

# BEACON

## Output 07

A competency framework for built environment professionals to tackle climate change in coastal regions.

Final Report

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# **1.Introduction**

This report is an outcome of the BEACON (Built Environment Learning for Climate Adaptation) project, a pioneering endeavor funded by the Erasmus+ programme of the European Union. The core objective of the BEACON project is to cultivate competencies in climate change adaptation through the development of an innovative, trans-disciplinary, and research-based learning approach. Focused on coastal regions, which face unique challenges due to climate change, this project sets out to identify the specific impact of climate change on the built environment in these vulnerable areas. In doing so, it aims to create a comprehensive framework that seamlessly integrates the requirements of the Paris Agreement, the Sustainable Development Goals (SDGs), and the Sendai Framework for Disaster Risk Reduction 2015–2030 (SFDRR).

By recognizing the opportunities for climate adaptation within this coherent framework, the BEACON project endeavors to address skills gaps in climate adaptation and foster sustainable practices in the coastal built environment. Through the development of a trans-disciplinary and innovative research-based learning approach, this project seeks to empower communities and professionals to effectively tackle the challenges of climate change and build a resilient future for their coastal environments. The subsequent sections of this report delve into the major objectives and key findings of the BEACON project, presenting valuable insights for advancing climate resilience in coastal regions.

## **1.1 Introduction to Output 07**

This report is titled "A Competency Framework for Built Environment Professionals to Address Climate Change in Coastal Regions". The primary aim of Output 07 is to create a comprehensive competency framework tailored for professionals operating within the built environment sector. With this competency framework as a foundation, the project endeavors to establish an innovative and trans-disciplinary research-based learning platform, focusing on enhancing competencies in climate change adaptation. The development of the competency framework was guided by the following sub-objectives:

1. Identifying and defining the essential competencies required for professionals in the built environment sector to effectively address climate change in coastal regions.
2. Developing a validated competency framework to ensure its efficacy and relevance in real-world scenarios.

## **1.2 Methodology**

### **1.2.1 Types of data**

The study utilized both primary and secondary data for its research. Secondary data was obtained from output 3 and 4 of the project, allowing the researchers to identify the specific built environment professionals for whom the report was developed. It also helped in pinpointing key skill and knowledge gaps in the field. Additionally, the secondary data played a crucial role in forming a panel of experts who would later review and validate the draft competency framework.

On the other hand, primary data was collected directly from an expert panel of built environment professionals. The primary data collection also enabled the experts to critique and validate the draft competency framework, ensuring its robustness and effectiveness.

By combining both primary and secondary data, the study was able to develop a comprehensive and validated competency framework tailored to address climate change in coastal regions effectively. The use of expert insights and existing project outputs added depth and credibility to the findings, making the resulting framework a valuable resource for built environment professionals in their efforts to tackle climate change challenges.

### **1.2.2 Data collection techniques**

#### **Secondary data collection techniques:**

Secondary data were collected using a systematic review of the key project outputs, closely studying the results from output 3 and 4 to identify the Built Environment professionals and key gaps. Additionally, a literature review was conducted to identify various types of competency development frameworks and determine the most appropriate type of framework for the project.

By integrating the findings from these reviews, the study gathered valuable insights and selected the most suitable approach to develop the competency framework for addressing climate change in coastal regions.

**Primary data collection techniques:**

The study utilized an online questionnaire to collect primary data from the aforementioned panel of experts. The Built Environment experts represented different fields affiliated with the built environment, including academia, management, engineering, architecture, and government officials, among others. The experts were nominated by partner universities of the project.

Table 1: Panel of experts

Nominating University	Expert
1. University of Colombo, Sri Lanka	<ul style="list-style-type: none"> <li>• Deputy Director General - Sri Lanka Tourism Development Board</li> <li>• Assistant Director - Disaster Management Centre</li> <li>• Former Scientist - National Building Research Organization</li> <li>• Senior Lecturer - Meteorology and Climatology)</li> <li>• Senior Lecturer (Bio geography)</li> <li>• Civil Engineer</li> <li>• Sociologist</li> </ul>
2. University of Huddersfield, United Kingdom	<ul style="list-style-type: none"> <li>• Sustainability Manager</li> <li>• Lecturer</li> <li>• Technical Specialist</li> <li>• Technical Coordinator</li> <li>• Project Engineer</li> </ul>
3. University of Malta, Malta	<ul style="list-style-type: none"> <li>• Engineer</li> <li>• Geoscientist</li> <li>• Architect</li> <li>• Education</li> <li>• Renewable Energy and Project Manager</li> <li>• Urban Planner</li> </ul>

<p>4. University of Lund, Sweden</p>	<ul style="list-style-type: none"> <li>• In charge of climate adaptation</li> <li>• Project leader Gothenburg region on climate adaptation</li> <li>• National climate change adaptation in the built environment coordinator</li> <li>• Climate adaptation coordinator, County Admin board</li> <li>• Researcher working on climate adaptation</li> <li>• Climate adaptation officer -holistic long-term solutions</li> <li>• Researcher</li> <li>• Water strategist and planning and building legislation expert</li> </ul>
<p>5. University of Moratuwa, Sri Lanka</p>	<ul style="list-style-type: none"> <li>• Construction Planner and Project Manager</li> <li>• Procurement and Logistics specialist.</li> <li>• Disaster Management</li> <li>• Architect</li> <li>• Urban Planner</li> <li>• Civil Engineer</li> </ul>
<p>6. IHCantabria - Universidad de Cantabria, Spain</p>	<ul style="list-style-type: none"> <li>• Construction Planner and Project Manager</li> <li>• Procurement and Logistics specialist.</li> <li>• Disaster Management</li> <li>• Architect</li> <li>• Urban Planner</li> <li>• Civil Engineering</li> </ul>

Source: Own data, 2023

The questionnaire provided detailed information about the overall framework, as well as specific details regarding basic, intermediate, and advanced competencies proposed by the draft framework. Additionally, it included inter-connected questions regarding the appropriateness of each tier, each competency, and their components. By gathering feedback and insights from these experts through the questionnaire, the study aimed to rigorously assess and validate the competency framework, ensuring its relevance and effectiveness for addressing climate change in coastal regions.

### **1.3 Data analysis**

The data collected from the online questionnaire was analyzed using the Statistical Package for Social Sciences (SPSS), which facilitated statistical analysis and quantitative interpretation of the responses. On the other hand, the data gathered from secondary sources was analyzed using the thematic analysis method. This qualitative approach involved identifying themes and patterns within the data, providing a deeper understanding of the information obtained from various sources, such as journal articles, research papers, and reports. By employing both quantitative and qualitative analysis methods, the study was able to gain comprehensive insights and draw meaningful conclusions to support the development and validation of the competency framework for climate change adaptation in coastal regions.



## 2. Findings

### 2.1 Introduction

This chapter of the report discusses the findings derived from secondary data sources. Firstly, the chapter delineates the key competencies required for Built Environment professionals to effectively counter the impacts of climate change on the coastal regions of Sri Lanka. It thoroughly examines the process of identifying skill and knowledge gaps, drawing insights from project outputs 3,4,5 and 6. Secondly, the chapter illustrates the results obtained from the analysis of different types of competency frameworks and the selection of the most appropriate model for developing competency frameworks.

### 2.2 Identifying skill and knowledge gaps

In Outputs 3, 4, 5, and 6, significant skill gaps among built environment professionals were identified. According to the report from Output 6, these skill gaps were evident in all partnering countries, and they were duly highlighted within their respective regions. These skills and knowledge gaps are discussed in the Table 2.1 below.

Table 2: Skill and knowledge gaps

<b>Skill Gaps</b>	<b>Knowledge Gaps</b>
1.Communication skills <b>Negotiation skills, conveying decisions</b>	1. Application of theoretical knowledge and vice versa
2.Technical skills <b>Computer modeling, mapping, programming etc.</b>	2. Green building concepts Radiant floors/Gray water recycling/Solar power/energy efficient window systems/municipal waste management
3. Language skills <b>English language proficiency</b>	3. Climate change & Mitigation and adaptation knowledge

	<b>Climate financing, Sea Level Rise (SLR), global warming, greenhouse effect, heat island effect, alternation of ocean currents/difference between adaptation and mitigation, etc.</b>
4.Integrated working skills  <b>Working as a team/group, team management, decision making etc.</b>	4.Research and investigation  <b>Ethical considerations, research methodology, sample selection, data collection methods and techniques, data analysis, analytical tools, data presentation, academic writing, etc.</b>
	5.Localization of mitigation and adaptation measures and strategies
	6.Legislation, policies, national plans on climate change

Source: Output 6, 2022

**2.3 Developing Competencies**

Based on the identified skills and knowledge gaps, the research team developed a comprehensive series of competencies. These competencies were carefully crafted to address the specific needs and challenges faced by Built Environment professionals in tackling climate change impacts on coastal regions.

**1. Improved communication - negotiation, dissemination**

Improved communication is a vital competency for Built Environment professionals in the context of climate change adaptation. It denotes the ability to effectively convey ideas, information, and knowledge to various stakeholders, both within and outside the profession. This competency involves clear and concise articulation of complex concepts related to climate change impacts, mitigation strategies, and adaptation measures, ensuring that the intended message is comprehensible to diverse audiences.

Key components or elements of improved communication encompass strong verbal and written communication skills, active listening, and the capacity to adapt the communication style to suit the audience. It also involves utilizing various communication channels, such as presentations, reports, visual aids, and digital platforms, to disseminate information efficiently. Moreover, the competency extends to fostering constructive dialogue and encouraging open discussions among team members, clients, policymakers, and communities to build collaboration and understanding.

The usefulness of improved communication cannot be overstated. Effective communication facilitates knowledge sharing and exchange of best practices among professionals, enabling them to stay updated with the latest advancements in climate change adaptation. It empowers Built Environment professionals to engage with stakeholders, including local communities and government authorities, in a way that garners support for sustainable initiatives and builds trust in climate resilience measures. Additionally, improved communication contributes to more robust decision-making processes, as it allows professionals to present data, evidence, and recommendations clearly and persuasively, ensuring that climate change adaptation efforts are well-informed and effective. Overall, this competency plays a crucial role in enhancing collaboration, fostering resilience, and promoting positive change in the face of climate challenges within coastal regions.

## **2. Advance digital literacy - computer modeling, mapping, programming**

The competency of advanced digital literacy, encompassing computer modeling, mapping, and programming, holds significant importance for Built Environment professionals in the realm of climate change adaptation. This competency involves proficiency in utilizing advanced digital tools and technologies to analyze, model, and map various aspects related to climate change impacts and adaptation strategies. It empowers professionals to leverage data-driven insights and simulations to make informed decisions and devise effective climate resilience measures.

Its key components or elements include expertise in computer modeling software, Geographic Information Systems (GIS), data analysis tools, and programming languages. Proficient use of these tools allows professionals to simulate and visualize potential climate scenarios, analyze spatial data, and develop data-driven solutions for climate adaptation in coastal regions.

Additionally, it enables the integration of complex datasets, fostering a holistic understanding of the multifaceted challenges posed by climate change.

As a competency it equips Built Environment professionals with the capability to create sophisticated climate models and predictive simulations, enabling them to assess the potential impacts of climate change on coastal areas accurately. Through advanced mapping techniques, professionals can identify vulnerable regions, assess risks, and design targeted adaptation strategies to mitigate climate-related risks effectively. Moreover, the competency enables professionals to develop innovative technological solutions, such as smart infrastructure and real-time monitoring systems, which contribute to building climate-resilient coastal environments.

### **3. Fluency in global languages – English language proficiency**

The competency of English language literacy is an essential skill for Built Environment professionals, particularly when dealing with computer modeling, mapping, and programming in the context of climate change adaptation. Improved communication through English language proficiency denotes the ability to articulate complex ideas, technical concepts, and data insights effectively in written and verbal forms, using English as the medium of communication. This competency ensures that professionals can communicate with colleagues, stakeholders, and international partners, fostering collaboration and knowledge exchange in a global context.

Key components of English language literacy encompass strong language comprehension, accurate grammar and vocabulary usage, and the capacity to convey information concisely and coherently. This proficiency enables Built Environment professionals to write detailed reports, research papers, and proposals that are clear and easily understandable by diverse audiences, including international peers and funding agencies. Additionally, effective verbal communication skills empower professionals to present their findings confidently and participate in discussions, conferences, and meetings on climate change adaptation, enhancing their influence and impact on the global stage.

In a world interconnected by digital platforms and global collaborations, English serves as a common language for knowledge sharing and dissemination. Professionals proficient in English can access a vast pool of research, resources, and best practices, keeping abreast of the latest advancements in computer modeling, mapping, and programming for climate change adaptation.

Furthermore, it facilitates cross-cultural exchanges, enabling professionals to collaborate with experts from diverse backgrounds and learn from different perspectives, thus enriching their climate resilience efforts in coastal regions worldwide.

#### **4. Integrated working skills - teamwork, team management etc.**

The competency of integrated working skills, encompassing teamwork and team management, in conjunction with computer modeling, mapping, and programming, is indispensable for Built Environment professionals engaged in climate change adaptation. Improved communication within this competency denotes the ability to foster seamless collaboration and effective coordination within multidisciplinary teams working on climate resilience projects. It involves clear and open communication channels, facilitating the exchange of ideas, sharing of data insights, and addressing challenges collectively.

Key components of integrated working skills include the capacity to promote teamwork, build strong interpersonal relationships, and manage diverse teams efficiently. Professionals adept at team management can create a collaborative and inclusive work environment, encouraging each team member to contribute their expertise and unique perspectives. Effective communication within the team ensures that information flows smoothly, leading to streamlined decision-making processes and the timely implementation of climate adaptation strategies.

In complex climate change adaptation projects, teamwork is essential for harnessing diverse skill sets and knowledge to develop comprehensive solutions. With improved communication and team management, professionals can effectively integrate computer modeling, mapping, and programming expertise into their collective efforts. This seamless collaboration enhances the accuracy and precision of climate impact assessments and empowers professionals to design innovative and data-driven adaptation measures for coastal regions.

#### **5. Comprehensive knowledge on climate change**

The competency of Comprehensive Knowledge on Climate Change is crucial for Built Environment professionals engaged in climate change adaptation efforts. Improved communication within this competency denotes the ability to effectively convey and share in-depth knowledge and insights about climate change and its impacts on coastal regions. It involves the skill of presenting complex scientific concepts in a clear and accessible manner, making the

information understandable to various stakeholders, including policymakers, communities, and other professionals.

Key components of Improved Communication within the context of Comprehensive Knowledge on Climate Change include the capacity to translate scientific research and data into practical applications. Professionals with this competency can communicate the latest findings and best practices related to climate change adaptation, helping stakeholders grasp the urgency and importance of resilience measures in coastal areas. Moreover, the ability to engage in informative and persuasive communication fosters a shared understanding of climate change challenges, leading to better-informed decisions and a more concerted effort towards sustainable solutions.

Built Environment professionals equipped with comprehensive knowledge on climate change can act as effective advocates for climate resilience, championing innovative strategies to address environmental challenges. By communicating effectively, they can raise awareness, build consensus, and mobilize support for initiatives that promote climate adaptation and mitigation. Furthermore, the competency empowers professionals to engage in evidence-based dialogue, collaborating with stakeholders to design adaptive measures tailored to the specific needs of coastal regions.

## **6. Comprehensive knowledge on research and investigation**

Comprehensive knowledge on research and investigation is a vital competency for built environment professionals, encompassing a broad range of skills and expertise. This competency denotes the ability to conduct thorough and systematic research and investigation related to various aspects of the built environment, including architecture, construction, urban planning, and environmental sustainability. It goes beyond surface-level understanding and requires professionals to delve into complex issues, analyze data, and draw meaningful conclusions.

The key components or elements of this competency involve proficiency in various research methodologies, data collection techniques, data analysis, and critical thinking. Built environment professionals must possess the capability to identify research gaps, formulate research questions, and design appropriate methodologies to address these questions effectively. Moreover, they

should be adept at using both quantitative and qualitative research approaches, as well as having an understanding of how to interpret and present research findings accurately.

This competency directly impacts the quality and sustainability of the built environment. Through comprehensive research and investigation, professionals can gain valuable insights into the latest trends, best practices, and innovative solutions within the industry. They can identify potential challenges and risks, allowing for informed decision-making and proactive problem-solving. Moreover, this competency enables professionals to contribute to the advancement of the field through the generation of new knowledge, theories, and practical applications. Ultimately, a comprehensive understanding of research and investigation empowers built environment professionals to create more efficient, safe, and environmentally conscious projects and developments, thus benefiting society as a whole.

By honing these competencies, Built Environment professionals can continue to champion climate resilience, advocate for evidence-based approaches, and spearhead initiatives that ensure a more sustainable and secure future for both current and future generations. As they engage in constructive dialogue, leverage technology, and conduct comprehensive research, these professionals play a vital role in shaping a climate-resilient built environment that can withstand the challenges posed by climate change in the years to come.

