’s fisheries as a whole, monitor landing sites or assessments of the health of coral reef ecosystems, together provide information on the past and current status of shark populations (see below). For rays, however, DoF in Tanintharyi has records from 2010 to the present on catches, although officers state that caution should be used in interpreting the data.

Research is a critical component to improving the understanding of the current state of Myanmar’s marine resources, identifying the primary threats to the sustainability of those resources and creating realistic plans for effective conservation and management. Stakeholders highlighted that there is insufficient funding and field and laboratory equipment available to support excellent research. Currently there is weak in-country capacity to conduct research. Poor communication channels and difficult logistical planning can be time consuming. Policy makers do not have sufficient data from which to develop action plans.

Fishes (greater mullet *Mugil cephalus*, lesser mullet *Rhinomugil corsula*, bull eye *Scomberomorus guttatus*, *S. lineolatus* etc grouper including *Ephinephalus*, snapper, *Lutjanus sp*, puffer fish *Tetraodon spp.* and porcupine fish, *Diodon spp.*), crabs (sand crab *Portunus*), rock lobsters (species of *Panulirus*, *Panulirus versicolor*, *P. ornatus* and *P. polyphagus* etc.), prawn (species of *Penaeus*, *Metapenaeus*, *Porapenaeopsis*, *Metapenaeopsis*, *Solenocera* etc), squids (*Loligo duvauceli*), cuttlefish (*Sepia pharoani*) and others, various species of rays (*Dasyatis*, *Aetobatus*, *Rhinoptera*, *Raja*, *Mobula* etc), various species of sharks including *Carcharhirus sorrah* and *Sphryna* etc., and chitons (species of *Ischnochiton* and *Autochiton* etc.) are collected by the Thayawthatangyi island fishing community. However, fisheries biological information of these resources is scarce. By doing some scientific and monitoring programme by the local authority and management committee of the locally-managed marine area throughout the year, information collected

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can support and provide effective management and sustainable use of the island resources. Students and teachers of Department of Marine Science, Myeik University, visited to the Thayawtangyi Island for their field work or higher degree research. But they are not recognized even by INGO. However, due to the nature of the papers, they are grey literature and have been kept at the university.

Traditional knowledge is essential information especially near shore fishery. Collection of traditional and local fisheries knowledge have not been done in Myanmar yet. Scientific information has not always been available. There are no scientific studies on the fishery biology of the Indian Threatfin in Kyunsu Township water. But, based on the local information and suggestions from local fishers, Department of Fisheries established Indian threadfin protection area at Wet phyu taung and Thar myar ami island water in Kyunsu Township, Myeik District, by notification on 20 November 2015.

### 3.2 Threats to Biodiversity

According to the International Union for Conservation of Nature (IUCN), 356 species of wild flora and fauna in Myanmar are considered to be globally threatened. Threats to the Myanmar biodiversity were identified in various documents.

In January 2012, the Wildlife Conservation Society with the support of the John D. and Catherine T. MacArthur Foundation, assembled over 80 of the country’s environmental experts from civil society and government to discuss the current status of the country’s biodiversity, the threats it faces, and the priorities for future investment to ensure that it is sustained. The participants identified twenty four specific threats for Myanmar biodiversity.\(^\text{12}\)

They are human encroachment, over-exploitation of animals (commercial), agricultural expansion, logging, over-fishing (commercial), conversion of forest to plantations, over-exploitation of non-timber forest products (commercial), over-exploitation of animals (subsistence), wildlife trade, over-exploitation of animals (subsistence), shifting cultivation, infrastructure development, over-fishing (subsistence), charcoal making (commercial), conversion of wetland habitats, pollution, gold mining, over-grazing, forest fire, charcoal

making (subsistence), conversion of coastal habitats, mineral extraction, invasive species and wildlife disease.

The highest threat is human encroachment and the lowest threat is wildlife diseases. Expanding infrastructure development is expected to become much greater in the near future. Climate change further threatens the future biodiversity of the country. Poverty and the general lack of awareness of environmental issues are seen as the most frequent root cause of biodiversity loss. Furthermore, recent interest in tourism development may accelerate threats to this area.

Threats to the marine and coastal biodiversity in particular are also identified as overfishing, destructive fishing, illegal fishing, accidental killing from gillnet entanglement, long-line, undisciplined tourism, watershed degradation, extractive industries, charcoal making, human settlements, blast/dynamite fishing, sand mining, increased natural resources demand from neighbouring countries and limited grassroots support for conservation. 11, 13

Threats identified by the community of the Thayawthatangyi island are blast fishing, tourism, rubbish/pollution, residential expansion on the beach, sand/pebble quarrying, low awareness, drag-netting/gleaning.

### 3.3 Climate Change

No comprehensive studies on the impacts of climate change on biodiversity have been done in Myanmar yet. But Myanmar is ranked 12 out of 20 countries in terms of population at risk due to sea-level rise. 4.6 million people will be at risk in 2050 (up from 2.8 million in 2008. In the nearer term, sea-level rise and increased water temperatures are projected to

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accelerate beach and coastal erosion and cause degradation of mangroves and coral reefs. These would in turn negatively influence human communities through impacts on water supply and fisheries productivity.\textsuperscript{18}

Climate change projections for Myanmar predict:\textsuperscript{19}

- a general increase in temperature across the whole country, particularly from December – May with the Central and Northern regions experiencing the greatest increases;
- a increase in clear sky days exacerbating drought periods;
- an increase in rainfall variability during the rainy season including an increase across the whole country from March – November (particularly in Northern Myanmar), and decrease between December and February;
- an increase in the risk of flooding resulting from a late onset and early withdrawal of monsoon events;
- an increase in the occurrence and intensity of extreme weather events, including cyclones/strong winds, flood/storm surge, intense rains, extreme high temperatures and drought.

Apart from the anthropogenic threats, some threats resulted from the climate change are also identified by the Thayawthatangyi community. They are coral bleaching, beach erosion, sea-level rise. Among them, major threats are identified as blast fishing or dynamite fishing and beach erosion/sea level rise.\textsuperscript{20} Coral bleaching was happened in 2010 in Thailand’s Andaman Sea water. The bleaching was severe and it was observed by many divers (tourists, researchers) and informed to the authority concerned. In this 2016, El Nino was happened in the Pacific and its effects were also suffered in Asia region. Coal bleaching was suspected in Pyin Sa Bu island water in Kyunsu Township.\textsuperscript{21}

The bleaching was also happened in Myanmar Myeik Archipelago water but information about the bleaching was received from sea cucumber fishermen one year later. Due to the geographic position, Myeik Archipelago is not a cyclone prone area.

\textsuperscript{18} https://myanmarbiodiversity.org/2015/impacts-of-climate-change-on-biodiversity-in-myanmar/
\textsuperscript{20} Schneider, H., Soe Thiha, M. Pontillas and E. M. Ponce de Leon (2014). Socio-economic baseline assessment: Thayawthatangyi and Langann Islands, Myeik Archipelago, Myanmar. Report No. 10 of the Tanintharyi Conservation Programme, a joint initiative of Fauna & Flora International (FFI) and the Myanmar Forest Department, FFI, Yangon, and the Bay of Bengal Large Marine Ecosystem project (BOBLME).
\textsuperscript{21} SoeThiha per.com.
The highest air temperature ever recorded at Myeik before 2016 was 38°C on the 23rd March 2010. But, that highest temperature record was broken by 38.5°C recorded on the 27th March 2016. It is the highest temperature in 69 years since the meteorology station was opened.

4. Barriers to Integrated Marine Management

One of the major barriers to integrated coastal management is a lack of intergovernmental coordination and cooperation in both horizontal and vertical directions.

Coordination and collaboration among the government agencies is very weak although they have been doing their work separately. Weak in transparency and, sharing and spreading fisheries related information resulted in weak participation of stakeholders from government, private sector and community. Department of Fisheries, Forest Department, Agriculture Department, General Administration Department, Water Resources Department, Irrigation Department, University are main stakeholders from government side and Myanmar Fisheries Federation, local and international Non-governmental Organizations and Community are from the non-government side. Projects are catalyst or a platform for cooperation and collaboration among the stakeholders and their participation in sustainable development and use of natural resources. Lack of appropriate data limits the quality of information available for stock assessments and effective management.

Lack of reliable, accurate and, timely data and information is very important to develop effective sustainable marine fisheries management plan. So far, comprehensive scientific studies are still in need.

Spreading and aware of fisheries information among the government agencies concerned and local communities is important for their participation in fisheries management. Awareness raising and educative talk on marine fisheries resources are seldom.

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22 The New Light of Myanmar, 28 March 2016
In adequate or lack of knowledge, weak or lack of governance, limited interactions between fisheries management entities and other sectors, weak in human and material resources are also found to be barrier to develop/for integrated management.

Government agencies are weak in touching with the villages. The project seascape site is situated in Yay Myit Kyee village tract, Kyunsu Township, Myeik District. Village authority office is located at the Don Pale Aw village. Two LMMAs are proposed to establish at two sites, Done Linn Lunn including Pa Raw Wah and Done Pale Aw. But, Pa Raw Wah village has not been listed as a village by General Administration yet.

The nearest fisheries office of the Department of Fisheries is situated in Kyunsu town which is a township level town in Myeik District. According to the community, except for collection of license fees, no other activities have been done at the village by DoF. It is the same for the municipal fees.

There is a pearl farm run by a joint peal company between State owned Myanma Pearl Enterprise and the Atlantic Pearl Co. in the Thayawthatangyi water but, so far, there is no discussion with the farm for participation of private sector participation in management. The pearl farm water is restricted area and no fishing has been allowed. Therefore, pearl farm is a virtual protected area for marine fishery resources.

According to the “Protection of Wildlife and Wild Plants and Conservation of Natural Areas Law” enacted in 1994, protected areas are designated by the then Ministry of Environmental Conservation and Forestry (now Ministry of Natural Resources and Environmental Conservation MONREC). Therefore, to raise from LMMA to Marine Protected Area, proposal must be submitted to the MONREC.


Department of Fisheries (DoF) has been working in cooperation with governments and international organizations to promote its performance in fisheries sector. It has been closely cooperated with Food and Agriculture Organization (FAO). The latest effort is
preparing a project proposal titling “My Coast: Ecosystem Based Conservation of Myanmar’s Southern Coastal Zone”, to submit to the GEF6.

DoF has cooperating with Association of South-East Asian Nations (ASEAN), National NACA, SEAFDEC, BOBLME, WORLDFISH, IOSEA, FFI, WCS as regional cooperation and with KOICA, JICA, ACIAR, Italy, Netherlands, Norway, EU, Denmark for bi-lateral cooperation.

Capacity building is a requirement for integrated management. In collaboration with the Asian Institute of Technology in Bangkok, Thailand, Mangrove for the Future (MFF) organized two and a half month certified training on Integrated Coastal Management at AIT in Thailand. Certified Integrated Coastal Management course organized by the trained some people from Myanmar. A total of 12 from Department of Fisheries, Forest Department, Department of Marine Science (Myeik & Pathein Universities) and local NGOs24.

Myanmar becomes 11th MFF member country in October 2014. National Coordination Body was officially formed in 2014 and it comprised of Government, NU agencies, International Organizations, NGOs and Academia and private organization. Forest Department functions as the National Secretariat. The Myanmar National Strategy and Action Plan (NSAP) has been formulated upon the agreements with Line Ministries, Non-Government Organizations, Academia, International Organizations and Private Sector. It has been submitted to the MFF Secretariat in October 2014.

At present, in cooperation and collaboration of Forest Department and Pathein University, Mangrove for the Future (MFF) has planned to give Integrated Coastal Management

Integrated coastal zone management subject is also taught in Myanmar. Department of Marine Science at three universities has taught integrated coastal zone management at third year class for bachelor degree. It is taught one semester (four month) course at the third year marine science.

The Training of Trainers in Essential Ecosystem Approach to Fisheries Management was held in Bangkok, Thailand, from 10 – 15 March, 2015 and a fisheries officer attended the ToT25.

Recently, DoF has organized a National- Onsite Training of Trainers Course on Essential Ecosystem Approach to Fisheries Management at Nay Pyi Taw, Myanmar, from 27 June to 1 July, 2016.

24 Maeve Nightingale per com.
In accordance with the guiding principles detailed in the Food and Agriculture Organisation’s (FAO) International Plan of Action for the Conservation and Management of Sharks (IPOA-Sharks), Myanmar Department of Fisheries initiated the task of developing a National Plan of Action (NPOA)-Sharks in 2005 but due to the lack of capacity and resources within the country the document lay in draft form. However, with the support of the Bay of Bengal Large Marine Ecosystem (BOBLME) Project of the FAO: “Strengthening existing marine reserves and shark conservation in Myanmar”, a collaborative effort between BOBLME and Fauna & Flora International (FFI) with technical support from SEAFDEC-MFRDMD, the plan has been reviewed and setting out the steps required to have the NPOA-Sharks approved as well as identify management actions that the plan should address and the immediate priorities.

A preliminary workshop organized by FFI to discuss the implementation of LMMAs in the Myeik Archipelago was conducted in Myeik in October 2014, which was attended by all the main stakeholders. LMMA is an innovative solution to restore and maintain marine resources and fisheries in the Myeik Archipelago. In the case of the Myeik Archipelago project, the LMMAs will be collaboratively co-managed by local communities and the Department of Fisheries (DoF); assisted by the Navy, Forest Department, the Administration Department and supported by conservation NGOs and INGOs. It is an attempt to undertake integrated coastal management practice at the local level. Management committees for the LMMA have been formed at the Don Linn Lun and Don Pale Aw villages of the Thayawtangyi Island.

Net fishing which deploy nets along the fringe of a shore or bay or stretch across a mouth of a bay are not allowed by the community and community is alert in watching such kind of fishing activities in its water and take necessary action in cooperation with the village authority.

Myanmar aquatic police force unit with a patrol boat was stationed in Myeik area in May 2016 and has been commissioned in June 2016 to take action on illegal and without licensed boats, cargo boats and fishing boats.

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6. Distribution and Conservation Status of Fisheries, Marine Resources and Marine Protected Areas

Myanmar’s Protected Areas (PAs) include the sub-temperate forests in the north and mangrove and tropical rain forests in the south. At present, 38 PAs have been established. Another seven areas are proposed and their establishment is in process. Among the 38 PAs, seven are ASEAN Heritage Parks (AHPs), which is the highest number among the ASEAN member states. In Myanmar, thirty eight protected areas, covering 5.6% of country’s total area, have now been established and another seven areas (1.2% of total area) have been proposed, pending stakeholder consultation and ground surveying.

