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MULTICLIMACT RESILIENCE SCORECARD METHOD

Deliverable 1.1

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MULTICLIMACT

D1.1 – MULTICLIMACT RESILIENCE SCORECARD METHOD

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ABBREVIATIONS AND ACRONYMS

ACRONYM	DESCRIPTION
ARCH	Advancing Resilience of Historic Areas against Climate-related and other Hazards - EU project
ARCH RAD	ARCH Resilience Assessment Dashboard
CINEA	European Climate, Infrastructure and Environment Executive Agency
CMCC	Fondazione Centro Euro-Mediterraneo sui Cambiamenti Climatici
CREMA	MULTICLIMACT Climate RESilience Maturity Assessment
DNSH	Do No Significant Harm
DRM	Disaster Risk Management
DRR	Disaster Risk Reduction
EU	European Union
ICLEI	ICLEI European Secretariat GMBH
KPIs	Key Performance Indicators
MULTICLIMACT	MULTI-faceted CLIMate adaptation ACTions
NbS	Nature-based Solutions
NCSRD	National Center for Scientific Research "Demokritos"
PDNA	Post-Disaster Needs Assessment
RINA-C	RINA Consulting SPA
UKA	Universitätsklinikum Aachen
UNDRR	United Nations Office for Disaster Risk Reduction
WP	Work Package





EXECUTIVE SUMMARY

This document serves as the deliverable for Task 1.1 within the MULTICLIMACT project, funded by the European Commission through CINEA. Led by ICLEI and in collaboration with RINA-C, CMCC, NCSRD, and UKA, its primary focus is on developing the MULTICLIMACT Resilience Scorecard.

The Scorecard is designed to comprehensively assess the resilience of the built environment and communities against a spectrum of hazards, both climatic and non-climatic. Grounded in the concept of resilience as the ability to anticipate, prevent, absorb, and recover from various shocks and stresses, the Scorecard has been developed through a meticulous process, embodying a multi-faceted approach by integrating insights from desk reviews, workshops, and stakeholder engagement to ensure its effectiveness and relevance.

Central to the Scorecard's innovation is its multi-scale framework, which allows for assessments across various levels, including individual buildings, urban areas, and territorial landscapes. This adaptability caters to the diverse contexts in which resilience planning occurs, facilitating targeted interventions tailored to specific needs and vulnerabilities.

Moreover, the Scorecard's incorporation of resilience dimensions adds depth and nuance to the assessment process. By encompassing physical, human, technical, economic, environmental, and organisational dimensions, it provides a holistic view of resilience, enabling stakeholders to identify strengths, weaknesses, and opportunities for improvement across different facets of the built environment.

A key highlight of the Scorecard is its emphasis on human wellbeing and quality of life, aligning with contemporary resilience paradigms that prioritise the welfare of communities and individuals. By integrating this human-centred approach, the Scorecard not only evaluates structural resilience but also considers the social, cultural, and psychological aspects that contribute to overall community resilience.

Through iterative refinement and participatory activities with project's partners, the Scorecard has undergone continuous improvement addressing usability concerns and incorporating stakeholder feedback to ensure its practicality and effectiveness. Its scoring system enables nuanced evaluation and visualisation of resilience performance, empowering decision-makers to prioritise interventions and allocate resources strategically.

Looking forward, the Scorecard holds promise for broader applications beyond the MULTICLIMACT project. Recommendations include further testing, validation, and collaboration with other initiatives to maximise its impact and adaptability across diverse contexts.

By fostering collaboration and knowledge exchange, the MULTICLIMACT Resilience Scorecard is a flexible and adaptable tool to support decision-making and enhance the resilience of built environments and communities in an ever-changing world.



1. INTRODUCTION

1.1. OBJECTIVE AND SCOPE OF THE DOCUMENT

This document serves as a deliverable and marks the initial milestone of the project titled "MULTICLIMACT - MULTI-faceted CLIMate adaptation ACTions to improve resilience, preparedness, and responsiveness of the built environment against multiple hazards at multiple scales", funded by the European Commission through the European Climate, Infrastructure, and Environment Executive Agency (CINEA). Specifically, this deliverable represents the primary outcome of Task 1.1, titled "MULTICLIMACT resilience scorecard method", spearheaded by ICLEI in collaboration with RINA-C, CMCC, NCSRD, and UKA. This task is one of the three within Work Package 1, dedicated to establishing the MULTICLIMACT mainstreamed resilience framework. This framework will be further developed across three subsequent Work Packages over the project's duration (see figure 1 below).

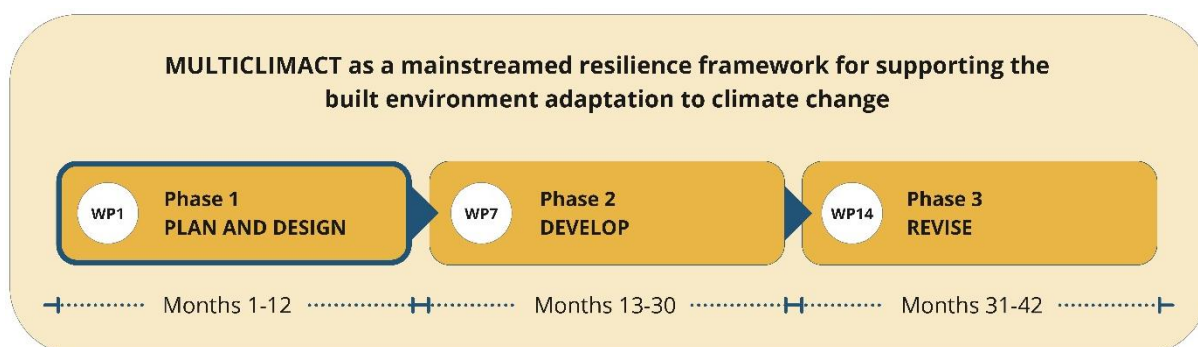


Figure 1 - Diagram on MULTICLIMACT phases related to plan, develop, and revise the mainstreamed resilience framework

The objective of this document is to provide an overview of the approach used for the development of the MULTICLIMACT Resilience Scorecard by describing the adopted methodology as well as the steps taken to implement it and the final results.