#### **2.4 Reviewing existing frameworks**

As discussed previously, another objective of the outcome is to explore the existing competency frameworks for built environmental professionals. This exploration aimed to gain a comprehensive understanding of the various competency models currently available within the field of climate change adaptation and its relevance to the built environment. By delving into these frameworks in detail, the researchers achieved;

1. Identification of sub competencies: An expectation was to identify and extract relevant sub-competencies that are specifically tailored to the challenges of climate change adaptation within the built environment sector. By analyzing different frameworks, it was expected to pinpoint the sub skills and expertise required for professionals to effectively address climate-related issues and develop sustainable solutions.

2. Identification of the suitability for the current Project: Another key expectation was to assess the suitability of each framework for the objectives and scope of the current project. It was crucial to determine whether the identified competency models aligned with the project's focus on coastal regions and the unique challenges they face in adapting to climate change.
3. Identification of a holistic approach: The exploration of competency frameworks aimed to seek a comprehensive and well-rounded approach that covers a broad range of competencies. The expectation was to find frameworks that encompass various dimensions, including technical, communication, leadership, teamwork, and research skills, providing a holistic view of the required expertise for climate change adaptation in the built environment.
4. Attain clarity and applicability: It was expected that the explored frameworks would provide clear and practical descriptions of each competency. The aim was to find frameworks that are easy to understand, implement, and apply within the context of the current project's objectives and the broader field of climate change adaptation.
5. Proven Efficacy: The exploration sought to identify competency frameworks that have been successfully utilized and validated in real-world scenarios by built environmental professionals. This expectation aimed to ensure that the chosen framework has a track record of enhancing professionals' capabilities and contributing to tangible and sustainable outcomes in climate change adaptation efforts.

#### **2.4.1 Climate Change Adaptation Competency Framework**

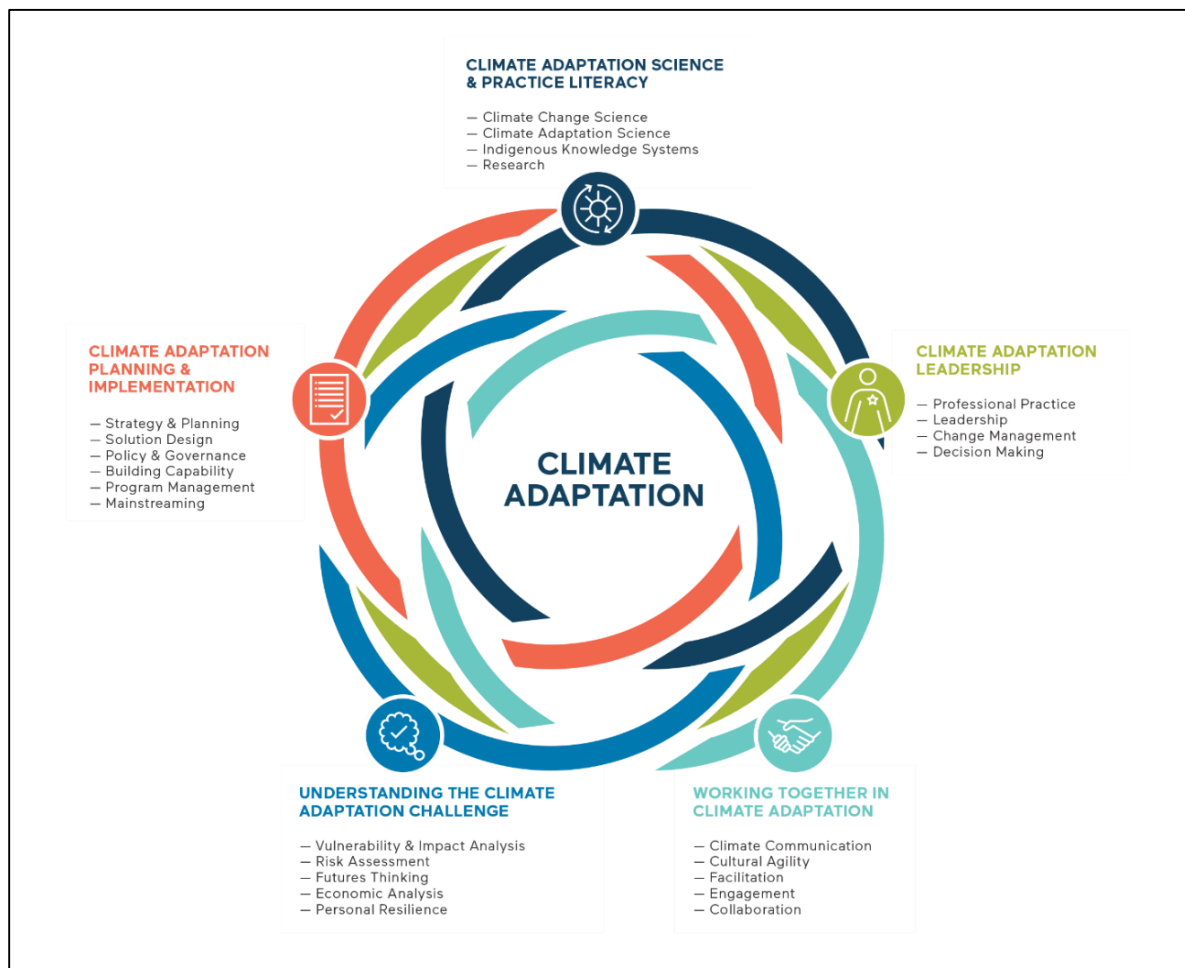
The Adaptation Learning Network Project, led by Dr. Robin Cox and the Resilience by Design (RbD) Lab of Royal Roads University developed this competency framework. It was funded by Natural Resources Canada and the BC Ministry of Environment and Climate Change Strategy. The design and development process of the Climate Adaptation Competency Framework has involved the contributions and insights of many subject matter experts and practitioners of climate adaptation, as well as other parties with a vested interest in the use of such a framework.



## Objectives of The Competency Framework

The Climate Adaptation Competency Framework attempts to illustrate the different breadth of competencies necessary to deal with and prepare for a climate change-altered present and future. It details the central competencies required by professional adaptation specialists and individuals working in a profession or field in which climate concerns and climate adaptation are being integrated. It provides individuals, managers, and teams with a shared understanding of what competencies are necessary for leading, delivering, and implementing climate adaptation plans, strategies, policies, programs, and projects.

Figure 1: Climate Change Adaptation Competency Framework



Source: Adaptation learning network, 2021

## **Domains of The Framework**

### **1. Climate Adaptation Science & Practice Literacy**

Climate adaptation requires a foundation of knowledge or literacy in a number of scientific areas and from diverse worldviews and perspectives. These include understanding and being able to bridge, and apply knowledge drawn from both Western climate science and climate models and Indigenous knowledge systems. It requires understanding and an ability to apply systems thinking and climate adaptation science to a range of issues and opportunities.

### **2. Climate Adaptation Leadership**

Effective leadership in the context of climate adaptation is adaptive, flexible, emotionally intelligent and culturally informed. This orientation to leadership recognizes the need for collaboration and cooperation amongst diverse rights-holders and stakeholders and is guided by principles and practices of culturally appropriate engagement, reconciliation, change management and adaptive decision-making processes.

### **3. Working Together in Climate Adaptation**

Problem-solving in the context of complex or wicked problems such as climate change is fundamentally collaborative, relying on the insights and wisdom of multiple rights-holders and stakeholders, and generative, culturally safe dialogue and learning. Working in this space requires strong science-communication skills (Indigenous and Western science); the ability to engage diverse parties; and to foster a sense of commitment and ownership of the problem that translates into shared understanding and action.

### **4. Understanding the Climate Adaptation Challenge**

Understanding a climate adaptation challenge requires an orientation to problem-solving that is grounded in the understanding of the uncertainty, unpredictability and the complexity of climate change and its impact on human (social, built, economic) and ecological systems. This approach to climate challenges understands that there is no single, definitive solution, rather that there are solutions that are better or worse or more or less adaptive or even maladaptive. Each solution may result in new, sometimes unanticipated consequences. Working with this kind of complexity

requires a systematic and holistic analysis of the risks and impacts of both the problem and the solutions; assessing who and what is, or will be, most vulnerable; and iterating and learning from adaptation measures that are implemented.

## **5. Climate Adaptation Planning & Implementation**

As with unpacking the problem, the generation and implementation of climate adaptation measures relies on a systematic, holistic, and inclusive approach that is guided by an appreciation of the goal of maximizing long-term social and ecological resilience, biodiversity, economic and financial viability and, finally, mainstreaming adaptation. Climate adaptation planning and implementation require being responsive to recognized policies, standards, regulations and agreements and applying a collaborative and outcomes-based approach that supports ongoing learning and iteration of ideas and strategies that flow from systematic monitoring and evaluation.

The framework carries information on the steps involved with implementing the project and developing proficiency scale and role descriptions. The report is available for download at;

[https://adaptationlearningnetwork.com/sites/weadapt.org/files/aln-competencyframework\\_2021\\_1.pdf](https://adaptationlearningnetwork.com/sites/weadapt.org/files/aln-competencyframework_2021_1.pdf)

### **2.4.2 Advanced Manufacturing Competency Model**

This model was developed by the United States Department of Labour for the manufacturing sector. This competency model is descriptive, rather than process-oriented, and shows the relationship between distinctly different attributes, or competencies, that are necessary to ensure professional success.

The Advanced Manufacturing Competency Model is depicted in a pyramid graph with nine tiers. This shape illustrates how occupational and industry competencies are built on the foundation of personal effectiveness, academic, and workplace competencies. Each tier is comprised of blocks representing the skills, knowledge, and abilities essential for successful performance in the Advanced Manufacturing industry. The competencies at the base of the model apply to many industries and as a user moves up the model, the competencies become industry and occupation specific. However, the graph is not intended to represent a sequence of competency attainment or to suggest that certain competencies are of greater value than others. The graph is accompanied by a table which contains definitions and associated key behaviors for each competency block.

## Tiers

### 1. Tier 1 – Personal Effectiveness Competencies

This tier represents personal attributes or "soft skills" essential for all roles of life. Personal effectiveness competencies generally are learned in the home or community and reinforced at the school or workplace.

### 2. Tier 2 - Academic Competencies

Academic competencies are critical competencies primarily learned in a school setting. They include cognitive functions and thinking styles that are likely to apply to most industries and occupations.

### 3. Tier 3 - Workplace Competencies

Workplace Competencies represent motives and traits, as well as interpersonal and self-management styles. They generally apply to many occupations and industries.

### 4. Tier 4 - Industry-Wide Technical Competencies

Wide Technical Competencies represent the knowledge and skills that are common across sectors within an industry. These technical competencies build on, but are more specific than, the competencies represented on lower tiers.

### 5. Tier 5 - Industry- Sector Technical Competencies

Technical Competencies represent a sub-set of industry technical competencies that are specific to an industry sector.

### 6. Tiers 6 through 9

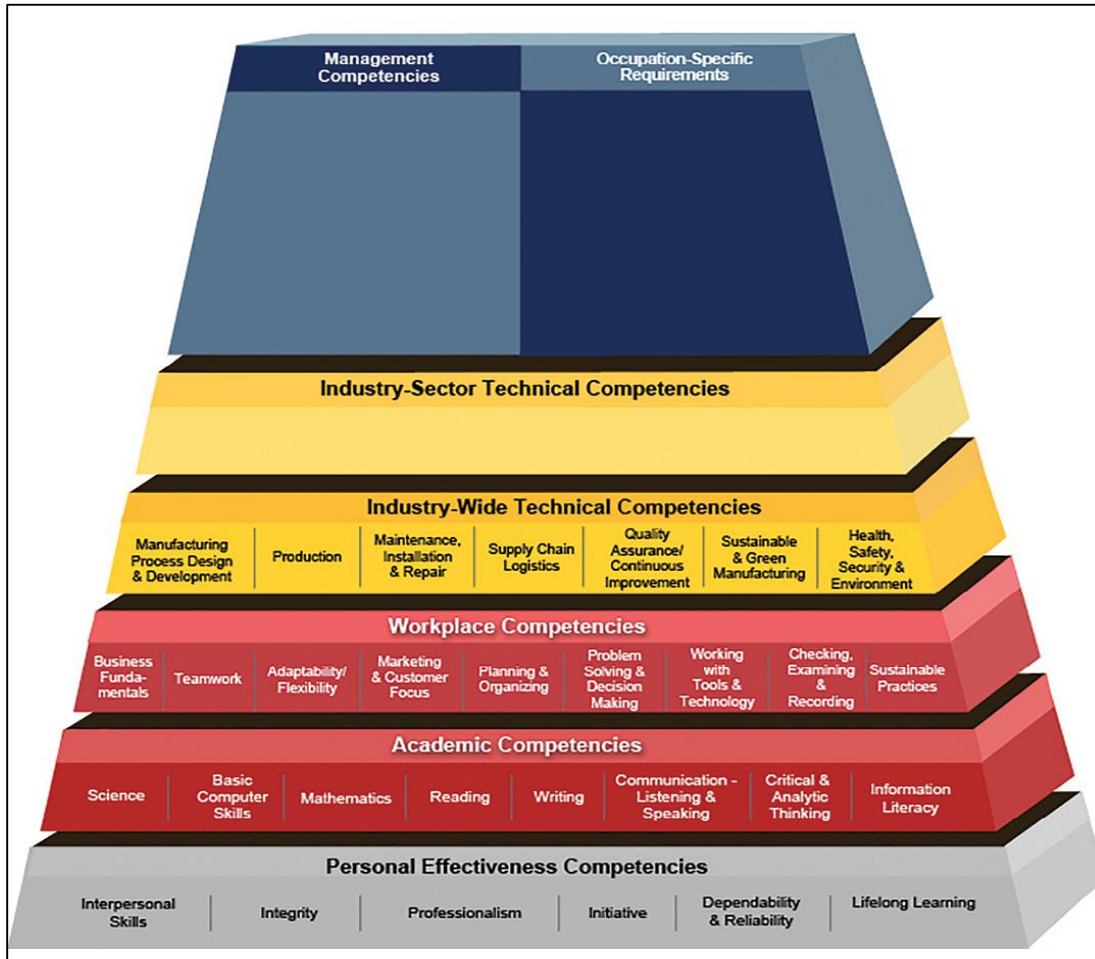
These represent the specializations that occur within specific occupations ~~within~~ of an industry.

Information on occupational competencies is available at <https://www.onetonline.org/>

The framework is available for download at:

[https://www.careeronestop.org/competencymodel/Info\\_Documents/Advanced-Manufacturing.pdf](https://www.careeronestop.org/competencymodel/Info_Documents/Advanced-Manufacturing.pdf)

Figure 2: Advance manufacturing competency model



Source: United States Department of Labour, 2022

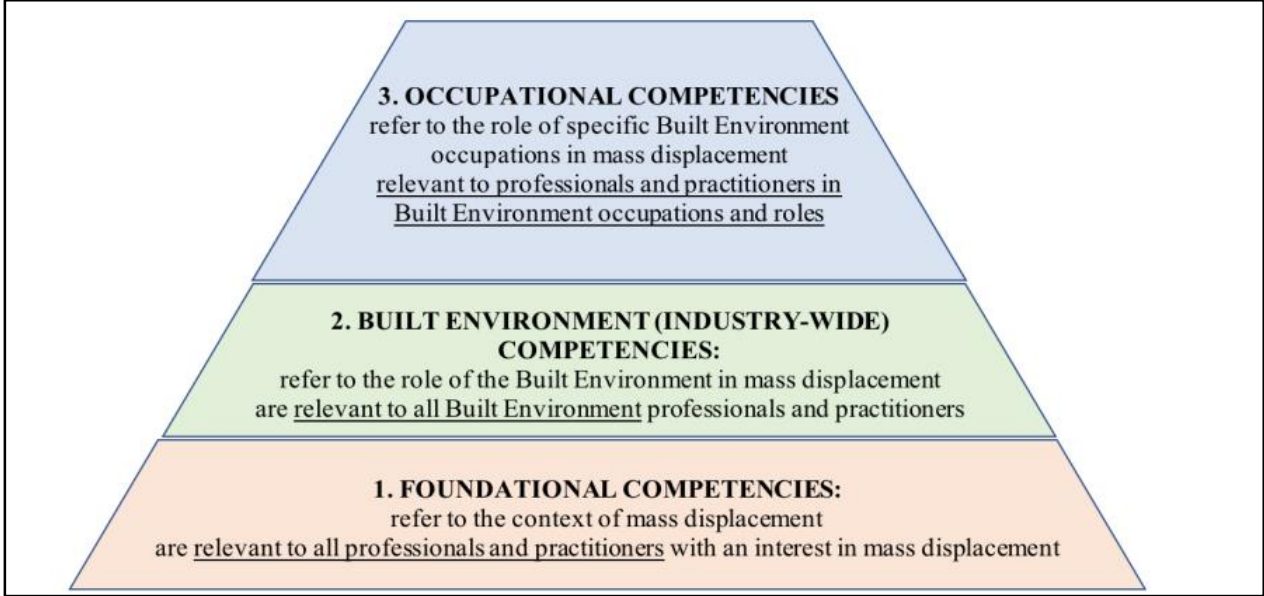
### 2.4.3 REGARD Competency Framework for Built Environment Professionals

This competency framework was developed under the project called REGARD, which stands for Rebuilding After Displacement. The target group of the competency framework was Built Environment professionals, and this was aimed at addressing the needs of the host and the displaced communities. The REGARD framework adopted the Missouri Green Industry Competency model in developing the Regard competency framework.