No data is available regarding the proportion of locally threatened species in Myanmar, however, according to the International Union for Conservation of Nature (IUCN), 356 species of wild flora and fauna in Myanmar are considered to be globally threatened28.

In Myanmar, PAs selection, establishment and planning have been done by the Forest Department mainly based on the Protection of Wildlife and Natural Areas Law and Rules. By practicing the Article 23 of the Myanma Marine Fisheries Law, Department of the Fisheries (DoF) also established some protected areas in fishery sector. But those established by the DoF have not been listed in the Myanmar Protected System and the areas of fishery protected areas have not been added to the total protected area of Myanmar.

6.1 Marine Protected Areas

Among the 45 established and proposed PAs, only four are marine PAs (MPAs), two in Ayeyawaddy Region and two in Tanintharyi Region, despite Myanmar’s long coastline and large marine area. There is a real and pressing need to protect a greater proportion of marine area by designation of marine PAs29. MPAs represented just merely 1.03% of the already established Myanmar PAs system.

Moscos Island Wildlife Sanctuary and Lampi Marine National Park are situated in the Tanintharyi Region. Lampi Island Marine National Park is also an ASEAN Heritage Park. However, no one is situated in the targeted area i.e. Myeik District and any MPA has not been established in the Rakhine Coast yet.

Table. Marine Protected Areas in Myanmar.

<table>
<thead>
<tr>
<th>No.</th>
<th>Name</th>
<th>State/Region</th>
<th>Year Established</th>
<th>Area (km²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Moscos Island Wildlife Sanctuary</td>
<td>Ayeyawaddy Region</td>
<td>1927</td>
<td>49</td>
</tr>
<tr>
<td>2</td>
<td>Thamihla Kyuun Wildlife Sanctuary</td>
<td>Ayeyawaddy Region</td>
<td>1970</td>
<td>0.88</td>
</tr>
<tr>
<td>3</td>
<td>Mainmahla Kyuun Wildlife Sanctuary</td>
<td>Tanintharyi Region</td>
<td>1993</td>
<td>137</td>
</tr>
<tr>
<td>4</td>
<td>Lampi Island Marine National Park</td>
<td>Tanintharyi Region</td>
<td>1996</td>
<td>205</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td><strong>391.88</strong></td>
</tr>
</tbody>
</table>

6.2 Cultured Pearl Station

Production of cultured South Sea pearl was started in Myanmar by establishing a Japan-Myanmar joint venture company in 1954. The company was nationalized in 1963 and it was a branch of the then People’s Pearl and Fishery Corporation, a State-owned corporation, under the Ministry of Agriculture and Forestry. Then, it was put under the Ministry of Mines in 1986 and it became as Myanma Pearl Enterprise (MPE) in 1989. The main farm site of Myanma Pearl Enterprise is on the Pa Lei Kyunn Island which was formerly known as Sir J Malcolm Island or Pale Kyunn, in Myeik Archipelago.

MPE had been producing precious pearl by itself before establishing joint venture farms with local and foreign companies in 1992. Nowadays, four foreign and two local joint ventures have also been doing pearl cultivation by signing production-sharing contracts with the State-owned Myanma Pearl Enterprise. All State-owned and joint venture farms are situated in the Myeik Archipelago.\(^{30}\)

Two joint ventures, Myanmar Atlantic Pearl and Myanmar Tasaki Pearl companies, have been stationed in the Kyunsu Township of the Myeik District. Atlantic company is stationed on the Thayawthatangyi Island and operating in Thayawthatangyi Island (formerly known as

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Elphinstone Island) and Daung Island (formerly known as Ross Island) waters. The Tasaki company is situated near the south-west tip of the Pandaung Island (formerly known as Domel Island). It is the main operating area of the Tasaki company and La Ngann Kyunn Su water is its extension.\(^{31}\)

MPE suggests an area in the north-east of Pawei Kyunn (Pawe Kyun; Latitude 11°25’N; Longitude 98°30’E) which is situated in the Kyunn Su Township to the potential investors in pearl culture business.\(^{32}\)

Pearl farm waters are, in fact, virtual protected areas or refuges for the marine biodiversity. Due to the nature of the work, except for their boats, ships and boats are not allowed to go in and fishing is also not allowed in their culture waters. They take care of their waters and oysters to be healthy so as to produce good quality pearls.

### 6.3 Fisheries Conservation Areas

Myanmar’s offshore fish stocks need recovery as they have been depleted by up to 80% since 1979. Integrated, ecosystem-based and spatial planning approaches to fisheries management can serve to secure the recovery, sustainability and management of fishery resources.

#### 6.3.1 Crab Bank

Crabs are famous seafood in Myanmar and they have been put on sale as normal or soft-shell crabs. In accord with the directives by the Ministry not to reduce production of crabs from mangrove area and to produce more crabs, DoF established three mud crab protected areas in Tanintharyi Region by 1\(^\text{st}\) of March, 2010 dated, Notification No. 5/2000, 6/2000 and 7/2000. The crab protected areas are situated one in each District of the Tanintharyi Region: Dawei, Myeik and Kawthaung.

Crab Protected Area in Myeik district is situated near the Panzin village in Kyunn Su Township and area of the crab protected area is 350 acre (ca. 142 ha). The area has not been aware of local community. Many fishers do fin fish and crab fishing in the crab protected

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\(^{31}\) U Khin Zaw, per. com.

area. DoF has not done patrolling and monitoring in the area. Mangrove in the area is also exploited heavily resulted in habitat degradation for the crabs. Though follow up action plan has been sent to the local authorities by the DG office, they have not been fully implemented yet.

### 6.3.2 Indian Threadfin Protected Area

In order to prevent from depletion of thread fin fish resource and to enhance reproduction of the fish, Department of Fisheries designated two thread fin protected areas in the waters around the Wet Phyu Taung and Thar Myar Ami islands in Kyunn Su Township, Myeik District by issuing 20 November 2015 dated Notification No. 4/2015. By practicing the Marine Fisheries Law, the Department issued the notification which prohibits gill nets with 2.5 inches mesh aperture or less in the designated areas throughout the year. The protected area is just a paper park. Nothing has been done after the establishment yet. Some local people do not know the Indian threadfin protected area.

### 6.3.3 Shark Protected Area I

By practicing the Marine Fisheries Law, two shark protected areas have been designated from Daung Island (Ross Island; 12°13'N, 98°05.2'E) to Lampi Island (Kyun Tann Shey Island; 10°48.0’N, 98°16.1'E) in Myeik Archipelago, Tanintharyi Region, by 2004 May 5th dated Notification No 2/2004 of the Department of Fisheries. Area of the shark protected area I is 1173400 ha. Among the 60 known shark species reported to have occurred in Myanmar waters, only 36 species have been reported recently by various research works.

According to an assessment of shark and ray fisheries in Myanmar most fishers interviewed at landing sites did not know of the reserves and if they did it was usually only for the block surrounding Lampi Island. Since 2004 however, no effective conservation plan has been developed for these sites meaning the reserves lack physical demarcation, an active law enforcement programme or monitoring of shark catches and populations. A formal evaluation of the reserves efficacy was undertaken as part of the Bay of Bengal Large Marine Ecosystem (BOBLME) Project of the Food and Agriculture Organisation (FAO) of the United

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Nations: “Strengthening existing marine reserves and shark conservation in Myanmar”. This project is a collaborative effort between BOBLME and FFI with support from the DoF.  

7. Development of Satellite RS and Maps of Seascapes, Marine Conservation and Development Plans and Initiatives Affecting the Project

Table 1. Location of marine conservation and development plans and initiatives in Myeik and Kyunsu townships.

<table>
<thead>
<tr>
<th>PA</th>
<th>Coordinates</th>
<th>Location &amp; Area</th>
<th>Ref:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Shark Protected Area I</td>
<td>Point A: 12°29'N; 97°25'E</td>
<td>Kyunsu Township, Myeik District.</td>
<td>DoF</td>
</tr>
<tr>
<td></td>
<td>Point C: 12°06'N; 98°18'E</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Point D: 12°06'N; 98°09'E</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Point E: 11°14'N; 98°09'E</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Point F: 11°14'N; 97°25'E</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Indian Thread Fin Protected Area</td>
<td>(a) 11°30'N – 12°00'N; 98°00'E – 98°35'E</td>
<td>Wet phyu taung and Thar myar ami island areas</td>
<td>DoF</td>
</tr>
<tr>
<td></td>
<td>(b) 12°00'N – 12°05'N; 98°08'E – 98°18'E</td>
<td></td>
<td>Notification No. 4/2015 (20/11/2015)</td>
</tr>
<tr>
<td>3 Crab Protected Area</td>
<td>Point A: 12°21.39'N; 98°32.43'E</td>
<td>Pahtaw area plot 9 (OSS), Kyunsu Township, Myeik District.</td>
<td>DoF</td>
</tr>
<tr>
<td></td>
<td>Point C: 12°23.84'N; 98°33.82'E</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Point D: 12°23.88'N; 98°33.97'E</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 Myanmar Atlantic Pearl Co. Ltd.</td>
<td>Latitude: 12°05’00”N – 12°20’00”N</td>
<td>Daung Island, Kyunsu Township, Myeik District.</td>
<td>Approved</td>
</tr>
<tr>
<td></td>
<td>Longitude: 97°53’00”E – 98°10’00”E</td>
<td>Joint Venture with Myanma Pearl Enterprise</td>
<td></td>
</tr>
<tr>
<td>5 Domel Island Development Co. Ltd.</td>
<td>-</td>
<td>Pan Daung (Domel) Island, Yay Myit Kyi Village Tract, Kyunsu Township, Myeik District.</td>
<td></td>
</tr>
</tbody>
</table>

35 DoF/FFI/BOBLME (2015). Assessment of the efficacy of Myanmar’s Shark Reserves. Department of Fisheries (DoF) Myanmar, Fauna & Flora International (FFI) and the Bay of Bengal Large Marine Ecosystem project (BOBLME).
Figure 1. Proposed zoning plan in Lin Lon (Don Linn Lunn)/ Pa-Ra-Wah (Pa Raw Wah)\textsuperscript{36}.

Additional information about the map

• LMMA boundary – Green polygon:
  - Area restricted to local fishers use
  - Prohibited practices: dynamite fishing, barrier nets, trawlers and lighting boats
  - Closed every other year, targeting blue swimming crab, mud crab, shrimp and mullet nursery ground
  - Main fishing ground of local fishers during rainy season
  - Used by crab, mullet and shrimp fishers all year round; however, since the competition with outsider fishing boats (mostly the trawlers) has increased, crab fishing is generally not considered to be productive within the bay anymore.

• Seasonal No-Take-Zone - Yellow polygons:
  Yearly season- Targeting all species
  - Replenishment zone, targeting blue swimming crab, mud crab, shrimp and mullet nursery ground
  - The local community decided to close the area every other year, however if the trawlers and the outsider fishers are effectively kept away from the LMMA boundary, they agreed to change the area to a permanent No-Take-Zone to protect the nursery grounds of their preferred target species.

  Oct to April - Targeting Cuttlefish-
  - Targeting cuttlefish spawning season
  - Open during rainy season for local fishers only

• The crab banks:

A separate study was conducted related to the implementation of a crab bank project in Lin Lon (Don Linn Lunn)/Pa-Raw-Wah (Pa Raw Wah) LMMA by Don Macintosh. A separate detailed report including site recommendations will be submitted later.

A further in-depth study about the proposed crab bank sites will be conducted separately.

Local communities have shown an interest in the proposed crab bank project.

Figure 2. Proposed zoning plan in Done Pale.\textsuperscript{38}

Additional information about the map:\textsuperscript{39}:

Three sites are involved in the Done Pale LMMA: Done Pale A, Done Pale B and Sharr-Aw. The LMMA boundary is restricted to only local fishers use.

- **In all fishing ground:**

  - Crab fishing is allowed only during spring tide
  - Mesh size for crab net must be <4 inches
  - Prohibited practices are: Barrier nets, dynamite fishing, trawlers and lighting boats.

- **Seasonal and rotational No-take-Zones for targeted species- Yellow polygons**

  Apr-Jun: targeting blue swimming crab and shrimp spawning season.

  Jun-Aug: targeting blue swimming crab and mullet spawning season.

  Jul-Sep: targeting mullet spawning season.

  Oct-Dec: targeting blue swimming crab and shrimp spawning season.

Local communities are mainly interested to manage the sites closed in Apr-Jun, Jun-Aug and Oct-Dec. However, the two sites closed in Jul-Sep were also proposed because it could be more suited to community monitoring.

The main issue is that the current proposed LMMA boundary for Done Pale does not encompass the seasonal NTZs they are proposing to hold outside the village bay. This issue could make the formalisation of the LMMA confusing and challenging for the DoF. In addition, the area surrounding the NTZs are open to outsider fishers which could make enforcement difficult, even though the communities seem confident that they could monitor the sites during the planned closure period between July and September.

8. Baseline Information for Targeted Seascape

8.1 Myanmar Coast

Myanmar is the largest country in main land Southeast Asia and it has shares common maritime border with Bangladesh, India and Thailand. Myanmar territorial sea, contiguous zone and Exclusive Economic Zone (EEZ) are 12 miles, 24 miles and 200 miles respectively. Myanmar continental shelf covers approximately 230,000 square kilometers and the area of the EEZ is about 486,000 square kilometers. Myanmar coast is fringing the Bay of Bengal and Andaman Sea which are parts of the Indian Ocean.

The Andaman Sea is situated in the southeast of the Bay of Bengal, south of Myanmar, west of Thailand, north-west of Malay Peninsula, north of Sumatra and east of the Andaman Islands, India, from which it takes its name. The Andaman and Nicobar Islands of India and Coco Islands of Myanmar along the eastern boundary separate the Bay of Bengal from the adjacent Andaman Sea. A semidiurnal tide is occurred along the coasts of Myanmar.\(^{40}\)

The coast line of Myanmar is approximately 2280 km long and it can be divisible into three coastal areas – Rakhine, Ayeyawardy Delta and Taninthary. Taninthary coast is the longest and southernmost coast of Myanmar. The Taninthayi Marine Corridor extends along virtually the entire length of Taninthayi Region in southern Myanmar and the corridor covers an area of 65,780 square kilometers.\(^{41}\)

Myanmar water is included in the Subarea 57.1 of the FAO Major Fishing Area 57.\(^{42}\)

8.2 Key Biodiversity Areas (KBA)

A total of 132 Key Biodiversity Areas (KBAs) identified for Myanmar. Three KBAs namely Myeik Archipelago, Shark Protected Area I and Central Tanintharyi Coast are situated in the

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\(^{40}\)https://en.wikipedia.org/wiki/Andaman_Sea


\(^{42}\)http://www.fao.org/fishery/area/Area57/en
Myeik District and their priority for conservation investment and areas are described in the following table.

