

# Competency framework for built environment professionals to tackle climate change in coastal regions

## Definitions of ‘Built Environment’

The built environment can be defined as a manmade surrounding that encompasses patterns of human activities and comprises land use, urban design, and transportation systems *(Sridarran, Keraminiyagel, & Amaratunga, 2016, p. 161)*.

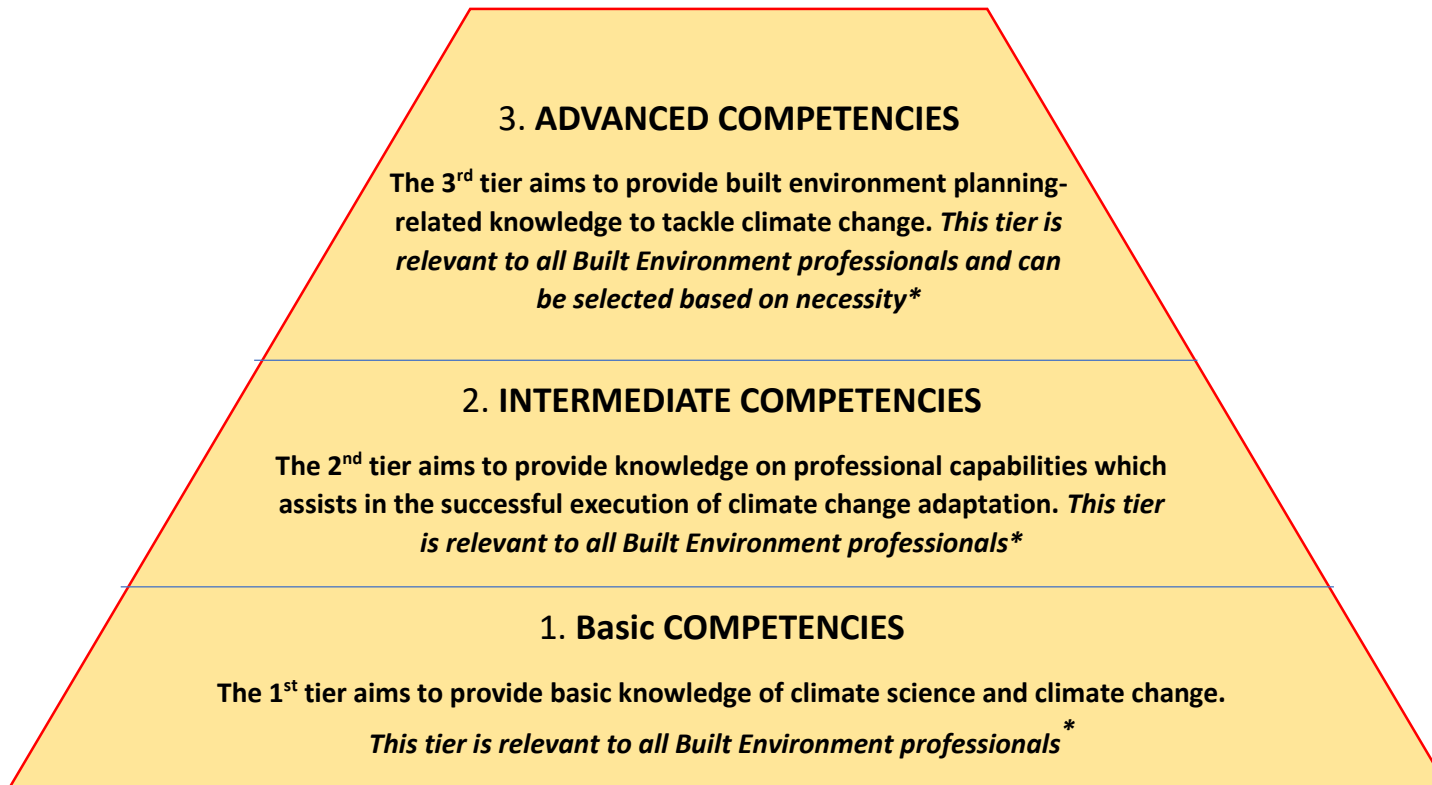
Built Environment refers to the man-made surroundings offering sites for human activity, ranging from buildings and parks to vicinities and cities that can often include auxiliary infrastructure such as water supply, or energy networks. It comprises places and spaces created or modified by people, including of buildings, roads, pavements, parks, and transportation systems. It is a structure in which people live, work, and recreate daily. The built environment enriches well-being and growth of children and young people and supports healthier communities. *-RICS School of built environment Amity University*

The built environment is the result of human needs and actions. All human beings are surrounded by a plethora of man-made physical elements that constitute the built environment, providing a setting for human actions. A built environment includes all structures created by people, including infrastructural elements like streets, sidewalks, water and sewer lines, electricity, and other utilities *(McClure and Bartuska, 2007)*.

