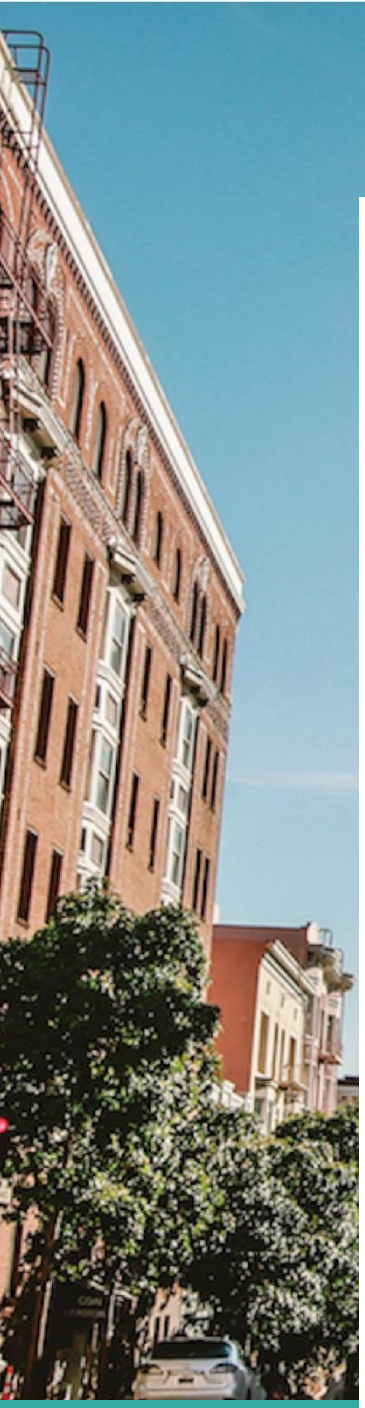

Erasmus+ CBHE project MARE

Co-funded by the Erasmus+ Programme of the European Union

Sustainability plan

Marine Coastal and Delta Sustainability for Southeast Asia / MARE

610327-EPP-1-2019-1-DE-EPPKA2-CBHE-JP

MARE

NOVEMBER, 2021

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CONTENT

DEVELOPMENT OF THE SUSTAINABILITY PLAN

The primary goal of the sustainability plan is twofold: to further extend the use, implementation and development of the MARE project results and deliverables, and to propose specific actions which promote its further exploitation. Towards this direction, its main objectives include:

1. To ensure the use of MARE project results, tools and services during project lifetime and after the completion of the project works.

2. To propose actions for exploitation of the MARE project results and solutions.

3. To suggest mechanisms as well as development and implementation actions for extending and improving MARE results and deliverables following the project's end.

Hence, the sustainability plan will attempt not only to provide the MARE project activities before the end of the project (and the associated end of the EC funding), but also to enhance their functionality and increase its outreach.

Planning for the sustainability of the project should occur throughout the life of the project to maintain desired outcomes after the grant period has ended. Sustainability is defined as the ability to achieve desired outcomes and maintain the ability to continue activities over time. The sustainability of project and post-project activities is ensured from the stage of the application to activities after the end of the project.

An approach of evaluating MARE project sustainability and the development of Sustainability plan based on the studying of project activities, project results and deliverables (trough web-site, mass-media and social networks), semi structed interviews with representatives of partner universities and was conducted into 3 phases (Table 1).

Table 1 – Matrix of the Sustainability plan

	Phase 1: Build Project (organizational) profile	**Phase 2: Complete Sustainability assessment**	**Phase 3: Create actions for Sustainability plan**
Who?	Partner universities	Representatives of the universities, external expert	Partner universities, external expert
What?	Key information about a network of the partner universities, Project Application	Interviews, discussions, project deliverables, activities and etc.	SWOT-analysis, Selected opportunities for sustainability, Mitigated threats and weakness, Planned sustainability actions

Why?	Prepare for Phase 2 by bringing all of project's systems into view	Identify specific areas of Partner universities and focus on activities increasing the probability of being sustainable over time	Outline how partner universities will address selected opportunities for improvement and provide insight on improving sustainability over time
How?	Summarize key information	Complete Sustainability assessment	Create Sustainability plan

Development of the Sustainability plan included 3 phases (Figure 1): describing organizational profile, evaluating sustainability and development Sustainability plan based on strengths and opportunities of Partner universities.

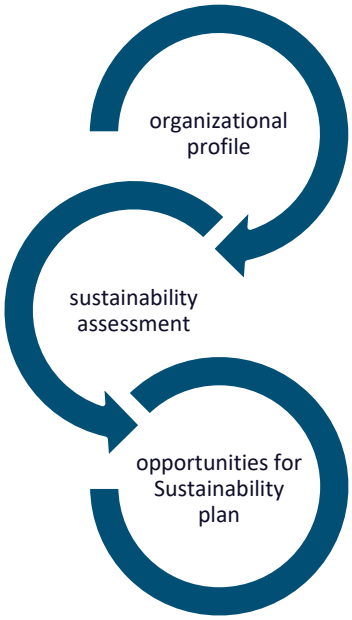

Figure 1. Phases of the Sustainability plan development

This report is organized into 3 parts: the first is about project consortium (Short description of the project), the second part presents sustainability assessment (Implementation status of partner universities), in the last part you could find Sustainability plan.