### Table. List of Key Biodiversity in Myeik District

<table>
<thead>
<tr>
<th>No.</th>
<th>KBA Name</th>
<th>Priority</th>
<th>Area (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Myeik Archipelago</td>
<td>High</td>
<td>3166400</td>
</tr>
<tr>
<td>2</td>
<td>Shark Protected Area I</td>
<td>More information needed</td>
<td>1173400</td>
</tr>
<tr>
<td>3</td>
<td>Central Tanintharyi Coast</td>
<td>Medium</td>
<td>331800</td>
</tr>
</tbody>
</table>

Source: Wildlife Conservation Society

### 8.3 Myeik Archipelago

Myeik Archipelago is situated in the Tanintharyi Region. It consists of more than 800 islands of various sizes from very small islet to hundreds of square kilometres. The area of the Archipelago is about 34,340 square kilometer and is lying up to 30 km off shore. The largest and highest island is Kadan Island and it is situated in Myeik District. “Ye”, “Dawai”, "Tanintharyi" and "Lenya" rivers flows into the Andaman Sea in the Tanintharyi coastal area.

In general, some physicochemical properties (chlorophyll a, dissolved oxygen, total suspended solid TSS values, ammonia nitrogen, nitrite nitrogen and orthophosphate, heavy metals (Pb), and cadmium (Cd) concentrations of sea water in Myeik region of Tanintharyi coastal zone were lower than the acceptable levels of ASEAN standards and, consequently, it can be deduced that it is not eutrophicated with nitrogen and phosphorus species. The pollution of radioactive radiation was not found in the Myanmar sea water at Tanintharyi Region.

### 8.4 Tanintharyi Region

Tanintharyi Region is also the southernmost region of Myanmar and it has three districts - Dawei, Myeik and Kawthaung Districts. Myeik District comprises four townships – Palaw,
Myeik, Kyunsu and Tanintharyi Marine Townships. Myeik is a coastal city and it is famous for fisheries. Myeik city can be accessed by land, air and sea. According to the latest census in 2014, population of the Myeik District is 692880\textsuperscript{46}.

<table>
<thead>
<tr>
<th>Table . Population of Myeik District, Tanintharyi Region.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
</tr>
<tr>
<td>Myeik District</td>
</tr>
<tr>
<td>Myeik Township</td>
</tr>
<tr>
<td>Kyunsu Township</td>
</tr>
<tr>
<td>Palaw</td>
</tr>
<tr>
<td>Tanintharyi</td>
</tr>
<tr>
<td>Palauk Subtownship</td>
</tr>
</tbody>
</table>

Source: Department of Population.

8.5 Thayawthadangyi Island

Thayawthadangyi Island which is also kown as Elphinstone Island, is an island of northern Myeik Archipelagoand. It is irregular in shape, hilly and thickly wooded. Area of Thayawthadangyi is 12000 ha\textsuperscript{47}. The highest point, Elphinstone Peak, rises on the western part of the island, is 533-metre-high (1,749-foot)\textsuperscript{48}.

The island lies between North Latitude 12º16' and 12º 26' and East Longitude 97º 56' and 98º 07'. The island is about 8.2 km long from East to West and about 6.3 km wide from north to south. The island lies in a south west to north east direction and the length from south west to north east is about 10km. The average width of the island at the middle (from north to south) is about 3.2 km. Thayawthadangyi Kyun is a mountainous island and covered with thick jungles which are still in relatively good shape after clandestine illegal logging which has started about 9 months ago. We could see a few vacant plots here and there which were rubber plantations with young plants or old taung yar (shifting farming; the slash and burn method of rice farming on hill side; the method is now prohibited). There are mangrove tree along the coastal rim of the island. Except for a relatively large coastal plain in the north around Linn-Lunn-Aw (Don Linn Lunn) village there is no substantial coastal plain. There are a few paddy fields around Linn-Lunn-Aw (Don Linn Lunn) village. Thick jungle of coconut palms and beetle palms could be seen around virtually all villages and hamlets. The island


\textsuperscript{47} https://en.wikipedia.org/wiki/thayawthadangyi

\textsuperscript{48} Chart No. 216, Mergyi Archipelago
has many gulfs, bays and coves. There are coral reefs around the island especially in the south east, east, north east and north based on information gathered. Villages and hamlets on Thayawthadangyi Kyun Island are Done-Palei-Aw (Done Pale Aw), Linn-Lunn-Aw (Done Linn Lunn), Za-Latt (Done Za Latt), Pa-Raw-Wah, Sharr-Aw and Za-Lwei. Myanmar, Karan and Salone people live in the villages. Karan owns land on the island but Myanmar and Salone people has no land.

Fishing is primary occupation of the local people. Sea cucumber, lobster, sand crab, mullet, shrimp/prawn, grouper, snapper, porcupine/puffer fish, cuttlefish/squid, mixed small size fishes are target marine resources for commercial purpose by using nets, traps, hook and line and diving. Chiton, sea urchin and shells are collected for gleaning. Seaweed cultivation has also been doing in the island water. Fishing for most medium and low value target species is undertaken year round largely confined to bays and coasts. Compressor diving for high value species such as lobster and sea cucumber is generally only undertaken in the dry season (October to April) on reefs and in bays. Local information on the fisheries is based on the practical knowledge of the fisheries community. Reproductive season is important for the blue swimming crab is by far the most important crab species supporting the livelihoods of many fisher households in Lin Long (Done Linn Lunn).

A joint venture pearl farm between Myanmar Pearl Enterprise and Atlantic Pearl Co. has been doing pearl culture and production at the southern water of the Thayawthatangyi island. Myanmar cultured South Sea Pearls are famous in the world and both State-owned and joint venture pearl culture farms are located at some islands of the Myeik Archipelago.

Establishment of locally-managed marine areas (LMMA) at the Thayawtangyi island have been in progress. The LMMAs will be collaboratively co-managed by local communities and the Department of Fisheries (DoF), assisted by the Navy, the Department of Environment, Conservation and Forestry (MOECAF), the Administration Department and supported by Saw Han Shein, Amt Maung, Salai Mon Nyi Nyi Lin and Zau Lunn (2013). Socio-Economics survey in the villages along Thayawthadangyi Kyun Group, Kyunsu Township, Tanintharyi Region, Myanmar. Report No. 1/2013, Fauna & Flora International.

Schneider, H., Soe Thiha, M. Pontillas and E. M. Ponce de Leon (2014). Socio-economic baseline assessment: Thayawthatangyi and Langann Islands, Myeik Archipelago, Myanmar. Report No. 10 of the Tanintharyi Conservation Programme, a joint initiative of Fauna & Flora International (FFI) and the Myanmar Forest Department, FFI, Yangon, and the Bay of Bengal Large Marine Ecosystem project (BOBLME).

Macintosh, D.J. (2015). Assessment of the Crab Fishery within Thayawthadangyi Island 24-29 May, 2015. Report No. 22 of the Tanintharyi Conservation Programme, a joint initiative of Fauna and Flora International (FFI) and the Myanmar Forest Department. FFI, Yangon
conservation NGOs and INGOs. Proposal to establish Thayawthatangyi locally-managed marine area (LMMA) was submitted, through the Department of Fisheries, to the Tanintharyi Regional Government in May 2016 and it has been still in processing stage. Objectives of the LMMA are:

- To assist the Department of Fisheries with the management of marine resources and fisheries at the local level.
- To improve and ensure the sustainability of the livelihood and culture of local fishers.
- To maintain the health of the nearshore ecosystem and marine biodiversity.

A management plan will be developed once the area is official. However, a management committee was established at two sites, Lin Luun (Done Linn Lunn)/Pa raw wah and Done Pale, with 12 and 15 members respectively. These committees will be primarily responsible for the management of the LMMAs at the local level and they will liaise with the support NGO and government representatives.

According to a study at Sha Aw, Linlong (Done Linn Lunn) aw, Palaw-wah (Pa Raw Wah), Zalat, Escape bay (East), and Phanlaung aw, a total of 114 species of hard corals belonging to 60 genera of under 19 families of Phylum Cnidaria could be recorded from Thayawthatangyi island water. The corals surrounding the island are patchy and shallow water coral reef types, but very rich in coral animal species.

Hard coral dominating (64.3%±2.8) at inner reefs of Thayawthatangyi Island Group water and the hard coral cover varied from 6 to 92% at 57 survey sites. No sharks, rays or sea turtles were recorded on any of the transects during the assessment of the Myeik Archipelago Reef Ecosystem at five island groups – Lampi Island Group, Pyin Sa Bu Island Group, Torress Island Group, Thayawthadangyi Island Group and Zar Dat Gyi Island Group.

Some international and local researchers did biodiversity researches in Thayawtangyi waters. They are


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University (Unpublished)


Appendix 2.

Report II

Ridge to Reef: Integrated Protected Area Land and Seascape Management in Tanintharyi

Identification of the Capacity Development Needs of the Fishery/Marine Stakeholder Groups

Tint Tun
National Consultant
July, 2016
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2. Scope of the Report ................................. 1
3. Proposed and existing fishery/marine protected areas in Myeik District ................. 2
4. Existing fishery/marine stakeholders ................ 2
5. Capacity development needs ......................... 7
1. Introduction

United Nation Development Programme (UNDP) Myanmar has been implementing UNDP Country Programme for 2013-2017 with the aim to promoting local governance, growth and sustainable development with the emphasis on rights-based, gender sensitive, inclusive and equality. This goal will be pursued through three complementary component; Local Governance, Environmental Governance and Disaster Resilience, and Democratic Governance.

UNDP has been closely working with the Ministry of Natural Resources and Environmental Conservation (MONREC) to improve environmental governance in Myanmar. UNDP developed a Project Identification Form (PIF) on “Ridge to Reef: Integrated Protected Area Land and Seascape Management in Tanintharyi” with guidance from MONREC and consultations with relevant line departments, Tanintharyi regional government and partner NGOs. The Project Identification Form (PIF) was submitted to the Global Environmental Facility (GEF) and it was approved by GEF Secretariat. A Project Preparation Grant (PPG) has been obtained to carry out necessary preparation of a fully-fledged project proposal. In consultation with the Forest Department, Myeik District was chosen as the project site.

2. Scope of the Report

The main title of this report is “Identifcation of the Capacity Development Needs of the Fishery/Marine Stakeholder Groups” and it will support development of the UNDP-GEF Full Project proposal. As the project will deal with the strengthening of the protected areas, identification of proposed and existing fishery/marine protected areas in Myeik District have been listed in this report. The stakeholders related to the proposed targeted areas and their roles and responsibilities have also been listed.
3. Proposed and Existing Fishery/Marine Protected Areas in Myeik District

Proposed and existing fishery/marine protected areas in Myeik District are described in the following table.

<table>
<thead>
<tr>
<th>PA</th>
<th>Location &amp; Area</th>
<th>Ref:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Shark Protected Area I&lt;br&gt;Kyunsu Township, Myeik District.&lt;br&gt;Area: 1,173,400 ha</td>
<td>DOF Notification No. 2/2004 (5/5/2004)</td>
</tr>
<tr>
<td>2</td>
<td>Indian Thread Fin Protected Area&lt;br&gt;Wet phyu taung and Thar myar ami island areas, Kyunsu Township, Myeik District.</td>
<td>DOF Notification No. 4/2015 (20/11/2015)</td>
</tr>
<tr>
<td>3</td>
<td>Crab Protected Area&lt;br&gt;Pahtaw area plot 9 (OSS), Kyunsu Township, Myeik District.&lt;br&gt;Area: 350 Acres (ca. 142 ha)</td>
<td>DOF Notification No. 5/2010 (1/3/2010)</td>
</tr>
<tr>
<td>4</td>
<td>Hard Clam Protected Area&lt;br&gt;Pulaw Township, Myeik District&lt;br&gt;Area: 20 Acres (ca. 8.1 ha)</td>
<td>DOF Directive No. 9/2008 (20/3/2008)</td>
</tr>
<tr>
<td>5</td>
<td>Myanmar Atlantic Pearl Co. Ltd.&lt;br&gt;Daung Island, Kyunsu Township, Myeik District.&lt;br&gt;Joint Venture with Myanmar Pearl Enterprise&lt;br&gt;Area: 87,463 ha</td>
<td>Approved</td>
</tr>
<tr>
<td>6</td>
<td>Locally-Managed Marine Protected Area (LMMA)&lt;br&gt;Thayawthatangyi Island, Yay Myit Kyi Village Tract, Kyunsu Township, Myeik District.&lt;br&gt;Area: 8,000 ha</td>
<td>Proposed</td>
</tr>
</tbody>
</table>

4. Existing Fishery/Marine Stakeholders

<table>
<thead>
<tr>
<th>Union Government and Union Government Agencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ministry of Natural&lt;br&gt;MONREC is the GEF operational focal point (OFP). It will be the lead ministry for project preparation and implementation and it is the lead</td>
</tr>
<tr>
<td>Resources and Environmental Conservation (MONREC)</td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td>Forest Department (FD)</td>
</tr>
<tr>
<td>Regional Government</td>
</tr>
<tr>
<td>Ministry of Natural Resources and Environmental Conservation</td>
</tr>
<tr>
<td>Ministry of Agriculture, Livestock and Irrigation (MALI)</td>
</tr>
</tbody>
</table>
**Union Government Agencies in Tanintharyi Region**

| Department of Fisheries (DOF) | Under the Union Ministry of Agriculture, Livestock and Irrigation, DOF is responsible for both freshwater and marine fisheries management and development. DOF is managed by the Director-General, with a staff of around 1,600. It has local offices at division, district and township level respectively.

Myeik District fisheries office is situated in Myeik and it has been undertaking licensing, vessel registration, fish landing data collection and fish export. Myeik DOF have Myeik DOF office has planned to issue Catch Certificate to the fishing vessels starting from July 2016.

The Myeik DOF office currently has 40 staff (35 permanent and 5 daily wages) and most of whom are reportedly graduates in either Zoology or Marine Science. Staff training is confined to short courses (<1 month) and mostly lower to mid-level staff (ca. 4 staff/year) organized by DOF Headquarters. Staff also participated in some other trainings such as shark identification, organized by DOF or other agencies/INGO.