This framework consists of three tiers, which address the foundational competencies, industry-wide competencies, and occupational competencies. The 1<sup>st</sup> tier refers to the context of mass displacement while the 2<sup>nd</sup> tier refers to the role of the built environment professionals. Furthermore, the 3<sup>rd</sup> tier refers to the role of certain built environment professions in mass

displacement, relevant to the professionals in specific built environment occupations. The structure of the competency framework is as follows.

Figure 3: Regard Competency Framework



Source: Regard Output 4 report, 2023

**Tier 1**

Tier 1 of the competency framework comprises foundational knowledge and skills necessary for professionals addressing displacement. It encompasses understanding the causes, contexts, and dynamics of mass displacement, and familiarizing oneself with legal, policy, and institutional frameworks governing displacement. Professionals must grasp the societal impacts on displaced populations and engage with diverse stakeholders involved. Additionally, they should address specific challenges such as language barriers, healthcare access, and discrimination. Social cohesion, cultural awareness, and integration play a crucial role in facilitating successful interventions. Moreover, cross-cutting issues like resilience and sustainable development are emphasized to ensure long-term solutions. By drawing lessons from past case studies, professionals can continuously improve their approaches to support and integrate displaced populations effectively. This foundational tier equips them with the necessary groundwork to navigate the complexities of mass displacement and work towards sustainable and inclusive solutions.

## **Tier 2**

Tier 2 of the competency framework for mass displacement centers on integrating competencies to address the challenges posed by displacement. Professionals need to understand the contextual differences in displacement causes, scales, and dynamics between industrialized and developing countries. Additionally, they must navigate the relevant policy, legal, and regulatory frameworks, including land issues, building codes, and regional strategies. Cross-cutting issues are emphasized in the second tier, encompassing disaster resilience, green and sustainable solutions, and inclusivity for vulnerable groups in the Built Environment. Managing interventions involves economic and financial considerations, stakeholder engagement, and adherence to ethical and professional standards. Housing and infrastructure components cover various housing types and stages, the significance of housing for social cohesion and inclusivity, and the importance of essential services such as water, sanitation, energy, and waste management. Lessons from past intervention cases aid in refining strategies for creating resilient and sustainable built environments for displaced populations. Tier 2 equips professionals with specialized knowledge and skills to design and implement effective and inclusive interventions, fostering resilient and supportive built environments amidst mass displacement challenges.

## **Tier 3**

Tier 3 of the competency framework focuses on the occupational competencies needed in planning and design to tackle mass displacement challenges. Professionals must comprehend how planning and design can alleviate displacement complexities and create resilient built environments. They must consider repair, rebuild, or resettle decisions, disaster resilience, environmental sustainability, and the policy framework. Addressing infrastructure and service needs, housing planning and design, and public building inclusivity are essential. Stakeholder engagement, life cycle considerations, and learning from past cases aid in developing innovative and sustainable solutions. Equipped with these competencies, planning and design professionals can effectively contribute to creating inclusive and resilient built environments that meet the needs of displaced populations.

The full description of the competency framework is available at [https://regardproject.com/portal/images/Downloads/REGARD\\_Output\\_04 -  
Competency Framework Report - Draft final version V21 - October 2021.pdf](https://regardproject.com/portal/images/Downloads/REGARD_Output_04_-_Competency_Framework_Report_-_Draft_final_version_V21_-_October_2021.pdf)

## **3. Developing the competency framework**

### **3.1 Introduction**

The chapter outlines each crucial step, from the initial development of the framework to the establishment of key tiers, the inclusion of relevant information, the rigorous process of revising and validating, and ultimately, the finalization of the framework. This systematic approach ensures that the competency model is robust, effective, and tailor-made to tackle the unique demands of mass displacement.

### **3.2 Selecting a framework model**

The competency framework employed in the REGARD project was chosen as the most suitable model for the current study due to several compelling reasons. Firstly, the framework underwent testing and development by a consortium of partner universities, including those involved in the current project. The University of Tallinn, Estonia, played a pivotal role in crafting this framework, specifically addressing the competencies of built professionals in the context of mass displacement, as discussed earlier.

Secondly, the framework's advantage lies in its ability to leverage inputs from the University of Tallinn and other partner institutions within the consortium. This collaborative approach ensures that the competency model benefits from diverse perspectives and expertise, fostering a well-rounded and comprehensive understanding of the challenges presented by climate change in the built environment.

Moreover, the framework's capacity to cater to different categories of built environment professionals is a significant asset. By accommodating various disciplines and expertise, the competency model can effectively complement their respective understandings and awareness, promoting a more holistic and inclusive approach to address climate change and coastal erosion.

### **3.3 Developing a draft competency framework**

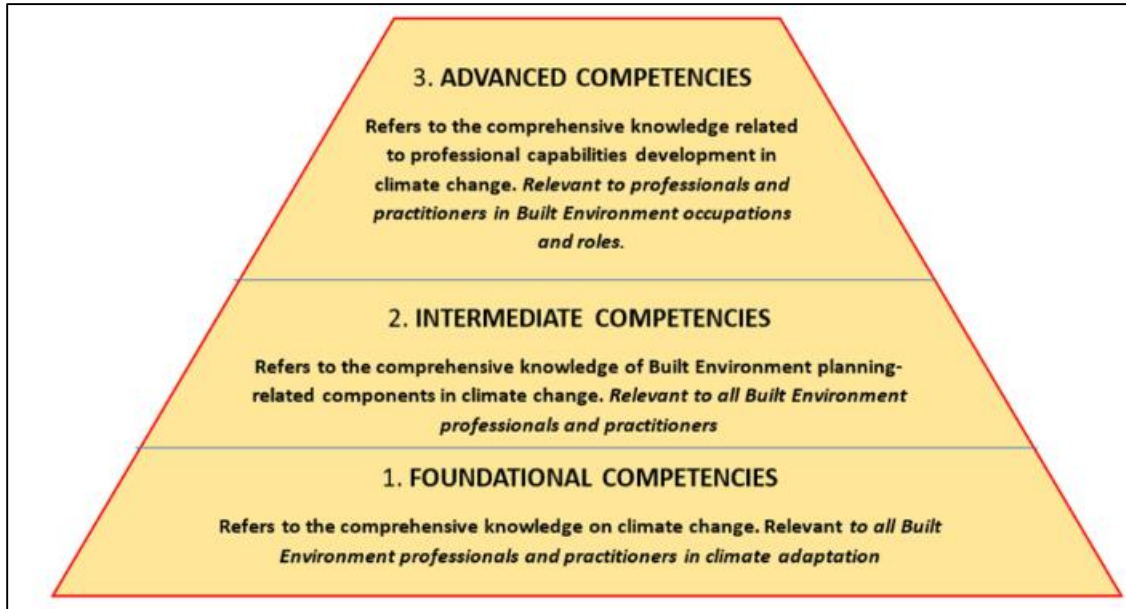
The research team initially developed a draft competency framework comprising three tiers for built environment professionals. The first tier encompasses basic competencies, providing a foundational understanding of the field. Moving to the second tier, intermediate competencies



offer a deeper level of expertise in specialized areas. Finally, the third tier encompasses advanced competencies, representing the pinnacle of knowledge and skills. This three-tiered framework offers a systematic and progressive pathway for professionals to excel in their careers, ensuring they are well-prepared to address the diverse and evolving challenges in the built environment related to climate change and coastal resilience.

1. Foundational Competencies : Refers to the comprehensive knowledge on climate change. Relevant to all built environment professionals and practitioners in climate adaptation
2. Intermediate Competencies : Refers to the comprehensive knowledge on built environment planning related components in climate change. Relevant to all built environment professionals and practitioners in climate adaptation
3. Advanced Competencies : Refers to the comprehensive knowledge related to professional capabilities development in climate change. Relevant to all built environment professionals and practitioners in built environment occupations and roles

Figure 4: Initial competency structure



Source: Own data,2023

The following section presents the key competencies promoted in the initial draft of the competency framework.

**(TIER 01) Foundational Competencies**

<b>1. Understand climate change and its impacts on coastal areas and the built environment.</b>
<ul style="list-style-type: none"> <li>• Understand climate variability and change.</li> <li>• Identify and understand the causes and impacts of climate change.</li> <li>• Understand the spatial and temporal changes of climate change impacts.</li> <li>• Assess climate-related disasters and natural disasters, with a disaster risk management approach.</li> <li>• Understand the climate change impacts on coastal environments.</li> </ul>
<b>2. Use new trends and predictions in climate change adaptation.</b>
<ul style="list-style-type: none"> <li>• Understand the importance of data in climate change studies, decision-making, and planning.</li> <li>• Understand how predictions on SLR and coastal impacts can be used in decision-making and planning.</li> </ul>

<b>3. Understand climate change mitigation and adaptation.</b>
<ul style="list-style-type: none"> <li>• Demonstrate the differences between mitigation and adaptation.</li> </ul>
<ul style="list-style-type: none"> <li>• Identify the importance of Technology in climate mitigation and adaptation.</li> </ul>
<ul style="list-style-type: none"> <li>• Identify mitigation measures and adaptation strategies.</li> </ul>
<b>4. Identify stakeholders (Actors) in climate change adaptation and mitigation and their responsibilities.</b>
<ul style="list-style-type: none"> <li>• Identify stakeholders (Actors) in climate change adaptation and mitigation.</li> </ul>
<ul style="list-style-type: none"> <li>• Identify their responsibilities, challenges, and suggestions.</li> </ul>
<b>5. Understand the built environment and its relationship with climate change.</b>
<ul style="list-style-type: none"> <li>• Understand the impact of climate change on the built environment and vice versa.</li> </ul>
<ul style="list-style-type: none"> <li>• Understand the need for mitigation and adaptation in the context of recent climate changes from sectoral and holistic perspectives.</li> </ul>

**(TIER 02) Intermediate Competencies**

<b>1. Understand the Role of built environment professionals in tackling climate change.</b>
<ul style="list-style-type: none"> <li>• Address the need for sociological, environmental, and economic considerations in planning.</li> </ul>
<ul style="list-style-type: none"> <li>• Understand policy, legal, and regulatory frameworks in the built environment and needs of the locality to move towards Climate Change Adaptation (CCA).</li> </ul>
<ul style="list-style-type: none"> <li>• Understand the contextual differences (developed vs developing countries)</li> </ul>
<ul style="list-style-type: none"> <li>• Understand the global frameworks and relationships.</li> </ul>
<ul style="list-style-type: none"> <li>• Methods to fulfill human needs while conserving nature.</li> </ul>
<ul style="list-style-type: none"> <li>• Understand the importance of bottom-up and top-down approaches in CCA.</li> </ul>
<b>2. Understand environmentally friendly planning.</b>
<ul style="list-style-type: none"> <li>• Basic Understanding on the Solar cycle in planning</li> </ul>
<ul style="list-style-type: none"> <li>• Understanding the practical usage of green building concepts.</li> </ul>
<ul style="list-style-type: none"> <li>• Application of green energies.</li> </ul>
<ul style="list-style-type: none"> <li>• Use of environmentally friendly building materials and techniques.</li> </ul>

<ul style="list-style-type: none"> <li>• Understand the importance of Analog Forestry as a nature-friendly environment restoration method (an approach to ecological restoration which uses natural forests as guides to create ecologically stable and socio-economically productive landscapes.)</li> </ul>
<b>3. Understand DRR in the construction industry.</b>
<ul style="list-style-type: none"> <li>• Adopt building codes and safety measurements in construction.</li> </ul>
<ul style="list-style-type: none"> <li>• Prioritize Industrial safety and health.</li> </ul>
<ul style="list-style-type: none"> <li>• Explore legal backgrounds related to the environment before construction.</li> </ul>
<b>4. Understand Planning in different contexts.</b>
<ul style="list-style-type: none"> <li>• Understand the importance of climate resilience planning.</li> </ul>
<ul style="list-style-type: none"> <li>• Understand climate related DRR and a multi-hazard approach in planning.</li> </ul>
<ul style="list-style-type: none"> <li>• Application of environmental sustainability in planning.</li> </ul>
<ul style="list-style-type: none"> <li>• Understand integrated land-use planning and construction planning.</li> </ul>
<ul style="list-style-type: none"> <li>• Resettlement and relocation.</li> </ul>
<b>5. Understand the household approaches in climate change adaptation.</b>
<ul style="list-style-type: none"> <li>• Application of household plans and designs in climate change adaptation</li> </ul>
<ul style="list-style-type: none"> <li>• Understand the sociology of housing.</li> </ul>
<ul style="list-style-type: none"> <li>• Understand types of housing and specific planning and design considerations.</li> </ul>
<ul style="list-style-type: none"> <li>• Understand refurbishment of existing housing.</li> </ul>
<b>6. Use of New trends and technologies in planning and designing, to tackle climate change.</b>
<ul style="list-style-type: none"> <li>• Understand and apply climate change-related concepts during planning and designing.</li> </ul>
<b>7. Understand how construction and facilities management address climate change.</b>
<ul style="list-style-type: none"> <li>• Understand the organization and management of construction and maintenance of built environments.</li> </ul>
<ul style="list-style-type: none"> <li>• Use of green construction materials and resources (green materials/low co2 emission)</li> </ul>
<ul style="list-style-type: none"> <li>• Create Employment and livelihood opportunities (green job creation)</li> </ul>
<ul style="list-style-type: none"> <li>• Project management</li> </ul>
<ul style="list-style-type: none"> <li>• Procurement, contracts, and project delivery</li> </ul>
<ul style="list-style-type: none"> <li>• Cost estimating cost control, and contract management.</li> </ul>
<ul style="list-style-type: none"> <li>• Understand the Stakeholder engagement in construction.</li> </ul>

<ul style="list-style-type: none"> <li>• Understand new trends, technologies, and good practices in Construction and facilities management to tackle climate change.</li> </ul>
<ul style="list-style-type: none"> <li>• Housing Construction and maintenance</li> </ul>
<ul style="list-style-type: none"> <li>• Approving plans</li> </ul>
<ul style="list-style-type: none"> <li>• Stakeholder consultation and participation in community engagement with construction and maintenance</li> </ul>

**(TIER 03) Advanced Competencies**

<b>1. Understand Planning in coastal contexts.</b>
<ul style="list-style-type: none"> <li>• Coastal adaptation strategies</li> </ul>
<ul style="list-style-type: none"> <li>• Identify climate change adaptation strategies in coastal areas.</li> </ul>
<b>2. Use of research methods in climate research</b>
<ul style="list-style-type: none"> <li>• Understand the research techniques.</li> </ul>
<ul style="list-style-type: none"> <li>• Understanding the methodology of research proposal writing</li> </ul>
<b>3. Use technical tools in climate change adaptation.</b>
<ul style="list-style-type: none"> <li>• Understand the ways of using technical tools in climate adaptation decision-making and planning.</li> </ul>
<ul style="list-style-type: none"> <li>• Understand the different methods used for climate change modeling.</li> </ul>
<b>4. Understand the environmental, social, financial, and governmental phenomena in climate change adaptation.</b>
<ul style="list-style-type: none"> <li>• Application of interdisciplinary approaches in climate change adaptation.</li> </ul>
<ul style="list-style-type: none"> <li>• Understand Global frameworks and local regulations which address climate change in the planning process.</li> </ul>
<ul style="list-style-type: none"> <li>• Understand the basics of green financing and climate financing.</li> </ul>
<b>5. Understand the communication strategies in climate change adaptation.</b>
<ul style="list-style-type: none"> <li>• Understanding communication approaches.</li> </ul>
<ul style="list-style-type: none"> <li>• Understanding negotiation techniques in climate change under different contexts.</li> </ul>
<b>6. Understand the importance of human resource management in CCA.</b>
<ul style="list-style-type: none"> <li>• Understanding the basics of human resources management in CCA.</li> </ul>

### 3.4 Refinement of the competency framework

#### **Refinement Round 1**

To refine and validate the competency framework, it was shared with the expert panel of built environment professionals discussed in Chapter Two. The opinions of the experts were gathered using a three-part online questionnaire.

The 1<sup>st</sup> section of the questionnaire consisted of basic questions related to the professionals. According to the results of the 2<sup>nd</sup> section, 53.8% of the total respondents agreed to the structure without any changes, while 42.3% of the respondents suggested some modifications to the structure. Additionally, 11.5% of the respondents mentioned that the structure was deemed inappropriate. Based on these results, priority was given to the majority responses. However, other suggestions and comments were also taken into consideration during the refinement process of the competency framework. It should be noted that some comments and suggestions were not addressed, and further details can be found in Appendix One, along with the UOC (University of Colombo) responses.

