



Figure 1. The central administration building and convocation hall of Myeik University.

**WP.1.1: Information on existing curricula and human/technical resources
of Myeik University
incorporating WP.1.3 Needs Assessment of Myeik University
providing baseline for WP.2.7 Technical up-date of equipment to support curriculum delivery to
Myeik University**

BASED ON THE FOLLOWING WORKSHOPS:

9-10 July 2018: Mawlamyine University
and **EQUIPMENT NEEDS 17-19 January, 2019: Myeik University**

1: Work packages 1.1 and 1.3 Results (narrative) (1000 characters)

In July 2019, a workshop took place in Mawlamyine University. As part of this workshop, information on existing curricula, human and technical resources (relating to environmental protection) of the Departments of Botany, Geology and Marine Science of Myeik University was compiled (WP.1.1). A needs assessment in environmental protection curriculum was initiated (WP1.3). The workshop was attended by Rectors and Pro Rectors of Mawlamyine and Myeik universities; 32 staff and students from Myeik and Mawlamyine universities; and 5 European staff. To support the monitoring and evaluation process of the project, information on the existing courses and syllabi will be used as a baseline to measure the project's progress in terms of developing a new curriculum in environmental protection. Further information was gathered at a subsequent meeting in January 2019. The latter will help support a technical up-date of equipment (WP.2.7), ensuring it is fit for purpose.

2: Anticipated outcome

- Compile information on existing curricula, human/technical resources at Myeik University (WP.1.1) - *to provide baseline to measure milestones of the project and measure progress*

from the current curricula in the Departments of Botany, Geology and Marine Science to the new curriculum

- Needs assessment in Environmental Protection curriculum (WP.1.3) – *survey of the needs/gaps in order to implement a successful new curriculum in environmental protection*
- Baseline for the technical up-date of ICT infrastructure and equipment to support curriculum delivery (WP.2.7) – *to ensure that academic and ICT literacy platforms are available and fit for purpose.*

3: Responsible: Project coordinator, project manager, Myanmar universities contact persons.

The workshops were coordinated by the European trainers. Myanmar staff were responsible for gathering and presenting all relevant information. All who attended are listed in the attendance lists for each of the workshops. They include for the 9-10 July 2018 workshop:

- The Pro Rector of Myeik University, Prof Ni Ni Oo
- The Rector of Mawlamyine University (Prof Aung Myat Kyaw Sein) and Pro Rector Dr Mie Mie Sein
- The in-country project coordinator Dr Sai Sein Lin Oo (University of Mandalay)
- Four European staff from the University of Natural Resources and Life Sciences (Dr Swen Renner and Dr Paul Bates) and the University of Extremadura (Dr Martha Fallola and Dr Macarena Cuellar)
- Thirty-two staff and students from Myeik and Mawlamyine Universities.

A subsequent workshop at Myeik University from 17-19 January 2019 undertook a final assessment of equipment needs. It was led by Dr Swen Renner and Dr Marcela Suarez-Rubio from BOKU and attended by 28 Myanmar staff. The latter came from Myeik University (13 staff from the Departments of Botany, English, Geography, Geology, Marine Science, Physics and Zoology); Mawlamyine University (8 staff from the Departments of Marine Science and Zoology) and Mandalay University (7 staff from the Departments of Botany, Geology and Zoology).