Myanmar NPOA for Sharks Page 34 of 46 therefore, DOF is a key stakeholder for the proposed and existing fishery protected areas planning and management in Myeik District. |

| Local Authorities | Myeik District General Administration Department and its township and village level authorities are partner at site level implementation. |

| Academic Institutions | Myeik University is potential collaborators for the project capacity building. They will actively participate in the project preparation process. Myeik University was started with a college in 1999 and it was upgraded to a university level as Myeik University in 2003. The Missions of the Myeik University are:

1. To develop highly qualified regional human resources needed by the district.
2. To promote basic research to generate new knowledge, applied research to fulfill the needs of private enterprises and |
organizations, and advanced research for economic and social development of the district.

3. To conduct programmes that cater to the demands of region and community by utilizing natural resources.

4. To become an education community that support students’ and staff’s development of material life and spiritual life.

5. To bring about a sound academic atmosphere by international collaboration.

Nowadays, it comprises 13 arts and science academic departments and it publishes research journal every year. The institution continuously focuses on expanding international collaboration in its academic and research programmes.

Marine Science Departments will be a key department in particular since it has been taught some related subjects to the project such as Myanmar Agenda 21, integrated coastal management, etc. Furthermore, it has been doing a wide range of marine fauna and flora researches in Tanintharyi Region including the project target site, Thayawthatangyi Island.

### INTERNATIONAL NON-GOVERNMENT ORGANIZATIONS

<table>
<thead>
<tr>
<th><strong>UNDP</strong></th>
<th>UNDP is the GEF Agency for this project and will lead the project preparation and implementation activities. UNDP has been providing development assistance in Myanmar since the 1950s. It has a large country programme in the field of climate change, environment, energy, disaster risk reduction, democratic governance, and sustainable and inclusive community development.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fauna and Flora International (FFI)</strong></td>
<td>FFI, through its Myanmar office, is an implementing partner for this project and will have an active role in project preparation, providing technical expertise based on its work in Myanmar, in particularly in Kachin and Chin states, and more recently in Tanintharyi region. Founded over a century ago, the UK-based FFI has been working closely with MONREC, supporting biodiversity management, protected area and forest management. It is expected to provide technical support for protected area planning/management and integrated land/ seascape management, as</td>
</tr>
</tbody>
</table>
well as act as a co-financier through the on-going and future projects in Tanintharyi financed by EU and other donors.

| Smithsonian Institution (SI) | SI is an implementing partner for this project and will have active roles in project preparation by providing technical expertise and inputs in the field of biodiversity information generation and management. Founded in 1846, US based quasi-government organisation SI is the world’s largest museum and research complex consisting of 19 museums and galleries, the National Zoological Park and 9 research institutions. Smithsonian scientists have 20-years of experience studying the biodiversity and ecology of Myanmar, and the organization has a long-term partnership with the MONREC. It is expected to provide capacity building support in generating biodiversity information and application tools, and to be a co-financier for the project. |
| Mangroves for the Future (MFF) | Mangroves for the Future (MFF) promote investment in coastal ecosystems for sustainable management and uses mangroves as a flagship ecosystem because of their important roles in coastal livelihood and security. Myanmar becomes 11th MFF member country in October 2014. The Myanmar National Strategy and Plan of Action (NSAP) has been formulated upon the agreements with line ministries, I/NGOs, academia and private sectors and it has been submitted to the MFF in October 2014. MFF has initiated its small grant programme in Palaw Township in Myeik District and it has planned to expend the programme in other part of the Myanmar coastal area. MFF, in collaboration with Asian Institute of Technology, has opened 2 and half months certified course on the Integrated Coastal Management in Bangkok, Thailand. Twelve Myanmar from Forest Department, Department of Fisheries, Marine Science Departments and NGOs attended the course between the years 2011 to 2015. It also has plan to open the course in Myanmar. |

**LOCAL NON-GOVERNMENT ORGANIZATIONS**

| Myanmar Fisheries Federation (MFF) | The Myanmar Fishery Federation (MFF) is founded in 1989. It is a national level organization with a membership of over 700 companies and 27,000 individuals, is mandated to encourage and promote fishing industries. MFF aims to promote the socio-economic life of member entrepreneurs and |
fishery communities, share information on economic policies and fishery technologies and advocate on behalf of the fishing industry, among other objectives. There are nine associations under MFF that deal with particular industries, namely, shrimp, fish, exporters, aquaculture feed, marine fisheries, freshwater capture fisheries, crabs, eels and ornamental fish. MFF has sub-federations at all township, districts, state/region levels. MFF has opened an office in Myeik. MFF is also a potential partner for awareness raising, protection and conservation of marine living resources.

### PRIVATE SECTOR

| **Myanmar Atlantic Peral Co. Ltd.** | Atlantic company is stationed on the Thayawthatangyi Island and operating in Thayawthatangyi Island (formerly known as Elphinstone Island) and Daung Island (formerly known as Ross Island) waters\(^1\). It helped in doing research by post graduate students for their higher degree in its water. |

### LOCAL COMMUNITY

| **Locally-managed marine area (LMMA) Committee** | The Committees of the LMMA at Theyawthatangyi are the key stakeholder at site level to implement management actions in the targeted site area. Members of the LMMA comprises Karen, Myanmar and Salone ethnic peoples. LMMA Committee is the key stakeholder at site level. Good and enough background knowledge on sustainable use and management of marine living resources is essential to be successful their participation in protection. |

## 5. Capacity Development Needs

Reliable and scientific data are very important to formulate and development of sustainable marine resources utilization and management. Establishment of Marine and coastal research centre using the Department of Marine Science (Department of Higher Education, Ministry of Education) as nucleus has been included in the plan of sustainable development of Myanmar\(^2\) and the centre will conduct research and training to upgrade the skills of staff and

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\(^1\) U Khin Zaw, per. com.  
facilitate information support for decision making. Myanmar currently lacks a research institute dedicated to coastal management and/or marine protected areas.

However, a number of marine fauna and flora researches have been done by either government agencies (DOF, Universities) or INGOs. Improved knowledge and understanding of integrated coastal management and ecosystem approach management among the stakeholders would promote their competencies, and enable cooperation and collaboration between/among them. Myanmar is recognized as one of the most biodiverse countries in the world. However, surveys and monitoring are still lacking for many areas, especially for aquatic ecosystems.

DOF is a key stakeholder for fishery sector at both township and district level. But, very few DOF staff have been trained specifically in fisheries research and management such as workshop on Gap analysis for supporting Sustainable Management and Conservation within Coastal Marine Fisheries and Systems. However, DOF initiated the National-onsite Training of Trainers Course on Essential Ecosystem Approach to Fisheries Management was conducted at Naypyitaw from 27 June to 1 July 2016. Multiplier course would be follow up in near future. Lack of materials for Monitoring, Control and Surveillance (MCS) is a barrier to do enforcement actions for fishing and protection.

Marketing is a problem for most of the local subsistence fishermen as they cannot go to the nearby city or lack of buyer for their catch. This can be overcome by establishing a local fisheries association to

<table>
<thead>
<tr>
<th>Capacity Development Needs</th>
<th>Stakeholders</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Human</strong></td>
<td></td>
</tr>
<tr>
<td>Basic knowledge on the sustainable use of marine living resources</td>
<td>Forest Department</td>
</tr>
<tr>
<td></td>
<td>Local Authority</td>
</tr>
<tr>
<td></td>
<td>Local Community.</td>
</tr>
<tr>
<td>Training on mangrove crab culture</td>
<td>Local community.</td>
</tr>
<tr>
<td></td>
<td>Myanmar Fisheries Federation</td>
</tr>
<tr>
<td>Training on crab fisheries data collection.</td>
<td>Local community.</td>
</tr>
<tr>
<td></td>
<td>Department of Fisheries</td>
</tr>
<tr>
<td></td>
<td>Myanmar Fisheries Federation</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Training</th>
<th>Responsible Party</th>
</tr>
</thead>
<tbody>
<tr>
<td>Training on targeted fisheries data collection</td>
<td>Local community, Department of Fisheries, Myanmar Fisheries Federation, Tanintharyi Region Fisheries Partnership</td>
</tr>
<tr>
<td>Training on monitoring and surveillance</td>
<td>LMMA Committee and members, Department of Fisheries</td>
</tr>
<tr>
<td>Training on Application of Global Information System (GIS) and Remote Sensing (RS)</td>
<td>Myeik University, Department of Fisheries</td>
</tr>
<tr>
<td>Integrated coastal zone management / ecosystem approach to fisheries management training course</td>
<td>Forest Department, Department of Fisheries, General Administration Department, Local environmental and fisheries NGOs, Hotel and Tourism, Private sector (Pearl Co)</td>
</tr>
<tr>
<td>Training on meteorological and hydrological data collection</td>
<td>Local community</td>
</tr>
<tr>
<td>Establishment of networking and information sharing system</td>
<td>by holding workshop), LMMA Committee, Fisheries Officer, University, General Administration Department</td>
</tr>
<tr>
<td>Training on taxonomy of sharks and rays</td>
<td>Department of Fisheries, University (Marine Science &amp; Zoology), Myanmar Fisheries Federation</td>
</tr>
<tr>
<td>Participation in Fisheries Workshops</td>
<td>LMMA Committee, Department of Fisheries, Myanmar Fisheries Federation, Tanintharyi Region Fisheries Partnership, General Administration</td>
</tr>
<tr>
<td>Formation of local fisheries association</td>
<td>Local community</td>
</tr>
</tbody>
</table>

**Material**

<table>
<thead>
<tr>
<th>Item</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motor boat</td>
<td>Township DOF office</td>
</tr>
<tr>
<td>Computer and accessories including</td>
<td>Myeik District DOF</td>
</tr>
<tr>
<td>Presentation support materials (printer, scanner, projector, screen, wireless mouse, pointer, memory sticks, external hard disc)</td>
<td>Kyunsu Township DOF</td>
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<tr>
<td>GPSs</td>
<td>University DOF</td>
</tr>
<tr>
<td>Set up a meteorological record materials (dry/web thermometer, rainfall record materials, anemometer, hand-held salinity refractometer, water sampler, normal thermometer)</td>
<td>LMMA Committee (in consultation with Department of Meteorology and Hydrology and University)</td>
</tr>
</tbody>
</table>
Ridge to Reef: Integrated Protected Area Land and Seascape Management in Tanintharyi

Assessment of the Policy Framework and Systemic and Institutional Review Related to Sea Use Planning and the Cross-Sectoral Planning for Terrestrial and Coastal Management

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July, 2016
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1. Introduction

United Nation Development Programme (UNDP) Myanmar has been implementing UNDP Country Programme for 2013-2017 with the aim to promoting local governance, growth and sustainable development with the emphasis on rights-based, gender sensitive, inclusive and equality. This goal will be pursued through three complementary component; Local Governance, Environmental Governance and Disaster Resilience, and Democratic Governance.

UNDP has been closely working with the Ministry of Natural Resources and Environmental Conservation (MONREC) to improve environmental governance in Myanmar. UNDP developed a Project Identification Form (PIF) on “Ridge to Reef: Integrated Protected Area Land and Seascape Management in Tanintharyi” with guidance from MONREC and consultations with relevant line departments, Tanintharyi regional government and partner NGOs. The Project Identification Form (PIF) was submitted to the Global Environmental Facility (GEF) and it was approved by GEF Secretariat. A Project Preparation Grant (PPG) has been obtained to carry out necessary preparation of a fully-fledged project proposal. In consultation with the Forest Department, Myeik District was chosen as the project site.

2. Scope of the Report

This is one of the reports of the National Fisheries and Marine Resource Management Expert (National Consultant) and it covers in-depth assessment of the policy framework and systemic and institutional review related to land and sea use planning and the cross-sectoral planning for terrestrial and coastal management which support development of the UNDP-GEF Full Project.

3. Myanmar Constitution

The highest commitment of Myanmar to environmental management has been stated in the Constitution of the Republic of the Union of Myanmar (2008). Article 45 of the Constitution states that “The Union shall protect and conserve natural environment.” Additionally, Article 390 (b) states that “Every citizen has the duty to assist the Union in carrying out the following matters: (a) Preservation and safeguarding of cultural heritage; (b) Environmental
conservation; (c) Striving for development of human resources; (d) Protection and preservation of public property.

4. Myanmar Agenda 21

Agenda 21 and the Rio Declaration on Environment and Development were adopted by more than 178 Governments at the United Nations Conference on Environment and Development (Earth Summit), held in Rio de Janeiro in June 1992. Agenda 21 calls for all nations to develop and put into effect their own national strategies, plans and policies for sustainable development.

Myanmar Agenda 21 is a blueprint for all natural resource management and environmental conservation work and the pursuit of the activities contribute to biodiversity conservation throughout the country. The formulation of Myanmar Agenda 21\(^1\) is part of the country’s effort to fulfil its commitments to the historic Earth Summit in 1992. Myanmar Agenda 21 serves as a framework to integrate environmental considerations into future national development plans as well as sectoral development programmes.

Myanmar Agenda 21 seeks to achieve four main objectives:—

(a) To provide a forum and context for the debate on sustainable development and the articulation of a collaborative vision for the future

(b) To provide a framework for negotiation, mediation, and consensus-building in the country to achieve development with due regard to the environment, to focus the entire country on a common set of priority issues;

(c) To provide a strategy and implementation plans for the changing and strengthening of values, knowledge, technologies and institutions with respect to environmental protection and development; and

(d) To provide the impetus and the framework for the development of organizational capacities and institutions required for sustainable development.

The integration of environment and development pervade the entire Myanmar Agenda 21. However, the activities related to the cooperation and integration of management among the stakeholders for protected area is also identified in the Agenda.

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\(^1\) National Commission for Environmental Affairs, Myanmar (1997). Myanmar Agenda 21
Regarding to the institutional trends, the Agenda has noted that Myanmar has the necessary institutional building blocks for sustainable development. However, these are plagued by inadequate inter-ministerial and inter-agency collaboration, imprecise definition of responsibilities in crucial sectoral areas lack of environmental analysis capacities in ministries and department and inadequate mechanisms for participation and consultation with affected communities.

The Myanmar Agenda 21 covers three broad dimensions of sustainable development the social, economic and environmental dimensions. To address the environmental dimension through environmental resource conservation and management, the policy strategies and actions in the environmental dimensions are broadly stated in the Myanmar Agenda 21. In regard to the biodiversity, and marine and coastal area, it mentions that

- Conservation of the rich biodiversity of the country through strengthening and expansion of protected areas and improved management;
- Sustainable coastal and marine s management through integrated environmental management of coastal resources and conservation.