1.2. STRUCTURE OF THE DELIVERABLE

This deliverable consists of **seven key chapters**, guiding the reader through the development and application of the "Resilience Scorecard Method".

Chapter 1 sets the stage by introducing the overarching project objectives and scope, while also delineating the document's structure. It also explores interactions with other tasks within the broader project framework.

Chapter 2 provides the general background and context, explaining the purpose of Task 1.1 objectives and providing an overview of the MULTICLIMACT Scorecard.

Chapters 3 delves into methodology employed to develop the Resilience Scorecard approach, outlining the three key activities of Task 1.1: desk review, collaborative content creation with project partners and structuring of the Scorecard. It also addresses limitations and reflections on this process.

Chapter 4 then presents how the Desk Review has been planned, detailing its three main steps: compiling a resource list, establishing analysis criteria for initial assessment, and identifying pertinent resources to serve as references for Scorecard development.

Chapter 5 introduces the essential components of the MULTICLIMACT Scorecard, beginning with an overview of its foundational principles and subsequent elaboration on its core elements.

Chapter 6 focuses on the two workshops organised to review the structure and content of the Scorecard with project partners and to validate the Scorecard with the demos, internal and external partners of Task 1.1.



Chapter 7 delves into the core of the tool, offering an overview of its structure and content, Exploring the ten Essentials that constitute the backbone of the Scorecard, and providing some basic information about the Excel-based tool developed for the purpose.

Finally, the deliverable concludes with **Chapter 8** that addresses a "Way Forward", outlining potential next steps and future applications of the Resilience Scorecard, picturing a clear understanding of its potential impact on resilience planning. The document also contains the references and appendix sections.

1.3. INTERACTION WITH OTHER TASKS

The MULTICLIMACT Resilience Scorecard serves as the cornerstone of the MULTICLIMACT Resilience Framework developed through the project. A significant portion of the input for this task originates from the references outlined in the Grant Agreement, notably the ARCH framework and the UNDRR Disaster Resilience Scorecard for Cities (detailed in section 2.2). Additionally, inputs are derived from the task's activities themselves, which include a thorough desk review and mapping of existing resilience assessment tools to identify potential gaps and opportunities in the current state of the art.

Conversely, the output of Task 1.1 will inform multiple tasks. At a primary level, it directly influences the other two tasks within Work Package 1. Specifically, it aids in identifying Key Performance Indicators (KPIs) in Task 1.2 and contributes to the development of the overarching MULTICLIMACT resilience framework in Task 1.3.

Moreover, the results of Task 1.1, in conjunction with those of Task 1.2, serve as a foundational reference for multiple tasks within Work Package 2, as well as for the entirety of Work Package 3 and 4. Furthermore, these outcomes play a crucial role in informing the activities of Work Packages 7 and 14. Collectively, these work packages, along with Work Package 1, are instrumental in shaping the comprehensive MULTICLIMACT resilience framework (refer to figure 2 for visualisation).