## Target group

\* Based on the definitions above, built environment professionals can be identified in a wide range of sectors. Some examples include **architects, engineers, contractors, town planners, designers, distributors, service providers, property managers, policymakers, administrative officers, developers, planners, landscape architects, designers, facilities (water and sewage ways, infrastructure, parks), building permit officers, social scientists, property managers, project managers, architects, property owners, physicians, environmentalist, professional social workers, experts in various fields such as climate adaptation, sociology, ecology, geography, geology, cultural environment conservation, construction, coastal zone managers, individuals working in human and animal health, supervisory functions, civil society, technical in biologist employees of insurance companies and banks, etc.** Additionally, professionals not specifically mentioned but who have any role or responsibility related to the built environment could be identified as built environment professionals.

## Structure



*See the above target group (built environment professionals) \**

**The 1<sup>st</sup> tier aims to provide knowledge related to the basics of climate science and climate change.**

	General Competency	Sub competencies
<b>(TIER 01) Basic Competencies</b>		
<b>1</b>	Understand the basics of climate science and climate change	<ul style="list-style-type: none"> <li>• Understand the uncertainties of sea level rise and other climate components.</li> <li>• Comprehend climate variability and change.</li> <li>• Identify and understand multidisciplinary areas related to climate change, its causes and effects, and their spatial and temporal changes.</li> <li>• Understand the compound effects of climate change and the importance of risk and vulnerability assessment.</li> <li>• Assess climate-related disasters, with a disaster risk management approach.</li> <li>• Identify the inter-relationship between environmental sustainability, climate change, growth, development, and social and economic issues.</li> <li>• Understand the impacts of climate change on coastal environments</li> </ul>
<b>2</b>	Comprehend new trends and predictions on climate change adaptation	<ul style="list-style-type: none"> <li>• Understand the importance of quality control, complete and representative data in climate change studies, and decision-making and planning</li> <li>• Understand the uncertainties of climate impact predictions and measures to reduce uncertainties.</li> <li>• Incorporate how predictions on sea level rise and coastal impacts can be used in decision-making and planning.</li> <li>• Identify global and regional Early Warning (EW) Systems and service providers for EW dissemination, climate change mitigation, and adaptations</li> </ul>
<b>3</b>	Understand climate change mitigation and adaptation	<ul style="list-style-type: none"> <li>• Demonstrate the differences between mitigation and adaptation</li> <li>• Identify mitigation measures and adaptation strategies.</li> <li>• Identify the importance of technology in climate mitigation and adaptation.</li> <li>• Identify nature-based solutions and ecosystem-based solutions vs. grey solutions</li> <li>• Understand indigenous knowledge and knowledge of local communities on prevention of climate-related impacts (knowledge and experiences of local people on adaptation to Climate Change and their applicability.)</li> </ul>

4	Identify stakeholders (Actors) in climate change adaptation and mitigation and their responsibilities	<ul style="list-style-type: none"> <li>• Identify stakeholders (Actors) in climate change adaptation and mitigation.</li> <li>• Comprehend their responsibilities, challenges, constraints, and suggestions.</li> <li>• Understand the importance of an integrated disaster risk management plan for all stakeholders.</li> <li>• Realize the thinking and behavioral patterns of people</li> </ul>
5	Understand the built environment and its relationship to climate change	<ul style="list-style-type: none"> <li>• Identify built environment impacts on climate change and vice versa (impacts to climate change and how the built environment is impacted by climate change)</li> <li>• Comprehend the need for mitigation and adaptation in the context of recent climate change from sectorial and holistic perspectives.</li> <li>• Understand indigenous knowledge related to the built environment</li> </ul>

**The 2<sup>nd</sup> tier aims to provide knowledge on professional capabilities which assists in the successful executions of climate change adaptation.**

	General Competency	Sub competencies
<b>(TIER02) Intermediate Competencies</b>		
<b>1</b>	Use research methods in climate research	<ul style="list-style-type: none"> <li>• Understand action research in climate change adaptation</li> <li>• Comprehend research techniques.</li> <li>• Comprehend location-specific useable research techniques</li> <li>• Understand research proposal writing</li> </ul>
<b>2</b>	Use technical tools in climate change adaptation	<ul style="list-style-type: none"> <li>• Understand the uncertainties of climate change modeling</li> <li>• Comprehend the ways of using technical tools, and terminologies in climate adaptation decision-making and planning.</li> <li>• Understand different methods used for climate change modeling, climate change impact prediction, and risk assessment.</li> </ul>
<b>3</b>	Comprehend the environmental, social, financial, and governance phenomenon in climate change adaptation	<ul style="list-style-type: none"> <li>• Application of interdisciplinary and multidisciplinary approaches in climate change adaptation</li> <li>• Identify global frameworks and local regulations which address climate change in the planning process.</li> <li>• Understand marketing mileage that economic value addition that can be given for tourism-related built environment.</li> <li>• Environmental regulations, legislation, and tools</li> <li>• Environmental ethics and responsibilities.</li> <li>• Comprehend the basics of green financing and climate financing.</li> </ul>
<b>4</b>	Understand the communication	<ul style="list-style-type: none"> <li>• Identify communication approaches</li> <li>• Understand negotiation techniques of climate change in different contexts</li> </ul>

	strategies in climate change adaptation	
5	Understand the importance of human resource management in Climate Change Adaptation (CCA)	<ul style="list-style-type: none"><li>• Understand the basics of human resources management in CCA</li><li>• Knowledge of the administrative system</li><li>• Environmental Management leadership</li></ul>

The 3rd tier aims to provide knowledge on planning in the built environment to tackle climate change.