Co-funded by the Erasmus+ Programme of the European Union

Marine Coastal and Delta Sustainability for Southeast Asia / MARE

Project partners:

P1 University of Bremen (UNIHB), Bremen, Germany

P2 University of Catania (UNICT), Catania, Italy

P3 Estonian University of Life Sciences (EMU), Tartu, Estonia

P4 National Research Council (CNR), Roma, Italy

P5 Ho Chi Minh City University of Natural Resources and Environment (HCMUNRE), Ho Chi Minh, Vietnam

P6 Vietnam Maritime University (VMU), Haiphong, Vietnam

P7 Can Tho University (CTU), Cần Thơ, Vietnam

P8 Centre for Marinelife Conservation and Community Development (MCD), Hanoi, Vietnam

P9 Institute of Oceanography (VNIO), Khanh Hoa, Vietnam

P10 Universiti Kuala Lumpur (UniKL), Kuala Lumpur, Malaysia

P11 Universiti Teknologi Malaysia (UTM), Johor, Malaysia

P12 Universiti Teknologi PETRONAS (UTP), Perak, Malaysia

P13 Universiti Malaysia Terengganu (UMT), Terengganu, Malaysia

Project aims and objectives

MARE in general aims to promote sustainable governance & management of coastal, delta & marine (CDM) socio-ecological systems in partner countries and adjacent waters through ICT-enhanced tertiary education linked to labour markets & wider stakeholder circles. This aim will be achieved through the following objectives:

1. To revise and upgrade selected CDM-relevant BSc, MSc & PhD CDM programs in partner universities to make them end-user-oriented & policy-relevant, and develop 6 modules addressing CDM-related hotspots, that can be used interchangeably in tertiary & LLL education.

2. To develop shared MARE open education environment platform & online training services of the new generation for qualitative improvement of the education process & academic workflow support among universities & stakeholders across the PCs & EU.

3. To create sustainable feedback mechanisms to end-users, ensuring adaptive & practice-relevant teaching contents, knowledge co-production opportunities and stakeholder support to post-project course development & teaching.

4. To develop capacity for academic mobility, shared experimental facilities and joint research by PIs & beyond.

List of short-term impact indicators

Table 1 – Short term impact indicators

Short term impact	Target groups/potential beneficiaries	Quantitative indicators	Qualitative indicators
Enhanced quality of BSc (specialist degree)/MSc provision in sustainable management of CDM at PCIs	Students, academic staff at PCIs, research administrators, institution	430 students enrolled to relevant BSc & MSs programs in PIs (from M22 to 36), exposed to new and updated courses (43.9 & 65ECTS), and to enhanced learning environment (over 90% of the students enrolled and actively using the eMARE platform); At least 10 MSc students used shared research facilities for their thesis projects	Students' satisfaction (good anonymous evaluation of new/revised courses with overly positive comments) and stronger learning outcomes (noted in the evaluation, e-learning successfully accomplished, praised MSc theses)
Enhanced quality of doctoral provision in sustainable management of CDM areas at PCIs	Student, academic staff at PCIs, research administrators, institution	4 PhD students (specifically enrolled to relevant doctoral programs at PIs from M23 to 36 to pursue MARE agenda); increased publication activity of PhD students and their supervisors (30% more paper submissions to international journals); at least 5 PhD students used joint research arrangements and shared access to research facilities through MARE network (including the students from other PhD programs at PCIs)	Students' satisfaction (expressed in overly positive annual assessments and in the end-of-the-project survey), stronger learning outcomes (noted in progress reports by dissertation committees), higher capacity for successful careers (noted in written expressions of interest of industry representatives on PhD research), more multidisciplinary and internationally/practice-oriented thesis topics (submissions to international multidisciplinary journals, written expressions of interest from the industry)
Satisfaction of academic staff at relevant departments	Academic staff, student, institution	Feedback from questionnaires (%; at least 80% of academics, staff and students are satisfied about the change)	Level of satisfaction of supervisors (general) expressed in the end-of-the-project survey; enhanced disciplinary expertise & teaching skills (positively assessed by students in course assessments)
Enhanced expertise of young academic staff at PCIs in	Young academic staff (including PhD students) and	At least 113 members of academic staff and PhD students trained by M36	More multidisciplinary, international- and practice-relevant research at PCIs

sustainable management of CDM areas	broader research community at PCIs	Increased submission to international journal at partner departments (c.a. 10% by M36)	
Enhanced expertise of technical and administrative staff at PCIs in IT and organisational aspects	Technical and administrative staff at PCIs	At least 18 learners trained by M36 on MARE summer schools and on-site seminars and training events at PIs	Smooth IT and organisational arrangements at PCIs (overly positively assessed by PIs' faculty, staff and students in end-of-the project survey)
Enhanced academic networking within the MARE consortium	Academic staff at PCIs	Number of joint academic publications (at least 8); number of jointly supervised MSc (at least 8) and PhD (at least 3) students; number of jointly co-organised training and networking events involving more than 2 PIs (at least 4); number of jointly developed courses (at least 8)	High motivation for joint work within the consortium (noted in the end-of-the-project survey)
Use of MARE e-learning resources by external users	Academic staff and students from HEIs and research institutions outside the MARE consortium, professionals and amateurs concerned with sustainable management of CDM areas (LLLearners and one-off learners)	Growing external visitors statistics from M12 to 36 (at least 120 unique users by M36) and learners enrolled to MARE modules (at least 40 external users)	Overly positive feedback (and the negative one followed up in a timely manner) from external users left on the Educational Portal, and e-courses positively evaluated
Interest of national academic communities in further developments of MARE deliverables and enhanced networking	External HEIs and research institutes	Number of external HEIs and research institutes expressed their interest in joining eMARE and/or SCPs (at least 3 by M36); number of representatives of external institutions attended MARE events (at least 30 by M36) and published in special issues followed up MARE events (at least 5)	Overall interest in MARE and its deliverables (expressed in written requests and recommendations to follow E-MARE by faculty and students); increased visibility of partner departments or institutions partnering MARE (good applications responses to BSc and MSc calls; expressions of interest from praxis partners in consulting and/or research cooperation)
Interest of national professional communities in the products developed	Companies (national parks, forestry, tourist and landscaping	Number of organisations and self-employed individuals joined the MARE SCP (at least 10 by M36) and number of their	Awareness of MARE activities and willingness to contribute (good response to the call for conference

under MARE and in cooperation under the MARE SCPs	companies, architectural bureaus, environmental consultancies) and entrepreneurs, municipalities, governmental agencies, NGOs	representatives participating in SCP seminars (at least 30); at least 12 companies offered practical placements to the students enrolled to the MARE universities	papers, SCP seminars, exhibitions), expressions of interest in joining the MARE SCPs or in other forms of participating in MARE activities