Seven sectoral areas have been divided in the “Environmental and Natural Resource Conservation and Management dimension”. Biodiversity Conservation, and Sustainable Management of Coastal, Marine and Island Ecosystem are included in the sectoral areas.

### 4.1 Biodiversity Conservation

Programme areas under the Biodiversity Conservation are -

(i) Strengthen protected area planning and management, and

(ii) Conserve biodiversity.

#### 4.1.1 Strengthen protected area and planning and management

The objective of the programme area is –

- Strengthen existing protected areas and develop new protected areas to enhance biodiversity conservation.

Activities have been categorized into three main action plans. They are -
1. Develop an action plan to strengthen protected area,
2. Promote and strengthen protected area management and,
3. Promote international cooperation.

The activities described in the “Develop an action plan to strengthen protected area” category are -

(a) Establish criteria for delineating areas to be declared as protected areas in order to ensure that such areas have a genetic as well as socio-economic justification and do not constrain management viability.

(b) Prepare management plans for protected areas system and buffer zone management along the line of Global Conservation Strategy.

The activities described in the “Promote and strengthen protected area management” category are -

(a) Upgrade manpower, skills in protected areas and buffer zone management.
(b) Strengthen and support Nature and Wildlife Conservation Division of the Forest Department
(c) Involve local communities in designing and planning of protected area management such as information gathering, consultation and decision making.
(d) Involve relevant agencies responsible for conservation and establish a comprehensive network of protected areas.
(e) Establish botanical and zoological gardens for conservation of endangered plants and animals. Integrate botanical and zoological gardens with protected areas system to promote conservation of endangered species.
(f) Manage the sustainable use of wildlife resources within the capacity of renewable rates. Wildlife resource uses must be managed to ensure that they are sustainable and do not cause damage to the wildlife population and habitats. Assessment of stocks and regulating the harvests should also be carried out.

The activity described in the “Promote international cooperation” category is-
Promote regional and international cooperation in the management of protected areas, the protection of migratory species; and development of data base information system.

**4.1.2 Conserve Biodiversity**

Objectives of the area are –

- Strengthen conservation and management of biological diversity and promote sustainable use of biological resources in line with the Convention on Biological Diversity and national policies.
- Develop new partnerships between the Government and local communities to prevent loss of biodiversity.

Activities have been categorized in seven main action plans. They are -

1. Strengthen the national data base on biodiversity.
2. Strengthen laws and legislations for biodiversity conservation management.
3. Protect threatened endangered species of plants and animals.
4. Strengthen sustainable use of wildlife resource.
5. Strengthen the institutional capacity for biodiversity conservation and management.
6. Promote education awareness and involvement of local communities.
7. Study the economic issues concerning biodiversity.

Four activities have been described in the “Strengthen the institutional capacity for biodiversity conservation and management (No. 5.)” and activity (d) states that Promote regional and international cooperation for the assessment and management of biodiversity conservation in line with the Convention on Biological Diversity and provide support to the ASEAN regional centre for biodiversity conservation.
4.2 Sustainable Management of Coastal, Marine and Island Ecosystem

Programmes under the Sustainable Management of Coastal, Marine and Island Ecosystem are –

(i) Strengthen sustainable use of coastal and marine living resources
(ii) Promote environmental conservation and integrated management of coastal resources and area, and
(iii) Promote effective management of island ecosystem.

4.2.1 Strengthen sustainable use of coastal and marine living resources

Objectives of the area are –

- Develop and increase the productivity of coastal and marine living resources up to the maximum sustainable yield to meet human nutritional needs as well as social, economic and development goals.
- Promote traditional knowledge and interest of local communities, and develop sustainable practices of utilizing coastal and marine resources.

Activities have been categorized into four main action plans. They are –

1. Promote research and monitoring programme
2. Develop and implement strategies for the sustainable use of marine living resources
3. Strengthen legal and regulatory frameworks
4. Enhance education and awareness campaign

4.2.2 Promote environmental conservation and integrated management of coastal resources and area

Objectives of the area are –

- Undertake measures for conservation and rehabilitation of degraded coastal and marine ecosystem.
- Apply preventive, precautionary and anticipatory approaches to avoid degradation of the coastal and marine environment and reduce the risk of long term or irreversible adverse effects.

Action plans have been categorized into four main action plans. They are –

1. Measures to conserve marine biological diversity
2. Establish a coordinating mechanism
3. Coastal zone development and management

The action plan in “Establish a coordinating mechanism” category is that government would establish, an appropriate coordinating mechanism (such as high-level policy planning body) for integrated management and sustainable development of coastal and marine areas and their resources at both the local and national level. Such mechanism should include consultation, as appropriate, with the academic and private sectors, non-governmental organizations, local communities, resources user groups, and indigenous people.

4.2.3 Promote effective management of island ecosystems

Objectives of the area are –

- Adapt and implement plans and programmes to improve the quality of life of island people.
- Adopt measures to effectively and creatively mitigate impacts and the threats posed to marine and coastal resources in the islands.

Action plans have been categorized into two main action plans. They are –

1. Conduct surveys and study
2. Prepare strategy for sustainable management of island ecosystems

In the Policies and Programmes which cut across all three dimensions (i.e. social, economic and environmental) of sustainable development include :-

(i) Full integration of environmental and developmental issues in governmental decision-making on economic, social, fiscal, energy, agricultural, transportation, trade and other policies, emphasizing broader public participation in the process.
(ii) Involvement and participation of different sectors of the population, and local and international community such as youth, national races, rural and urban populations,
the private and public sector, non-governmental organizations, all sectors of business and industry, and the scientific and technological community

(iii) Identification of financial resources and mobilization mechanisms;
(iv) Building of legal instruments and mechanisms and strengthening of information databases for sustainable development.

5. National Sustainable Development Strategy (NSDS)

Myanmar’s National Sustainable Development Strategy NSDS vision is “Wellbeing and Happiness for Myanmar People”. It supports the goals of sustainable management of natural resources, integrated economic development and sustainable social development. Three goals identified are as follows:

Goal 1: Sustainable Management of Natural Resources
Goal 2: Integrated Economic Development; and
Goal 3: Sustainable Social Development.

Sustainable management of natural resources in Myanmar, from environmental perspective, comprises 11 areas, namely:

(i) Sustainable forest resources management;
(ii) Biodiversity conservation;
(iii) Sustainable freshwater resources management;
(iv) Environmental quality management and enhancement;
(v) Sustainable management of land resources;
(vi) Sustainable management of coastal, marine and island ecosystems;
(vii) Sustainable management of ecotourism;
(viii) Sustainable management for mineral resources utilization;
(ix) Sustainable management of agriculture, livestock and fisheries;
(x) Sustainable energy production and consumption; and
(xi) Sustainable industrial, transport and communication development
Lead institution and collaborating institutions are identified for each area which has objective(s) with activities to be implemented to achieve the set objective(s) within the short-, medium-, and long-terms.

To enhance conservation of coastal, marine and island ecosystems and sustainable harvesting of marine living resources, NSDS identified activities to be completed within 5 years and 10 years including on-going ones\(^2\). Most of the activities identified in the Sustainable Management of Coastal, Marine and Island Ecosystems in environmental perspective concerned with fisheries. However, cooperation and collaboration with ASEAN countries and Bay of Bengal Large Marine Ecosystem (BOBLME) have been included in the activities to be completed within 10 years activities.

Activity No. 9 in the Activities in 10-year time frame An activity (No.18) in the activities to be completed within 10 years states that “Cooperate with ASEAN countries in developing and improving regional coordination for the integrated protection and management of coastal zones. Another activity in the same 10-year time frame states that collaborate and cooperate with Bay of Bengal Large Marine Ecosystem (BOBLME) Programme for sustainable development of the coastal area and marine environment.

No activity has been identified specifically for integration of protected area landscape and seascape management. But, Activity No. 10 in the 10-year time frame states that protect marine life by controlling what materials may be removed ships at sea and by banning removal of hazardous waste.

6. National Biodiversity Strategic Action Plan (NBSAP)

Vision of the Myanmar’s National Biodiversity Strategic Action Plan (NBSAP)\(^3\) is “Conserving, management and utilization of biodiversity in a sustainable manner for sound and resilient ecosystems and national posterity.

Mission statement of the Myanmar NBSAP states that “By 2020, biodiversity is valued, effectively conserved, sustainably used, and appropriately mainstreamed to ensure the


continuous flow of ecosystem goods and services for the economic, environmental and social wellbeing of the present and future generation.

NBSAP outlines nine strategic directions together with five-year action plans for different sectors. Most of the activities being implemented by respective ministries appear to be in line with the objectives of the NBSAP. Although biodiversity conservation activities are being mainstreamed into relevant sectors including forestry, agriculture, mining, trade, health, education and science and technology, better integration of NBSAP’s actions into respective departmental plans is still needed. NBSAP is still not being implemented at a national scale. Myanmar is planning to soon update the NBSAP.

NBSAP noted the important of ecosystem-based fishery management which integrates management of human and natural systems to improve the health of marine ecosystems and the sustainability of marine fisheries. It also suggests the needs for development of the management plans for Myanmar which will require increased data collection including on species life cycles and habitat se, habitat mapping, and socio-economic data on fishing pressures and livelihoods. Governance of marine resources and establishment of marine protected areas and locally-managed marine areas are also parts of a nested approach of fisheries management. It highlights the Myeik Archipelago as a priority area for developing an ecosystem-based fisheries management plan due to its rich marine diversity and valuable coral reefs.

The actions for the Target 6.1 and 6.2 are concerned with fisheries and it covers broad range of field from legislation, through ecosystem based fishery management to develop guidelines. An action will do amendment to the legislation will be made for only freshwater fisheries to create legal support although some locally-managed marine areas have been being in process to be official.

Two national targets and seven actions have been set for the Aichi Targets 6 have been identified in the Myanmar NBSAP. National targets and priority actions for Aichi Target 6 have been described in the following table.

<table>
<thead>
<tr>
<th>Target and Action</th>
<th>Lead</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Target 6.1</strong> By 2020, states/regions have approved laws allowing for community and/or co-managed fisheries</td>
<td></td>
</tr>
<tr>
<td><strong>Action 6.1.1</strong> Amend state/regional fisheries legislation to create legal support for locally-managed freshwater fisheries and establish legal status for CFiUGs</td>
<td>DOF</td>
</tr>
</tbody>
</table>
### Action 6.1.2
Register 400 additional CFiUGs and explore further capacity development, including through partnerships

DOF, Universities

### Action 6.1.3
Expand area under CFiUG management to cover 10,000 hectares through establishment of locally-managed fishery management zones.

DOF

### Action 6.1.4
Develop guidelines for sustainable management of CFiUG and provide support to communities in following the guidelines

DOF, I/NGOs

### Action 6.1.5
Implement projects demonstrating benefits of integrated mangrove aquaculture

DOF, Universities

<table>
<thead>
<tr>
<th>Target 6.2</th>
<th>By 2020, total commercial marine catch reduced to more sustainable levels</th>
</tr>
</thead>
<tbody>
<tr>
<td>Action 6.2.1</td>
<td>Develop an ecosystem-based fishery management plan for the Myeik Archipelago and begin to establish LMMAs at key sites</td>
</tr>
<tr>
<td>Action 6.2.2</td>
<td>Identify and establish species- and site-specific closed seasons through coordination of government and private sector</td>
</tr>
</tbody>
</table>

CFiUG = Community Fishery User Group  
DOF = Department of Fisheries  
MFFed = Myanmar Fisheries Federation  
MOECAF = Ministry of Environmental Conservation and Forestry

Target 10 of the Strategic Goal B of the Aichi Target states that “By 2015, the multiple anthropogenic pressure on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning”.

National targets and priority actions for Aichi Target 10 have been described in the following table.

<table>
<thead>
<tr>
<th>Target and Action</th>
<th>Lead</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target 10.1</td>
<td>By 2020, 15 per cent of Myanmar’s coral reefs conserved within MPAs, including LMMAs and other area-based conservation measures</td>
</tr>
<tr>
<td>Action 10.1.1</td>
<td>Carry out detailed feasibility assessments and public consultations at priority sites for establishing new LMMAs and MPAs</td>
</tr>
<tr>
<td>FD, DOF</td>
<td></td>
</tr>
<tr>
<td>Action 10.1.2</td>
<td>Enhance the capacity of Mawlamyine University as a national centre for marine excellence</td>
</tr>
<tr>
<td>Universities</td>
<td></td>
</tr>
<tr>
<td>Action 10.1.3</td>
<td>Establish a national coordination body to manage overlapping jurisdiction and coordinate activities</td>
</tr>
<tr>
<td>DOF, FD, Navy</td>
<td></td>
</tr>
<tr>
<td>Target 10.2</td>
<td>By 2018, destructive fishing practices in coral reef areas banned and effectively enforced</td>
</tr>
<tr>
<td>Action 10.2.1</td>
<td>Develop an effective interagency law enforcement system</td>
</tr>
<tr>
<td>DOF, Navy</td>
<td></td>
</tr>
</tbody>
</table>
Target 12 of Strategic Goal C (Improve the status of biodiversity safeguarding ecosystems, species and genetic diversity) states that “By 2010 the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained. Action 12.4.2 is “Prepare a species conservation action plans to protect endangered migratory species, including marine turtles and mammals, migratory birds and sharks, and to sustain the ecological health of their corridor. This action will be led by Forest Department, Department of Fisheries, and local and international NGOs.

7. Fifth National Report to the Convention on Biological Diversity

The Fifth National Report to the Convention on Biological Diversity (CBD) is composed of three main parts, providing the latest information on the country’s implementation on biodiversity conservation since the Fourth National Report in 2009. The implementation of the CBD Programme of Work in Myanmar is tabulated in the Appendix 3 of the report. Implementations related to the marine protected area related to the present R2R project are described in the following table –

APPENDIX 3: Implementation of the CBD Programme of Work.

