



Climate change impact on the built environment in  
coastal regions

## **OUTPUT\_08**

**A trans-disciplinary and innovative research-based learning  
platform in the built environment to tackle climate change in  
coastal regions**

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## **A trans-disciplinary and innovative research-based learning platform in the built environment to tackle climate change in coastal regions**

### **1.1 Introduction**

Output 08 of the BEACON PROJECT refers to a trans-disciplinary and innovative research-based learning platform in the built environment. This is developed to tackle climate change in coastal regions, through a Research-based learning approach which is presented as an alternative learning model that can develop independent research and critical thinking skills. The objectives of the platform is to facilitate learners to show their interpretation, analysis, evaluation, inference, and explanation abilities. The Platform is developed through Massive Open On-line Courses (MOOC).

### **1.2 Output 8 – A trans-disciplinary and innovative research-based learning platform**

Output Title	A trans-disciplinary and innovative research-based learning platform in the built environment to tackle climate change in coastal regions
Output Lead	UNIVERSITA TA MALTA
Output Duration	2023-03-01 - 2023-06-30 (4 Months)

#### **Description**

Based on the competency framework (O7), which was developed based on the outcomes of previous outputs (O3, O4, O5 and O6) a trans-disciplinary and innovative research-based learning platform in the built environment was developed to tackle climate change in coastal regions. Research-based learning (RBL) presents as an alternative learning model that can develop the independent research and critical thinking skills. It facilitates learners to show their interpretation, analysis, evaluation, inference, and explanation abilities. It is intended to develop the platform as a Massive Open On-line Courses (MOOC). The MOOC directly addresses the competency requirements identified under O7 with a special emphasis on the knowledge gaps identified under O6 and will have components associated with independent research and critical thinking skills. This is mainly targeted at built environment professionals, built environment students and teachers. Based on the competency framework (O7), course outline and the course structure will be developed, outlining the course objectives, key learning outcomes, syllabus outline, research-based learning and teaching strategies, assessment requirements, and key readings.

#### **Methodology**

The Methodology developed is based on the following principles:

- UM will lead the development of the research-based platform with extensive consultations with project partners and the course structure and associated parameters will be drafted.
- The course will be developed by experienced researchers and managers from partner institutions, led by UM but in close consultation with the relevant stakeholders.

- UM will also lead the development of the virtual training environment. It is intended to develop the platform as a Massive Open On-line Courses (MOOC).
- The development lifecycle will have 3 milestones: the prototype, first alpha release for internal testing; first beta release for public (partner) testing; and the final product.
- User surveys in accordance with the quality plan will be used to capture feedback and refine the platform once developed.
- Technical manuals and user instructions will be prepared to ensure that the platform is easy to maintain and use.
- User surveys in accordance with the quality plan will be used to capture feedback and refine the manual.

## 2 Skills and Knowledge Gaps

The trans-disciplinary and innovative research-based learning platform in the built environment is developed to tackle climate change in coastal regions. It is based on the competency framework (Refer to Output 07), which is developed based on the outcomes of the previous outputs (Output 03, Output 04, Output 05 and Output 06). The MOOC e Learning Platform therefore addresses directly the key skill gaps and the Knowledge gaps defined at the end of the process developed in Output 6, assessed and revised then in Output 7 of the BEACON Project.

Skill gaps	Knowledge gaps
<b>Communication skills</b> (Negotiation skills, conveying decisions etc.)	<b>Application of theoretical knowledge practically or vice versa</b>
<b>Technical skills</b> (computer modelling, mapping, programming and etc.)	<b>Green building concepts</b> Radiant floors/Gray water recycling/Solar power/energy efficient window systems/municipal waste management
<b>Language skills</b> (English language proficiency)	<b>Climate change, Mitigation and adaptation related knowledge</b> Climate financing, Sea level rise, global warming, green house effect, heat island effect, alternation of ocean currents/difference between adaptation and mitigation and etc.
<b>Integrated working skills</b> (working as a team/group, team management, decision making etc.)	<b>Research and investigation</b> ethics/research methodology, sample selection, data collection methods and techniques, data analysis /analytical tools/ data presentation/ academic writing, and etc.
	<b>Localization of mitigation and adaptation measures and strategies</b>
	<b>Legislation, policies, national plans on climate change</b>

### 3 Learning Platform Modules

The Key components proposed for the E learning Platform, based on the outcomes of Output 7, are summarised in the table below. The Areas were addressed by the BEACON project partners who provided the different contributions, primarily based on power point presentations, recorded videos, shared resources and links to important online resources.