Dissemination and exploitation strategy. Sustainability of the project

MARE dissemination is encompassed in the business plan, and specific promotion activities in the promotion plan. The groups targeted by MARE dissemination and exploitation include:

(1) Partner universities involved to MARE: academic (we make them aware of MARE and engage with its objectives), administrative (to gain support for MARE activities and promote its approach to curriculum development) and technical staff (they secure ICT development), students (we help them to make most of MARE opportunities);

(2) External universities and organizations: students, academic and administrative staff (we want them to participate in MARE events and actions, to use MARE learning contents, research agenda & regulation);

(3) Practitioners working in the field: companies, entrepreneurs, NGOs, agencies, municipalities (involve them into the MAREE stakeholder collaborative platforms, students&graduates, and innovative solutions for CDM);

(4) Broader stakeholder circles: government, local communities, environmental activists, amateur naturalists (use learning resources and participation in stakeholder collaborative platform events);

(5) Prospective applicants to degree programs at partner universities (consortium create interest in their career track and attract the applicants).

MARE sectoral collaborative platforms is a formal network set to disseminate and sustain MARE results after the end of the project; and promotes the engagement of professionals dealing with sustainable management and policies with academia for knowledge co-production and development of excellence in training and research. Stakeholder collaborative platforms will organise annual national seminars discussing emerging issues and possible solutions, training events and conferences.

The www portal (https://mare-project.net/) is the main tool for information and awareness. It contains project news, discussion section, surveying tools, repositories, links to MARE open education, and the catalogue of potential employers in partner countries, with an option for them to edit profiles and information on cooperation opportunities, invitations to students & graduates, promotion to other stakeholders. A dedicated working groups ensures that target groups are addressed. After the end of the project, the Portal will serve as the platform of stakeholder collaborative platforms.

MARE courses will be submitted to Ministries of education to enhance the national dissemination.

A newsletter will target all the groups; social media (Twitter, FB) will be exploited and connected to the site. PIs will hold responsible for media coverage of MARE events they are involved to. MARE conferences and journal special issues will enhance its visibility to academia, while stakeholder platforms-branded activities (e.g. national seminars, training events) will reach employers.

Analysis of the progress

Implementation status of the project progress was evaluated based on next criteria:
Exceeding Target (ET):
The project has gone beyond the requirements of the defined ESAP target and evaluation criteria within the defined timeframe.
Achieved Target (AT):
The project has achieved the ESAP action targets and fulfilled the evaluation criteria within the defined timeframe.
On Target (OT):
The project is on target for achieving ESAP action targets and fulfilling the evaluation criteria within the defined timeframe.
Minor Delay (MD):
The project has not achieved the ESAP action targets within the defined timetable but has put systems, processes or mitigation measure in place, which are working towards addressing the deficiencies within a reasonable timeframe. In such case please specify the new target date.
Significant Delay (SD):
No significant progress has been made towards achieving the ESAP action targets within the defined timeframe. In such case please specify the new target date.
Not Applicable yet (NA):
The defined ESAP action is not applicable yet, e.g., if the project is currently at design stage and the defined ESAP action will be applicable only during the operational stage.

Table 3 – Implementation status of short term indicators

Indicator	Implementation status	Comments
Enhanced quality of BSc (specialist degree)/MSc provision in sustainable management of CDM at PCIs		
430 students enrolled to relevant BSc & MSs programs in PIs (from M22 to 36),	OT	
exposed to new and revised courses (43.9 & 65ECTS),	OT	
and to enhanced learning environment (over 90% of the students enrolled and actively using the SUNRAISER platform);	OT	
At least 10 MSc students used shared research facilities for their thesis projects	OT	Due to Covid-19
Enhanced quality of doctoral provision in sustainable management of CDM areas at PCIs		
4 PhD students (specifically enrolled to relevant doctoral programs at PIs from M23 to 36 to pursue MARE agenda);	AT	
increased publication activity of PhD students and their supervisors (30% more paper submissions to international journals);	N/A	
at least 5 PhD students used joint research arrangements and shared access to research facilities through MARE network (including the students from other PhD programs at PCIs)	OT	Due to Covid-19
Satisfaction of academic staff at relevant departments		

Feedback from questionnaires (%; at least 80% of academics, staff and students are satisfied about the change)	AT
Enhanced expertise of young academic staff at PCIs in sustainable management of CDM areas	
At least 113 members of academic staff and PhD students trained by M36	OT
Increased submission to international journal at partner departments (c.a. 10% by M36)	N/A
Enhanced expertise of technical and administrative staff at PCIs in IT and organisational aspects	
At least 18 learners trained by M36 on MARE summer schools and on-site seminars and training events at PIs	OT
Enhanced academic networking within the MARE consortium	
Number of joint academic publications (at least 8); number of jointly supervised MSc (at least 8) and PhD (at least 3) students; number of jointly co-organised training and networking events involving more than 2 PIs (at least 4); number of jointly developed courses (at least 8)	OT
Use of MARE e-learning resources by external users	
Growing external visitors statistics from M12 to 36 (at least 120 unique users by M36) and learners enrolled to MARE modules (at least 40 external users)	MD
Interest of national academic communities in further developments of MARE deliverables and enhanced networking	
Number of external HEIs and research institutes expressed their interest in joining eMARE and/or SCPs (at least 3 by M36)	MD
number of representatives of external institutions attended MARE events (at least 30 by M36)	OT
published in special issues followed up MARE events (at least 5)	OT
Interest of national professional communities in the products developed under MARE and in cooperation under the MARE SCPs	
Number of organisations and self-employed individuals joined the MARE SCP (at least 10 by M36)	OT
number of their representatives participating in SCP seminars (at least 30)	OT
at least 12 companies offered practical placements to the students enrolled to the MARE universities	MD

Implementation status of partner universities

MARE revision and upgrading the educational programs

101 ECTS of B/MSc courses revised & 45 ECTS developed, peer-reviewed & added to curricula. All the curricula have been duly accredited. The development tasks for any new courses included the course concept building and content development in cooperation with a relevant EU partner. The update tasks have been deemed valid if whole new topics or modules have been added. Typically, the depth of course revisions was between 30 and 40%. Both in VN and MY course accreditation rules are set by the national legislation and entail several levels of vigorous review and approval, including an external review, while the actual accreditation decision is taken at the Departmental level in MY and at the university level in VN. For the updated courses, the review and approval stays with Departments both in MY and VN.