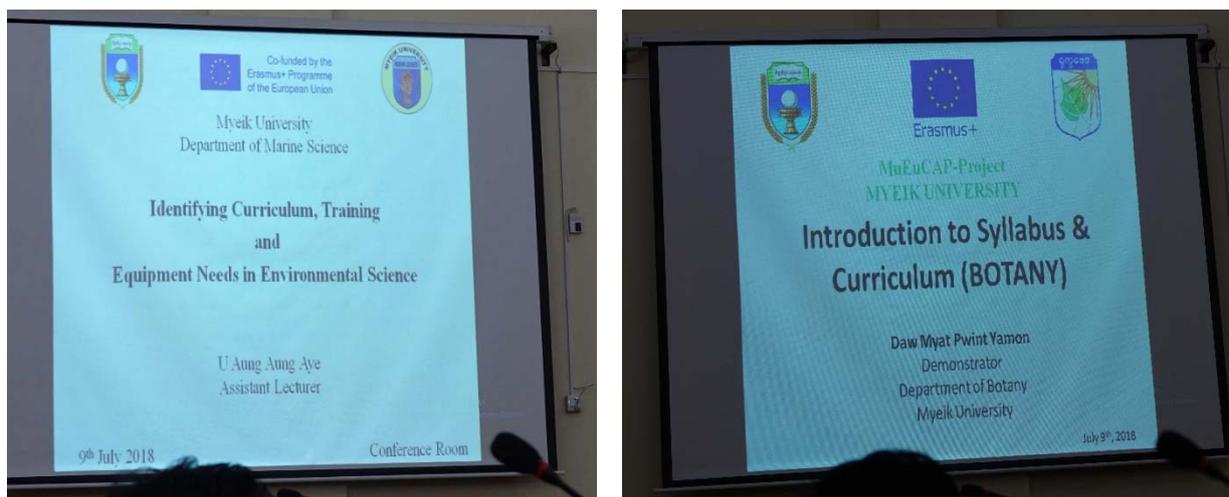


Figure 2. Presentations by Myeik University staff member at the needs-assessment workshop in Mawlamyine University, which took place on 9 and 10 July 2018. Left: U Aung Aung Aye from the Department of Marine Science; Right: by Ms Myat Pwint Yamon from the Botany Department.

4: Outcomes/outputs reached

- Baseline information on current curricula, courses and syllabi (MSc) in Botany, Geology, and Marine Science in Myeik University relating to environmental protection (WP.1.1) (Appendix 1 and Item 8b on MuEuCAP website Downloads page <https://www.myanmar.edu.org/downloads>)
- Database of needs/gaps in teaching materials in Botany, Geology, and Marine Science in Myeik University in environmental protection (WP.1.3)
- Baseline information to assist with the technical up-date of ICT infrastructure and equipment to support equipment delivery (WP.2.7).



Figure 3. (Left): U Soe Naing of the Zoology Department, Myeik University speaking at the needs-assessment workshop, which took place in Mawlamyine University from 9-10 July 2018.

5: Remarks – Myeik University - Background Information

Acting Rector: Prof. Dr (Daw) Ni Ni Oo

Originally founded as Myeik College in 1999 and upgraded in 2004, Myeik University currently hosts over 2500 day students and about 5000 distance education students (http://www.myeikuniversity.edu.mm/?page_id=1148). Today, ably led by Prof Dr Ni Ni Oo, it is an ambitious, positive and increasingly successful university. This is despite some impediments, which include difficulties in recruiting staff to work in a small city far from Yangon and financial restraints.

Departments related to biodiversity conservation include Botany, Zoology, Geography, Geology and Marine Science. The Marine Science Department closely cooperates with Mawlamyine University's Department of Marine Science on coordinating the curriculum. The Board of Studies of Marine Science in HEI in Myanmar is hosted by Mawlamyine University.

Besides the central university library (which caters to the needs of undergraduate students), each department has its own library and supports 12-14 staff, of whom a minority undertake active research.

Research areas include Botany and Zoology, with a strong emphasis on identification skills and taxonomy (sea grass; small mammals, birds, earthworms, freshwater fish), and Geography, which mainly focuses on land cover.



Figure 4. Currently, at undergraduate level, emphasis is placed on learning facts by rote, as here in a Geography class. There is little emphasis on student-led, problem solving exercises or designing and implementing individual projects.

Unlike the Yangon and Mandalay universities, Myeik University does not offer PhD degrees. Even though all five departments offer MSc degrees, the Botany and Geography MSc programs are new. Like all other MUPs, Myeik, as outlined above, has difficulties in developing and retaining staff expertise due its peripheral geographical location and the national rotation system, but it has addressed this problem by prioritizing staff of local origin for capacity-development support (these being the least likely to request transfer to another university).