	Module – Key Areas	Basic / Specialised
1	Climate Change Science Basics – Overview of <b>Climate change, Mitigation and adaptation related knowledge – Focus on Adaptation</b> . Climate science and impacts.  Climate financing, Sea level rise, global warming, green house effect, heat island effect, alternation of ocean currents/difference between adaptation and mitigation and etc. With a focus on Built Environment. Case Studies – theory to practice.  Terminology	Basic
1.1	Climate Science	Basic
1.2	Adaptation Science & Practice	Basic
1.3	Adaptation Actors	Basic
2	Coastal Built Environment Climate Change Adaptation. Including Case Studies	Specialised focus
2.1	Built Environment - <b>Green building concepts – Mitigation – focus on Adaptation</b> Radiant floors/Gray water recycling/Solar power/energy efficient window systems/municipal waste management. Climate change KPIs Sustainability Assessment frameworks & Climate Change Adaptation. Urban planning and Climate Adaptation	Specialised
2.2	Coastal Areas Climate Change Adaptation	Specialised
2.3	Case Studies ref. O5	
3	<b>Research Methods and Techniques</b>	Basic
3.1	<b>Research Methods</b> ethics/research methodology, sample selection, data collection methods and techniques, data analysis /analytical tools/ data presentation/ academic writing, and etc. Risk management, Applied to climate change	Specialised
3.2	<b>Technical tools</b> (computer modelling, mapping, programming etc.) energy modelling, GIS etc. design build, climate modelling, How the tools are used in relation to climate adaptation.  Examples.	Specialised
4	<b>The ESGs – Political and Governance Agenda.</b> <b>Communication</b> (Negotiation, conveying decisions etc. interdisciplinarity in climate adaptation, team management)  Communication strategies.  Communication in climate adaptation as against communication skills.	Specialised
	<b>Climate Finance</b>	Specialised

## 4 Module Structure

The Module structure was planned on the following key components as outlined in the template below. The Template below was used to prepar and present each Study Unit delivered. The example presented is indicative only.

CODE	BEACON_LEARNING_01
UNIT TITLE	Title of the Study Unit (Example: <i>Systems Management and Climate Change Adaptation</i> )
UNIT LEVEL	Basic / Specilaised (Where and if relevant, state the Level with reference to the European Qualifications Framework – example Level 6, Level 7 etc.)
ECTS Credit Value	Where relevant State credit value
LECTURER	Name and Surname of Lecturer/ Lecturers
INSTITUTION	Name of Institution
DESCRIPTION OF THE STUDY UNIT	A brief description of the Module Content.  Example: <i>The aims of this study-unit are to introduce students to the concepts of strategic management with respect to Climate Change Adaptation. The main objective of the study-unit is to provide students and researchers with the opportunity to view project management with clear objectives in asset systems management towards climate change adaptation.</i>
STUDY UNIT SPECIFIC AIMS	Presentation of the specific aims of the Study Unit  Example: <i>The aims of the study-unit are the following:</i> <ul style="list-style-type: none"> <li>▪ <i>To introduce students to the significance of built environment assets as key and major component of the capital assets, in relation to climate change adaptation;</i></li> <li>▪ <i>To identify the stakeholders involved in asset management;</i></li> <li>▪ <i>To identify key issues in relation to climate change adaptation in the built environment;</i></li> <li>▪ <i>To define the programme management as an intermediate phase between strategic and project management;</i></li> <li>▪ <i>To establish project benchmarks for performance objectives twards climate change adaptation;</i></li> <li>▪ <i>To explore tools and techniques in programme management towards climate change adaptation.</i></li> </ul>
LEARNING OUTCOMES [A]: Knowledge and Understanding	Knowledge and Understanding capabilities envisaged for the Study Unit.  Example: <i>By the end of the study-unit the student will be able to:</i> <ul style="list-style-type: none"> <li>▪ <i>Identify the strategic, financial and organizational importance of an asset through an analysis of an entity's capital assets;</i></li> <li>▪ <i>In the context of case studies, define a client's brief for a project with a view to Climate Change Adaptation;</i></li> </ul>