Ho Chi Minh City University of Natural Resources and Environment updated 2 courses: Modeling the marine environment -4,5 ECTS ; Marine Ecology 4,5 ECTS and developed 2 new disciplines: Control of marine pollution -3 ECTS and Marine resources and environment management -3 ECTS for BSc Marine environment and resource management

Vietnam Maritime University updated: Port and Marine constructions - 3 ECTS (BSc Marine environment and resource management); Sustainability in coastal construction -2 ECTS (Master in Construction project management); Hydro-meteorology -4,5 ECTS (Bachelor in Maritime Safety Engineering, Waterway Construction Engineering): Environmental Law and Policy -3 ECTS (Bachelor in Global Study and Maritime Affairs); Developed 2 new disciplines: Ocean Environmental Management - 4.5 ECTS (Bachelor in Global Maritime Affairs); Management and Control of marine pollution -6 ECTS. (Bachelor - Environmental Engineering).

Can Tho University updated: Fundamentals of climate change and natural disasters -3 ECTS; Climate change mitigation and adaptation - 4.5 ECTS and Watershed management -3 ECTS for MSc of Climate change and Delta Management; Environmental Modelling-3 ECTS for MSc of Environment and Natural resources; Hydrological Modelling -3 ECTS for Master of Engineering.

Institute of Oceanography developed 2 new disciplines for *Ho Chi Minh City University of Natural Resources and Environment*: River-sea interactions -4.5 ECTS and Fisheries Oceanography -3 ECTS for Bachelor of Marine environment and resource management;

Universiti Kuala Lumpur updated: Integrated Marine Pollution and control 5 ECTS, Oceanography -5 ECTS, Law of the Sea and Ship Operation -5 ECTS for Bachelor of Maritime Operations; Marine and Coastal Environment - 5 ECTS (Master of Maritime Operations and Management); Developed 1 new discipline: Maritime and Offshore Safety Analysis 5 ECTS (Bachelor degree).

Universiti Teknologi Malaysia updated: Marine environment-2 ECTS (Bachelor of Engineering); Environmental management and sustainability - 5 ECTS (Master of Engineering); Water quality

assessment and management – 5 ECTS and Water quality assessment and management – 5 ECTS for Master of Engineering; Develop 1 MSc discipline Marine Environment and Renewable Energy -3 ECTS (MSc (Mechanical Engineering)

Universiti Teknologi PETRONAS updated: Introduction to Oil & Gas Industry and Sustainable Development -3 ECTS (Bachelor of Petroleum Engineering with Honours); Physical Geology -5 ECTS (BSc (Hons) in Petroleum Geoscience); Ocean and Coastal Engineering - 5 ECTS, Coastal Planning and Management -5 ECTS and Pipeline and Risers - 5 ECTS for Bachelor of Civil and Environmental Engineering with Honours; Deepwater Maintenance - 5 ECTS (Master in Asset Maintenance and Management).

Universiti Malaysia Terengganu updated: Environment: Global Issues and Perspective -5 ECTS (BSc (Marine Science)). Developed 2 new disciplines: Tropical Oceanography -5 ECTS (MSc (by Research); Marine Resources Management - 5 ECTS (BSc (Marine Science)).

The development/update task for all courses are fulfilled app. to 80%. Recognition tasks - to 70%. The percentage of courses already delivered to the target groups is 14%.

MARE open education environment Platform and online training services

Under MARE project the educational e-learning platform was developed. MARE's aims are to develop adaptive, end-user-oriented and internationally-relevant curricula to support sustainable management and governance of coastal and adjacent marine areas of partner countries: Malaysia and Vietnam, and to create sustainable feedback mechanisms to end-users, ensuring practical relevance of teaching contents and knowledge co-production opportunities (https://mare-project.net/index.php/2021/08/12/emare/)

The eMARE will focus on the following issues:

1) Coastal science and management: science, management, technology and policy issues related to the coastal zones and land-sea interactions in general; particular attention will be based to adaptive co-management and policy and technological innovation in support to adaptation plans; another major foci are tourism and urbanisation, and integrative solutions for addressing these challenges;

2) Delta science and management: science, management, technology and policy issues related to delta areas, particularly targeting Mekong and Red River (VN); the foci will be on urbanisation, sustainable agriculture and aquaculture, pollution prevention and control, and sustainable regional and urban planning informed of ecosystem services and nature-based solutions;

3) Area-based management: the focus is on policy and management instruments, such as marine protected areas, pollution control zones, or fisheries closures, and other institutional frameworks and marine spatial management tools, which are in use or under development in order to ensure sustainable governance of marine resources and to prevent potential conflicts;

4) Fisheries, seabed resources & food security: science, management, policy and technology in support sustainable fisheries and sustainable seabed management; the theme further involves such governance aspect as interactions of actors, drives and impacts relevant for sustainable management of marine bioresources, trade-offs it involves (e.g. related to aquaculture, biodiversity conservation, urbanisation and tourism, navigation and harbour development);

5) Offshore exploration & mining: science, management, technology and policy in support to sustainable offshore mining and exploration, recognising the scale and importance of the issue in MY and its growing importance in VN; a particular attention will be on interactions and trade-offs with other MARE themes.