Faculty members interviewed (and/or holding a short presentation of their work) included Dr. Ni Ni Oo (Acting Rector), and Dr. Khin Myo Thant (Associate Professor, Botany Department), Dr. Khin Swe Oo and Soe Naing (both Lecturers, Zoology Department), Aung Aung Aye (Assistant Lecturer, Department of Marine Science) and Myat Pwint Yamon (Demonstrator, Botany Department). All reported limited capacity in all of the MSc courses and felt all of these were important. They also identified several subjects as priorities for capacity-development with an emphasis on practical applications, namely: "Scientific Writing", "Data Presentation", "Research Methods and research design", "Biostatistics", "Ecological Field Techniques" and "Project Cycle Management". Capacity-development was also identified as being needed for supervision of MSc theses, and support in a step-by-step teaching-approach was suggested.

Myeik University does offer degrees related to biodiversity conservation, including BSc, BSc Hons and MSc degrees in Zoology, Botany, Marine Science, Geology and Geography. The number of students graduating with BSc, BSc (Hons) and MSc degrees in these subjects varies considerably per year.

Although undergraduate curricula for Zoology, Botany and Marine Science appear to cover the principles of Biology relatively well, most of the courses emphasise pure topics with a small minority devoted to conservation biology, biodiversity management or other applied subjects (which typically occur only in final years). As for all 3 MUPs, almost no attention is given to the development of skills for biodiversity surveys and research, quantitative methods, data management, remote sensing analyses and/or geographic information systems, with the latter entirely absent from Zoology and Botany curricula.

MSc curricula (which unlike undergraduate degrees include a research thesis) provide slightly greater attention to these, although conservation and protected area management topics remain poorly represented, and the quality of teaching of these courses is substandard. Geography curricula cover a greater variety of disciplines, including several subjects related to biodiversity research (e.g. biodiversity, ethics in environmental conservation, climatology, natural resource management and conservation, statistics, remote sensing and geospatial technology), though protected area management and environmental law are missing.

Previous assessments have revealed Myeik University's limited capacity for delivering interdisciplinary curricula concerning biodiversity conservation, particularly practical aspects and thesis research. This finding was echoed in the present assessment.



Figure 5. Funding for equipment and laboratories is limited, and as here in the Zoology Department. However, staff are enthusiastic and committed and there is an excellent academic atmosphere within the university.

APPENDIX 1: Existing courses in Myeik University relating to Environmental Protection

Botany Department

- Course No: Bot 1101
 - Name of module: **Plant Biology**
 - Teacher(s): Khin Moe Moe Myint
 - Type of course:
 - Level: BSc
 - ECTS: 4
 - Curriculum: Botany
 - Semester/Theory/Practical/Tutorial: 1 4 2 0
 - Remarks:
 - Learning Outcomes: Understand the basic botanical knowledge. Get knowledge of the organization of cell and progressive organization of tissue and organs; followed by the diversity of plants and their relatives, the evolutionary relationship between plant groups. Know broadly about plant physiology or day-to-day functioning of the most complex groups of plants growth, reproduction, heredity and plants and their environment.
 - Course description: Botany as a science, The origin of life, Cell, Tissue and organ, Diversity of plants, Absorption and transport, Plant nutrition, Energy in plants, Plant growth, Plant reproduction, Plant heredity, Plants and their environments.
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- Course No: Bot 1102
 - Name of module: **Basic concept of Applied Botany**
 - Teacher(s): Khin Moe Moe Myint
 - Type of course:
 - Level: BSc
 - ECTS: 4
 - Curriculum: Botany
 - Semester/Theory/Practical/Tutorial: 2 4 2 0
 - Remarks:
 - Learning Outcomes: To know the dependence of human and all animals life on plants (food, medicine, clothing and shelters), to understand the basic concepts of an applied field of botany concerning the plant hormones, various kinds of biotechnology and bonsai growing technique.
 - Course description: Managing a Long Term Seed Stored for Genetic Recourses Conservation, The Determination of Moisture Content and the Number of Seeds in Accession, Characteristics of Seed Dormancy and Factors which Influence it, The Determination of Empty Seed Fraction, The Conduct of Seed Germination Test, Dependence of Human and All Animals life on Plants, Early History and Development of Plant Study, Plants and Peoples, Plants as Medicine, Plants for Clothing, Plants Hormones, Introduction to Plant Biotechnology, Fungi Technology, Bonsai.
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- Course No: Bot 2104
 - Name of module: **Ecology**
 - Teacher(s): Lae Lae Khaing
 - Type of course:

- Level: BSc
- ECTS: 4
- Curriculum: Environmental Science
- Semester/Theory/Practical/Tutorial: 1 4 2 0
- Remarks:
- Learning Outcomes: Understand the meaning of ecology and the relationship between the ecosystem and biosphere. Gain the knowledge of climatic factor, edaphic factor, topographic factor and biotic factor.
- Course description: Introduction the meaning of ecology, Environment of plants: Climate factor, Environment of plants: Edaphic factor, Environment of plants: Topographic factor, Environment of plants: Biotic factor, Species and population, Ecosystems and living organisms.

- Course No: Bot 3104/3204
- Name of module: **Environmental Biology**
- Teacher(s): Lae Lae Khaing
- Type of course: BSc, BSc(Hons)
- Level:
- ECTS: 4
- Curriculum: Environmental Science
- Semester/Theory/Practical/Tutorial: 1 4 2 0
- Remarks:
- Learning Outcomes: To understand the interrelationship among organisms and their surrounding environment and how they symbiosis each other, To gain the knowledge of human population problems, origin of pollution and types of pollutants.
- Course description: To know the Biotic and its Surrounding or Environments, Abiotic environmental Factors, Biotic environmental Factors, Population, Pollution, Natural Resources and Management.

- Course No: Bot 3110/3210
- Name of module: **Biodiversity and Conservation**
- Teacher(s): Lae Lae Khaing
- Type of course:
- Level: BSc, BSc(Hons)
- ECTS: 4
- Curriculum: Environmental Science
- Semester/Theory/Practical/Tutorial: 2 4 2 0
- Remarks:
- Learning Outcomes: Understand the current information to biodiversity and able to know why they are important for the whole ecosystem.
- Course description: Introduction to biological diversity, Threatto biodiversity, The value of biodiversity, Wildlife, Fisheries and Endangered species, Conservation and sustainable development.

- Course No: Bot 4107/4207
- Name of module: Applied Ecology

- Teacher(s): Khin Myo Thant
- Type of course:
- Level: BSc, BSc(Hons)
- ECTS: 4
- Curriculum: Environmental Science
- Semester/Theory/Practical/Tutorial: 2 4 2 0
- Remarks:
- Learning Outcomes: To understand deeply about the sustainability. To gain the knowledge of Applied Ecology. To know clearly about the characteristics Pollution. To be able to find good solution to solve the conservation. To get the information for EIA.
- Course description: Sustainability Exploitation and agriculture, Pollution, Conservation, Introduction of exotic species, The principles of EIA.



Figure 6. Dr Khin Myo Thant

Course No: Bot 5211

Name of module: **Ethnobotany**

Teacher(s): Khin Myo Thant

Type of course: BSc, BSc(Hons)

Level:

ECTS: 4

Curriculum: Botany

Semester/Theory/Practical/Tutorial: 2 4 2 0

Remarks:

Learning Outcomes: Understand the meaning of Ethnobotany and its related subjects. Also understand the disciplines and sub-disciplines related to Ethnobotany and know how they are important for peoples' daily life. Also gain the ethno-medicinal knowledge and environmental conservation knowledge that is related with the Ethnobotany.

Course description: Introduction, Ethnobotany: Scope and Status, General Ethnobotanical techniques, Data collection and data compilation, Ethno-medicine, Ethnobotany and conservation, Quantitative ethnobotany, Applied ethnobotany.



Figure 7. Dr Khin Myo Thant

Course No: Bot 5212

Name of module: **Environmental Education and Ethics**

Teacher(s): Khin Hla Win

Type of course:

Level: BSc, BSc(Hons)

ECTS: 4

Curriculum: Environmental Science

Semester/Theory/Practical/Tutorial: 2 4 2 0

Remarks:

Learning Outcomes: To foster clear awareness of, and concern about, economic, social, political and ecological interdependence in urban and rural areas. To provide every person with opportunities to acquire the knowledge, values, attitudes commitment and skills needed to protect and improve the environment. To create new patterns of behaviour of individual, groups and society as a whole, towards the environment.