Implementing the Programme of Work on Protected Areas (PoWPA)

<table>
<thead>
<tr>
<th>Targets</th>
<th>Implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Programme Element 1: Direct actions for planning, selecting, establishing, strengthening, and managing, protected area systems and sites</td>
<td>• PAs in Myanmar cover diverse ecosystems and vegetation types but gap analysis is still needed to understand the representativeness of PAs.</td>
</tr>
<tr>
<td>Target 1</td>
<td>By 2010, terrestrially, and 2012 in the marine area, a global network of comprehensive, representative and effectively managed national and regional protected area system is established as a</td>
</tr>
</tbody>
</table>
contribution to (i) the goal of the Strategic Plan of the Convention and the World Summit on Sustainable Development of achieving a significant reduction in the rate of biodiversity loss by 2010; (ii) the Millennium Development Goals - particularly goal 7 on ensuring environmental sustainability; and (iii) the Global Strategy for Plant Conservation.

<table>
<thead>
<tr>
<th>Target 2</th>
<th>By 2015, all protected areas and protected area systems are integrated into the wider land- and seascape, and relevant sectors, by applying the ecosystem approach and taking into account ecological connectivity and the concept, where appropriate, of ecological networks.</th>
<th>• A “reef to ridges” program is being implemented in the Sundaic bioregion in collaboration with Fauna and Flora International. This program is the first landscape/seascape approach in conservation of Myanmar, and consists of marine and terrestrial PAs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target 4</td>
<td>All protected areas to have effective management in existence by 2012, using participatory and science-based site planning processes that incorporate clear biodiversity objectives, targets, management strategies and monitoring programmes, drawing upon existing methodologies and a long-term management plan with active stakeholder involvement.</td>
<td>• Park offices are setup at 20 PAs in Myanmar and will follow five-year operational action plans. However no scientifically based park management plans have yet been developed. • In collaboration with Istituto Oikos, an Italian NGO, the FD has prepared a draft management plan for Lampi Marine National Park through a multi-stakeholder consultation process and is awaiting final validation and approval from MOECAF. FD has prepared guidelines for park management plan preparation based on IUCN guidelines, but Myanmar needs to strengthen human resources and finances before developing individual plans.</td>
</tr>
</tbody>
</table>

**Programme Element 2: Governance, Participation, Equity and Benefit Sharing**

<p>| Target 7 | Full and effective participation by 2008, of indigenous and local communities, in full respect of their rights and recognition of their responsibilities, consistent with national law and applicable international obligations, and the participation of relevant stakeholders, in the management of existing, and the establishment and management of new, | • Although the rights of indigenous and local communities are fully respected in PA management, the participation of indigenous and local communities in management is still lacking in the current legal framework. • Recently, the government is encouraging a more people-centred approach, which should present a good opportunity for including |</p>
<table>
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</thead>
<tbody>
<tr>
<td></td>
<td>protected areas.</td>
</tr>
<tr>
<td></td>
<td>• Zoning in the Lampi Marine National Park Management Plan (draft) is mainly based on consultation with local communities.</td>
</tr>
</tbody>
</table>

**Programme Element 3: Enabling Activities**

**Target 8**  
By 2008, review and revise policies as appropriate, including use of social and economic valuation and incentives, to provide a supportive enabling environment for more effective establishment and management of protected areas and protected areas systems.

- PAs in Myanmar are managed mainly under the Myanmar Forest Policy (1995), and the Protection of Wildlife and Protected Areas Law (1994) and accompanying Rule (2002).
- The policy and legal framework for PA management includes social integration, although economic valuation is still lacking.

**Target 9**  
By 2010, comprehensive capacity building programmes and initiatives are implemented to develop knowledge and skills at individual, community and institutional levels, and raise professional standards.

- A needs assessment for capacity building among relevant government staff.
- Capacity building trainings, joint research and surveys with international organizations.
- In collaboration with the Norwegian Environment Agency, the FD conducted a training of trainers (ToT) programme for biodiversity and PA management.

**Target 10**  
By 2010, the development, validation, and transfer of appropriate technologies and innovative approaches for the effective management of protected areas is substantially improved, taking into account decisions of the Conference of the Parties on technology transfer and cooperation.

- A needs assessment of PA management revealed the use of spatial information in conservation and management is very limited, though these are crucial. Data management systems are also currently lacking in Myanmar’s PAs.
- Trainings for the application of the PA Spatial Monitoring And Reporting Tool (SMART) have been conducted in collaboration with WCS.
- SMART is now being promoted in PAs for law enforcement and monitoring.

**Target 11**  
By 2008, sufficient financial, technical and other resources to meet the costs to effectively implement and manage national and regional systems of protected areas are secured, including both from national and international sources, particularly to support the needs of developing countries.

- The Union Government is providing funding for PAs, but the funding mainly covers staff salaries and infrastructure maintenance.
- In comparison to other developing countries, Myanmar currently receives very low levels of international assistance for biodiversity conservation.
and countries with economies in transition and small island developing States.

| Target 12 | By 2008 public awareness, understanding and appreciation of the importance and benefits of protected areas is significantly increased. | • In Myanmar, patrolling and public education are the major tools for biodiversity conservation and PA management.  
• Between 2009 and 2013, education activities were conducted among communities living around the PAs on 296 occasions. |

| Programme Element 4: Standards, assessment, and monitoring |
| --- | --- | --- |
| Target 13 | By 2008, standards, criteria, and best practices for planning, selecting, establishing, managing and governance of national and regional systems of protected areas are developed and adopted. | • Myanmar has its own procedures for PAs selection, establishment and planning mainly based on the Protection of Wildlife and Natural Areas Law/Rules.  
• PA governance is hierarchical, with Park offices following orders of the Ministry. Stakeholder participation in PA governance has only recently been piloted. |

| Target 14 | By 2010, frameworks for monitoring, evaluating and reporting protected areas management effectiveness at sites, national and regional systems, and transboundary protected area levels adopted and implemented by Parties. | • Standardized framework for monitoring, evaluating and reporting protected areas management effectiveness has not been developed but some PAs are implementing SMART, a useful tool for monitoring and evaluating PAs’ effectiveness. |

| Target 15 | By 2010, national and regional systems are established to enable effective monitoring of protected-area coverage, status and trends at national, regional and global scales, and to assist in evaluating progress in meeting global biodiversity targets. | • Monitoring of PA land cover, status and trends has not been conducted, primarily due to the lack of standard PA management plans. |

| Target 16 | Scientific knowledge relevant to protected areas is further developed as a contribution to their establishment, effectiveness, and management. | • In collaboration with international organizations, the FD is conducting research and scientific surveys in PAs across the country, and the findings are used to improve PA management. |

As described in an implementation for Target 7, selection, establishment and planning have been done by Forest Department based on the Protection of Wildlife and Natural Areas Law/Rules. Myanmar is working to conserve its biodiversity through its protected area network, stakeholder engagement, and enforcement of laws and regulations.
Myanmar coastal area is currently relatively poorly covered by existing PAs primarily because of the complications associated with management of coastal areas especially the general lack of forests controlled by the Forest Department combined with high populations and unclear responsibilities between the Department of Fisheries and the Navy for the protection of offshore resources.

By practicing the Article 23 of the Myanma Marine Fisheries Law, Department of the Fisheries (DoF) also established some protected areas in fishery sector. Article 23 states “The Director General may, for the purpose of carrying out the fishery systematically, and for the conservation and protection of the fish, issue conditions, prohibitions, orders, and directives relating to fishery. The fishery protected areas established by the DoF have not been listed in the Myanmar Protected System and the areas of fishery protected areas have not been added to the total protected area of Myanmar yet. There is an increasing use of marine protected in marine conservation.

8. Legal Framework

A number of laws relating to the fisheries of Myanmar have been enacted by Union and Regional Governments to manage and protect fisheries resources. However, without adequate compliance and enforcement, many of these laws are ineffectual. Weak in law enforcement and lack of clarity on some laws and legal structures are still barriers. There is confusion among government officials as to how to interpret the delineation of inshore and offshore zones. It is not clearly stated in the fisheries laws whether the coastline from which the inshore fishing zone is defined includes the coasts of islands or only the main land. Myanmar’s fisheries laws are weak in research which is important for getting reliable and scientific inputs to manage marine fisheries resources. Weak rule of laws has driven illegal fishing and declining fish stocks. Currently, there is no legal and institutional framework for the development of seascape-level integrated management institutions in Myanmar.

8.1 Union Laws

3. Myanmar Marine fisheries Law (1990) and

Myanmar Marine Fisheries Law (1990) defines “Fish” and “Fisheries” as follows.

“Fish” means all aquatic organisms spending the whole of or a part of their life cycles in the water, their spawns, larvae, frys and seeds. This expression also includes aquatic plants, their seedlings and seeds.

“Fisheries” means carrying out operations relating to fish in a systematic manner, production on a commercial scale, conservation of seeds and for development. This expression also includes catching, breeding, exploring, researching, seeding, propagating, processing, transporting, storing and selling of fish etcetera.

Myanmar Marine Fisheries Law also defines the inshore and offshore fisheries for fisheries management. Nowadays, inshore fisheries authority has been transferred from Union to State/Region. At present, more comprehensive new Myanmar Marine Fisheries Law is drafted and consultation with stakeholders for getting inputs. Some integrated management actions have been included in the new marine fisheries law. The law is still in process to be enacted in near future.

The Law relating to fishing rights of foreign fishing vessels (1989) is now dormant as a ban on the licensing of foreign vessels imposed on 1st April, 2015.

8.2 Regional Law

Nowadays, State/Regional governments have authority to enact the freshwater fisheries law. Tanintharyi Regional Government has enacted “Tanintharyi Region Freshwater and Inshore Fisheries Law” on 15 October 2013.
9. Fisheries Sector

Structure of line ministries and departments responsible for the general administration, fisheries, forest and education sectors at Union and Regional levels are described in the following table.

<table>
<thead>
<tr>
<th>Sr</th>
<th>Regional Ministries</th>
<th>Union Ministries</th>
<th>Regional Departments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Chief Minister</td>
<td>Ministry of Home Affairs</td>
<td>General Administration Department</td>
</tr>
<tr>
<td>2</td>
<td>Ministry of Agriculture, Livestock and Irrigation</td>
<td>Ministry of Agriculture, Livestock and Irrigation</td>
<td>Department of Fisheries</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Department of Rural Development</td>
</tr>
<tr>
<td>3</td>
<td>Ministry of Natural Resources and Environmental Conservation</td>
<td>Ministry of Natural Resources and Environmental Conservation</td>
<td>Forest Department</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Environmental Conservation Department</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Myanma Pearl Enterprise</td>
</tr>
<tr>
<td>4</td>
<td>Ministry of Social and Municipal</td>
<td>Ministry of Education</td>
<td>Department of Higher Education</td>
</tr>
</tbody>
</table>

Myanmar has formulated a fishery development policy that respects national and international agreements and the conditions and nature of the resources.

National policy frameworks of fishery sector are -

- To promote all-round development in the fisheries sector;
- To increase fish production for domestic consumption and share the surplus with neighboring country;
- To encourage the expansion of marine and fresh water aquaculture;
- To upgrade the socio-economic status of fishery communities.
- To conserve the fishery resources and environment

In fisheries, management and development of fisheries resources is undertaken by the Department of Fishery (DoF) of the Ministry of Agriculture, Livestock and Irrigation. Vision of the DoF is “to ensure a sufficiency of fish supplies not only for the present entire national people but also for future generations by conserving of the fisheries resources with sustainable fisheries at all times.”

As the changing system of government giving more autonomy in planning and development activities for freshwater and inshore fisheries to the States and Regions, it is expected to be
conducting their own spatial planning and development of PA to consider State and Regional level conservation priorities.

**Mission (or) Responsibilities of Department of Fisheries for Development and Management are –**

(a) Conservation and rehabilitation of fisheries resources;
(b) Promotion of fisheries researches and surveys;
(c) Collection and compilation of fishery statistics and information;
(d) Extension services;
(e) Supervision of fishery sectors;
(f) Sustainability of fishery resources;

According the Myanma Marine Fisheries Law (1990), Fishing Ground means the fishery waters in the Myanma Marine Fisheries Waters or place specified by the Department for the purpose of fishery. This expression also includes Myanma Marine Fisheries Waters or place, where fishery can be carried out.

In order to manage marine fishery, Department of Fisheries designated a total of 140 fishing grounds of 30X30 nautical miles block by using latitude and longitude lines in four fishing areas - Rakhine, Ayeyawaddy, Mon and Tanintharyi. In Myanmar waters. The Tanintharyi fishing area comprises 52 blocks.

Myanma Marine fisheries water means the waters along the sea coast of Myanmar from the high tide mark toward the open sea, the waters on the seaside of the straight line drawn from one extreme end of one bank to the extreme end of the other bank of the river and creek mouths, the water from the said high tide mark to the end of the Exclusive Economic Zone⁴;

Besides enacting appropriate legal framework, DoF has issued notifications to formulate and implement various strategies for the sustainable development and management of marine fisheries. Fisheries management is pursued by proper licensing, prescribing exploitable species, designating environmental friendly fishing gears and methods, imposing closed areas and seasons, etc.

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⁴ Myanma Marine Fisheries Law, Chapter I, Article 2, Sub-article (f)
Even though DoF has good policy and comprehensive mission, reliable and scientific data, capacity in both man and materials are still remained as challenging factors for management and development of the fisheries sector. These challenges resulted in overfishing, over fishing capacity, widespread illegal fishing and very weak enforcement activities. Policies and laws can be modernized to manage offshore fish stocks effectively.

There are a number of issues and constraints associated with the managements of the coastal, island and marine ecosystems in Myanmar. Integrated approach to problem solving is generally lacking. The difficulty of access to remote areas, where many of the important coastal and marine zones exist and lack of adequate infrastructure, insufficient funding, and inadequate trained personnel are serious constraints in the effective management of the resources.

10. National Plan of Action (NPOA) - Shark

Department of Fisheries (DoF) notified two Shark Protection Areas were established off of the Tanintharyi coast, stretching from Ross Island to Lampi Island of the Myeik Archipelago, with the objective of protecting endangered shark species from extinction on 5 May 2004.

In accordance with the guiding principles detailed in the Food and Agriculture Organisation’s (FAO) International Plan of Action for the Conservation and Management of Sharks (IPOA-Sharks) Myanmar has undertaken the task of developing a National Plan of Action-Sharks. This process was initiated in 2005 by the DoF, but due to the lack of capacity and resources within the country the document lay in draft form5.