At the web-page you could find presentation of eScience Module and e-Science MARE Module.

MARE stakeholder-academia collaborative platforms

Cooperation with stakeholders is in the core of MARE. It follows two main strands – (1) development of sectoral collaboration platforms and (2) activities outside of the work on the planform.

The development of national sectoral collaborative platforms aims at the development of sustainable collaborative arrangements for the engagement of stakeholders to curriculum development and teaching as well as for the academics of MARE play a meaningful role for stakeholder communities. Due to drastic differences in national contexts, this activity took different forms in the two partner countries.

In Malaysia, where the platform development is led by the University of Petronas, the consolidation of stakeholder work is envisioned and implemented under the umbrella of the Malaysian Geological Society that is very much concerned about the quality of marine environment, plays an important role of a science-policy interface in the field, and involves in this multiple stakeholders, including public bodies, business and NGOs.

In Vietnam the platform's development is taken care of by a dedicated NGO partner – MCD that is directly approaching stakeholder partners (from its own network and on suggestion by MARE academic partners in Vietnam) with invitations to the network in making. In both countries the platform development is greatly delayed, because such an activity requires face-to-face meetings, which are not possible in many situations.

The activities outside the collaboration platform include hosting internship and/or shorter courses, guest lecturing, participation in job fairs and other career-related activities, co-organisation of events such as conferences, workshop, and exhibitions, joint research and development, etc. These activities are expected to be partly channelized and structured by the platforms in-making, however stakeholder collaborations beyond platforms will still remain important. In the statistics submitted with the interim report (27 stakeholder organisations), we have listed those currently cooperating with partner universities on the issues listed above, as long as this involves project activities. This also includes the partners provisionally interested to join collaborative platforms.

MARE research activities

The MARE research framework is a framing document outlining issues, problems, discussing the latest international literature and possible directions of relevant PhD research (https://mare-project.net/index.php/2021/07/05/master-and-phd-research-framework/). It is based on an overview of policy-relevant issues related to the thematic scope of MARE and offers references to international and European policy documents and scientific assessments focusing on or strongly featuring MARE issues. Based on the MARE research framework, departments at partners higher education institutions in Malaisia and Vietnam develop their institutional and/or departments research agendas. Such agendas provide support to PhD (but also MSc/MA) students and their supervisors to identify the research topics and plan thesis contents relevent to the latest scientific and policy developments.

To consolidate the activities under the MARE research framework, dedicated PhD positions were created across the partnership to pursue the MARE agenda. During project the practice of join supervising of PhD students was established. Profiles of PhD supervisors available at the web-page https://mare-project.net/index.php/2021/09/13/mare-supervisors/ . Now the list of supervisors includes 10 persons. Number of SUNRAISE PhD students is 14 persons (https://mare-project.net/index.php/2021/08/24/profiles-of-mare-phd-students/).

In order to create added networking value during and after the project lifetime, MARE partners have agreed on arrangements for sharing research equipment and experimental facilities within the partnership, so students and researchers would continuously benefit from a partnership-wide research capacities.

Ho Chi Minh City University of Natural Resources and Environment - Set of 20 computers will be used to conduct virtual laboratory work in the oceanography, marine environment and ecosystem as well as to access e-library. Camcorder will be used to for the creation of interactive online MARE courses.

Vietnam Maritime University - Teleconferencing equipment is installed in the meeting room no 2.1 of VMU; online meeting room will create partnership-wide collaborative environment; it will be used for distant learning and joint teaching activities, including open public ones. MacBook ccomputers for e-learning materials production; Streaming Green Screen; Cameras for the development and the implementation of MARE eLearning modules.

Can Tho University – Equipment for online/distance-learning room (Wireless Presentation System, Smartboard, Projector, Laptop, PC workstations, camera) will be installed in The College of the Environment and Natural Resources. It will be used to serve faculty and alumni students who require lectures, meetings, e-learning, distance learning, and for the development of interactive course materials.

Universiti Kuala Lumpur - Set of equipment for educational laboratory. It is installed in the academic and auxiliary audiences of the university. A computer class of 15 workplaces is used to conduct virtual laboratory work in the oceanography and marine environment and ecosystem, to test students

in the disciplines related to pollution and ecosystem of the environment. Moodle eLearning environment, employed by students to perform independent work according to Syllabi

Universiti Teknologi Malaysia - Data storage server; Water quality measurement system with Optical Dissolved Oxygen Smart Sensor; computer for simulation processing and database management. It will be useful for data collection needed for all the courses. Specifically, for the course Environmental Management and Sustainability and Water Quality. Assessment and Management, the data collection will be used to monitor the changes of water quality. The data will be sent to server. Simulation project will be added as the course work for MARE courses.

Universiti Teknologi PETRONAS - Interactive Flat Panels; Smart UHD TVs; Laptop. The equipment is installed in three academic departments, Mechanical Engineering Department, Petroleum Engineering Department, and Civil and Environmental Engineering Department. Under current situation, all teaching and learning activities are conducted via online platforms. The equipment will be used for interactive teaching, adjunct lectures, meetings with other partners, as well as presentation sessions by students and staff.

Universiti Malaysia Terengganu - Dell Computer; Interactive Smart Projector; Camcorder; High End Data Processing Workstation System; Drone for the development and the implementation of eLearning modules. 12 workstations for the implementation of MARE curricula and research training. Wall Partition and UHD Smart TV and video conferencing system to support join teaching, conferencing, and to support the running of collaborative sectoral platform.

The target groups, using the equipment in PCU, are students, teachers, tutors, researchers and administrative staff. The number of final beneficiaries of the equipment on a yearly basis for all PCU app.: Students – 550, Academic staff – 90.