Course description: History and Development of Environmental Education, The global Agenda, Perspectives on Theory and Researching in Environmental Education, Environmental Education: Structure and practice, The Global Scene, Towards progress and Promise in the Twenty-first Century.

Course No: Bot 622

Name of module: **Environmental Science**

Teacher(s): Yadana

Type of course:

Level: MSc

ECTs: 4

Curriculum: Environmental Science

Semester/Theory/Practical/Tutorial: 2 4 2 0

Remarks:

Learning Outcomes: Understand deeply about the Environmental Science. Gain the knowledge of Environmental Ecology, Know clearly about the characteristics of minerals and natural resources and their values; how they are important for the whole ecosystem. Able to find good solutions to solve the environmental problems. Get the ideas and information for a sustainable plan.

Course description: 1) Introduction to Estuaries 2) Physical and Chemical Characteristics of Estuaries 3) Biological Processes in Estuaries and Marine Ecosystems 4) Ecological Processes of Estuarine 5) Ecological Compartments and Their Interactions 6) Impacts on Estuaries Communities 7) Conservation 8) Recent and Management Issue in Various Myanmar Estuaries.

Geology Department

- Course No: Geol 2104
- Name of module: **Environmental Geology I**
- Teacher(s): Ky Ky Maw and Myint Swe
- Type of course:
- Level: BSc
- ECTs: 3
- Curriculum: Geology
- Semester/Theory/Practical/Tutorial: 1 2 n/a 2
- Remarks:
- Learning Outcomes: Understanding and monitoring of the geologic hazards.
- Course description: Geologic Hazards, (Hazards from earthquake, Hazards from volcanic eruption, Hazards from ground failures, Hydrologic Hazards and Coastal Hazards).



Figure 8. Dr Myint Swe

- Course No: Geol 2108
- Name of module: **Environmental Geology I**
- Teacher(s): Ky Ky Maw and Myint Swe
- Type of course:
- Level: BSc
- ECTs: 3



Figure 9. Dr Myint Swe

- Curriculum: Geology
- Semester/Theory/Practical/Tutorial: 2 2 n/a 2
- Remarks:
- Learning Outcomes: To understand the protection and conservation of natural environment
To know the basic knowledge of protection and conservation for pollution.
- Course description: Human Induced Hazards (Waste disposal, Disposing of solid waste and Management of waste disposal). Soil Degradation, Erosion, Desertification and Deforestation Using and Caring for Earth Resources (Environmental impacts of mineral development and using fossil fuels)Pollutions (Water and Air pollution).

- Course No: Geol 621R
- Name of module: **Environmental Geology**
- Teacher(s): Ky Ky Maw Myint Swe
- Type of course:
- Level: MSc
- ECTS: 4
- Curriculum: Geology
- Semester/Theory/Practical/Tutorial: 2 2 n/a 2
- Remarks:



Figure 10. Dr Myint Swe

- Learning Outcomes: To provide advanced the various geological and human induced hazards
· To know solid and liquid wastes disposal · To know disaster management and risk reduction
To upgrade the apply knowledge and to solve problems related to conservation and managements of, the natural environments for students.
- Course description: Nature and Aspects of various geologic Hazards (Hazard from earthquake, volcanic eruption, and ground failures) Ways and means of mitigating these Hazards Geologic condition for proper waste disposal Proper use and care of earth resources (groundwater and mineral resources, fossil fuel, and soil)Disaster management and risk reduction Impacts of Sedimentation Various Coastal Processes Biodiversity and their ecosystem Managements of waste disposal.