NPOA stated objectives

• To ensure the sustainable use of sharks and rays
• To assess threats to shark and ray populations and to provide special attention to the threatened populations
• To minimize unutilized incidental catches, waste and discards from shark and ray captures
• To encourage the full use of dead sharks

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• To facilitate the identification and reporting of species-specific biological and trade data and collaboration with biologists in the gathering of these data
• To facilitate improved species-specific catch and landings data and monitoring of sharks and rays catches
• To develop a framework for establishing research, management and educational initiatives for sharks and rays and economic alternatives to their fisheries

However, with the support of the Bay of Bengal Large Marine Ecosystem (BOBLME) Project of the FAO: “Strengthening existing marine reserves and shark conservation in Myanmar”, a collaborative effort between BOBLME and FFI with technical support from SEAFDEC-MFRDMD, the plan has been reviewed. This document forms the base of this revision setting out the steps required to have the NPOA- Sharks approved as well as identify management actions that the plan should address and the immediate priorities. These priorities include, in summary:

- Strengthening of current rules and regulations;
- Improvement of data collection on landings by species;
- Identification of natural habitats for breeding and nursery grounds of sharks and rays for conservation and protection;
- Study on ecology and biology of sharks and rays to determine status of stocks;
- Improvement of data acquisition on sharks products and trade; and
- Active enforcement at sea, landing sites and markets.

Although several laws have been put in place that deal with shark conservation, the actual application of these laws and the management of fisheries related to sharks has been minimal. This problem stems from a number of issues:

- Lack of enforcement in applying the law. This results from an absence of funds and therefore resources for DoF to undertake on-water patrols including boat inspections.
- No identification nor use of indicators for the sustainable exploitation of shark and ray by-catch.

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• Lack of information on critical habitats including breeding and nursery grounds in which to focus compliance activities.
• No requirements regarding the catch-and-release of by-catch.
• No data collection on shark species and abundances at landing sites and/or markets. Collection of ray catches is undertaken but not at a species level.

11. Crab Protected Area Follow Up Action

The DoF established three crab protected areas in Tanintharyi Region, by notifications issued on the 1 March 2010. In Myeik District, a crab protection area (142 ha) is situated in Kyuun Su Township. Following the establishment of the areas, ten follow up actions have been instructed for the crab protected areas by the DoF on 9 March 2010 including formation of conservation group with local fishers and NGOs, awareness raising, monitoring and, in collaboration with Forest Department, protection of illegal logging and conservation of mangrove. Some important actions such as formation of conservation group, monitoring and collaboration with Forest Department cannot be done so far.

12. Hotel and Tourism

In order to be sustainable of the coastal area, the ministry of Hotel and Tourism issued a notification, Notification No. 1/2015, the 1st January, 2015. The notification gives directives concerning building hotels and, hotel, tourism and restaurant services.

13. Climate Change

Climate change is expected to exacerbate existing threats to Myanmar’s biodiversity both directly through habitat loss and reduced resilience of ecosystems and indirectly through impacting people and their dependence on natural resources. In terms of marine coastal systems, communities living on the shore and on islands are particularly vulnerable to
climate change. Sea level rise, salt-water inundation and increasing frequency and strength of storms can lead to failed crops and human displacement. Meanwhile, increasing water temperature and ocean acidification will affect near shore reef ecosystems in both predictable and unpredictable ways, negatively impacting the food security of coastal peoples. Increased water temperatures paired with sea level rise will accelerate coastal erosion and impact estuarine communities, mangroves and reefs and displace coastal communities.

The Myanmar Action Plan for Disaster Risk Reduction (MAPDRR) of 2012 explicitly discusses the unique vulnerabilities of coastal communities and has given high priority to the production of cyclone and storm surge vulnerability maps for coastal areas. This effort is to be led by the Department of Meteorology and Hydrology, the Settlement and Land Records Department and Local Governments; to be contributed to by the Irrigation Department and the Department of Health; and to be partnered by the Myanmar Information Management Unit, the Myanmar Engineering Society, the Myanmar Geosciences Society, UN Agencies and International NGOs.

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Appendix 4.

**LANDSCAPE / SEASCAPE AND PROTECTED AREA (PA) PROFILES**

**Introductory Note:**
It is proposed that a landscape/seascape profile be prepared for each demonstration PA (or possibly combined PAs), including its buffer zone and adjacent landscape / seascape area with significant ecological and socioeconomic inter-connectedness proposed for sustainable management. Pressures emanating from the landscape towards the PA and/or the landscape's role in providing the PA with wider ecological connectivity (e.g. as tiger habitat) are key considerations in determining the extent of these areas. The project activities will therefore aim to reduce the degree of ecological and management isolation of the target PAs, while enhancing the positive aspects of this inter-connectedness. (The project will cover 500,000 ha of demo PAs and 200,000 of demo landscapes in adjacent areas, so 700,000 ha in total approximately).

Landscapes and seascapes have been selected on the basis of topography (e.g. river basins in the case of landscapes; opportunities to establish, maintain or enhance connectivity; and current political feasibilities. The selected demonstration landscapes / seascapes are:

- a. Tanintharyi Landscape (occupying part of the Tanintharyi River basin in Myeik District and comprising: Lenya extension proposed NP and two reserve forests to the north, Thein Khun and Tha Gyet, that constitute an ecological corridor linking Lenya Extension proposed NP with Tanintharyi proposed NP).
- b. Lenya Landscape (occupying part of the Lenya River Basin in Kawthaung District and comprising Lenya proposed NP);
- c. Auckland Bay Mangroves Landscape (comprising coastal mangroves in Kyunsu Township, Myeik District);
- d. Thayawthatangyi Islands Seascape (in Myeik District and including LMMAs); and
- e. Langan Islands Seascape (in Kawthaung District and including LMMAs).

PAs have yet to be identified in the mangroves landscape but, working with the Fisheries department and fishing communities, a number of LMMAs or similar initiatives will be established during the course of the project.

I. **Baseline seascape context**

1.1. Defining the landscape:
The proposed seascape area of the project is situated in southern Myanmar. It includes Thayawthatangyi Island and some mangrove area of the Auckland Bay area of Kyunsu Township in Myeik District of the Tanintharyi Region. Department of Fisheries designated Crab Protected Area, Indian Threatfin Protected Area and Shark Protected Area in the Kyunsu Township. An area at the Thayawtangyi has been proposed to the Department of Fisheries to designate as a Locally Managed Marine Area (LMMA). A joint pearl culture company between Myanmar Pearl Enterprise and Atlantic Pearl Company has also been doing pearl culture in southern coastal water of Thayawthatangyi Island. The seascape area has been used by some sharks and marine mammals and the Auckland bay area is a famous for its marine product, shrimp paste, made by small planktonic shrimps.
Table 1. Marine habitat and Forest type coverage inside focal PA/s and across its landscape

<table>
<thead>
<tr>
<th>Habitat / Forest type</th>
<th>Entire landscape (km²)</th>
<th>Inside existing / proposed PA #1 (km²)</th>
<th>Inside existing / proposed PA #2 (km²)</th>
<th>Outside existing / proposed PA in surrounding landscape (km²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coral reef</td>
<td>na</td>
<td>na</td>
<td>na</td>
<td>na</td>
</tr>
<tr>
<td>Seagrass bed</td>
<td>na</td>
<td>na</td>
<td>na</td>
<td>na</td>
</tr>
<tr>
<td>Mangrove</td>
<td>na</td>
<td>na</td>
<td>na</td>
<td>na</td>
</tr>
<tr>
<td>Freshwater Swamp Forest</td>
<td>na</td>
<td>na</td>
<td>na</td>
<td>na</td>
</tr>
<tr>
<td>Peat swamp forest</td>
<td>na</td>
<td>na</td>
<td>na</td>
<td>na</td>
</tr>
<tr>
<td>Lowland (0-300m asl)</td>
<td>na</td>
<td>na</td>
<td>na</td>
<td>na</td>
</tr>
<tr>
<td>Hill (300-800m asl)</td>
<td>na</td>
<td>na</td>
<td>na</td>
<td>na</td>
</tr>
<tr>
<td>Submontane (800-1400m asl)</td>
<td>na</td>
<td>na</td>
<td>na</td>
<td>na</td>
</tr>
<tr>
<td>Montane (&gt;1400m asl)</td>
<td>na</td>
<td>na</td>
<td>na</td>
<td>na</td>
</tr>
<tr>
<td>Total</td>
<td>na</td>
<td>na</td>
<td>na</td>
<td>na</td>
</tr>
</tbody>
</table>

Note: Add further columns for additional existing / proposed PAs within each landscape

1.2 Climate context
Tanintharyi Region has tropical monsoon climate and it has summer, rainy and cold season. Monthly average rainfall, average temperature, highest and lowest temperature recorded at Myeik in 2015 were described in the following table. The highest temperature at Myeik was recorded as 38.5°C on the 27th March 2016. It was the highest temperature at Myeik in 69 years. The previous highest temperature was recorded on the 23rd May 2010 as 38°C.

<table>
<thead>
<tr>
<th>Month</th>
<th>Rainfall (inch)</th>
<th>Mean Temperature (°C)</th>
<th>Highest Temperature (°C)</th>
<th>Lowest Temperature (°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>3.99</td>
<td>24.50</td>
<td>31.5</td>
<td>16.5</td>
</tr>
<tr>
<td>February</td>
<td>0.53</td>
<td>23.50</td>
<td>34.5</td>
<td>17.5</td>
</tr>
<tr>
<td>March</td>
<td>0.55</td>
<td>33.75</td>
<td>35.5</td>
<td>17.5</td>
</tr>
<tr>
<td>April</td>
<td>0.98</td>
<td>28.50</td>
<td>36.5</td>
<td>20.5</td>
</tr>
<tr>
<td>May</td>
<td>33.28</td>
<td>24.75</td>
<td>30.5</td>
<td>23.5</td>
</tr>
<tr>
<td>June</td>
<td>37.93</td>
<td>26.75</td>
<td>25.5</td>
<td>20.5</td>
</tr>
<tr>
<td>July</td>
<td>45.21</td>
<td>22.50</td>
<td>30.5</td>
<td>21.5</td>
</tr>
<tr>
<td>August</td>
<td>35.38</td>
<td>26.25</td>
<td>30.0</td>
<td>21.0</td>
</tr>
<tr>
<td>September</td>
<td>30.92</td>
<td>21.25</td>
<td>29.5</td>
<td>18.0</td>
</tr>
<tr>
<td>October</td>
<td>17.83</td>
<td>31.30</td>
<td>31.5</td>
<td>20.5</td>
</tr>
<tr>
<td>November</td>
<td>1.01</td>
<td>24.50</td>
<td>33.5</td>
<td>22.5</td>
</tr>
<tr>
<td>December</td>
<td>0.00</td>
<td>29.25</td>
<td>37.5</td>
<td>19.5</td>
</tr>
</tbody>
</table>

Source: Meteorology and Hydrology Department

1.3 Hydrological context
Tanintharyi River is one of the important rivers in the Tanintharyi Region and it flows into the Andaman Sea by several distributaries near Myeik. Tidal rhythm is semidiurnal in Myeik District. Tidal range is about 6 meters and speed of the tidal streams in the area is about 1 knot. In general, depth at the Thayawhatangyi is deeper than the Auckland Bay Area as the island is situated more far away from the shore but Auckland Bay area is very shallow at some places with wetland and mud flats.

Average chlorophyll a was found to be 1.22 mg/m³ in Myeik Archipelago. Average concentrations of TSS, NH₃-N, NO₂-N, and phosphate were found to be, 6.84 ppm, 0.029 ppm, 0.025 ppm, and 0.024 ppm in Myeik archipelago respectively. Pb, Hg and Cd concentrations in Myeik archipelago were in the range of 1.1 to 7.7 ppb, 0.0 to 1.6 ppb and 1.1 to 5.7 ppb, respectively. Average concentrations of
Pb, Hg and Cd in Myeik archipelago were 5.50, 1.07 and 1.95 ppb, respectively. It can be deduced that the studied regions are not eutrophicated with nitrogen and phosphorus species. Low concentrations of organic matter can be found in sea water naturally. The sewage, excess nutrients from agriculture and aquaculture, chemical fertilizer residue, persistent organic pollutants from pesticide residue and used household materials like plastic bags, medical wastes, excreted pharmaceuticals, etc. may organic components of land-based source for coastal pollution in Tanintharyi coastal zone.1.

1.4. Biodiversity context:
the significance of the landscape for globally significant species; apparent changes such as decline or disappearance of key species (e.g. tiger, elephant, dolphins, sharks and rays, turtles). Include a few sentences on agrobiodiversity if information is available – this is relevant to climate change adaptation and niche marketing issues.