It is expected that once successful deployment of the eMARE platform will be reported and disseminated, other faculties and departments at PIs will be interested in the development or expansion of their own eLearning resources. The educational laboratories, and high-performance computers will be used by other faculty staff members and students. This ensures that the number of beneficiaries will be increased in the future.

MARE dissemination

MARE dissemination is organised according to its Dissemination and Exploitation strategy that was developed and agreed by project partners. The key target groups - the academia within and outside the formal partnership, stakeholders representing the world of profession and students (current and future ones) are reached through publications in corporate and regular media, consultations, workshops, conferences and training events.

The logos for the project were developed and consistently used in all project documents. Different banners and templates for the project documentation have been designed and circulated for use in internal and external documents and reports.

The Leaflets for the project are also developed, published and distributed during information workshops and other dissemination activities. The leaflets, announcing the new courses, were developed by partner universities. They are distributed at Open Days Doors activities and are available to download on the Web site of the project (www.mare-project.net/2021/04/22/dissemination-materials/).

Project partners inform the wide audience about the project events and activities in Facebook group MARE (https://www.facebook.com/groups/mare2020). Any project event is announced and reported through the project website, websites of relevant partners and social media, and in case of open call events also broadly disseminated through various list serves and online communities. Dedicated dissemination events for national stakeholder and academic communities have been organized in MY and VN within Y1. In addition, all partners have organised information workshops and reported about the project at different conferences and round tables with the stakeholders.

Given the dynamic situation in national HE landscapes due to the global pandemics, the management team is prepared to exercise extra flexibility as regards the emerging needs. For instance, in addition to the common ICT training session for MY and VN partners, one more ICT training has been arranged with a view to address specific needs of VN participants they expressed in their feedback to the first training. Likewise, different stakeholder collaboration modalities in MY and VN have been accepted as given, and hence the different configurations of collaboration platforms in these countries. Public authorities are involved to the project to a moderate extent, except the fact that most PI institutions are public or even structurally belong to the national government. The role of public authorities in the project is accreditation and regulation provision as well as (in case of VN) permitting for equipment purchases and support to stakeholder collaboration platforms. Students are involved to QA process, as their feedback is an important part of MARE QA process, while student representatives will also participate in MARE consortium meetings. External stakeholders are specifically targeted by WP4 whereas organizational arrangements are being set up for their engagement in curriculum planning and development as well as in QA. In terms of the type, the external stakeholders are diverse and represent any types ranging from NGO and business to public authorities. As of August 2021, 27 external stakeholder organisations have been reported as actively involved. They provide external review, participate in teaching, provide internship placements, supply information and feedback, and participate in the development of relevant institutional arrangements.

Results of monitoring of website

The project website (http://mare-project.net/) was developed within the first month of the project. The website gives the information about the project (http://mare-project.net/about), partners (http://mare-project.net/partnership), project activities and results (http://mare-project.net/project-results) the contact details of the co-ordinator and national co-ordinators, newsletters, links related to the project, promotion, questionnaires for the employers, etc. It is linked to the Erasmus+ program site and the sites of the partners. The web-site is maintained by the P1 and updated regularly. The Google search for “Marine Coastal and Delta Sustainability for Southeast Asia” or “mare erasmus” give the link to MARE website and websites of the partners at the 1st page in results. Each project partner has set up

its own project page linked to the project website and containing information about the project on the websites of their universities. Project-related information is also published on Erasmus+ Dissemination Platform.

The internal project website is restricted for the beneficiaries and is maintained in Management platform (https://projects.zmml.unibremen.de/portal/site/mare1). This internal website supports the daily work within the project and ensures transparency for all partners. It has sections for: - Work plan with the description of the tasks, deadlines, and responsible partners - Schedule for all activities - Announcements, Chat room, Forums – for the discussion of the current issues. - Quality Control Plan with Quality Control Matrix, QA of progress and QA of Dissemination activities. - Dissemination Plan, Strategy, Impact and Sustainability All the Results of the project are published there in a structured form. Each beneficiary has an access to these resources.

Sustainability plan

SWOT-analysis

Strength	Weakness
Good co-operation between partner universities; Developed the project web-site and e-learning platform; Developed educational materials including -e-materials and MOOC courses; Approved SUNRAISE and national agreements of cooperation and the development of stakeholder-academic collaboration platform; Established national stakeholder-academic collaboration platforms; Organized labs with co-sharing equipment; Established academic community for co-supervising of Master and PhD thesis and scientific research; Established scientific conferences, expertise for Summer school and other educational events organization; Published promoting project materials	Links between national universities stronger than between project consortium partners; Different state (national) obligatory requirements for Master and PhD educational programs; Strong competition for students and resources at national and even international levels; Significant remoteness of partners from each other
Opportunities	**Threats**
Further strengthening of cooperation between partner universities; Open collaboration platforms for other universities at the national and international levels; Further development of e-learning education; Supporting conferences and Summer schools in the future; Enroll students from other universities whish do not have the accredited Master and PhD educational programs; Implementation the Dissemination strategy; Financing new project and initiatives from national and international Funds	Continuing pandemic of Covid-19, lockdowns and bans for travelling and off-line communications; Political situation in- and out- boarders of partner countries; Change of the rules and regulations from national educational Ministries; The low attractiveness of MARE collaboration platforms for external partners and students; Lack of financing International educational programs; Established by national Ministries of education assigned number of Master and PhD students;

Goals of Sustainability plan

Overall, sustainability of the MARE project means achieving and ensuring:

- an efficient and effective set of activities for boosting the number of enrolled Bachelor, Master and PhD students;
- continuous improvement and extensions of the educational content, e-learning tools and services taking into consideration their competitive environment and technological advancements;
- continuous development of the capacity for academic mobility, shared experimental facilities and joint research;
- intensified interest as well as boosted motivation of the participating organisations to use, promote and further improve MARE stakeholder-academia collaborative platforms and their governance.