In the 3<sup>rd</sup> section, the questionnaire assessed the suitability of each competency mentioned above. The results are depicted in the table below.

Table 3: Results

<b>Competency</b>	<b>Acceptance results</b>
<b>Tier 01</b>	
1.Understand climate change and its impact on the coastal areas and the built environment	
1.1 Understand climate variability and change.	Accept=90% Revise=5% Remove=5%
1.2 Identify and understand the causes and impacts of climate change.	Accept=85% Revise=15% Remove=0
1.3 Understand the Spatial and temporal changes of climate change impacts	Accept=90% Revise=0 Remove=10%
1.4 Understand the Spatial and temporal changes of climate change impacts	Accept=70% Revise=30%

	Remove=0
1.5 Assess climate-related disasters and natural disasters, with a disaster risk management approach.	Accept=80% Revise=15% Remove=5%
1.6 Understand the climate change impacts on coastal environments	Accept=90% Revise=5% Remove=5%
<b>2. Use new trends and predictions in climate change adaptation</b>	
2.1 Understand the importance of data in climate change studies, decision-making, and planning.	Accept=90% Revise=10% Remove=0
2.2 Understand how predictions on sea level rise (SLR) and coastal impacts can be used in decision-making and planning.	Accept=90% Revise=10% Remove=0
<b>3. Understand the climate change mitigation and adaptation</b>	
3.1 Demonstrate the differences between mitigation and adaptation	Accept=80% Revise=15% Remove=5%
3.2 Identify the importance of Technology in climate mitigation and adaptation	Accept=75% Revise=20% Remove=5%
3.3 Identify mitigation measures and adaptation strategies	Accept=75% Revise=20% Remove=5%
<b>4. Identify stakeholders (Actors) in climate change adaptation and mitigation and their responsibilities</b>	
4.1 Identify stakeholders (Actors) in climate change adaptation and mitigation.	Accept=95% Revise=5% Remove=0
4.2 Identify their responsibilities, challenges, and suggestions	Accept=90% Revise=10% Remove=0
<b>5. Understand the built environment and its relationship with climate change</b>	
5.1 Understand the impact of climate change on the built environment and vice versa	Accept=75% Revise=25% Remove=0
5.2 Understand the need for mitigation and adaptation in the context of recent climate changes from sectoral and holistic perspectives	Accept=80% Revise=15% Remove=5%

<b>Tier 02</b>	
<b>1. Understand the Role of built environment professionals in tackling climate change</b>	
1.1 Address the need for sociological, environmental, and economic considerations in planning.	Accept=90% Revise=5% Remove=5%
1.2 Understand policy, legal, and regulatory frameworks in the built environment and needs of the locality to move towards Climate Change Adaptation (CCA)	Accept=90% Revise=5% Remove=5%
1.3 Understand the contextual differences (developed vs developing countries)	Accept=80% Revise=0 Remove=20%
1.4 Understand the global frameworks and relations among them.	Accept=75% Revise=12.5% Remove=12.5%
1.5 Methods related to fulfilling human needs while conserving nature	Accept=80% Revise=20% Remove=0
1.6 Understand the importance of bottom-up and top-down approaches in CCA.	Accept=80% Revise=10% Remove=10%
<b>2. Understand the Environment-friendly planning</b>	
2.1 Basic Understanding on the Solar cycle in planning	Accept=80% Revise=10% Remove=10%
2.2 Understanding the practical usage of green building concepts.	Accept=80% Revise=10% Remove=10%
2.3 Application of green energies	Accept=80% Revise=15% Remove=5%
2.4 Use of environmentally friendly building materials, Disaster Resilient infrastructure and techniques	Accept=80% Revise=20% Remove=0
2.5 Understand the importance of Analog Forestry as a nature-friendly environment restoration method (an approach to ecological restoration which uses natural forests as guides to create ecologically stable and socio-economically productive landscapes.)	Accept=80% Revise=10% Remove=10%
<b>3. Understand DRR in the construction industry</b>	



3.1 Adopt building codes and safety measurements in the construction.	Accept=75% Revise=25% Remove=0
3.2 Prioritize Industrial safety and health	Accept=85% Revise=10% Remove=5%
3.3 Explore legal backgrounds related to the environment before construction.	Accept=80% Revise=20% Remove=0
<b>4.Understand Planning in different contexts</b>	
4.1 Understand the importance of climate resilience planning.	Accept=92% Revise=8% Remove=0
4.2 Understand climate related DRR and a multi hazard approach in planning.	Accept=92% Revise=8% Remove=0
4.3Application of environmental sustainability in planning	Accept=92% Revise=8% Remove=0
4.4 Understand integrated land-use planning and construction planning.	Accept=92% Revise=8% Remove=0
4.5 Resettlement and relocation	Accept=88% Revise=8% Remove=4%
<b>5.Understand the household approaches in climate change adaptation</b>	
5.1 Application of household plans and designs in climate change adaptation	Accept=80% Revise=20% Remove=0
5.2 Understand the sociology of housing	Accept=80% Revise=20% Remove=0
5.3 Understand types of housing and specific planning and design considerations	Accept=85% Revise=15% Remove=0
5.4 Understand refurbishment of existing housing	Accept=80% Revise=20% Remove=0
<b>6.Use of new trends and technologies, in planning and designing to tackle climate change</b>	

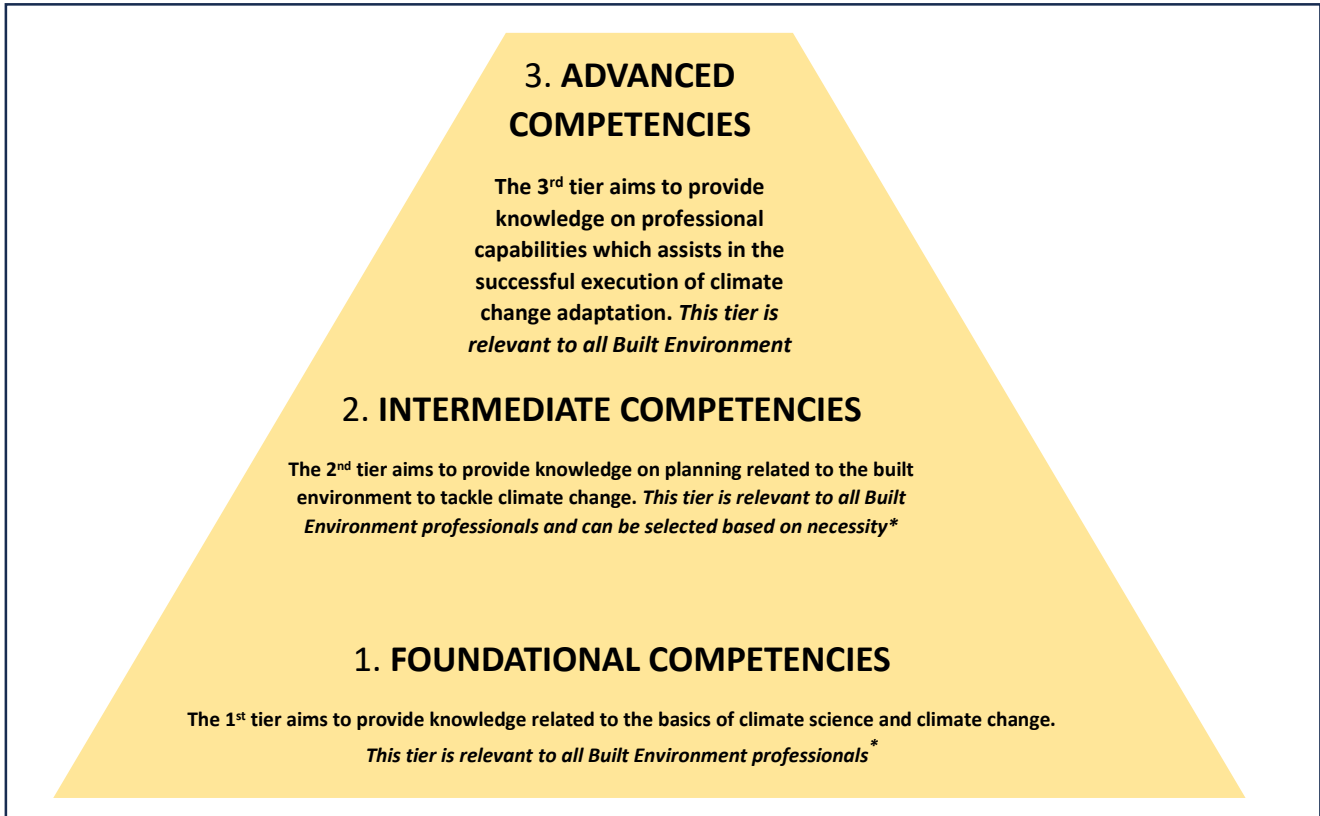
6.1 Understand and apply climate change-related concepts during planning and designing	Accept=80% Revise=15% Remove=5%
<b>7.Understand how construction and facilities management address climate change</b>	
7.1 Understand the Organization and management of construction and maintenance of the built environment.	Accept=80% Revise=20% Remove=0
7.2 Use of green construction materials and resources (green materials/low co2 emission)	Accept=80% Revise=15% Remove=5%
7.3 Create Employment and livelihood opportunities (green job creation)	Accept=85% Revise=15% Remove=0
7.4 Project management	Accept=80% Revise=20% Remove=0
7.5 Procurement, contracts, and project delivery	Accept=80% Revise=15% Remove=5%
7.6 Cost estimating cost control, and contract management	Accept=85% Revise=15% Remove=0
7.7 Understand the Stakeholder engagement in construction.	Accept=95% Revise=5% Remove=0
7.8 Housing Construction and maintenance	Accept=80% Revise=20% Remove=0
7.9 Approving plans	Accept=80% Revise=10% Remove=10%
7.10 Stakeholder consultation and participation in community engagement in construction and maintenance	Accept=95% Revise=5% Remove=0
<b>Tier 03</b>	
<b>1.Understand Planning in coastal contexts</b>	
1.1 Coastal adaptation strategies	Accept=75% Revise=20% Remove=5%
1.2 Identify climate change adaptation strategies in coastal areas	Accept=85%

	Revise=5% Remove=10%
<b>2. Use of research methods in climate research</b>	
2.1 Understand the research techniques	Accept=70% Revise=25% Remove=0
2.2 Understanding the methodology of research proposal writing	Accept=75% Revise=20% Remove=5%
<b>3. Use technical tools in climate change adaptation</b>	
3.1 Understand the ways of using technical tools, and terminologies in climate adaptation decision-making and planning.	Accept=85% Revise=15% Remove=0
3.2 Understand the different methods used for climate change modeling	Accept=75% Revise=20% Remove=5%
<b>4. Understand the environmental, social, financial, and governmental phenomena in climate change adaptation</b>	
4.1 Application of interdisciplinary approach in climate change adaptation	Accept=80% Revise=20% Remove=0
4.2 Understand Global frameworks and local regulations which address climate change in the planning process	Accept=85% Revise=10% Remove=5%
4.3 Understanding the basics of green financing and climate financing.	Accept=85% Revise=10% Remove=5%
<b>5. Understand the communication strategies in climate change adaptation</b>	
5.1 Understanding communication approaches	Accept=84% Revise=16% Remove=0
5.2 Understanding negotiation techniques in climate change under different contexts	Accept=84% Revise=12% Remove=4%
<b>6. Understand the importance of human resource management in CCA</b>	
6.1 Understanding basics of human resources management in CCA	Accept=75% Revise=15% Remove=10%

Majority of the suggested changes were accepted and incorporated to the framework. Please see the appendix 1 for suggestions. According to the suggestions the framework was further revised and a version two of the framework was developed by the team.

### 3.4.1 Refined competency framework - version 2

Figure 5: Refined competency framework-version 2



Source: Own data,2023

#### (TIER 01) Foundational Competencies

<b>1. Understanding the basics of climate science and climate change.</b>
<ul style="list-style-type: none"> <li>• Understand the uncertainties of sea level rise and other climate components.</li> </ul>
<ul style="list-style-type: none"> <li>• Understand climate variability and change.</li> </ul>
<ul style="list-style-type: none"> <li>• Identify and understand multidisciplinary areas related to climate change, causes and effects, and their spatial and temporal changes.</li> </ul>
<ul style="list-style-type: none"> <li>• Assess climate-related disasters, with a disaster risk management approach.</li> </ul>

<ul style="list-style-type: none"> <li>• Identify the inter-relationship between environmental sustainability, climate change, growth, development and social and economic issues.</li> </ul>
<ul style="list-style-type: none"> <li>• Understand the impacts of climate change on coastal environments.</li> </ul>
<b>2. Using new trends and predictions on climate change adaptation</b>
<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> </ul>
<ul style="list-style-type: none"> <li>• Understanding the uncertainties of climate impact predictions and measures to reduce uncertainties.</li> </ul>
<ul style="list-style-type: none"> <li>• Understand how predictions on sea level rise and coastal impacts can be used in decision-making and planning.</li> </ul>
<ul style="list-style-type: none"> <li>• Identify global and regional Early Warning (EW) Systems and service providers for EW dissemination, climate change mitigation and adaptations</li> </ul>
<b>3. Understanding climate change mitigation and adaptation</b>
<ul style="list-style-type: none"> <li>• Demonstrate the differences between mitigation and adaptation and Identify mitigation measures and adaptation strategies.</li> </ul>
<ul style="list-style-type: none"> <li>• Identify the importance of Technology in climate mitigation and adaptation.</li> </ul>
<ul style="list-style-type: none"> <li>• Nature-based solutions and Ecosystem-based solutions vs grey solutions</li> </ul>
<ul style="list-style-type: none"> <li>• Understand indigenous knowledge and knowledge of local communities on prevention of climate related impacts.</li> </ul>
<b>4. Identifying stakeholders (Actors) in climate change adaptation and mitigation and their responsibilities</b>
<ul style="list-style-type: none"> <li>• Identify stakeholders (Actors) in climate change adaptation and mitigation.</li> </ul>
<ul style="list-style-type: none"> <li>• Identify their responsibilities, challenges, constraints, and suggestions.</li> </ul>
<ul style="list-style-type: none"> <li>• Identifying the importance of an integrated disaster risk management plan for all stakeholders</li> </ul>
<ul style="list-style-type: none"> <li>• Understand thinking and behavioral patterns of people</li> </ul>
<b>5. Understanding the built environment and its relationship to climate change</b>
<ul style="list-style-type: none"> <li>• Understand built environment impacts on climate change and vice versa (impacts to climate change and how the built environment is impacted by climate change)</li> </ul>

<ul style="list-style-type: none"> <li>• Understand the need for mitigation and adaptation in the context of recent climate change from sectoral and holistic perspectives</li> </ul>
<ul style="list-style-type: none"> <li>• Understand indigenous knowledge related to the built environment</li> </ul>

**(TIER 02) Intermediate Competencies**

<b>1. Understanding the Role of built environment professionals to tackle climate change</b>
<ul style="list-style-type: none"> <li>• Understand policy, legal, and regulatory frameworks in the built environment and local needs to move towards CCA.</li> </ul>
<ul style="list-style-type: none"> <li>• Identify responsibilities, challenges and constraints of built environment professionals and providing suggestions for challenges and constraints.</li> </ul>
<ul style="list-style-type: none"> <li>• Address sociological, environmental, and economic needs in planning.</li> </ul>
<ul style="list-style-type: none"> <li>• Understand contextual differences (Industrialized countries vs. developing countries)</li> </ul>
<ul style="list-style-type: none"> <li>• Trans-disciplinary approaches, integrating knowledge and skills from different stakeholders in design and construction.</li> </ul>
<ul style="list-style-type: none"> <li>• Methods related to fulfilling human needs while conserving nature.</li> </ul>
<ul style="list-style-type: none"> <li>• Understand the importance of bottom-to-top and top to bottom approaches in CCA.</li> </ul>
<ul style="list-style-type: none"> <li>• Understand the functions and components of the natural environment in a particular area before making decisions.</li> </ul>
<b>2. Understanding Environment-friendly planning</b>
<ul style="list-style-type: none"> <li>• Basic understanding of the Solar cycle and planning</li> </ul>
<ul style="list-style-type: none"> <li>• Understand and practical usage of green building concepts.</li> </ul>
<ul style="list-style-type: none"> <li>• Application of green energies and energy-related adaptations</li> </ul>
<ul style="list-style-type: none"> <li>• Use of environmental friendly planning, building materials, sustainable construction, disaster resilient infrastructure and techniques</li> </ul>
<ul style="list-style-type: none"> <li>• Understand more design and technical details to achieve energy efficiency during the design and construction period and the building usage period (post occupancy).</li> </ul>
<ul style="list-style-type: none"> <li>• Basic understand of the importance of Analog Forestry as a nature-friendly environment restoration method (an approach to ecological restoration which uses natural forests as guides to create ecologically stable and socio-economically productive landscapes.)</li> </ul>
<b>3. Understanding DRR in the construction industry</b>