	General Competency	Sub competencies
<b>(TIER03) Advanced Competencies</b>		
<b>1</b>	Incorporate the Role of built environment professionals to tackle climate change	<ul style="list-style-type: none"> <li>• Incorporate policy, legal, and regulatory frameworks in the built environment and local needs to move towards CCA.</li> <li>• Identify the responsibilities, challenges, and constraints of built environment professionals and provide suggestions for challenges and constraints.</li> <li>• Address sociological, environmental, and economic needs in planning.</li> <li>• Understand contextual differences (Industrialized countries vs. developing countries)</li> <li>• Transdisciplinary approaches, integrating knowledge and skills from different stakeholders in design and construction.</li> <li>• Methods related to fulfilling human needs while conserving nature.</li> <li>• Understand the importance of bottom-to-top and top to bottom approaches in CCA.</li> <li>• Understand the functions and components of the natural environment in a particular area before making decisions.</li> </ul>
<b>2</b>	Understand Environment-friendly planning	<ul style="list-style-type: none"> <li>• Basic understanding of the solar cycle and planning</li> <li>• Understand and practical usage of green building concepts.</li> <li>• Application of green energies and energy-related adaptations</li> <li>• Use of environmentally friendly planning, building materials, sustainable construction, disaster-resilient infrastructure, and techniques</li> <li>• Understand the design and technical details to achieve energy efficiency during the design and construction period and the building usage period (post-occupancy).</li> <li>• Basic understanding of the importance of Analog Forestry as a nature-friendly environment restoration method (an approach to ecological</li> </ul>

		restoration which uses natural forests as guides to create ecologically stable and socio-economically productive landscapes.)
<b>3</b>	Incorporate disaster risk reduction in the construction industry	<ul style="list-style-type: none"> <li>• Understand key regulations related to the built environment and CCA</li> <li>• Understand stakeholder engagement in construction</li> <li>• Adopt building codes and safety measurements in construction.</li> <li>• Prioritize industrial safety, human rights, and health.</li> <li>• Embrace legal backgrounds related to the environment before the construction</li> <li>• Understand institutional disaster management planning and business continuity management plan</li> </ul>
<b>4</b>	Incorporate development planning in different contexts	<ul style="list-style-type: none"> <li>• Understand the importance of climate resilience planning.</li> <li>• Adopt climate change adaptation strategies in city planning, integration of environment and climate priorities into development planning</li> <li>• Understand climate-related DRR and the multi-hazard approach in planning.</li> <li>• Application of environmental sustainability in planning</li> <li>• Incorporate servitude rights in land use planning together with development activities.</li> <li>• Use of new trends and technologies in planning and designing to tackle climate change</li> <li>• Good practices in construction and facilities management to tackle climate change</li> <li>• Understand integrated land-use planning and construction planning. (Inter-relationships between environmental sustainability, climate change, growth, development, poverty, social and economic issues)</li> <li>• Understand design and resettlement, relocation criteria</li> </ul>
<b>5</b>	Incorporate household approaches in	<ul style="list-style-type: none"> <li>• Application of household plans and designs in climate change adaptation</li> <li>• Understand the sociology of housing</li> <li>• Identify types of housing and specific planning and design considerations</li> </ul>



	climate change adaptation	<ul style="list-style-type: none"> <li>• Understand refurbishment of existing housing</li> <li>• Understand the importance of having an insurance scheme</li> </ul>
<b>6</b>	Incorporate how construction and facilities management address climate change	<ul style="list-style-type: none"> <li>• Understand the organization and management of construction and maintenance of the built environment.</li> <li>• Use of green construction materials and resources (green materials/low co2 emission)</li> <li>• Create employment and livelihood opportunities (green job creation)</li> <li>• Project management</li> <li>• Procurement, contracts, and project delivery</li> <li>• Cost estimating, cost control, and contract management</li> <li>• Risk financing and risk insurance</li> <li>• Housing construction and maintenance</li> <li>• Approving plans</li> <li>• Stakeholder consultation and participation in community engagement in construction and maintenance</li> <li>• Understand the importance of empowering the media sector to promote community participation and engagement in construction and maintenance</li> </ul>
<b>7</b>	Incorporate Planning in coastal contexts	<ul style="list-style-type: none"> <li>• Understand coastal zone management planning, coastal resource mapping and coastal risk mapping</li> <li>• Coastal adaptation strategies</li> <li>• Identify climate change adaptation strategies in coastal areas</li> <li>• Case studies and best practices</li> </ul>