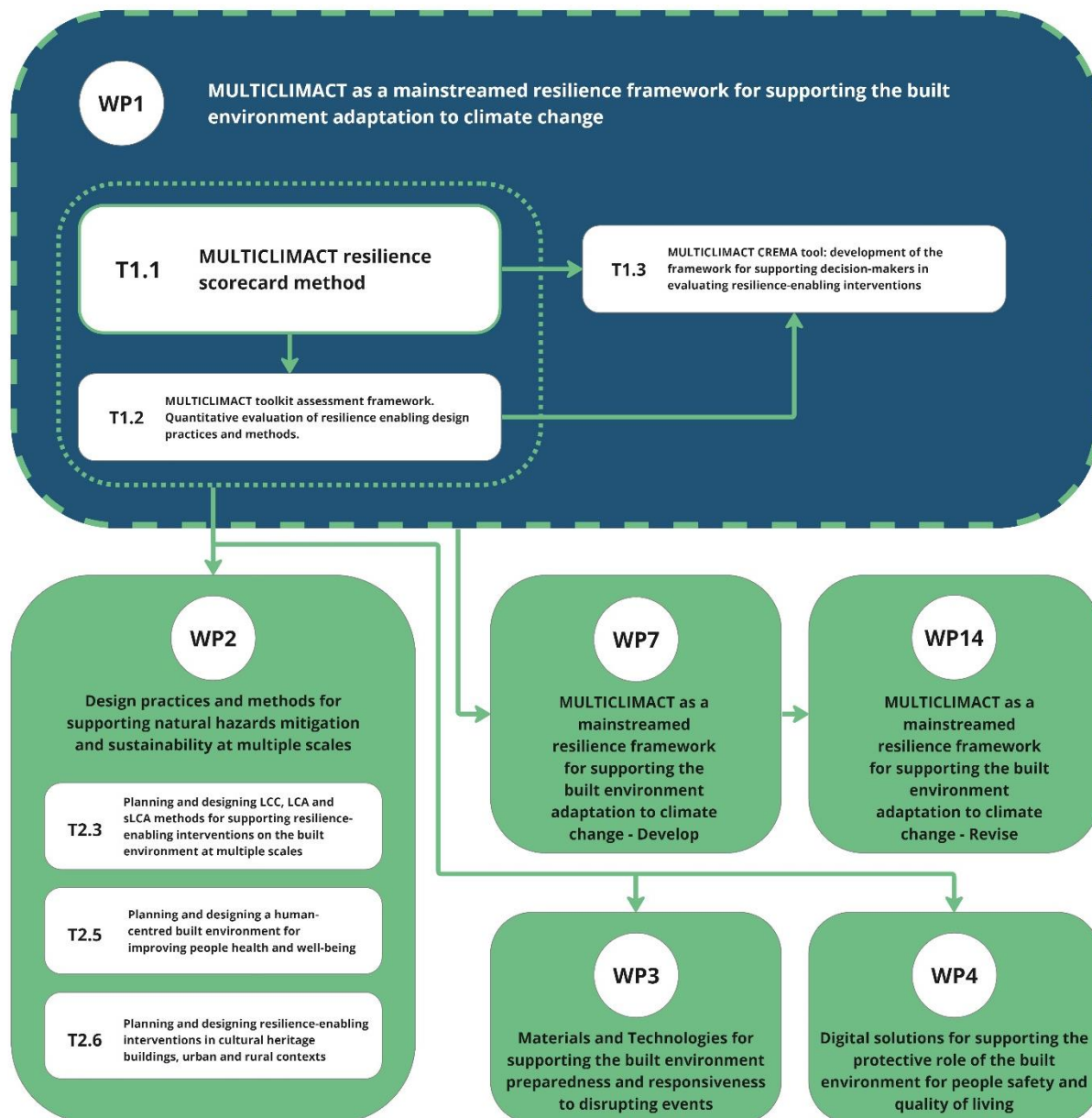


Figure 2 - Diagram on linkages of Task 1.1 with other Tasks and WPs



2 GENERAL BACKGROUND AND CONTEXT

2.1. TASK 1.1 OBJECTIVES AND OVERVIEW

Task 1.1 plays a crucial role within the MULTICLIMACT project, focusing on the development of the **MULTICLIMACT resilience scorecard method**. Along with task Task 1.2 ‘*MULTICLIMACT toolkit assessment framework. Quantitative evaluation of resilience enabling DESIGN practices and methods*’ and Task 1.3 ‘*MULTICLIMACT CREMA tool: development of the framework for supporting decision-makers in evaluating resilience-enabling interventions*’ (for more information see section 1.3 on the interaction with other tasks), the development of the scorecard method constitutes the foundation of the MULTICLIMACT resilience framework. This framework intends to be a method for assessing the resilience of the built environment - also taking into consideration the specificities of areas and assets of cultural interests - and the people living in it at different scales against locally relevant climate- and non-climate-related hazards and extreme events, as well as for supporting decision-makers in evaluating resilience building interventions by assessing their impact on specific assets.

Leveraging the expertise of each partner involved in Task 1.1¹, the MULTICLIMACT scorecard method has been developed in the form of a questionnaire composed by 134 questions spanning across different thematic areas (see Chapter 7) aiming at serving local administrators, building and infrastructure managers among others, to assess the “as is” resilience of an asset against a spectrum of natural and climatic hazards, supply-chain disruptions, and socio-economic stressors. In developing the scorecard method, a thorough mapping of the needs and requirements related to climate change was conducted. The method incorporates multi-hazard and multi-dimensional considerations to ensure alignment with the Do No Significant Harm (DNSH) approach, with corresponding questions developed to reflect the compliance with the six environmental objectives of the EU Taxonomy Regulation (2020/852). This multi-faceted approach ensures a holistic understanding of vulnerabilities and potential areas for improvement, recognising moreover the intrinsic link between built environment resilience and human well-being and integrating insights from various disciplines.

Throughout the development process, all partners involved in this task have collaboratively conducted a thorough desk review and mapping of existing resilience assessment tools (see Chapter 4 for more details). Identifying their strengths and weaknesses allowed to build upon their successes while addressing any identified gaps in functionality or applicability.

The development of the scorecard itself has also been the result of the collective effort of multiple parties. Starting by the partners officially involved in Task 1.1, and thanks to a process of subsequent revisions and consultations, the scorecard has also been enriched by the inputs and feedback of partners external to Task 1.1.

The total duration for its development spanned 7 months, which is one month longer than originally planned. The project commenced in October 2023, with the initial deadline for Deliverable 1.1 set for the end of March 2024. However, by the third month of work, it became evident that an additional month was necessary for the proper development of the scorecard. The decision to request an extension was primarily driven by insufficient time, compounded by delays resulting from the time required for organizational setup and full operational readiness at the project's onset. Additionally, the winter break, which lasted approximately three weeks, involved the majority of the task partners.

A formal request for the extension was submitted to the Project Officer through the Project Coordinator and was promptly approved, as it would not impact the timely completion of the action.