<ul style="list-style-type: none"> <li>• Understanding key regulations related to the built environment and climate change adaptation</li> </ul>
<ul style="list-style-type: none"> <li>• Understand stakeholder engagement in construction</li> </ul>
<ul style="list-style-type: none"> <li>• Adopt building codes and safety measurements in the construction.</li> </ul>
<ul style="list-style-type: none"> <li>• Prioritize Industrial safety, human rights and health.</li> </ul>
<ul style="list-style-type: none"> <li>• Explore legal backgrounds related to environment before the construction</li> </ul>
<ul style="list-style-type: none"> <li>• Understand institutional disaster management planning and Business continuity management plan</li> </ul>
<b>4. Understanding development planning in different contexts</b>
<ul style="list-style-type: none"> <li>• Understand the importance of climate resilience planning.</li> </ul>
<ul style="list-style-type: none"> <li>• Adopt climate change adaptation strategies in city planning, integration of environment and climate priorities to development planning</li> </ul>
<ul style="list-style-type: none"> <li>• Understand climate related DRR and the multi hazard approach in planning.</li> </ul>
<ul style="list-style-type: none"> <li>• Application of environmental sustainability in planning</li> </ul>
<ul style="list-style-type: none"> <li>• Understating servitude rights in land use planning together with development activities.</li> </ul>
<ul style="list-style-type: none"> <li>• Use of new trends and technologies in planning and designing to tackle climate change</li> </ul>
<ul style="list-style-type: none"> <li>• Good practices in construction and facilities management to tackle climate change</li> </ul>
<ul style="list-style-type: none"> <li>• Understand integrated land-use planning and construction planning. (Inter-relationships between environmental sustainability, climate change, growth, development, poverty, social and economic issues)</li> </ul>
<ul style="list-style-type: none"> <li>• Design and Resettlement, relocation criteria</li> </ul>
<b>5. Understanding household approaches in climate change adaptation</b>
<ul style="list-style-type: none"> <li>• Application of household plans and designs in climate change adaptation</li> </ul>
<ul style="list-style-type: none"> <li>• Understand sociology of housing</li> </ul>
<ul style="list-style-type: none"> <li>• Understand types of housing and specific planning and design considerations</li> </ul>
<ul style="list-style-type: none"> <li>• Understand refurbishment of existing housing</li> </ul>
<ul style="list-style-type: none"> <li>• Understand the importance of having an insurance scheme</li> </ul>
<b>6. Understanding how construction and facilities management address climate change</b>

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

**(TIER 03) Advanced Competencies**

<b>1. Using research methods in climate research</b>
<ul style="list-style-type: none"> <li>• Understanding action research in climate change adaptation</li> </ul>
<ul style="list-style-type: none"> <li>• Understand research techniques.</li> </ul>
<ul style="list-style-type: none"> <li>• Understand location-specific useable research techniques.</li> </ul>
<ul style="list-style-type: none"> <li>• Understanding research proposal writing</li> </ul>
<b>2. Using technical tools in climate change adaptation</b>
<ul style="list-style-type: none"> <li>• Understand the uncertainties of climate change modeling.</li> </ul>

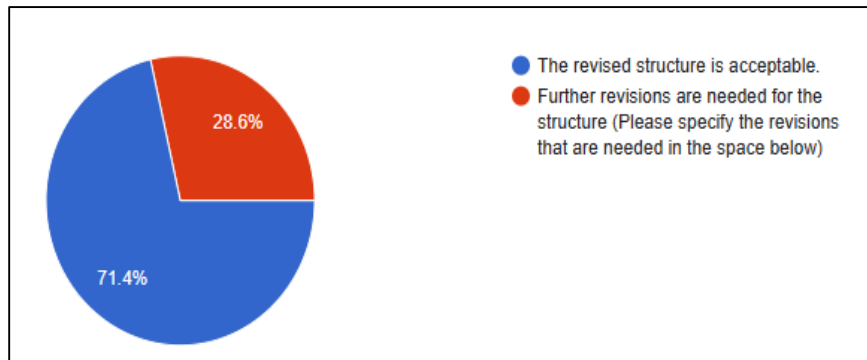


<ul style="list-style-type: none"> <li>• Understand the ways of using technical tools, and terminologies in climate adaptation decision-making and planning.</li> </ul>
<ul style="list-style-type: none"> <li>• Understand different methods used for climate change modeling, climate change impact prediction and risk assessment.</li> </ul>
<b>3. Understanding the environmental, social, financial, and governance phenomenon in climate change adaptation</b>
<ul style="list-style-type: none"> <li>• Application of interdisciplinary and multidisciplinary approaches in climate change adaptation</li> </ul>
<ul style="list-style-type: none"> <li>• Understand global frameworks and local regulations which address climate change in the planning process.</li> </ul>
<ul style="list-style-type: none"> <li>• Understanding on marketing mileage the economic value addition that can be given for tourism related built environment</li> </ul>
<ul style="list-style-type: none"> <li>• Environmental regulations, legislation and tools</li> </ul>
<ul style="list-style-type: none"> <li>• Environmental ethics and responsibilities.</li> </ul>
<ul style="list-style-type: none"> <li>• Understanding the basics of green financing and climate financing.</li> </ul>
<b>4. Understanding the communication strategies in climate change adaptation</b>
<ul style="list-style-type: none"> <li>• Understanding communication approaches</li> </ul>
<ul style="list-style-type: none"> <li>• Understanding negotiation techniques in climate change under different contexts</li> </ul>
<b>5. Understanding the importance of human resource management in CCA</b>
<ul style="list-style-type: none"> <li>• Understanding the basics of human resources management in CCA</li> </ul>
<ul style="list-style-type: none"> <li>• Knowledge of the administrative system</li> </ul>
<ul style="list-style-type: none"> <li>• Environmental Management leadership</li> </ul>

### **Refinement Round 2**

Version 1 of the competency framework was subjected to a second refinement round and further refined based on comments. Also, final acceptance for each tier was obtained.

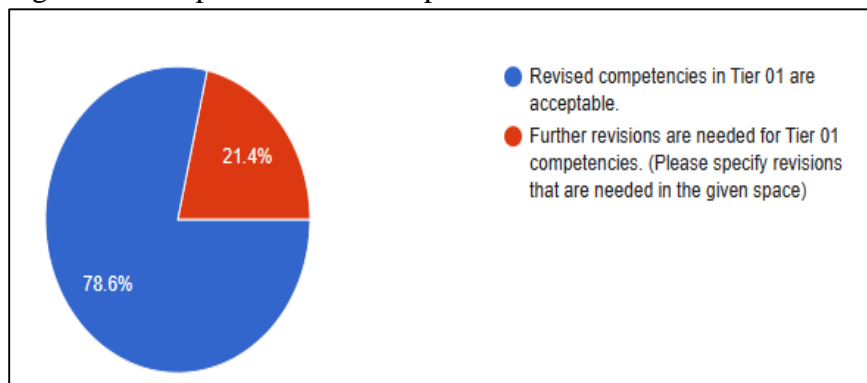
Figure 6: Overall Acceptance of the framework



Source: Own data,2023

Accordingly, the overall structure was accepted by 71.4% of the respondents while another 28.6% suggested further revision (See figure 6).

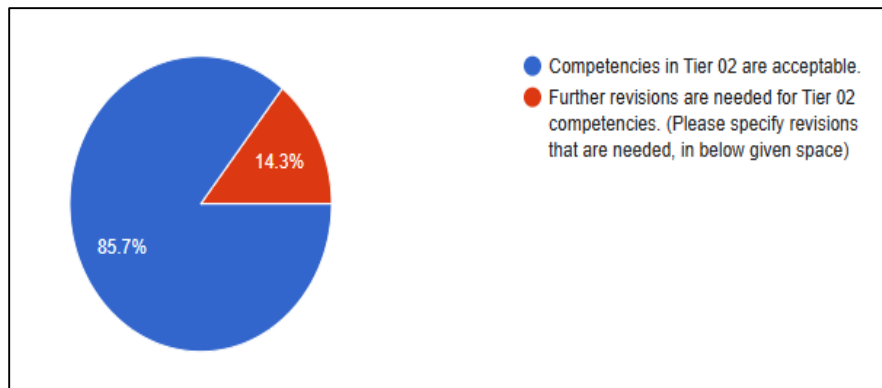
Figure 7: Acceptance of the competencies in tier 01



Source: Own data, 2023

On the topic of tier 01, 78.6% of the respondents accepted the contents with 21.4% of respondents voting for further revisions.

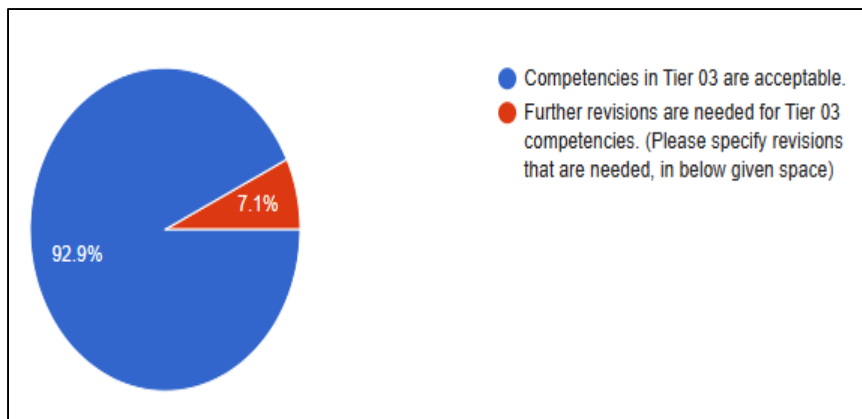
Figure 8: Acceptance of the competencies in tier 02



Source: Own data, 2023

As, for the second tier, 85.7% of the respondents accepted the competencies without any change while 14.3% of respondents recommended further suggestions for the tier.

Figure 9: Acceptance of the competencies in tier 03



Source: Own data, 2023

The third tier of the framework was accepted by 92.9% of the respondents, while 7.1% suggested further revision.

### 3.4.2 Major changes to the tiers

During the final round of refinement, a significant change was made to the competency framework. Based on the feedback received during the refinement process, the contents of the advanced competency tier were moved to the intermediate tier, and vice versa, in order to better align the framework with the professionals' needs. Additionally, the title of the tier was revised from "foundational competencies" to "basic competencies" to accurately reflect its content and level. These adjustments were made to ensure that the competency framework accurately represents the progressive skill development required for built environment professionals, and to enhance its overall effectiveness and relevance.

**After these changes and refinement the second version of the competency framework was adopted as the final version of the framework.**

## 4. Competency Framework for Built Environment Professionals to Tackle Climate Change in Coastal Regions

### 4.1 Introduction

This chapter presents the finalized competency framework for Built Environment Professionals to Tackle Climate Change in Coastal Regions. It incorporates the comments and opinions of the panel of built environment experts and the inputs from the project partners. The competency framework is organized into three tiers: basic, intermediate, and advanced. Each tier caters to different groups of built environment professionals, offering a progressive pathway for skill development and expertise in addressing climate change challenges in coastal regions.

#### (TIER 01) Basic Competencies

<b>1. Understand the basics of climate science and climate change</b>
<ul style="list-style-type: none"><li>• Understand the uncertainties of sea level rise and other climate components.</li></ul>
<ul style="list-style-type: none"><li>• Comprehend climate variability and change.</li></ul>
<ul style="list-style-type: none"><li>• Identify and understand multidisciplinary areas related to climate change, causes and effects, and their spatial and temporal changes.</li></ul>

<ul style="list-style-type: none"> <li>• Understand the compound effects of climate change, and importance of risk and vulnerability assessment.</li> </ul>
<ul style="list-style-type: none"> <li>• Assess climate-related disasters, with a disaster risk management approach.</li> </ul>
<ul style="list-style-type: none"> <li>• Identify the inter-relationship between environmental sustainability, climate change, growth, development and social and economic issues.</li> </ul>
<ul style="list-style-type: none"> <li>• Understand the impacts of climate change on coastal environments</li> </ul>
<p><b>2. Comprehend new trends and predictions on climate change adaptation</b></p>
<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> </ul>
<ul style="list-style-type: none"> <li>• Understand the uncertainties of climate impact predictions and measures to reduce uncertainties.</li> </ul>
<ul style="list-style-type: none"> <li>• Incorporate how predictions on sea level rise and coastal impacts can be used in decision-making and planning.</li> </ul>
<ul style="list-style-type: none"> <li>• Identify global and regional Early Warning(EW) Systems and service providers for EW dissemination, climate change mitigation and adaptations</li> </ul>
<p><b>3. Understand climate change mitigation and adaptation</b></p>
<ul style="list-style-type: none"> <li>• Demonstrate the differences between mitigation and adaptation</li> </ul>
<ul style="list-style-type: none"> <li>• Identify mitigation measures and adaptation strategies.</li> </ul>
<ul style="list-style-type: none"> <li>• Identify the importance of technology in climate mitigation and adaptation.</li> </ul>
<ul style="list-style-type: none"> <li>• Identify nature-based solutions and ecosystem-based solutions vs. grey solutions</li> </ul>
<ul style="list-style-type: none"> <li>• Understand indigenous knowledge and knowledge of local communities on prevention of climate related impacts (knowledge and experiences of local people on adaptation to CC and their applicability.)</li> </ul>
<p><b>4. Identify stakeholders (Actors) in climate change adaptation and mitigation and their responsibilities</b></p>
<ul style="list-style-type: none"> <li>• Identify stakeholders (Actors) in climate change adaptation and mitigation.</li> </ul>
<ul style="list-style-type: none"> <li>• Comprehend their responsibilities, challenges, constraints, and suggestions.</li> </ul>
<ul style="list-style-type: none"> <li>• Understand the importance of an integrated disaster risk management plan for all stakeholders</li> </ul>
<ul style="list-style-type: none"> <li>• Realize about the thinking and behavioral patterns of people</li> </ul>

<b>5. Understand the built environment and its relationship to climate change</b>
<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> </ul>
<ul style="list-style-type: none"> <li>• Comprehend the need for mitigation and adaptation in the context of recent climate change from sectorial and holistic perspectives</li> </ul>
<ul style="list-style-type: none"> <li>• Understand indigenous knowledge related to the built environment</li> </ul>

**(TIER02) Intermediate Competencies**

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

<b>4. Understand the communication strategies in climate change adaptation</b>
<ul style="list-style-type: none"> <li>• Identify communication approaches</li> </ul>
<ul style="list-style-type: none"> <li>• Understand negotiation techniques of climate change in different contexts</li> </ul>
<b>5. Understand the importance of human resource management in Climate Change Adaptation (CCA)</b>
<ul style="list-style-type: none"> <li>• Understand the basics of human resources management in CCA</li> </ul>
<ul style="list-style-type: none"> <li>• Knowledge of the administrative system</li> </ul>
<ul style="list-style-type: none"> <li>• Environmental Management leadership</li> </ul>

**(TIER 03) Advanced Competencies**

<b>1. Incorporate the Role of built environment professionals to tackle climate change</b>
<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> </ul>
<ul style="list-style-type: none"> <li>• Identify responsibilities, challenges and constraints of built environment professionals and providing suggestions for challenges and constraints.</li> </ul>
<ul style="list-style-type: none"> <li>• Address sociological, environmental, and economic needs in planning.</li> </ul>
<ul style="list-style-type: none"> <li>• Understand contextual differences (Industrialized countries vs. developing countries)</li> </ul>
<ul style="list-style-type: none"> <li>• Trans-disciplinary approaches, integrating knowledge and skills from different stakeholders in design and construction.</li> </ul>
<ul style="list-style-type: none"> <li>• Methods related to fulfilling human needs while conserving nature.</li> </ul>
<ul style="list-style-type: none"> <li>• Understand the importance of bottom-to-top and top to bottom approaches in CCA.</li> </ul>
<ul style="list-style-type: none"> <li>• Understand the functions and components of the natural environment in a particular area before making decisions.</li> </ul>
<b>2. Understand Environment-friendly planning</b>
<ul style="list-style-type: none"> <li>• Basic understanding of the solar cycle and planning</li> </ul>
<ul style="list-style-type: none"> <li>• Understand and practical usage of green building concepts.</li> </ul>
<ul style="list-style-type: none"> <li>• Application of green energies and energy-related adaptations</li> </ul>
<ul style="list-style-type: none"> <li>• Use of environmental friendly planning, building materials, sustainable construction, disaster resilient infrastructure and techniques</li> </ul>

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



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

**4.2 Target group**

The framework targets **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.