Hence, the sustainability planning of the MARE project results will be performed at two parallel and complementary levels:

- Internally in the consortium organizations, i.e. through ensuring that all consortium participants will continue to use and expand the educational platform, e-learning materials and MOOC courses, co-sharing laboratory equipment, co-supervising Master and PhD students following the end of the project. To this end, all consortium partners that will act as end-users of the MARE project results intend to gradually involve more users in the SUNRAISE consortium.
- Externally through attracting and engaging third parties in the MARE stakeholder-academia collaborative platforms and educational programs. Such an engagement will be also part of the project's plans for the wider implementation of the SUNRAISE educational programs and e-platform.

Two approaches are considered for the MARE sustainability strategy: (a) viability at a mid-term level and (b) sustainability at a long-term level.

Strategy for MARE project sustainability

A key aspect of the sustainability strategy involves the actions to be made for attracting and engaging Bachelor, Master and PhD students. The initial sustainability plan will include the following ones:

1. Strong involvement of students within the Consortium. The partner universities will comprise the initial pool of Bachelor, Master and PhD students for the MARE educational programs. Each one of partner universities has committed to disseminate the e-learning platform within their context and engage Bachelor, Master and PhD students during the project's lifetime. The successful enrolling students and use of the e-learning platform along with the internal dissemination activities to be held via presentations MOOC courses and e-learning educational materials under educational programs and information at the university's website and e-mail campaigns among others will further attract students. Partner universities will save the link to MARE web-page .

Opportunities for Sustainability:

Involvement of students within the Consortium

Action steps	*Who will implement*	*Timeline:*
Selection of laboratories, and educational programs to be initially targeted for students and researchers who could involve into MARE educational programs	P5, P6, P7, P10, P11, P12, P13	Months 1-3 of project duration; Annual revision at September-October
Announcement of MARE educational programs and e-learning platform at the university websites and through the university mailing lists	P5, P6, P7, P8, P9, P10, P11, P12, P13	1st year of project duration; Revision and updating information annually in April-May
Publishing of promoting materials (leaflets) and regular distribution among students at partner universities	P5, P6, P7, P8, P9, P10, P11, P12, P13	2nd year of project duration; Revision and updating information annually in March-April
Presentation of MARE educational programs and e-learning platform for students of targeted educational programs	P5, P6, P7, P10, P11, P12, P13	Annually in April
Regular communication with partner universities for announcing project progress and MARE activities	P5, P6, P7, P8, P9, P10, P11, P12, P13	Constantly during project implementation
Enroll students into scientific researches, MARE activities (conferences, workshops, Summer schools and etc.)	P5, P6, P7, P8, P9, P10, P11, P12, P13	Constantly
Collection of feedback from students, academic staff, and partners	P5, P6, P7, P10, P11, P12, P13	Constantly

2. Involvement of “external” Bachelor, Master and PhD students, expansion of the Consortium. The Consortium will exploit their scientific networks in order to disseminate the information about educational programs, e-learning platform and stakeholder-academia collaboration platforms and attract more Bachelor, Master and PhD students and organizations. Initially, partners universities will attempt to attract students from their research networks. Gradually, the next plans will include broad dissemination activities held by the partners individually and the Consortium as a whole in order to increase awareness about educational programs, e-learning platform and stakeholder-academia collaboration platforms and attract more students, universities and other organizations. This step is highly dependent on the dissemination and project activities and its success is strongly affected by their positive outcome. More specifically, the project activities will thoroughly present the targeted students’ group within the current and near future context. The dissemination activities will involve the preparation of a dissemination plan which will include the selection of the dissemination methods, the determination of the dissemination material to be prepared taking into consideration the targeted audiences, the selection of the events (conferences, workshops, etc.) to use for the dissemination purposes, etc. As the researchers and lecturers in the MARE Consortium are highly reputed scientists in their field of expertise, each one of them will be acting as research community leader in their domain. Hence, they will be actively participating in the project activities, including conferences, summer schools and e-learning. With the effect of an influencer in their fields, their high activity/involvement is expected to trigger students into educational programs and other universities and organizations – into stakeholder-academia collaborative platforms.

Moreover, the MARE experts (researchers and lecturers) will be sending personalized emails to their research or university community members and collaborators throughout the project’s lifetime, notifying them about the project’s activities, the educational programs status and about stakeholder-academia collaborative platforms. Given that the purpose of the dissemination activities will be not only to raise awareness about MARE but also promote the project’s outputs and results to interested stakeholders and engage the research and university community, particular focus should be given on the preparation of e-learning materials visualizing the project results and their expected benefits for students and academic staff. The latter could take place either through guided use of the e-learning platform and by inviting researchers and universities to join the MARE stakeholder-academia collaborative platforms and use laboratory equipment and e-learning platform for a specific period of time. The different regular forms of communication will allow for the incorporation of the group participants’ feedback and ideas into the project’s activities and implementation outcome and, hence, increase their commitment to cooperate with MARE Consortium. In order to maximize the sustainability potential of the MARE project and the outcome of the related activities, the MARE communication will be used for identifying the major influencers in a specific scientific area or field, so that the communication efforts are targeted and effective.