¹ Task 1.1 was led by ICLEI Europe (ICLEI) and involved the following project's partners: RINA Consulting (RINA-C), Fondazione Centro Euro-Mediterraneo sui Cambiamenti Climatici (CMCC), National Center For Scientific Research "Demokritos" (NCSR), and Universitaetsklinikum Aachen (UKA).



22 THE MULTICLIMACT SCORECARD

One of the initial steps toward enhancing the response of the built and human environment to both climate and non-climate-related challenges involves gaining a comprehensive understanding of the present situation. This entails identifying the strengths, weaknesses, and potential entry points or opportunities for improvement. In this context, the MULTICLIMACT resilience scorecard serves as a method for determining an asset's current position on the journey towards building resilience.

Considering that resilience encompasses various dimensions, the MULTICLIMACT resilience scorecard is designed to untangle this complexity. It achieves this by evaluating the resilience status of an asset from diverse perspectives, utilizing focused questions that target various strategic areas of intervention (refer to Chapter 7 for the scorecard's essentials).

The scorecard method aligns with the overarching ambition of the MULTICLIMACT framework which, as also stated in the Grant Agreement², seek to build upon the insights derived from the development of the ARCH disaster risk management framework³ and expanding it to adopt a multi-scale and multi-hazard approach. Originally, tools for ARCH were created to complement the UNDRR Disaster Resilience Scorecard for Cities⁴, focusing on evaluating and enhancing resilience in areas with cultural heritage significance within specific cities. MULTICLIMACT, on the other hand, aims to broaden its application to diverse geographical contexts and accommodate various assets and scales. This entails evaluating resilience across three distinct tiers of the built environment, namely individual buildings, urban systems (including cities or neighbourhoods/ districts), and the broader territorial level while also evaluating the resilience of assets in response to different hazards.

Another stride forward taken by the MULTICLIMACT scorecard concerning the current state in the field is its commitment to reflecting the new conditions that have emerged in recent years as comprehensively as possible. Societies are encountering both novel challenges and the exacerbation of existing ones; concurrently, new tools and technologies present invaluable resources to enhance preparedness and facilitate recovery.

An example can be the heightened awareness surrounding human well-being and quality of life that has surfaced in the aftermath of the COVID-19 pandemic. Subsequently, it has become increasingly apparent that resilience must encompass both the built and human environments. This realization underscores the aim of the MULTICLIMACT scorecard method, which seeks to contribute to a novel concept integrating resilience across the human-built environment.

As the starting point of the MULTICLIMACT resilience framework, the scorecard aims to gather qualitative information without delving too deeply into granularity. The resulting method intends to furnish end-users such as city or district administrators and building managers with insights into an asset's overall resilience to disruptive events. Simultaneously, it offers the opportunity to identify specific areas for intervention that require prioritization.

² "Taking into account that ARCH was only applied in the historical sites of the cities of Bratislava, Camerino, Hamburg and Valencia, MULTICLIMACT tool can operate as a mechanism to upscale the implementation of ARCH tools across wider geographical contexts, as well as accounting for different assets and scales. Co-created to help cities save cultural heritage from the effects of climate change, ARCH focused on assessing climate resilience for one hazard per city, which also can be upscaled by MULTICLIMACT toolkit to apply multi-hazard resilience assessment and enhance the decision-making process of the built environment policy planning, legislation, financing and implementation at different scales (from the building to the territorial ones)" (MULTICLIMACT Grant Agreement, Part B, Page 12).

³ <https://websites.fraunhofer.de/arch/>

⁴ <https://mcr2030.undrr.org/disaster-resilience-scorecard-cities>



3. METHODOLOGY AND DEVELOPMENT

3.1. RESILIENCE SCORECARD METHOD: CONCEPTUAL DEVELOPMENT

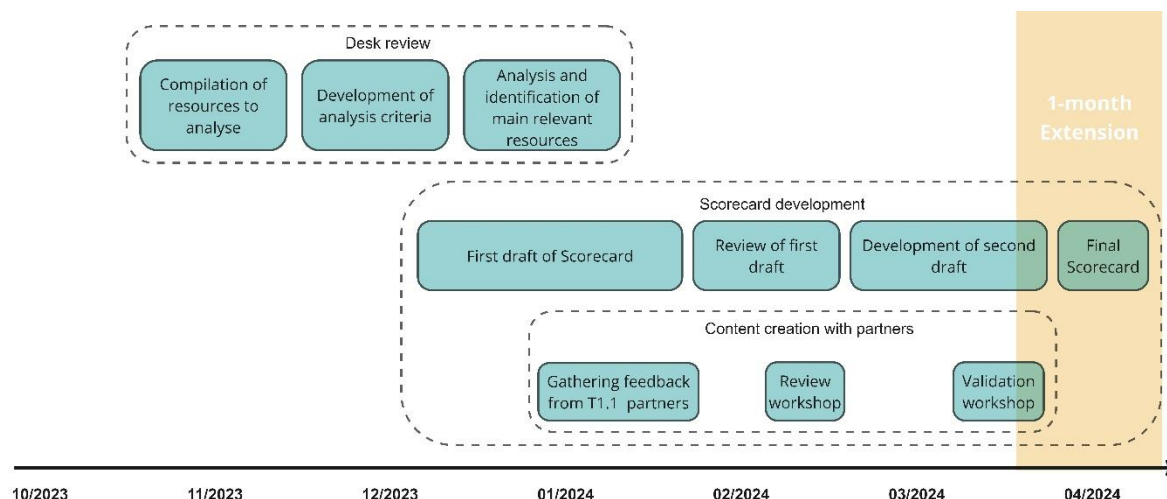


Figure 3 - Timeline of Task 1.1 activities

In the development of the Methodology to complete Task 1.1, the primary aim has been to ensure the reflection of the MULTICLIMACT approach in the Scorecard. To achieve this objective and produce a Scorecard that is deemed useful, innovative, and reflective of reality, the methodology employed encompasses diverse and multiple key steps:

- Desk Review of existing resilience assessment tools:** it involved the collection of various tools, strategies, scorecards, and frameworks to assess the “as is” resilience of diverse assets, followed by a more thorough analysis of the collected resources done on the basis of specific criteria formulated for the purpose. These criteria were crucial in both evaluating the results of the desk review and guiding the subsequent development of the Scorecard (see Chapter 4).
- Content Creation through Consortium Partners engagement:** Collaboration through sustained dialogue and active involvement, valuable input and diverse perspectives were integrated into the framework, ensuring the incorporation of diverse expertise and considerations throughout the whole task. For this purpose, besides the regular task’s meetings, bilateral interactions, and specific requests for inputs, two virtual workshops - namely a Review Workshop and a Validation Workshop - were facilitated for the continuous refinement of the Scorecard (see Chapter 6).
- Definition of the Scorecard structure:** based on the reference provided in the Grant Agreement and the results of the desk review, a structure for the Scorecard method was defined including the selection of specific themes to investigate and the definition of a scoring system (see Chapter 5).

These activities are further explained in the next subchapters.

Desk Review

One of the ambitions of the project is to offer a resilience assessment tool that incorporates a multi-disciplinary scorecard system capable of evaluating built environment assets - including cultural heritage assets - across various scales. To do that, as a basis of the state of the art a comprehensive



review of existing resilience assessment methods and tools was conducted starting from analysing two particular scorecard models that have been used as reference, namely, the UNDRR Disaster Resilience Scorecard for Cities and the ARCH Resilience Assessment Dashboard (RAD), both relevant to the project's scope and expected outcomes. The research was then expanded to identifying strengths, weaknesses, and gaps relevant to the project's scope and objectives within the existing realm of resilience assessment tools to ensure that the MULTICLIMACT scorecard addresses critical needs and offers innovative solutions.

Therefore, as a first step, the partners collaborated to compile a list of existing tools and methods based on their own experience and knowledge, utilizing an Excel-based template provided by ICLEI (see Annex A). This endeavour extended beyond mere collection of resources, involving the careful selection of analysis criteria to thoroughly investigate the materials gathered in alignment with the overarching approach and objectives of the MULTICLIMACT project. To facilitate a comprehensive evaluation process, a dedicated sheet was incorporated into the Excel file, outlining each criterion - chosen for assessment. Furthermore, to enhance efficiency, potential answers for each criterion were preselected, thereby streamlining the subsequent analysis.

Content Creation with Project Partners

This sub-chapter outlines the strategies employed to leverage the expertise of our partners and to strengthen coordination within the Consortium. In addition to fostering internal connections among partners working on Task 1.1, we recognized the importance of establishing connections with Tasks 1.2 and 1.3. Since both tasks started after Task 1.1 and are strictly dependant on our results, we aimed to engage in the most effective way.

Below the used approaches:

- **Continuous engagement through online meetings:** Regular online meetings among Work Package (WP) leaders, task leaders, and bilateral meetings when deemed necessary have been organised. Considering the short time of Task 1.1, they have served as platforms for reviewing planned activities such as the Desk Review and the Scorecard Development, knowledge exchange, issue resolution, and strategic planning.
- **Utilization of shared files for information collection:** Shared files have been implemented to collect inputs from partners to work simultaneously on collection of resources. A further aim, it is to create living documents that serve as dynamic repositories of knowledge for all the MULTICLIMACT Consortium Partners and beyond (such as the Desk Review). These documents are envisioned to evolve beyond the boundaries of Task 1.1, serving as valuable resources throughout the project's lifecycle.
- **Coordination meeting with Task 1.2 and Task 1.3:** A presential meeting at the RINA offices in Milan has been organised by the Project Coordinators to align the activities of WP1, since most of the work is based on the interlinkages among them and how each Task feed into the others.
- **Development and facilitation of virtual workshops:** Throughout Task 1.1, the crucial role of the Scorecard method and the necessity for alignment with project partners and activities became increasingly apparent. To address this, two virtual workshops were organized to refine the MULTICLIMACT Scorecard. The first, the Review Workshop, aimed to utilize the expertise of partners involved since inception to tailor the Scorecard's content and scope. The second, the Validation Workshop, gathered input on usability, accessibility, and clarity by engaging a broader range of participants from project case studies, including local representatives and partners involved in local-level activities.

Scorecard Structuring

As previously highlighted, the initial reference points for the MULTICLIMACT Scorecard were the UNDRR Disaster Resilience Scorecard for Cities and the ARCH RAD tool. As mentioned above, these choices were detailed in the project's Grant Agreement (Part B, page 12 of 58), which presented the



MULTICLIMACT Scorecard as an extension of these two existing frameworks. While ARCH concentrates on evaluating the climate resilience of cultural heritage for a single hazard at the city level, MULTICLIMACT extends its scope to assess the current resilience across multiple hazards and diverse built environment scales.