## **5. Conclusion**

Based on the findings from the output 6 report and the outcomes of outputs 3, 4, and 5, it has been confirmed that there exists a skill and knowledge gap among built environment professionals concerning climate change adaptation in coastal built environments. Consequently, output 7 of the project aimed to address these identified gaps by developing a competency framework. To create this framework, the REGARD competency framework on Mass Displacement was utilized as a reference model. The BEACON competency framework was then structured into three hierarchical tiers and underwent validation through structured online questionnaires. Built environment experts and practitioners participated as respondents in two rounds of questionnaires, providing valuable feedback to refine the initial competency framework. During the second round, the refined framework received approval from the majority of respondents. This finalized competency framework serves as the foundation for the development of the MOOC platform in the 8th output of the BEACON project.

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**Appendix 01:** Revisions made to framework in each round -1<sup>st</sup> round)

Section	Comments	Response of UOC
<p><b>Overall Structure</b></p>	<p>Agree without changes (50%)                      Agree with some revisions (40%)                      Inappropriate (10%)</p>	<p>The major structure was not changed, but other revisions were done according to the suggestions.</p>
	<p>Advanced competencies must be focusing on the implementation phase. (1<sup>st</sup> Phase will be learning about climate changes, 2<sup>nd</sup> phase to understating the impact of the climate change on the built environment hence the 3<sup>rd</sup> phase should be discussing about the initiation of thought process on mitigations measures, approaches, possible ways of implementations for different professionals, etc.)</p>	<p>The wording and the descriptions of tiers were changed as follows.  <i>The 1<sup>st</sup> tier aims to provide the basics of climate science and climate change</i></p> <p><i>The 2<sup>nd</sup> tier aims to provide knowledge on planning in the built environments to tackle the climate change</i></p> <p><i>The 3<sup>rd</sup> tier aims to provide knowledge on professional capabilities which helps successful climate change adaptation</i></p>
	<p>The first level is described as relevant to all built environment professionals and practitioners, but limited to "in climate adaptation", while the second level seems to be of broader relevance (without the limitation). The definition of "occupations and roles" of the third level, compared to "professionals and practitioners" of all levels is not clear to me. But I do agree with the conclusion that different stakeholders need different kind of competencies.</p>	<p>The wording and the descriptions of tiers were changed as follows.  <i>The 1<sup>st</sup> tier aims to provide the basics of climate science and climate change</i></p> <p><i>The 2<sup>nd</sup> tier aims to provide knowledge on planning in the built environment in order to tackle <del>the</del> climate change</i></p> <p><i>The 3<sup>rd</sup> tier aims to provide knowledge on professional capabilities</i></p>

		<i>which helps successful climate change adaptation</i>
	my opinion is in climate change not only adaptation there is mitigation aspect also, and also competencies should address disaster-resilient infrastructures	Since the project mainly focused on CCA, mitigation was not highlighted in the structure. However, Mitigation is addressed in sections of the 1 <sup>st</sup> tier. Disaster-resilient infrastructure is added to the framework.
	Better to define climate change (Natural or manmade as present) because the climate is always changed, based on the Milankovitch cycle. Always there should be continuous assessments to do predictions which cannot be done easily. However, the global climate is a function of planetary geometry which has not yet been understood by present-day Western scientists (better look for Eastern knowledge for a solution). Need to address the causes, not the results as many have grabbed.	The facts mentioned here are discussed under tier one as an introduction to climate science.
	Given details on the different levels of the structure in the paragraph above the figure is clear and well explained. However, I find that the idea hasn't been properly summarized/presented in the figure.	The wording and the descriptions of tiers were changed as follows. <i>The 1<sup>st</sup> tier aims to provide the basics of climate science and climate change</i>  <i>The 2<sup>nd</sup> tier aims to provide knowledge on planning in the built environment to tackle climate change</i>

		<p><i>The 3<sup>rd</sup> tier aims to provide the knowledge on professional capabilities which helps successful climate change adaptation</i></p>
	<p>Several problems:  1) Define competence: It seems that competence here has (at least) two meanings, partly knowledge and skill, partly educational category/label.  2) Define built environment. It can be anything or a concept linked to physical planning and - in Sweden - to the Planning and Building Act. EX According to PBL, kind of green structure and certain green areas is included (which with a more modern concept today is often called "blue-green infrastructure"). The Built Environment covers not only buildings and developments, including smaller property-related facilities, but also all infrastructure such as roads and wind turbines, nuclear power plants.  3) Demarcation: Relevance to coastal areas (often specific risks and issues and solutions) has been lost?  4) What is the context and context: Is there purpose and societal goals to relate to? For example, in Sweden today we see an increased need to work with total defense and the security of civil society. Here maybe there is a need, motive, relevance for synergies?</p>	<p>Both skills and knowledge are addressed.</p> <p>Built environment is defined.</p> <p>Specific points related to coastal areas were added.</p>

	<p>Suggestion: Turn the funnel upside down. Many people need basic knowledge about climate change, understand and accept its relevance in terms of effects and risks. But it is not a matter of competence.</p>	<p>Did not change the attire of the structure.</p>
	<p>It is necessary to define more accurately the proposed competences, including the task and jobs that have to develop these responsibilities.</p>	<p>Since this framework just develop to address the skills and knowledge gaps, we are not able to do this.</p>
	<p>Not only the comprehensive knowledge on climate change but also the comprehensive knowledge on climate is needed.</p>	<p>Yes. Added this section.</p>
	<p>It is somewhat unclear what is meant by the different levels of competence proposed in the framework. The framework would benefit from a little more specific description. The focus of the framework is built environment professionals and practitioners, and it usually encompasses much more than just the buildings. The built environment consists of all the structures that build a society.</p>	<p>Yes. Definitions were added for the built environment, built environment professionals, and competence. Specific professionals and practitioners are mentioned as examples.</p>
	<p>The concept of built environment professionals is very broad and encompasses a wide range of skills that include developers, planners, architects, landscape architects, experts (in various fields such as climate adaptation, ecology, cultural environment conservation), designers, facilities (water and sewage, infrastructure, parks), building</p>	<p>Yes. Agreed. The mentioned categories can be included as applicable professionals.</p>

	<p>permit officers, engineers, construction, supervisory functions, property managers etc. I think the framework needs to be a little more specific regarding what kind of built environment professionals and practitioners that are the target group in the different levels of competence.</p>	
	<p>It is a very good start if all these functions have foundational competence in climate change and climate adaptation, but it is nevertheless doubtful whether it is possible to assume that everyone should be able to reach that level of competence.</p>	<p>Through the course modules competence will be given</p>
	<p>It is suitable to assume that the functions and roles involved in planning (comprehensive plan and detailed development plans) should be included in the second level, intermediate competence. On this level it is assumed that there must be an ability to acquire the knowledge required to plan new buildings, for the unique location, as suitable and long-term sustainable as possible. Even at this stage, many different roles are involved and contribute their part</p>	<p>Accepted and comprehensive plans and detailed development plans were added.</p>
	<p>The third and last level, advanced competence, is possessed by a smaller number of professionals, a few people who are experts in the subject.</p>	<p>Added example professionals in the list.</p>
	<p>Competency framework seems to have a sensible progression from Foundational to Advanced.</p>	<p>Yes. Accepted.</p>
	<p>However, I suggest that the content of three tiers could be better worded enabling for a clearer understanding. To be honest, I had to read it several times to distinguish and absorb</p>	<p>The wording and the descriptions of tiers were changed as follows. <i>The 1st tier aims to provide the basics of</i></p>



	<p>the difference in the 3 tiers. The intro in this section explains the 3 tier in a simpler manner that could be understood by anybody.</p>	<p><i>climate science and climate change.</i></p> <p><i>The 2nd tier aims to provide knowledge on planning in the built environment to tackle climate change</i></p> <p><i>The 3rd tier aims to provide knowledge on professional capabilities which helps successful climate change adaptation</i></p>
	<p>Project Managers, Architect, Engineers, QS and Planners at least</p>	<p>Added to the list</p>
	<p>The structure is fine and ideal as it requires communication with all stake-holders.</p>	<p>Competencies related to communication are added.</p>
<b>Foundational Competencies</b>	<b>Overall Comments</b>	
	<p>Should able to answer the question of why we need worry about the climate changes as we are not suffering from it at the moment in our day to day life.</p> <p>You may outline other typical aspects on climate changes.</p>	<p>It was already mentioned in tier one (Under the 1<sup>st</sup> competency).</p>
	<p>Climate change and impacts on society. Principles of adaptation (justice, climate-resilient development, risk handling strategies, etc.)</p>	<p>It was already mentioned in tier one.</p>
	<p>climate change impacts and anthropogenic impacts on the environment, international frameworks, and conventions</p>	<p>It was already mentioned in the tier one and tier three</p>
	<p>No competencies can be developed without a proper and correct understanding of climate change basics</p>	<p>Climate change basics were already mentioned in tier one.</p>
	<p>Focus on the mitigation as well.</p>	<p>It was already mentioned in the tier one</p>

	Everyone who works with human and animal health, everyone in healthcare. National economists. Politicians and decision-makers. Contractors, Social scientists, and engineers. Civil society, property owners, employees of insurance companies, and banks	These professions were added
	Physicians, environmentalists, technical biologist and earth, etc.	These professions were added
	Main effects of climate change: SLR, extreme weather events, changes in temperature	Already mentioned in tier one.
	Fundamental and evidence-based knowledge of climate changes related impacts	Already mentioned in tier one.
	Climate change modeling and scenarios	Included in the advanced tier.
	Uncertainties of sea level rise and other climate components	Included in the foundational tier.
	Comprehensive knowledge of the climate in the particular area is needed to understand the climate change in the area.	It was added as new competency under the foundational tier.
	FOUNDATIONAL competencies across all built environment professionals and practitioners should be as follows: (1) Environmental Regulations and Legislation, (2) Environmental Ethics and Responsibilities.	This was added to advanced competencies which discusses international environmental frameworks.
	Climate resilient environment	Already added to the intermediate tier.
	Difference between climate adaptation and mitigation	Already added to the foundational tier.
	Environmental sustainability Inter-relationships between environmental sustainability, climate change, growth, development, poverty, social and economic issues	Already added to the in the intermediate tier
	In terms of designing of sustainable buildings, which is	Comments were accepted. Yet we intend

	<p>part of my expertise, the foundational competencies will be skills and knowledge on how to design with sustainable strategies, such as considering orientations of the buildings, maximizing natural ventilation and lighting to create a comfortable interior environment and design for energy efficiency in general.</p>	<p>to give more emphasis on climate change-related phenomena only.</p> <p>Planning-related components are mentioned at the intermediate level.</p>
	<p>Understand the functions and components of the natural environment in a particular area before making decisions.</p>	<p>Added to the intermediate level.</p>
	<p>A clear definition and understanding of 'climate change' and what is climate change adaptation. How it is related to the Built environment and why it is important.</p> <p>Who are the stakeholders who could be impacted?</p> <p>From a tourism perspective, there needs to be a globally applicable common understanding of these concepts and the importance of those targeting an effective impact.</p>	<p>The things mentioned in the first section are covered in the foundational tier.</p> <p>The things mentioned in the second section are covered in the advanced competencies.</p>
<b>Intermediate Competencies</b>		
	<p>No competencies can be developed without a proper and correct understanding of climate change basics</p>	<p>Added in the 1<sup>st</sup> tier.</p>
	<p>Knowledge of the administrative system</p>	<p>Added to the advanced level.</p>
	<p>Disaster Resilient infrastructure</p>	<p>Added as sub-competency in the intermediate tier.</p>
	<p>You may provide detailed information on the rapid aging of the built environment and the cost needed for restoration works if not addressed immediately.</p>	
	<p>Possible climate adaptation measures, including potential co-</p>	<p>These components were already added.</p>

	benefits and risks of maladaptation (green cities, sustainable physical planning, etc.).	
	Political economy and governance of climate change/environment Links between global, regional, and local environment and development issues related to climate change	These components were already added.
	Modeling of actions and parameters (sea level rise, relevant wave heights, and directions, flood levels, rainfalls...)	Added as advanced competency.
	Promoting sustainable building construction at the grassroots level	Added for sustainable planning in 2 <sup>nd</sup> tier.
	Adaptation and Mitigation approaches	Added in the 1 <sup>st</sup> tier.
	As for sustainable building design, experts at this level will understand more design details and technical details to achieve energy efficiency in both the design and construction period and the building usage period (post-occupancy).	Added in the 2 <sup>nd</sup> tier.
	Need to consider the biodiversity and other abiotic components in planning	Concerned
	The importance of planning the Built environment for a better adaptation to climate change. Understanding of key regulations related to the built environment and climate change adaptation. A deeper understanding of how each regulation and implementation measure can impact each stakeholder base across the tourism value chain.	Added in the 2 <sup>nd</sup> tier.
	INTERMEDIATE competencies across all built environment professionals and practitioners	Added to the professional list.

	should be as follows: (1) Environmental Design and Management, (2) Lean Engineering Processes (to Improve Environmental Regulatory Alignment).	
	Territorial and urban planners, coastal zone managers, administrative and professional end users of the effects of climate change	Added to the professional list.
<b>Advanced Competencies</b>	Should discuss the implementation of the code of practices and other means of applying the understanding on the field.	Concerned
	Specific climate adaptation measures depending on the role (how to plan, how to build). Legal issues, cost-benefits of different kinds of measures.	Concerned
	Coalition of disaster-resilient infrastructures	Already added the 2 <sup>nd</sup> tier.
	No competencies can be developed without a proper and correct understanding of climate change basics.	Acknowledged. Climate basics were added in the 1 <sup>st</sup> tier.
	Risk assessment and access to good data in the form of maps with risk areas etc.	Risk assessment is added to the advanced competencies and data-related components were added in the 1 <sup>st</sup> tier.
	A scientific team composed of multidisciplinary areas related to climate change causes and effects.	Changed the wording in 1 <sup>st</sup> tier and replaced it with “multidisciplinary areas related to climate change causes and effects.”
	Specific measures to adapt/mitigate the effects of climate change. Nature-based solutions and Ecosystem-based solutions vs grey solutions	Added to the 1 <sup>st</sup> tier.
	Exploring evidence-based policies on enhancing the built environment	Concerned

	Design and relocation criteria	Initial wording related to this in the 2 <sup>nd</sup> tier was changed as the “design and relocation criteria”
	Knowledge of responsibility for implemented measures	
	ADVANCED competencies across all built environment professionals and practitioners should be as follows: (1) Environmental Management Leadership, (2) Environmental Management Implementation.	Environmental management leadership is added to the advanced competencies. Environmental management implementation is not added, because its components are added in other areas.
	Urban Planning- Climate change adaptation strategies in city planning, integration of environment and climate priorities to development planning Urban Design- Urban design interventions for climate change adaptation Architecture- Architectural solutions for climate change adaptation BE Professionals- Understanding of environmental management systems and tools e.g. EIA and SEA	“Climate change adaptation strategies in city planning, integration of environment and climate priorities to development planning” is added to the 2 <sup>nd</sup> tier.  “Understanding of environmental management systems and tools e.g. EIA and SEA” is added to the section on advanced competencies.
	Apart from the skills and knowledge mentioned above, advanced competencies include trans-disciplinary approaches and integrate knowledge and skills from different stakeholders in the design and construction.	This is added to the intermediate tier.
	Research should be carried out related to considering the biotic factors in the selected area	Included.
	How the specific policies and guidelines could be applicable when planning and implementing them. In-depth understanding of	Aspects related to policies and guidelines were included.

	practical implementation targeting a specific impact.	
<b>Tier 01</b>		
1. Understand climate change and its impact on the coastal areas and the built environment	I think that the causes of climate change should only be handled briefly. However, it is important in the context of adaptation measures, i.e. that they should not increase emissions of greenhouse gases. That is part of the maladaptation issues that needs to be addressed.	The contents mentioned are addressed 1 <sup>st</sup> and 2 <sup>nd</sup> tiers.
a. Understand climate variability and change. <b>Accept=90%</b> <b>Revise=5%</b> <b>Remove=5%</b>	This item (item 5) should be moved to item 4	It was moved.
b. Identify and understand the causes and impacts of climate change. <b>Accept=85%</b> <b>Revise=15%</b> <b>Remove=0</b>	here, only discussed on the climate change impact, my opinion is to include manmade impacts on the coastal and the built environment. e.g.: constructing harbors, hotels, factories, removing sand dunes and mangrove, oil spills, etc.	Since our sole objective is to address climate change, we did not include the aspects mentioned here.
c. Understand the Spatial and temporal changes of climate change impacts <b>Accept=90%</b> <b>Revise=0</b> <b>Remove=10%</b>	1. Second must be first 2. Climate change must be defined properly referring to the present-day CC?? 3. No such term as natural disaster since disasters are neither natural nor man-made. 4. Coastal built environment???	Addressed 1 and 3 points. 2 <sup>nd</sup> and 4 <sup>th</sup> points are already addressed.
d. Understand the Spatial and temporal changes of climate change impacts <b>Accept=70%</b> <b>Revise=30%</b> <b>Remove=0</b>	Understanding the uncertainties of climate impact predictions is of prime importance. Also, making appropriate measures to reduce uncertainties is also important.	Added to the 2 <sup>nd</sup> competency of 1 <sup>st</sup> tier.