Marine Science

- Course No: MS 624
- Name of module: Estuarine Ecology
- Teacher(s): Aung Aung Aye
- Type of course:
- Level: MSc
- ECTS: 4
- Curriculum: Marine Science
- Semester/Theory/Practical/Tutorial: 2 4 3 0
- Remarks:



Figure 11. Dr Aung Aung Aye

- Learning Outcomes: (1) Understand habitats in estuaries and the physical processes that contribute to their formation (2) Understand the important ecological processes that operate in estuaries (3) Understand human and natural impacts on estuary ecosystems and

how animals and plant respond and adapt to these impacts (4) Synthesis information about assessment of estuary health and management processes in Myeik Estuary Area (5) Engage in informed discussions related to complexity and functioning of soft sediments ecosystems, how science is conducted in these systems, the science behind management/ conservation and possible solutions to the challenges caused by human activities (6) Critically evaluate relevant scientific literature and demonstrate this ability through a written essay and discussions in seminars (7) Design, collect and analyse field data using appropriate techniques (8) Write a scientific report that is integrated with the relevant literature.

- Course description: 1) Introduction to Estuaries 2) Physical and Chemical Characteristics of Estuaries 3) Biological Processes in Estuaries and Marine Ecosystems 4) Ecological Processes of Estuarine 5) Ecological Compartments and Their Interactions 6) Impacts on Estuaries Communities 7) Conservation 8) Recent and Management Issue in Various Myanmar Estuaries.

APPENDIX 2: WP1.3 Needs Assessment of Myeik University

Myeik University has similar needs to those of the Universities of Mandalay and Mawlamyine.

Curriculum: As with the University of Mandalay, in general, elements of courses within the existing curricula can be adapted and enhanced to provide a good delivery of an Environmental Protection curriculum. Only a small number of new courses are required. As WP2 is developed, it will become apparent that some will be developed by splitting topics from existing courses.



Figure 12. There is a need to upgrade equipment and ICT at Myeik University as and when finances permit.

Staff needs: Almost all staff of Myeik University require skills upgrading before they can supervise an MSc in Environmental Protection to an international standard. As with Mandalay and Mawlamyine Universities, technical/scientific skills are most needed in the following aspects:

- Developing a research question and literature research
- Developing a testable hypothesis
- Selecting measurable indicators
- Planning of analysis and statistics
- Design of empirical study
- Preproposal and presentation
- Sampling/fieldwork
- Statistical analysis
- Writing report/paper.

These skills will be enhanced in WPs2 and 3. At the same time, the project will seek to upgrade the soft/transferable skills of Myeik University staff.

Technical needs: Most technical equipment in Myeik University is of limited quality and quantity. There are some simple microscopes and simple equipment but much/most equipment which is associated with best practice in teaching science is absent.



Figure 13. Staff show much enthusiasm both for field and lab-based research.

ICT needs: Most staff and many students have their own laptops. Some seminar rooms have a LCD projector of varying quality. IT communication (LAN network access and infrastructure is absent, own servers are absent, access to "EduRoam" or other internationally standards are not yet available.

Library resources: Library resources are challenging. Many of the books are out-of-date and in general there is little or no access to the web of science or any other web-based resources, such as online libraries. Access to scientific journals, which are not open access, is only through international co-operation.

Language skills: The majority of staff and students at Myeik University have restricted English skills. Most can understand English, if spoken slowly; some are shy to speak English and many/most struggle to write scientific English. A minority speak English fluently and have excellent comprehension; a small minority are unable to speak English to any extent.

Gender, ethnic background: The vast majority of staff in Myeik University in the subject areas with which MuEuCAP is involved (Departments of Botany, English, Geography, Geology, Zoology), including senior staff are female. The Acting Rector of Myeik University is female as too are the majority of students - undergraduate and especially postgraduate. Ethnicity is a difficult subject in Myanmar but Myeik University staff and students within the MuEuCAP group are mainly drawn from the Myeik geographical area.

Specialisation: Myeik University is geographically situated adjacent to the biodiversity-rich Myeik Archipelago. As such, with its existing strength, and international reputation, in the Department of Marine Science, it would seem logical for the university to reinforce its environmental protection expertise in all aspects that relate to marine science, island biogeography, water quality and pollution control, as well as related such subjects such as ecotourism and the impact of development on fragile ecosystems.