Opportunities for Sustainability

Involvement of external students and expansion of the stakeholder-academia collaborative platforms

Action steps	*Who will implement*	*Timeline:*
Determination of specific scientific fields, potential partners (universities and research groups, NGOs) to initially target at	P5, P6, P7, P8, P9, P10, P11, P12, P13	Months 1-3 of project duration; Annual revision at September-October
Preparation of a list of researchers, research groups, potential partner universities and organizations they will contact with based on the above fields	P5, P6, P7, P8, P9, P10, P11, P12, P13	Months 1-3 of project duration; Annual revision at September-October
Preparation of a list of stakeholders for each role in the MARE project who could serve as potential participants	P5, P6, P7, P8, P9, P10, P11, P12, P13	Months 1-3 of project duration; Annual revision at September-October
Identify the major influencers in each one of the specific scientific fields and stakeholder group	P5, P6, P7, P8, P9, P10, P11, P12, P13	Months 1-3 of project duration; Annual revision at September-October
Decision for the communication channels to be used for contacting the external students, researchers and universities, NGO and other organizations	P5, P6, P7, P8, P9, P10, P11, P12, P13	1st year of project duration; Revision and updating information annually in March-April
Development of the dissemination strategy	P5, P6, P7, P8, P9, P10, P11, P12, P13	2nd year of project duration; Revision and updating information annually in March-April
Preparation of a template e-mail for the communication with the potential partners	P5, P6, P7, P8, P9, P10, P11, P12, P13	1st year of project duration; Revision and updating information annually in March-April
Each partner contacts the potential users they have identified as well as the influencers in their specific scientific field	P5, P6, P7, P8, P9, P10, P11, P12, P13	Constantly
Personalized communication with the potential partners	P5, P6, P7, P8, P9, P10, P11, P12, P13	Constantly
Presentation of the MARE educational programs and stakeholder-academia collaborative platforms to the external universities and potential partners	P5, P6, P7, P8, P9, P10, P11, P12, P13	During joint events

Inclusion of new partner universities and organizations into stakeholder-academia collaborative platforms based on Agreement	P5, P6, P7, P8, P9, P10, P11, P12, P13	As an interested university emerges
Inclusion of the MARE link at web-sites of other potential participants of open stakeholder-academia collaborative platforms	P5, P6, P7, P8, P9, P10, P11, P12, P13	Constantly
Regular communication with potential partners for announcing project / stakeholder-academia collaborative platforms activities and e-learning platform updating	P5, P6, P7, P8, P9, P10, P11, P12, P13	Constantly
Distribution of project leaflets and brochures	P5, P6, P7, P8, P9, P10, P11, P12, P13	Constantly
Collection of feedback	P5, P6, P7, P8, P9, P10, P11, P12, P13	After join events
News announcements, invitations to join to events, distribution of the promoting materials based on the feedback submitted	P5, P6, P7, P8, P9, P10, P11, P12, P13	Constantly

3. Continuous improvement of the educational content. MARE consortium will continue to improve developed educational programs through the development of the educational materials in English, uploading presentations, textbooks, reading and other supporting materials to the e-learning platform: following development of the MOOC courses and other tools for digital education. Partner universities will organize annual scientific conference and at least one summer school for Master and PhD students with participation of the Consortium members and other research groups and universities. The established practice of scientific co-supervising will be used for increasing quality of students' research and publishing its results. In order to maximize the sustainability potential of the MARE project and the outcome of the related activities, the laboratory equipment will be used for collaborative research of Master and PhD students.

In order to ensure the financial viability of the MARE project and its continuous enhancement for purpose of competitiveness, the partners universities will be investigating different potential funding sources, including regional, national or EU programs, sponsorships by interested stakeholders, etc.

Opportunities for Sustainability

Improvement of the educational content of the educational programs and development of the capacity for academic mobility, shared experimental facilities and joint research

Action steps *Who will implement* *Timeline:*

Regular revision and upgrading educational programs (including doctoral school program)	P5, P6, P7, P10, P11, P12, P13	1st year of project duration; Revision and updating information annually in March-April
Regular revision and upgrading laboratory equipment	P5, P6, P7, P10, P11, P12, P13	1st year of project duration; Revision and updating information annually in November-December
Improving language skills of the academic staff involved (directly or potentially) into MARE project	P5, P6, P7, P10, P11, P12, P13	Annually, 1 time during educational year
Supporting close scientific cooperation with partner universities through collaborative research, conferences and workshops	P5, P6, P7, P10, P11, P12, P13	Constantly
Supporting co-supervising of Ms and PhD students	P5, P6, P7, P10, P11, P12, P13	Constantly
Regular organization of conference and Summer school	P5, P6, P7, P10, P11, P12, P13	Annually, 1 conference and 1 Summer school at one of the member of Consortium
Conversion of the research results into scientific papers and published them	P5, P6, P7, P10, P11, P12, P13	Constantly
Development e-learning educational materials (including new MOOC courses) and uploading them into e-platform	P5, P6, P7, P10, P11, P12, P13	Constantly
Supporting access to e-learning platform for internal and external users	P5, P6, P7, P10, P11, P12, P13	Constantly
Monitoring of each user's activity in the e- platform (how often, for how long, which services)	P5, P6, P7, P10, P11, P12, P13	Constantly
Communication with the users based on their activity in the platform, announcements for new features to be included in the e-learning platform, etc.	P5, P6, P7, P10, P11, P12, P13	Constantly
Development and use of the pool digital activities on the base of e-platform for further cooperation between partner universities and implementation of doctoral school	P5, P6, P7, P10, P11, P12, P13	Constantly

Investigating different potential funding sources for further supporting of MARE project	P5, P6, P7, P8, P9, P10, P11, P12, P13	Constantly

Conclusions

A sustainability plan is, in essence, a road map that lays a foundation for planning and action. It defines and illustrates an organizational philosophy toward sustainability through an established vision, goals, strategies, and metrics to improve educational programs and stakeholder-academia platform and their governance at the partner universities.

This Plan integrates strategies and practices that can provide near-term benefits for MARE educational programs and stakeholder platforms as well as tools for continual and long-term progress toward sustainability. The Plan provides a shared decision-making and problem-solving framework for sustainability of the MARE educational programs and stakeholder platforms at the partner universities. It is the logical first step for the partner universities that are serious about tangible and measurable long-term sustainability practices. The Plan was developed using a collaborative process of interviewing and surveying university staff and studying of the visible deliverables of MARE project. This process was designed to build off a platform of existing Consortium practices and work toward continuous improvement with regard to effectively managing educational programs, use of laboratory equipment, development and support e-learning platform, develop strong cooperation through stakeholder-academia platform and other practices to achieve sustainability of MARE project.