<p>e. Assess climate-related disasters, and natural disasters, with a disaster risk management approach.</p> <p><b>Accept=80%</b> <b>Revise=15%</b> <b>Remove=5%</b></p>	<p>Natural disasters are a thing (normality). The effects of climate change are another matter (new).</p>	<p>Word natural disaster was removed.</p>
<p>f. Understand the climate change impacts on coastal environments</p> <p><b>Accept=90%</b> <b>Revise=5%</b> <b>Remove=5%</b></p>	<p>This includes understanding the causes of climate change in order to prevent them and the impacts in order to mitigate them.</p>	<p>Already added.</p>
	<p>Assess climate-related disasters on coastal environments, and natural disasters, with a disaster risk management approach.</p>	<p>Already added with change of some wording.</p>
	<p>Relevant professionals should have knowledge on climate in particular coastal areas.</p>	<p>Concerned</p>
	<p>Move revised sub-competency to intermediate competencies</p>	<p>It is difficult to move because the 2<sup>nd</sup> tier discusses planning-related competencies</p>
	<p>Framework TIER 1 competencies and sub-competencies all seem suitable for inclusion.</p>	<p>Considered.</p>
	<p>Causes and impacts of climate change needs to be identified sector-wise. Most importantly, it is good to cover "the inter-relationships between environmental sustainability, climate change, growth, development, social and economic issues", as a sub-component.</p>	<p>Added as new sub-competency.</p>
	<p>To me, the assessment level could be more suitable for</p>	<p>Not clear.</p>



	experts in the intermediate competence rather than the foundational level.	
2. Use new trends and predictions on climate change adaptation		
<p>g. Understand the importance of data in climate change studies, decision-making, and planning.</p> <p><b>Accept=90%</b> <b>Revise=10%</b> <b>Remove=0</b></p>	Addressing uncertainties is of major importance.	It is added.
<p>h. Understand how predictions on sea level rise and coastal impacts can be used in decision-making and planning.</p> <p><b>Accept=90%</b> <b>Revise=10%</b> <b>Remove=0</b></p>	"uncertainty" should be explicitly addressed in item 2 ( Understand how predictions on sea level rise and coastal impacts can be used in decision-making and planning.)	It is addressed.
	there are global and regional Early Warning Systems and service providers for EW dissemination, climate change mitigation, and adaptations	It is added as new sub-competency.
	If the climate is continuously changing, how do we define or propose adaptations??	Concerned.
	Understand the importance of quality control, complete and representative data in climate change studies, and decision-making and planning. Sea level rise is only a single issue. Need to address the compound effects.	It is added as new sub-competency.

	Knowledge changes all the time and many people refer to the knowledge of others, so it is important to keep up.	Concerned.
	To analyze the present data and apply new technologies to make approaches to the climate changes predictions	It was added.
	would add a new competency regarding "understand the uncertainties associated with predictions"	Added.
	Understand the importance of conducting innovative experimental research in climate change adaptation.	Added in the 3 <sup>rd</sup> tier.
	Framework TIER 1 competencies and sub-competencies all seem suitable for inclusion.	Concerned.
3. Understand the climate change mitigation and adaptation		
i. Demonstrate the differences between mitigation and adaptation <b>Accept=80%</b> <b>Revise=15%</b> <b>Remove=5%</b>	See comment above, not too much focus on mitigation. Technology is part of the solution, but not the only possible solution. Analytical, informative and steering/organizational measures also have to be addressed. And of course nature based solutions.	Nature-based solutions are added.
j. Identify the importance of Technology in climate mitigation and adaptation <b>Accept=75%</b> <b>Revise=20%</b> <b>Remove=5%</b>	should teach on terminologies, tools, methods and technologies	Added to the advanced tier.
k. Identify mitigation measures and adaptation strategies	Same as the above	

<p><b>Accept=75%</b>  <b>Revise=20%</b>  <b>Remove=5%</b></p>		
	<p>Identify the importance of responsibilities, obligations, best practices, and Technology in climate mitigation and adaptation</p>	<p>Best practices were included in the advanced tier.</p>
	<p>Yes, good, but here it is about prioritizing and highlighting the climate adaptation aspect. Finding synergies with emission limitations is no more important than finding synergies with the designed living environment, biological diversity, etc. - if it does not increase the total funding!</p>	<p>Concerned.</p>
	<p>It is important in the implementation of climate change strategies for dealing with it.</p>	<p>Accepted. But here we are trying to give knowledge related to this.</p>
	<p>I would review the first competency, so that it could be integrated with the last one (identification measures and adaptation strategies). In my point of view, the last one must be the first one.</p>	<p>The first and last ones are added</p>
	<p>Understand what are the prevention mechanisms to respond to sea level rise-related impacts.</p>	<p>Need help on this.</p>
	<p>Technology is a tool that should not be overestimated as a definitive solution.</p>	<p>Concerned.</p>
	<p>Not so important to show the differences between Mitigation(M) and Adaptation(A). It can be more important to show measures which can be a solution of both for example restoration of wetlands. Land-use mostly affect both M and A at the same time. Behavior change is more important than technology</p>	<p>Concerned.</p>

	Need to consider the knowledge of local communities.	Added.
	Move revised sub competency to intermediate competencies	Intermediate competencies consist of major planning-related competencies. Therefore, it is difficult to add this to the intermediate section.
	Framework TIER 1 competencies and sub-competencies all seem suitable for inclusion	Concerned.
4. Identify stakeholders (Actors) in climate change adaptation and mitigation and their responsibilities		
<p>l. Identify stakeholders (Actors) in climate change adaptation and mitigation.</p> <p><b>Accept=95%</b> <b>Revise=5%</b> <b>Remove=0</b></p>	confusing question	NA.
<p>m. Identify their responsibilities, challenges, and suggestions.</p> <p><b>Accept=90%</b> <b>Revise=10%</b> <b>Remove=0</b></p>	not only roles and responsibilities but also their SOPs(Standard operating procedure)(Can be added, but need advice)	Need advice on this.
	See above, focus on adaptation rather than mitigation.	Concerned.
	Empower stakeholders in climate change adaptation and mitigation and their responsibilities in diversifying manner.	Already added.
	stakeholders' constraints should also be identified	Added.
	Identify actors that can influence adaptation not emission limitations - distinguish between these	This is discussed in the 1 <sup>st</sup> tier.

	Identify the gaps and weaknesses in the existing system to incorporate among different stakeholders.	There is an emphasis on gaps and weaknesses under challenges.
	Framework TIER 1 competencies and sub-competencies all seem suitable for inclusion.	Concerned.
	There are the actor in this scenario, it is necessary to identify them and define their responsibilities. All these structures can help the planners to define the strategies for climate change adaptation and mitigation	Addressed.
5. Understand the built environment and its relationship with climate change		
n. Understand built environment impacts on climate change and vice versa <b>Accept=75%</b> <b>Revise=25%</b> <b>Remove=0</b>	Are you sure we may make an impact on the environment??	Concerned.
o. Understand the need for mitigation and adaptation in the context of recent climate change from sectoral and holistic perspectives <b>Accept=80%</b> <b>Revise=15%</b> <b>Remove=5%</b>	here, my opinion is to include historical practices and indigenous knowledge on kingdoms (ancient built environment)	Added as a sub competency.
	Mitigation is mainly a global aspect, therefore, at the more local level, the analysis should be emphasized on how the built	Concerned.

	environment is impacted by climate change.	
	The competency about the need for mitigation and adaptation should have already been acquired in the previous sections	Concerned.
	Risk of sub-optimization if you have to do both adaptation and emission restrictions	
	Climate Change impacts on the built environment and the contribution from the built environment to the climate change	Addressed.
	Framework TIER 1 competencies and sub-competencies all seem suitable for inclusion	Concerned.
	Both are cause and effect at the same time. It is necessary to understand the role of each one for implement climate changes strategies	Addressed.
	Move revised sub-competency to intermediate competencies	Concerned.
<b>Overall comments on Tier 01</b>	An important fact of a built environment is the safety of the citizens, maximin utilization of resources, critical infrastructures, availability of services and disaster resilience Awareness is the key to work on t HR I protection of the environment.	
	Need to rethink and redesign, poorly studied.	Concerned.
	Please work on wording	Edited the words.
	Group 1 includes everyone who works with climate adaptation and effects of climate change and forms the broad base. This includes consultants, contractors, procurers, project managers, community planners, decision makers, local politicians, etc. Most have different educational	Included for built environmental professionals

	skills and backgrounds as well as experiences.	
	A comprehensive understanding of climate changes includes the analysis of causes and effects, stake holders, adaptation and mitigation, and built environment	Already included.
	I think that this Tier is very ambitious	Concerned.
	The aforementioned factors should be critically analyzed and evaluated by the relevant professional bodies of the stakeholders.	Concerned.
	All Framework TIER 1 suggested competencies and sub-competencies seem perfectly suitable for inclusion.	Concerned.
	The indicators in Tier 1 are comprehensive and appropriate	Concerned.
1. Understand the Role of built environment professionals to tackle climate change		
1.1 Address sociological, environmental, and economic needs in planning. <b>Accept=90%</b> <b>Revise=5%</b> <b>Remove=5%</b>	The global frameworks (an overview) could be addressed on the first level. I do not understand the meaning of "importance of bottom-to-top and top to bottom approaches".	The global competency framework was removed since it is discussed in the 3 <sup>rd</sup> tier.  Top-down and bottom-up approaches are kept without any change
1.2 Understand the policy, legal, and regulatory frameworks in the built environment and local needs to move towards CCA Accept=90% Revise=5% Remove=5%	I do not understand the relevance of item 1 in "Understand the Role of built environment professionals to tackle climate change"	Since the report commonly discusses built environment professionals, their role and its importance should be understood by all stakeholders.
1.3 Understand the contextual differences (Industrialized countries vs. developing countries) <b>Accept=80%</b>	Impact based Early warnings	Concerned.

<p><b>Revise=0</b> <b>Remove=20%</b></p>		
<p>1.4 Understand the global frameworks and relations among them. <b>Accept=75%</b> <b>Revise=12.5%</b> <b>Remove=12.5%</b></p>	<p>What we must understand is that nature is the first to be considered. Cultures or societies are highly dependent on the climate of a particular area. Hence different climates have different cultures and societies. There is no top to bottom or bottom to up approaches when it is dealt with environment, but it is totally cyclic.</p>	<p>Concerned.</p>
<p>1.5 Methods related to fulfilling human needs while conserving nature <b>Accept=80%</b> <b>Revise=20%</b> <b>Remove=0</b></p>	<p>Understand why the current system among the government authorities is not working.</p>	<p>Added.</p>
<p>1.6 Understand the importance of bottom-to-top and top to bottom approaches in CCA. <b>Accept=80%</b> <b>Revise=10%</b> <b>Remove=10%</b></p>	<p>Built environment professionals are the key of tackle climate change. The acknowledgment, understanding and implementation programs, rules, and projects are important for implementing climate change strategies</p>	<p>Concerned.</p>
	<p>I think that "Understand policies and regulatory frameworks" must be the first one. "Global frameworks and relations among them" must include the previous competency ("Contextual differences"), so I would remove it.</p>	<p>The placement of "Understand policies and regulatory frameworks" in the list was changed as per recommendation.</p>
	<p>Formation of bottom-to-top and top-to-bottom mechanisms in order to encourage active participation in Climate change.</p>	<p>Already addressed.</p>
	<p>It would be desirable to find new ways to satisfy human needs that were more neutral than the current ones with respect to emissions and consumption of natural resources.</p>	<p>Concerned.</p>



	Framework TIER 2 competencies and sub-competencies all seem suitable for inclusion.	Concerned.
	Considering the knowledge of natural scientist also important	Concerned.
2. Understand the Environment-friendly planning		
2.1 Basic Understanding on the Solar cycle and planning <b>Accept=80%</b> <b>Revise=10%</b> <b>Remove=10%</b>	I'm not sure that it is of relevance to go deep into a certain kind of measure to adapt forests to climate change or green energy. However, it would be useful to give examples of measures that can led to climate resilient development and multifunctional measures. Detailed descriptions of some of the topics above might be more relevant for level 3?	Added This cannot be added to the third tier as it primarily addresses the components related to professional development.
2.2 Understand and practical usage of green building concepts. <b>Accept=80%</b> <b>Revise=10%</b> <b>Remove=10%</b>	role of local authorities and risk governance	This is covered in the 1 <sup>st</sup> tier.
2.3 Application of green energies <b>Accept=80%</b> <b>Revise=15%</b> <b>Remove=5%</b>	Now time to think about using of the term called environmentally friendly. avoiding is much appreciated and if it is there, no one cares about conserving the nature. it should be stressed that we are part of the nature.	Concerned.
2.4 Use of environmentally friendly building materials, Disaster Resilient infrastructure and techniques <b>Accept=80%</b> <b>Revise=20%</b> <b>Remove=0</b>	Making renewable energy more portable and affordable. For example, instead of focusing on a single source, improve the technology to harvest both solar and wind at the household level.	Energy is addressed here.
2.5 Understand the importance of Analog Forestry as a nature-friendly environment	Understanding Environment-friendly planning is the most important step for dealing with climate change	Concerned.

restoration method (an approach to ecological restoration which uses natural forests as guides to create ecologically stable and socio-economically productive landscapes.) <b>Accept=80%</b> <b>Revise=10%</b> <b>Remove=10%</b>		
	I think that the competency about "Solar cycle" is not necessary The last one competency is too specific. If it is included, many more approaches should be detailed.	Concerned.
	developing a well-organized investment platform for investors to commence sustainable, eco-friendly productions.	Concerned.
	In addition to solutions based on new energy generation technologies, other forms of adaptation should be sought (reduction of individual mobility and energy consumption).	Added.
	Framework TIER 2 competencies and sub-competencies all seem suitable for inclusion.	Concerned.
	For an architect/designer, the 1st, 2nd and 4th items would be basic requirements, although those may be different for other subjects.	Concerned.
	Indigenous knowledge	Added in 1 <sup>st</sup> tier.
3. Understand DRR in the construction industry		
3.1 Adopt building codes and safety measurements in the construction. <b>Accept=75%</b> <b>Revise=25%</b> <b>Remove=0</b>	In my understanding, a more detailed description of some of the topics above might be more suitable for level 3?	In level 3 the framework intends to provide knowledge related to basic competencies for professionals. Therefore, these components should be kept without change.

<p>3.2 Prioritize Industrial safety and health <b>Accept=85%</b> <b>Revise=10%</b> <b>Remove=5%</b></p>	<p>Institutional DM Planning and Business' continuity management</p>	<p>Added as a new sub competency.</p>
<p>3.3 Explore legal backgrounds related to environment before the construction. <b>Accept=80%</b> <b>Revise=20%</b> <b>Remove=0</b></p>	<p>Modify the building codes to incorporate climate-induced changes</p>	<p>Concerned.</p>
	<p>The analysis of disaster risk can help planners to implement climate change strategies in the construction industry</p>	<p>Concerned.</p>
	<p>I don't agree with the selected competency.</p>	<p>Concerned.</p>
	<p>promoting sustainable construction technology by evidence base experiment.</p>	<p>Added.</p>
	<p>I think the choice of site should be emphasized over construction technology.</p>	<p>Concerned.</p>
	<p>This list of competencies feels small for such a crucial aspect of the framework. I would have expected circa 5 or 6 sub-competencies here.</p>	<p>Concerned.</p>
	<p>Follow-up the activities also important</p>	<p>Concerned.</p>
<p>4. Understand Planning in different contexts</p>		
<p>4.1 Understand the importance of climate resilience planning. <b>Accept=92%</b> <b>Revise=8%</b> <b>Remove=0</b></p>	<p>buildings codes, policies, by laws, etc</p>	<p>Addressed.</p>
<p>4.2 Understand the climate related DRR and a multi hazard approach in planning. <b>Accept=92%</b> <b>Revise=8%</b> <b>Remove=0</b></p>	<p>Planning is the key. As Abraham Lincoln said "if we have the key (Vicksburg) in the pocket, we will win the war" (Vickburg battle)</p>	<p>Addressed.</p>

4.3 Application of environmental sustainability in planning <b>Accept=92%</b> <b>Revise=8%</b> <b>Remove=0</b>	understating servitude rights in the land use planning with the development activities.	Added.
4.4 Understand the integrated land-use planning and construction planning. <b>Accept=92%</b> <b>Revise=8%</b> <b>Remove=0</b>	Is 'PLANNING' development planning or project planning? I think it should be clearer.	Addressed. Added the word development before planning.
4.5 Resettlement and relocation <b>Accept=88%</b> <b>Revise=8%</b> <b>Remove=4%</b>	For an architect/designer, the 3rd item would be basic requirement, although those may be different for other subjects.	Agreed. However changes were not made since this is a general framework aimed at different built environment stakeholders.
	Sustainability is a broad concept, which is difficult to implement in the practical situation. Good to identify the important aspect to be address.	Concerned.
5. Understand household approaches in climate change adaptation		
5.1 Application of household plans and designs in climate change adaptation <b>Accept=80%</b> <b>Revise=20%</b> <b>Remove=0</b>	I think all practitioners needs to have the same base level knowledge (in order to understand each other). However, more specific knowledge (on how for example) may be more relevant for certain roles and, therefore, as I understood the competence levels, rather an issue for level 3.	Concerned.  Understood. But the content is related to planning.
5.2 Understand the sociology of housing <b>Accept=80%</b> <b>Revise=20%</b> <b>Remove=0</b>	best practice's and case studies	Added in the 1 <sup>st</sup> tier.
5.3 Understand types of housing and specific planning and design considerations	Household approaches is very important in order to implement climate change strategies. Close	Concerned.