### Table 2. Status of globally threatened and endemic species for each seascape.

<table>
<thead>
<tr>
<th>Species</th>
<th>Red List / Endemic status</th>
<th>CITES Appendix for illegally traded/hunted species</th>
<th>Notes on species status and associated local conservation challenges</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Marine Mammals</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Irrawaddy dolphin <em>(Orcaella brevirostris)</em></td>
<td>VU</td>
<td>I</td>
<td>In collaboration with Department of Fisheries, conservation of the freshwater population of the Irrawaddy dolphin in the upper Myanmar have been done by the Wildlife Conservation Society (WCS). But, no actions have been done for the coastal population yet. Irrawaddy dolphin has been protected by law (Protection of Wildlife and Wild Plants and Conservation of Natural Areas Law, 1994) in Myanmar. According to the Law, Forest Department announced list of protected wildlife in three categories – completely protected, normal protected and seasonal protected wildlife. Irrawaddy dolphins are listed in the “completely protected wildlife” category.</td>
</tr>
<tr>
<td>Finless porpoise <em>(Neophocaena phocaenoides)</em></td>
<td>VU</td>
<td>I</td>
<td>Nothing has been done for the finless porpoise yet. It is not included in the list of protected animals.</td>
</tr>
<tr>
<td><strong>Shore Birds</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plain Pouched Hornbill <em>(Aceros subraficollis)</em></td>
<td>VU</td>
<td>I &amp; II</td>
<td>Hornbills are protected by law and they all are listed in the “completely protected wildlife” category.</td>
</tr>
<tr>
<td>Pale-capped pigeon <em>(Columba punicea)</em></td>
<td>VU</td>
<td>-</td>
<td>Pale-capped pigeon is not in the list of protected wildlife.</td>
</tr>
<tr>
<td>Wallae hawk eagle</td>
<td>VU</td>
<td>II</td>
<td>Hawks and eagles are protected by law</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>(Nisaetus nanus) ***</th>
<th></th>
<th></th>
<th>and they all are listed in the “completely protected wildlife” category.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Great slaty woodpecker (Mulleripicus pulverulentus) ***</td>
<td>VU</td>
<td>-</td>
<td>Woodpeckers are protected by law and they are listed in the “completely protected wildlife” category.</td>
</tr>
<tr>
<td>Lesser adjutant stork (Leptoptilos javanicus) ***</td>
<td>VU</td>
<td>-</td>
<td>Lesser adjutant stork and storks are protected by law and they all are listed in the “completely protected wildlife” category.</td>
</tr>
<tr>
<td>Great knot (Calidris tenuirostris) ***</td>
<td>EN</td>
<td>-</td>
<td>Great knot are not in the list of protected wildlife.</td>
</tr>
<tr>
<td>Nordmann’s green shank (Tringa guttifer) ***</td>
<td>EN</td>
<td>I</td>
<td>The Nordmann’s green shank is protected by law and it is listed in the “completely protected wildlife” category.</td>
</tr>
<tr>
<td>Spoon-billed sandpiper (Calidris pygmaea) ***</td>
<td>CR</td>
<td>-</td>
<td>Spoonbills and sandpipers are protected by law and they all are listed in the “completely protected wildlife” category.</td>
</tr>
<tr>
<td><strong>Sharks</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sandbar shark (Carcharhinus plumbeus) +</td>
<td>VU</td>
<td>-</td>
<td>Sharks are protected by establishment of two shark protected areas in Myeik and Kawthaung Districts in Tanintharyi Region. The shark protected areas are established by the Department of Fisheries by issuing 4th, May 2004 dated Notification No. 2/2004.</td>
</tr>
<tr>
<td>Zebra shark (Stegostoma fasciatum) +</td>
<td>VU</td>
<td>-</td>
<td>Department of Fisheries’ (DoF) issued Notification No. 2/2001 on 8 January 2001 for the protection of the whale shark.</td>
</tr>
<tr>
<td>Shark ray (Rhina ancylostoma) +</td>
<td>VU</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Snaggletooth shark (Hemipristis elongata)</td>
<td>VU</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Hooktooth shark (Chaenogaleus macrostoma)</td>
<td>VU</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Sicklefin weasel shark (Hemigaleus microstoma)</td>
<td>VU</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Scallop hammerhead (Sphyrna lewini)</td>
<td>EN</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Borneo shark (Carcharhinus borneensis)</td>
<td>EN</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Great hammerhead (Sphyrna mokarran)</td>
<td>EN</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Ganges shark (Glyphis gangeticus)</td>
<td>CR</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>whale shark (Rhincodon typus)</td>
<td>VU</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td><strong>Fish</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indian threatfin (Leptomelanosoma indicum)</td>
<td>EN</td>
<td>-</td>
<td>Indian threatfin are not in the list of protected wildlife. But, Department of Fisheries established an Indian threatfin protected area in Kyunsu Township of Myeik District by issuing Notification No. 4/2015 on 20 November 2015.</td>
</tr>
</tbody>
</table>

1.4. Socio-economic context: 
(Also see NC3 report)
Fisheries and horticulture is the main business of the island. Depending on the season and weather condition they change one fishing gear and target to the other. Mullets and crabs are their main targets. They use nets and spear in their fishing. They also do diving for seacucumber fishing.

1.5. Developmental context:
(Also see NC1 & NC3 reports)
In order to protected marine living resources in the island waters, locally-managed marine areas (LMMA) have been in process to establish at the island. A village health center is opened at the Done Pale Aw village by the Department of Health. A crab cage culture has been tested in Langan village bay by a local fisher to do aquaculture for an alternate income option. Water supply system has been set up with the aid from the World Bank and Rural Development Department.

1.6. Institutional context:
According to the General Administration Department, the Thayawthatangyi island seascape is situated in the Yemyitkyi village tract, Kyunsu Township, Myeik District. Village authority officers (100 household group leaders) have been appointed at Done Pale Aw village and Lin Lun Village. Department of Fisheries rarely comes to the village to make licenses of the local fishers.

II. Baseline PA description (Note: This section should be repeated for each PA within a landscape)

2.1. Defining the PA
Name: Thayawthatangyi Locally-Managed Marine Area (LMMA)
Status: Proposed
Location: Between N 12°16’ and N 12°26’
Between E 97°56’ and E 98°07’
Districts: Kyunsu Township, Myeik District
Area: 8,000 ha
Elevation Range: 0 (sea level)

2.2. History/Timeline
The area has been used by the local communities for fish, crabs, shrimps and squids fishing. In order to conserve the marine resources and protected from illegal fishing activities such as encroachment of off-shore fishing vessels into near-shore water and blast fishing etc., local communities were interested in establishing a Locally Managed Marine Area (LMMA) in the island water. Until now, a proposal to establish the LMMA was submitted to the Department of Fisheries and it has been under processing.

2.3. Physical Features
The area is about 50km away from mainland and a number of small bays are situated in the area. Tidal cycle is two times a day. The sea is usually calm in area in the east of the island but rough in the west as it is facing the open sea. Physical and chemical parameters of the Don Pale Aw village during June 2011 to February 2013 in Thayawtangyi water are as follows:

<table>
<thead>
<tr>
<th>Month</th>
<th>Temperature (°C)</th>
<th>Salinity (ppt)</th>
<th>pH</th>
<th>Transparency (m)</th>
<th>PO₄ (mg/l)</th>
<th>NO₃ (mg/l)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Done Pale Aw</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jun 2011</td>
<td>28</td>
<td>32</td>
<td>7.4</td>
<td>0.90</td>
<td>0.87</td>
<td>0.12</td>
</tr>
<tr>
<td>Jul 2011</td>
<td>28</td>
<td>30</td>
<td>7.4</td>
<td>0.88</td>
<td>0.73</td>
<td>0.10</td>
</tr>
<tr>
<td>Aug 2011</td>
<td>28</td>
<td>20</td>
<td>7.2</td>
<td>0.77</td>
<td>0.02</td>
<td>0.02</td>
</tr>
<tr>
<td>Sep 2011</td>
<td>27</td>
<td>20</td>
<td>7.3</td>
<td>0.79</td>
<td>0.02</td>
<td>0.02</td>
</tr>
<tr>
<td>Oct 2011</td>
<td>28</td>
<td>26</td>
<td>7.6</td>
<td>0.85</td>
<td>0.03</td>
<td>0.03</td>
</tr>
<tr>
<td>Nov 2011</td>
<td>30</td>
<td>30</td>
<td>7.6</td>
<td>0.89</td>
<td>0.03</td>
<td>0.05</td>
</tr>
<tr>
<td>Dec 2011</td>
<td>29</td>
<td>34</td>
<td>7.8</td>
<td>1.55</td>
<td>0.05</td>
<td>0.06</td>
</tr>
<tr>
<td>Jan 2012</td>
<td>28</td>
<td>31</td>
<td>8.0</td>
<td>1.75</td>
<td>0.06</td>
<td>0.05</td>
</tr>
</tbody>
</table>
Mean percentage hard coral (HC) cover across the whole survey area i.e. Thayawthatangyi and Daung Island water was 75.48%. Massive Coral (CM) was the most dominant HC growth form at almost all survey sites and represented 49% of all coral recorded (see Figure 4). Mean percentage cover of CM was 36.48% across the project area. Where CM is removed from the dataset, overall mean percentage HC cover falls to 39.0%. Foliose Coral (CF) was the second most dominant coral growth form across the survey area at 13.12% followed by Branching Acropora (ACB) corals with a mean percentage cover of 12.78%^2.

2.4 Cultural Heritage
(Also see NC3 report)

2.5 Key Biodiversity Features:
The proposed Two mud crabs and one blue swimming crab *Scylla olivacea* – known as the black mud crab; and *Scylla paramamosain* – the white mud crab Blue Swimming crabs (*Portunus pelagicus*) Thus most of this report focusses on future management options for blue swimming crab within the proposed LMMA near Lin Lun

The main species in the fishery seems to be *Mugil cephalus*, which was identified from a specimen on ice at the Lin Lun dealer’s house (figure 10). Smaller mullet species (Genus *Liza*) are also common according to the dealer, but none were seen during the visit. This is a very widely distributed, fast swimming and migratory fish associated with both the open ocean and brackishwater habitats. Given these characteristics, and the fact that mullets seem to enter the bay very seasonally in response to the decrease in salinity generated by the wet season, no fishery management measures are proposed in relation to the LMMA at this early stage.

2.6. PA management system

a. Review of the PA site management structure, including reporting, decision-making functions and financial flows

Proposal to establish Thayawthatangyi locally-managed marine area (LMMA) was submitted through the Department of Fisheries to the Tanintharyi Regional Government in May 2016 and it has been still in processing stage.

The objectives^3 of the Thayawthatangyi LMMA are

- To assist the Department of Fisheries with the management of marine resources and fisheries at the local level.

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- To improve and ensure the sustainability of the livelihood and culture of local fishers.
- To maintain the health of the nearshore ecosystem and marine biodiversity.

In order to implement the objectives of the LMMA, a management committee was established at two sites, Lin Lun/Pa Raw Wah and Done Pale, with 12 and 15 members respectively. These committees will be primarily responsible for the management of the LMMAs at the local level; and they will liaise with the support NGO and government representatives.

Table 3. Existing staff profiles and gaps

<table>
<thead>
<tr>
<th>PA management office</th>
<th>Staff in place</th>
<th>Staff vacancies</th>
<th>Needs identified</th>
</tr>
</thead>
<tbody>
<tr>
<td>nil</td>
<td>nil</td>
<td>nil</td>
<td>monitoring, patrolling, enforcement networking</td>
</tr>
</tbody>
</table>

b. Visitors
Just a few local and overseas visitors came to the area. Students from Myeik University came to the island as their field trip. Some foreigners also came to the island on duty for their respective international organization.

c. Status of PA management plan
The management strategies and zoning plans for Lin Lun and Done Pale Aw of the Thayawthatangyi island LMMA were proposed in 2015.

d. Site-level implementation status of management actions, priority species conservation and other site- and/or national-level initiatives.
The actions of local community on protected area from illegal fishing have been aware of by peoples from other area.

e. SWOT analysis of existing institutional frameworks against conservation and sustainable development objectives.

Table 4. Summary of the major strengths and weaknesses of the PA and the associated opportunities and threats.

<table>
<thead>
<tr>
<th></th>
<th>Opportunities</th>
<th>Threats</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Strengths</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Active to conserve marine resources.</td>
<td>Establishing LMMA.</td>
<td>Illegal fishing.</td>
</tr>
<tr>
<td>Aware decrease marine fisheries resources.</td>
<td>Development of fish and crab cage culture.</td>
<td>By-catch.</td>
</tr>
<tr>
<td>Strong public awareness.</td>
<td>Good for floating/cage aquaculture.</td>
<td>Climate change.</td>
</tr>
<tr>
<td>Formation of Management Committee.</td>
<td>Private sector participation.</td>
<td>Weak cooperation between the Forest Department and Department of Fisheries.</td>
</tr>
<tr>
<td>Strong interest in formation of fishery products association.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No apparent existing conflict among communities.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Department of Fisheries is interested in the establishment of LMMA.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>INGOs have been supporting and collaborating.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Weaknesses</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Opportunities | Threats
---|---
Management plan has not been developed yet but it will be developed once the LMMA is official. |  |
Weak enforcement. |  |
No monitoring. |  |
No capacity for patrolling, monitoring and enforcement. |  |
Weak networking and reporting. |  |
A few marine products purchasing people. |  |

Note: 2016 June 3

Key recommendations from the SWOT analysis
- Establishment of LMMA.
- Floating/Cage fish and crab culture should be upgraded in order to do store, do fattening and secure reproductive gametes releasing.
- Formation of fishery products association to store and sell their catches to Myeik by themselves.

III. Baseline Seascape analysis

3.1. Threats, underlying causes / drivers and associated barriers

The principal threats focusing on those the project will address (as documented in the table below, perhaps elaborate with several key examples) and the barriers (here we’d focus on the intractable problems, e.g. unresolved land disputes, poor coordination between different forest/environmental agencies, weak/lack of prosecutions, internally displaced people)

Table 5. Threats to biodiversity within the landscape

<table>
<thead>
<tr>
<th>Threat Description</th>
<th>Threat Intensity*</th>
<th>Area impacted by threat**</th>
<th>PAs Affected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Illegal fishing</td>
<td>permanent</td>
<td>widespread</td>
<td></td>
</tr>
</tbody>
</table>

*Temporary impact, or Permanent and irreversible impact
* Less than 33% (localized), 34-66% (widespread) or >67% (ubiquitous) of area affected by threat

The principal threats in the proposed seascape is illegal fishing. Illegal fishing such as intrusion of off-shore fishing boats into the near shore water, blast/dynamite fishing, is the main threat in the seascape.

Underlying causes are weak enforcement, depleting fishery resources, poverty, weak awareness, few alternative livelihood.

Department of Fisheries is the main responsible agency for enforcement, awareness raising, monitoring etc. But, lack or weak capacity is a barrier to undertake the activities. Poor coordination between the Department of Fisheries and local communities

3.2. Baseline support:
General conservation programs/action of the PA management authority [might tabulate this]; should mention NGO partnering actions.
LMMA rules include both existing fisheries law (ban of dynamite fishing, mesh size etc.); and new locally established laws, which might be necessary to achieve LMMA objectives (e.g. those related to gear and species restrictions, No-Take-Zone, access restriction etc.). A community enforcement mechanism will be established, along with a strategy to ensure effective collaboration with the DoF
and the Navy to respond in cases of infractions, which exceed the capacity of local communities to deal with.

3.3. **Community stakeholder needs assessment**

Enforcement in monitoring the illegal fishing and establish an association e.g. fisheries association in order to solve some difficulties in marketing and supply some things in fishery e.g. ice. It will be very helpful, especially, subsistence fishers as they have not good financial and material capacities. The community also needs a training on mangrove crab culture so as to keep the crabs in their protected area properly and scientifically.

### IV. Reports and publications


socio-economic importance. TCP Report No. 12, FFI.


Khin Khin San (2010). Preliminary Investigation on the Eel Catfish (Family – Plotosidae) and Sea Catfish (Family – Ariidae) Common to Myeik Waters. MSc Thesis, Department of Marine Science, Myeik University (Unpublished)


Ma Than Tin (1972). A Taxonomy of Some of the Marine Fishes of Mergui Area. MSc Thesis,


San Tha Tun, Win Hteik and Kyaw Thuya (2014). Survey of mangroves in Aucklan Bay and adjacent areas, Kyun-Su and Boke-Pyin Township, Taninthary Region. TCP Report No. 4, FFI.


Report No. 10, FFI.