	<ul style="list-style-type: none"> <li>▪ <i>Produce a programme plan with clear objectives for performance benchmarks in relation to Climate Change Adaptation;</i></li> <li>▪ <i>Demonstrate an understanding of programme management techniques by applying them to a Climate Change Adaptation Case Study and producing a management report concerned with the technique;</i></li> <li>▪ <i>Produce a project plan for a specific project with reference to time, cost and quality parameters in the context of Climate Change Adaptation.</i></li> </ul>
LEARNING OUTCOMES [B]: Skills	<p>Example: <i>By the end of the study-unit the student will be able to:</i></p> <ul style="list-style-type: none"> <li>▪ <i>Within the context of an organization, evaluate the strategic importance of capital assets and the context of Climate Change Adaptation;</i></li> <li>▪ <i>Define project requirements and formulate them in a programme management plan for others to follow;</i></li> <li>▪ <i>Understand and deploy programme planning techniques in the context of case studies.</i></li> </ul>
KEY REFERENCES	<p>Outline main text and books / Papers as key references: Example:</p> <ul style="list-style-type: none"> <li>▪ APM Introduction to Programme Management. Association for Project Management 2007.</li> <li>▪ The Handbook of Program Management: How to Facilitate Project Success with Optimal Program Management (2007) James T Brown.</li> <li>▪ Organizational Project Portfolio Management: A Practitioner's Guide (2014) Prasad Kodukula.</li> <li>▪ Portfolio and Programme Management Demystified: Managing Multiple Projects Successfully (2012) Geoff Reiss, Paul Rayner.</li> <li>▪ Program Management (Fundamentals of Project Management) (2010) Michel Thiry.</li> <li>▪ Portfolio, programme and project offices (P30) Paperback (2008) Office of Government Commerce, Great Britain.</li> <li>▪ Strategic Project Management: Creating Organisational Breakthroughs (2002) T. Grundy &amp; L. Brown.</li> </ul>
SUPPLEMENTARY REFERENCES	<p>Provide Additional references including links to websites, vidoes, databases which support the Study unit.</p> <p><b>NOTE: INLCUDE URL AND REFERENCE TO ESTABLISHED PLATFORMS AND SUPPLEMENTARY MATERIAL.</b></p>
STUDY UNIT MODE	Define the Study unit mode and presentation / delivery method: Power point presentation, video presentation, other online material
METHOD OF ASSESSMENT	This Study Unit is not assessmend. However outline 4 key questions which can help in the assessment of the Study Unit.

## 5 The e Learning Platform

The e Learning platform can be accessed through the following link:

<https://beacon.research.um.edu.mt/moodle/>



The courses are organised in 4 clusters as follows:

Course 1	Course 1: Climate Change Science Basics
Course 2	Course 2: Coastal Climate Change Adaptation
Course 3	Course 3: Research Methods and Techniques
Course 4	Course 4: The ESGs – Political and Governance Agenda

## 6 The Course Structure

Each Course outlined above includes different sections and is organised as outlined below:

### **Course 1: Climate Change Science Basics**

- 1.1 Climate Science
- 1.2 Adaptation Science and Practice
- 1.3 Adaptation Actors

### **Course 2: Coastal Climate Change Adaptation**

- 2.1 Climate Change Adaptation and the Built Environment
- 2.2 Climate Risks in coastal areas
- 2.3 Climate change adaptation options in coastal areas and case studies

### **Course 3: Research Methods and Techniques**

- 3.1 Introduction to focus group
- 3.2 Introduction to Quantitative Data Analysis and Techniques
- 3.3 Introduction to questionnaire and interview
- 3.4 Introduction to research process
- 3.5 Introduction to research proposal
- 3.6 Introduction to Selecting a Sample

### **Course 4: The ESGs – Political and Governance Agenda**

- 4.1. Introduction to Climate Governance
- 4.2. Global Agendas of Climate Governance
- 4.3. Communication in Climate Change Adaptation
- 4.4. Introduction to Climate Finance



## 7 Conclusions

### **Trans-Disciplinary Research Based Learning**

The BEACON e learning platform presents a trans-disciplinary and innovative research-based learning platform addressing Climate Change Adaptation in the built environment. Research-based learning (RBL) presents an important development and is an alternative learning model that can help develop independent research and critical thinking skills, facilitating learners to show their interpretation, analysis, evaluation, inference, and explanation abilities. It is intended to develop the platform as a Massive Open On-line Courses (MOOC). The e Learning also presents an important legacy of the BEACON project, where the platform, developed and used during the project activity period, continues to be active after the completion of the project.

### **E Learning Platform Sustainability**

The longer term sustainability of the e Learning platform is based on the following principles:

1. It is set up on the University of Malta online system and web, and therefore shall be available in the long term, beyond project completion.
2. The e Learning platform is based on MOODLE and designed to require minimal maintenance, not relying on complex plugins and which can be well altered for by the University of Malta partner team on the BEACON Project.

### **E Learning Platform Innovation**

The e learning Platform presents a useful reference point to guide students in both early studies in built environment and climate adaptation but also supports specialised studies presenting important and key material, based on the BEACON Project outputs and other relevant and important resources.

## **Annex**