<b>Accept=85%</b> <b>Revise=15%</b> <b>Remove=0</b>	approaches in planning is important	
5.4 Understand refurbishment of existing housing <b>Accept=80%</b> <b>Revise=20%</b> <b>Remove=0</b>	enhancing knowledge of household planning in terms of diversifying and dynamic factors.	Concerned.
	Knowledge of legal operation of insurance is also relevant in this context.	The insurance scheme is added to this.
	Framework TIER 2 competencies and sub-competencies all seem suitable for inclusion.	Concerned.
	For an architect/designer, the 3rd item would be basic requirement, although those may be different for other subjects.	Agreed. However changes were not made since this is a general framework aimed at different built environment stakeholders.
	Understand the thinking and behavioral patterns of the people also will be important	Added as sub competency in Tier 1.
6. Use New trends and technologies, in planning and designing to tackle climate change		
6.1 Understand and apply climate change-related concepts during planning and designing <b>Accept=80%</b> <b>Revise=15%</b> <b>Remove=5%</b>	I do not see the relation between "Understand and apply climate change-related concepts during planning and designing" and the "Use New trends and technologies, in planning and designing to tackle climate change"	Accepted and the competency is removed since it is discussed in other places of the framework. Added to tier 2.
	experience sharing, case studies	Added in 1 <sup>st</sup> tier.
	Since the climates is different in different regions, this is highly local and specific to the local environment	Concerned.
	Planning and design is the main tolls to make proposals in climate change strategies	Concerned.

	I don't know how this competency integrates news technologies	Concerned.
	Applying evidence-based lessons learned in planning and designing to tackle climate change	Added.
	This list of competencies feels small for such a crucial aspect of the framework. I would have expected circa 3 or 4 sub-competencies here.	The competency is removed since it is discussed in other places of the framework. Added to tier 2.
	How the technology can be used to disseminate knowledge and information from top to bottom and bottom to top	Concerned.
7. Understand how construction and facilities management address the climate change		
7.1 Understand the Organization and management of construction and maintenance of the built environment. <b>Accept=80%</b> <b>Revise=20%</b> <b>Remove=0</b>	See comments above	Concerned.
7.2 Use of green construction materials and resources (green materials/low co2 emission) <b>Accept=80%</b> <b>Revise=15%</b> <b>Remove=5%</b>	"Understand New trends, technologies, and good practices in Construction and facilities management to tackle climate change" should be part of section 6 "Use of new trends and technologies, in planning and designing to tackle climate change"	Yes, changed it.
7.3 Create Employment and livelihood opportunities (green job creation) <b>Accept=85%</b> <b>Revise=15%</b> <b>Remove=0</b>	risk financing, risk insurance and access to disaster information	Risk financing and risk insurance is added as a sub competency.
7.4 Project management <b>Accept=80%</b>	Point 7 can go to Group 3	Yes, it is moved.

<b>Revise=20%</b> <b>Remove=0</b>		
7.5 Procurement, contracts, and project delivery <b>Accept=80%</b> <b>Revise=15%</b> <b>Remove=5%</b>	It is necessary to implement climate change strategies. Pilot projects, case studies and lessons learned are important .	Case studies and good practices are added in the upper layers.
7.6 Cost estimating cost control, and contract management <b>Accept=85%</b> <b>Revise=15%</b> <b>Remove=0</b>	Empowering media sector on promoting participation in community engagement in construction and maintenance.	Yes, it is added as a sub-competency.
7.7 Understand the Stakeholder engagement in construction. <b>Accept=95%</b> <b>Revise=5%</b> <b>Remove=0</b>	I think the choice of site should be emphasized over construction technology. From a local point of view, adaptation is more relevant than mitigation.	Concerned.
7.8 Housing Construction and maintenance <b>Accept=80%</b> <b>Revise=20%</b> <b>Remove=0</b>	Need for further elaboration.	Concerned.
7.9 Approving plans <b>Accept=80%</b> <b>Revise=10%</b> <b>Remove=10%</b>	Framework TIER 2 competencies and sub-competencies all seem suitable for inclusion.	Concerned.
7.10 Stakeholder consultation and participation in community engagement in construction and maintenance <b>Accept=95%</b> <b>Revise=5%</b> <b>Remove=0</b>	For architect/designers, project management and cost normally belong to further stage beyond intermediate level.	Concerned. Here the competency framework addresses the common knowledge and skill gaps of built environment professionals.
Overall comments-Tier 02	good, ensures the citizens human rights, development rights and the safety	
	Skip the whole of Group 2, focus on the needs of Group 3 and include the issues of Group 2 in Group 1 includes everyone who works with climate adaptation and effects of climate change and	The professionals mentioned here are included.

	forms the broad base. This includes consultants, contractors, procurers, project managers, community planners, decision makers, local politicians, etc. Most have different educational skills and backgrounds as well as experiences.	
	To understand the template of the climate change strategies are really important in order to implement it. It is necessary to move from the ideas to the planning and to the projects. Only real actions can improve climate change strategies	Yes accepted. However, here we try to provide knowledge related to climate change adaptation, and observing practical implementation is difficult.
	Developing strong community based mechanisms to expand comprehensive knowledge of the built environment.	Community-based approach is concerned and added.
	All Framework TIER 2 suggested competencies and sub-competencies seem perfectly suitable for inclusion....some comments made in Sections 3, 4 and 6.	Concerned.
	Items included in Tier 2 are generally comprehensive and appropriate. Some indicators, as selected, might be moved to either higher or lower levels for architectural requirements	Concerned. Necessary changes were done.
<b>Tier 03</b>	The only way to protect the environment is to cut down on anything. If not, this is just red tape to increase the number of pollutants in the environment. We lost the game, we only have time to add a couple of years.	
1. Understand Planning in coastal contexts	Might be good to address in level 2?	Yes. Will change.
1.1 Coastal adaptation strategies <b>Accept=75%</b> <b>Revise=20%</b> <b>Remove=5%</b>	Bathymetric survey, coastal hazard zonation mapping, usage of COMIT software, tsunami barriers, resilient infrastructures and constructions, EWs.	“Resilient infrastructures and constructions, EWs” were added in other tiers.



1.2 Identify climate change adaptation strategies in coastal areas <b>Accept=85%</b> <b>Revise=5%</b> <b>Remove=10%</b>	Better read the paleo climate to get an understanding the changes in strand lines.	Concerned.
	It is not comprehensive enough. Focus on compound impacts and suitable adaptation measures	Added.
	This is the fundamental of the whole study, isn't it? here you can obtain knowledge from geographically close conditions, even if it is in another country	Concerned.
	Planning is the best tool for coastal adaptation strategies taking account climate change	Added as a sub competencies.
	All this competency must be included in the Tier 2	Yes accepted.
	innovative coastal adaptation strategies	Concerned.
	Need to elaborate further (Wordings are not clear).	Accepted and changed.
	Framework TIER 3 competencies and sub-competencies all seem suitable for inclusion.	Concerned.
2. Using research methods in climate research		
2.1 Understand the research techniques <b>Accept=70%</b> <b>Revise=25%</b> <b>Remove=0</b>	I do not think that practitioners need to know about research writing. Maybe a little about how to interpret results from research?	When it comes to BE professionals, it includes administrators as well. They need to obtain funds for coastal adaptation projects and proposal writing is important in that context. Interpretation is also important.
2.2 Understanding the methodology of research proposal writing <b>Accept=75%</b> <b>Revise=20%</b> <b>Remove=5%</b>	I do not understand the relevance of this item	Research is the basement for applying and implementing CCA measures. Therefore, knowledge of research methodology is important

	Coastal exposure assessment, risk assessment and impact base EWs for related research. social research on impact based EWs	Concerned.
	specific to local area of concerned	Addressed.
	Need to understand the problem and research need	Concerned.
	the research must have a material	Concerned.
	If we want to obtain good results, we need good basements. Research techniques and methodology of research are necessary.	Concerned.
	Understand the location-specific useable research techniques.	Added as a new competency.
	Second one need to consider as the first one. Also, not clear the words "research techniques." What about 'Research Methodology'.	Concerned.
	Framework TIER 3 competencies and sub-competencies all seem suitable for inclusion.	Concerned.
	Implementing the findings of the research	Concerned.
3. Use technical tools in climate change adaptation		
3.1 Understand the ways of using technical tools, and terminologies in climate adaptation decision-making and planning. <b>Accept=85%</b> <b>Revise=15%</b> <b>Remove=0</b>	Practitioners need to understand the uncertainties of climate change modeling. But probably not the methods.	Added "uncertainties of climate change modeling".
3.2 Understand the different methods used for climate change modeling Accept=75% Revise=20% Remove=5%	Based on the research findings and the international experiences study on the best feasible adaptation measures.	Concerned.
	specific to local area of concerned	Concerned.

	Climate impact prediction must also included	It is added.
	a list of good examples can be a good tool	Concerned.
	Technical tools are the keys for implement climate change adaption. If we don't have good tools and different methods for climate change modeling, we can't reach our objectives.	Concerned.
	As the section 1 of this Tier 3, I think that all these competencies must be included in Tier 2	Yes, it is added.
	Understanding action research and technical tools in climate change adaptation	Yes, it is added to the research methodology sub competency.
	Second one should be the first one.	Yes, included.
	Framework TIER 3 competencies and sub-competencies all seem suitable for inclusion.	Concerned.
4. Understand the environmental, social, financial, and governance phenomenon in climate change adaptation	Maybe rather level 2?	Since this addresses general facts, we placed it here.
4.1 Application of interdisciplinary approach in climate change adaptation <b>Accept=80%</b> <b>Revise=20%</b> <b>Remove=0</b>	Under the SFDRR, SDG, and COP21 developing systems and SOPs on EW & operations, While developing Institutional DM plans and simulating frequently.	It is included.
4.2 Understand Global frameworks and local regulations which address climate change in the planning process <b>Accept=85%</b> <b>Revise=10%</b> <b>Remove=5%</b>	Specific to the local area of concerned.	Concerned.
4.3 Understanding the basics of green financing and climate financing.	well of course but mainly locally where you work if you want to see concrete results	Concerned.

<b>Accept=85%</b> <b>Revise=10%</b> <b>Remove=5%</b>		
	Multidisciplinary knowledge is needed.	Accepted.
	Application of a holistic approach to different phenomena in climate change adaptation	Addressed.
	Framework TIER 3 competencies and sub-competencies all seem suitable for inclusion.	Concerned.
	An understanding of the marketing mileage and the economic value addition that can be given for a tourism-related built environment.	Concerned.
5.Understand the communication strategies in climate change adaptation	Maybe also competencies needed in level 2?	Since it belongs to soft skills, this competency should remain.
5.1 Understanding communication approaches <b>Accept=84%</b> <b>Revise=16%</b> <b>Remove=0</b>	specific to local area of concerned	Concerned.
5.2 Understanding negotiation techniques in climate change under different contexts <b>Accept=84%</b> <b>Revise=12%</b> <b>Remove=4%</b>	Please be more specific	Concerned.
	It can be important to tell the public what you are doing	Concerned.
	All we are, are all we can communicate.	Concerned.
	Understanding will simplify communication and human-friendly approaches in developing interactions on climate change adaptation.	Concerned.
	Framework TIER 3 competencies and sub-	Concerned.

	competencies all seem suitable for inclusion.	
6. Understand the importance of human resource management in CCA		
6.1 Understanding the basics of human resources management in CCA <b>Accept=75%</b> <b>Revise=15%</b> <b>Remove=10%</b>	Level 2?	Since it belongs to soft skills, this competency should remain.
	initially coastal resource mapping, then coastal risk mapping and finally community resilience	Coastal resource mapping and coastal risk mapping are added.
	specific to local area of concerned	Concerned.
	Too vague. Please be more specific.	Concerned.
	same as above	Concerned.
	Climate change strategies implementation need of human resources. Climate change causes come from humans and climate change adaptation and mitigation is the responsibility of humans.	Concerned.
	enhancing competence and capacity on the basics of human resources management in CCA	Concerned.
	Framework TIER 3 competencies and sub-competencies all seem suitable for inclusion.	Concerned.
	Not very clear about the idea. what does this imply? Having human resources with the right skills/training etc.? Is it?	Yes, that is the idea.
Overall comments	fine	Concerned.
	Need to think something innovative.	Concerned.
	Group 3 includes those who will actually make decisions in the short and long term about measures that are important for	Concerned.

	the relevance of the climate adaptation measures.	
	It is necessary to understand the knowledge, multidisciplinary teams, communication and human resources for implementing climate change strategies.	Concerned.
	Introducing new policies and regular training forums on comprehensive knowledge of research and investigation, advanced digital literacy, improved communication, and integrated working skills.	Concerned.
	All Framework TIER 3 suggested competencies and sub-competencies seem perfectly suitable for inclusion. The overall numbers of sub-competencies seems to be a bit unbalanced: TIER 1 (14 sub-competencies), TIER 2 (29 sub-competencies), TIER 3 (12 sub-competencies).	Concerned.
	Indicators in Tier 3 are comprehensive, and well defined	Concerned.

Appendix 02-Memo of round 2

Section	Comments	Responses of UOC
<b>Overall Structure</b>	The revised structure is acceptable (71.4%) Further revisions are needed (28.6%)	
	Maybe also the third tier should be selected based on necessity? To clarify that competences gets more specific the higher the tier. Professional social workers should also be incorporated into the target groups.	*Most of the BE professionals did not have the competencies mentioned in the third tier. Therefore, that section should be followed by them as a compulsory section. *Professional social workers were added.

	<p>1. The definition does not apply with our regulations</p> <p>2. I find the target group far too wide</p> <p>In addition to climate adaptation, is it possible to consider mitigation?</p>	*Including that wide group is necessary, since they are part of the built environment.
Tier 1	<p>Revised competencies in Tier 01 are acceptable (78.6%)</p> <p>Further revisions are needed for Tier 01(21.4%)</p>	
	<p>Understanding the importance of introducing new national policies in climate change studies and decision-making processes</p> <p>Identifying the importance of an integrated disaster risk management plan (considering all the relevant stakeholders).</p> <p>Understanding the compound effects of climate change is needed. Also, the risk and vulnerability assessment must be included before the risk management.</p>	Added to the competency framework.
Tier 2	<p>Revised competencies in Tier 01 are acceptable (85.7%)</p> <p>Further revisions are needed for Tier 01(14.3%)</p>	
	<p>Understanding the climate models, scenarios that are used for climate models, and uncertainties of climate models on future predictions. simplify</p>	<p>Already added to the framework.</p> <p>Already added to the framework.</p>
Tier 3	<p>Revised competencies in Tier 01 are acceptable (92.9%)</p> <p>Further revisions are needed for Tier 01(7.1%)</p>	
	<p>This level seems broader and more basic than tier 2.</p> <p>Understanding impacts-based and multi-hazard evidence-based best practices (this</p>	Contents of tier 3(Advanced) were moved to the intermediate tier and the contents of the intermediate

	<p>should be incorporated under number 2).          Understanding the knowledge and experiences of local people on adaptation to CC and their applicability.</p>	<p>tier were moved to the Advanced tier.</p> <p>Added to indigenous knowledge.</p>
Overall	<p>My input is that this sort of very general framework with belonging questionnaires doesn't contribute to either Sweden's development of dealing with climate adaptation problems or the world's climate adaptation so I'm sorry to say that the results are too general to be useful.          All are fine, no further comment.</p>	<p>This is not a country-specific framework and so should be looked at as a general framework. It is well suited for that purpose.</p>

Appendix 03: Online Questionnaire Round 1

[https://docs.google.com/forms/d/e/1FAIpQLSdCgYw94LlLp\\_Icll4B\\_ClymeeGxA02cCBD8hhq\\_dzh1KdUWw/viewform?usp=sharing](https://docs.google.com/forms/d/e/1FAIpQLSdCgYw94LlLp_Icll4B_ClymeeGxA02cCBD8hhq_dzh1KdUWw/viewform?usp=sharing)

Appendix 04: Online Questionnaire Round 2

<https://docs.google.com/forms/d/e/1FAIpQLSc0ApszqwRd-6BTOaS9pI2gQNDTfvobEZR4JFiZAFabolM1og/viewform?usp=sharing>