Hence, to ensure a robust alignment with the other two scorecards, these references were utilized to establish the fundamental structure for the MULTICLIMACT resilience scorecard methodology. This approach entailed adopting the same **10 Essentials**⁵ criteria and a comparable scoring system.

The essentials' definition, along with the structuring and content of the sub-essentials, were subsequently adjusted to align with the objectives of the MULTICLIMACT project, also considering the desk review results (more details in Chapter 4) and always taking into consideration the alignment with the DNSH principles by embedding climate resilience, sustainability, ecosystem protection, and circular economy concepts into its framework. ICLEI developed the MULTICLIMACT resilience Scorecard using an Excel format, which allowed to easily collect partners' contributions and comments in during the development period. In Chapter 7, it is possible to review the final Essentials and their description.

3.2 LIMITATIONS AND REFLECTIONS

Throughout the Scorecard's development, various constraints have become evident, with the most notable being the limited timeframe of just six months. Serving as the foundational task upon which all subsequent project activities rely, this timeframe has proved inadequate given the extensive scope of the endeavour. Additional months could have substantially enhanced further development and facilitated a more thorough exploration of the scorecard's constituent topics. Nevertheless, the approval of one-month extension for Task 1.1 presented a valuable opportunity for more comprehensive exploration and refinement of the MULTICLIMACT Resilience Scorecard.

Beside the time constraints, additional limitations and reflections emerged throughout the process, as follows:

- **Scope of the Scorecard:** One notable limitation pertains to the scope of the Scorecard. Despite efforts to encompass diverse scales and dimensions of resilience, there may still exist gaps or blind spots in the assessment framework. As resilience is inherently complex and context-specific, achieving comprehensive coverage across all possible scenarios and contexts remains a challenge.
- **Data Availability and Quality:** Another challenge revolves around the availability and quality of data necessary for completing the Scorecard assessment. While the tool aims to provide a structured framework for resilience evaluation, its effectiveness relies heavily on the availability of accurate and up-to-date data. In many cases, stakeholders may encounter difficulties in accessing relevant data or may face discrepancies in data quality, potentially affecting the accuracy and reliability of the assessment results.
- **Scalability and Adaptability:** While the Scorecard demonstrates versatility across different scales and contexts, ensuring its scalability and adaptability remains a critical consideration. As resilience assessments extend beyond the project's scope, the Scorecard must remain flexible enough to accommodate diverse applications and evolving challenges. Balancing the need for standardised methodologies with the demand for context-specific customisation presents a delicate balancing act.

⁵ The UNDRR's "Disaster Resilience Scorecard for Cities" is based on the UNDRR's Ten Essentials for Making Cities Resilient. These ten topics were initially formulated to expedite the implementation of the Sendai Framework for Disaster Risk Reduction (2015-2030) at the local level. Each Essential is further divided into sub-essentials, which delineate specific actionable and measurable items or criteria. More information can be found at: <https://mcr2030.undrr.org/ten-essentials-making-cities-resilient>.



- **Integration with Existing Frameworks:** Integrating the Scorecard with existing resilience assessment frameworks and tools poses both opportunities and challenges. While alignment with established methodologies enhances interoperability and comparability, it also requires careful navigation of differences in terminology, metrics, and assessment criteria. Harmonizing these frameworks while preserving the unique features and strengths of each presents a complex undertaking.
- **Resource Constraints:** Finally, resource constraints may pose practical limitations on the widespread adoption and implementation of the Scorecard. Inadequate funding, limited technical expertise, and competing priorities may hinder the deployment of the tool in resource-constrained settings, limiting its accessibility and impact.
- **User Engagement and Training:** The successful implementation of the Scorecard hinges on robust user engagement and training initiatives. However, ensuring widespread adoption and effective utilization of the tool among diverse stakeholders poses a significant challenge. Adequate training and capacity-building efforts are essential to empower users with the knowledge and skills required to navigate the Scorecard effectively and interpret the assessment results accurately.

Addressing these limitations would be important for the potential further development of the Scorecard. Continuous iteration, stakeholder engagement, and capacity-building efforts are essential to refine the Scorecard and maximize its utility as a robust and adaptable tool for resilience assessment and planning.



4. DESK REVIEW

4.1. COMPILING THE LIST OF RESOURCES

Considering the broad scope of the MULTICLIMACT project, which seeks to develop a framework and tool to bolster the resilience of built environments and communities against a spectrum of climatic and non-climatic hazards, it was imperative for the Desk Review and its analysis criteria to align with this multifaceted ambition. Moreover, for the development of the analysis criteria, it was also taken into consideration that the one of the primary purposes of this Desk Review lies in informing the development of the Scorecard.

The initial stage involved collaborating with the task's partners to compile a list of existing resilience assessment methods, organizing them by typology, as illustrated below:

- **Scorecard Method:** intended as a structured approach used to evaluate resilience based on a predefined set of criteria or indicators. These criteria cover various aspects of resilience, such as preparedness, response, recovery, and adaptation. The assessment results in a numerical score or rating for each asset being evaluated, providing a quantitative measure of resilience performance.
- **Rating System:** intended as a mechanism for assigning qualitative or quantitative evaluations, categorizing assets according to predetermined criteria or performance benchmarks, also allowing for comparative analysis and identification of strengths and weaknesses.
- **Certification System:** intended as a formalized process through which assets are evaluated against established resilience standards or criteria. Assets that meet these standards receive certification or accreditation, indicating their level of resilience and adherence to best practices.
- **Guidelines:** intended as a set of recommendations, principles, or best practices intended to guide stakeholders in assessing and improving the resilience of assets. They provide direction on key considerations, methodologies, and approaches for resilience.
- **Toolkit:** intended as a collection of resources, methodologies, and tools assembled to assist stakeholders in assessing and enhancing resilience. It may include guidelines, templates, assessment frameworks, and software applications designed to support various aspects of resilience assessment and planning.

The resulting list comprised 48 resources developed between 2008 and 2023 (see Annex A). Despite the observation that the categorisation of the resources did not precisely align with the presented rationale, it was determined not to alter the inputs provided by the partners, allowing them the opportunity to edit the information during the analysis of these resources (see Table 1 below).

4.2. DEVELOPING CRITERIA AND FIRST ANALYSIS

After finalizing the list of resources, the subsequent stage involved ICLEI developing analysis criteria to conduct a thorough evaluation of the resources, which were categorized into three primary groups, as outlined below:

- **General Features:** This category involves evaluating the fundamental attributes and qualities of the resources, such as their typology, target users, and intended outcomes.
- **Content Information:** This section aims to delve into the substance of the resources and assess their relevance to the objectives of the MULTICLIMACT project. Specifically, it examines the scale of application, thematic focus, whether they address single or multi-hazards, and which resilience perspectives they incorporate. Additionally, partners were tasked with identifying **potential indicators** within the analysed resources that align with the 10 Essentials of the UNDRR Scorecard and the ARCH tool.



- **Implementation Details:** Lastly, the focus shifts to understanding how the methodologies outlined in the resources are intended to be implemented in practice. This entails scrutinizing the methodologies, tools, and guidelines proposed for practical application.

Each group was provided with distinct analysis criteria, along with a predefined set of potential responses (see Table 1 below). These were consolidated into an Excel-based tool for partners to input their data. To facilitate this **initial analysis**, the total number of resources to be assessed was evenly distributed between ICLEI and the task's partners (for the full list of collected resources see Annex A).

Outlined below is an overview of the criteria for each group along with the possible answer provided to analyse the resources identified in the initial phase of the desk analysis review:

Table 1 - Analysis criteria of Desk Review

GENERAL FEATURES		
Analysis criteria	Guidance notes	Possible answers
Typology	Please indicate the typology of the resource. You can also amend what has been indicated in the previous tab if deemed appropriate.	Design guidelines Rating system Scorecard Method Toolkit Other (please specify)
Primary target	For whom is the resource meant? Who are the primary users?	Local governments, Communities Other (please specify)
Final output	What kind of output the resource is meant to generate?	"As is" assessment Integrated action plan Site specific solutions Report Other (please specify)
CONTENT INFORMATION		
Analysis criteria	Guidance notes	Possible answers
Scale	To what scale the resource is tailored?	Building Urban – city or district Territory Multiple Other (please specify)
Thematic focus	Does the resource have a clear thematic focus?	Cultural heritage Impact on human well-being/ quality of life Gender and/or vulnerable groups Economy/ finance Environment Policy/ legislation Other (please specify)



Single or multi-hazard	Please specify if the resource is looking at one (or more) specific hazard.	Single Hazard Multi-hazard
Resilience "angle"	Does the resource consider one (or more) specific aspect of resilience?	Broader climate resilience Sustainability Climate Change Adaptation Climate Change Mitigation DRM/DRR Other/ multiple (please specify)
IDENTIFICATION OF POTENTIAL INDICATORS DIVIDED BY RESILIENCE ESSENTIALS (to specify if the resource contains elements that could be considered as potential indicators)		
Essentials	Guidance notes	
Organizational structure and procedures for resilience	Plan making, organization, coordination for resilience.	
Risk scenarios	Future projections and current scenarios - availability of information/ capacity to identify and understand context-specific hazards, exposures, vulnerabilities, their implications and interdependencies using this knowledge to inform decision making.	
Financial capability for resilience	Understanding the economic impact of disasters and the need for investment in resilience. Identifying and developing financial mechanisms that can support resilience activities.	
Resilient urban development and design	Assessments/ data of the built environment on land use, population, income levels and economic activity, building codes.	
Resilience through natural environment and ecosystems	Identification, protection and monitoring of critical ecosystems services having a protective function enhancing disasters resilience.	
Institutional capacity for resilience	Analysing existing or missing capacities, education levels and specialising trainings of relevant institutions on resilience and related topics.	
Societal capacity for resilience	Education and understanding of resilience and disaster risk reduction concepts in different social groups. Presence or lack of social connectedness and a culture of mutual help.	
Resilient infrastructure	Assessment of the capacity and adequacy of critical infrastructure systems as well as the linkages between them	
Disaster response	Presence and scope of early warning systems, emergency management plans and procedures, trainings/ drills.	
Recovery and Building Back Better	Pre-disaster plans for post-disaster recovery, rehabilitation and reconstruction. Focus on Building Back Better approaches.	
Other resilience dimensions	Any other resilience dimension that emerged from the resource but is not included in this group and could be relevant for our project.	
IMPLEMENTATION DETAILS		
Analysis criteria	Guidance notes	Possible answers



Implementation modality	Does the resource need the facilitation of experts, or it can be implemented autonomously?	Self-paced Needs facilitation Mixed modality, Other (please specify)
Implementation material	Is the resource entirely available/ implementable online? Does it have key downloadable material?	Digital tool Downloadable material Other/ mixed
Material typology	What kind of material has been developed for the implementation of the resource?	Questionnaires Presentations Guided exercises Other (please specify)
Material available at	Please provide information on where the implementation material can be found. If the hyperlink provided previously is the only access, please use the same information.	---
Participatory approach/ activities	Does the resource entail any participatory activity?	Participatory risk mapping Focus Group Discussions Community consultations/ assessments Key stakeholders interviews Other (please specify)
Contacts for interview	Please indicate if you have access to any person involved with the implementation of the resource for potential interviews.	---

Finally, for each resource to be analysed, a space for additional notes and comments was also made available in the Excel sheet.

4.3. IDENTIFYING THE MOST RELEVANT RESOURCES

After conducting the first review of the collected resources, ICLEI proceeded with the **second phase of the analysis**, which involved scrutinizing all the information for each resource, including comparing information across different resources. The aim was to pinpoint any noticeable gaps, highlight positive examples, and ultimately identify the resources most pertinent to the development of the MULTICLIMACT Scorecard. To do that, bilateral calls with the partners were also undertaken to collect any additional feedback related to the resources that they analysed.

Upon initial examination of the desk review analysis, it became evident that there was a shortage of comparable products. Specifically, no resources were identified that comprehensively tackled resilience across various scales and hazards in the format of a scorecard. Furthermore, the majority of these resources were created before the onset of the COVID-19 pandemic, thus failing to address the newest challenges and opportunities that have arisen in recent times. With this information, the approach for developing of the MULTICLIMACT Scorecard method was validated.

Despite the initial plan was to arrange interviews with individuals involved in implementing the selected most relevant resources to gather more information on their practical applicability, this was not feasible due to time constraints.

In order to start developing the questions for the MULTICLIMACT Scorecard, the most relevant resources were chosen based on the following characteristics:



- Accessibility and format of material online (resources providing questionnaires, for instance, were prioritized).
- Consistency with the structure of the 10 Essentials of UNDRR utilized for the MULTICLIMACT Scorecard, whether through explicit reference or containing relevant themes.
- Focus on either health and quality of life or cultural heritage themes.

Based on an in-depth review of those resources, ICLEI started drafting the questions of the Scorecard (more information on the MULTICLIMACT Scorecard and its questions can be found in Chapter 7).



5. ELEMENTS OF THE SCORECARD

5.1. THE FOUNDATIONS

Considering resilience as the ability to “*anticipate, prevent, absorb and recover from shocks and stresses, in particular those brought about by rapid environmental, technological, social and demographic change, and to improve essential basic response structures and functions*”⁶, the overarching concept from the outset was to devise a comprehensive scorecard method capable of addressing various dimensions of resilience - thus transcending mere disaster risk reduction or climate change adaptation - while avoiding excessive emphasis on quantitative specifics.

The solution was found in formulating a scorecard approach that, despite being grounded in qualitative inquiries and corresponding qualitative responses, still yields a numerical score. Essentially, each qualitative question is matched with a range of potential qualitative responses, each assigned a numerical value or score, enabling a more nuanced assessment of resilience.

In alignment with the guidelines outlined in the Grant Agreement, the structure of the MULTICLIMACT Scorecard revolves around ten resilience topics akin to the **10 Essentials** featured in the UNDRR Disaster Resilience Scorecard for Cities and the ARCH Resilience Assessment Dashboard (RAD). Concurrently, this framework is enhanced through the incorporation of the following elements (also represented in figure 4):

- **Holistic View of Human-Built Environment:** The scorecard embraces the concept of the human-built environment, encompassing both physical structures and the inhabitants within. Emphasis is hence placed on the dimension of wellbeing and quality of life. In the initial draft of the Scorecard, dedicated questions concerning this topic were integrated into each Essential. However, as the development progressed, the necessity for such distinct thematic questions decreased, leading to their seamless integration throughout the entirety of the Scorecard (more information can be found in Chapter 7).
- **Identification of Resilience Dimensions:** Specific resilience dimensions are identified to frame the assessment, providing a holistic perspective on resilience across various aspects of the human-built environment (for more details see section 5.2). These dimensions allow for an additional layer of analysis and contribute to better alignment with the CREMA tool, which will undergo further development throughout the project.
- **Consideration of multiple hazards:** Instead of focusing solely on one hazard, the assessment accounts for the potential occurrence of various hazards (individually or simultaneously), ensuring a more comprehensive evaluation. The questions are formulated to allow for responses that address either one specific hazard or multiple hazards, as deemed appropriate.
- **Multi-Scale Consideration:** The scorecard is adaptable to different scales of the human-built environment, enabling assessments at the level of individual buildings, urban areas (including both entire cities or specific districts), or even beyond urban boundaries.
- **Incorporation of Cultural Heritage Perspective:** Cultural heritage is consistently integrated into the assessment process, acknowledging its significance in resilience planning for each scale. Similarly, to the thematic questions on wellbeing and quality of life, initially the approach involved allocating at least one thematic question to each Essential. However, as time progressed, a strategic shift occurred towards seamlessly integrating the cultural heritage aspect across the entire Scorecard. This decision was made with awareness of the existence of a dedicated tool, such as the ARCH RAD, for evaluating the resilience of cultural heritage assets.

⁶ ICLEI. (2018). The ICLEI Montréal Commitment and Strategic Vision 2018 - 2024. https://worldcongress2018.iclei.org/wp-content/uploads/The_ICLEI_Montréal_Commitment.pdf

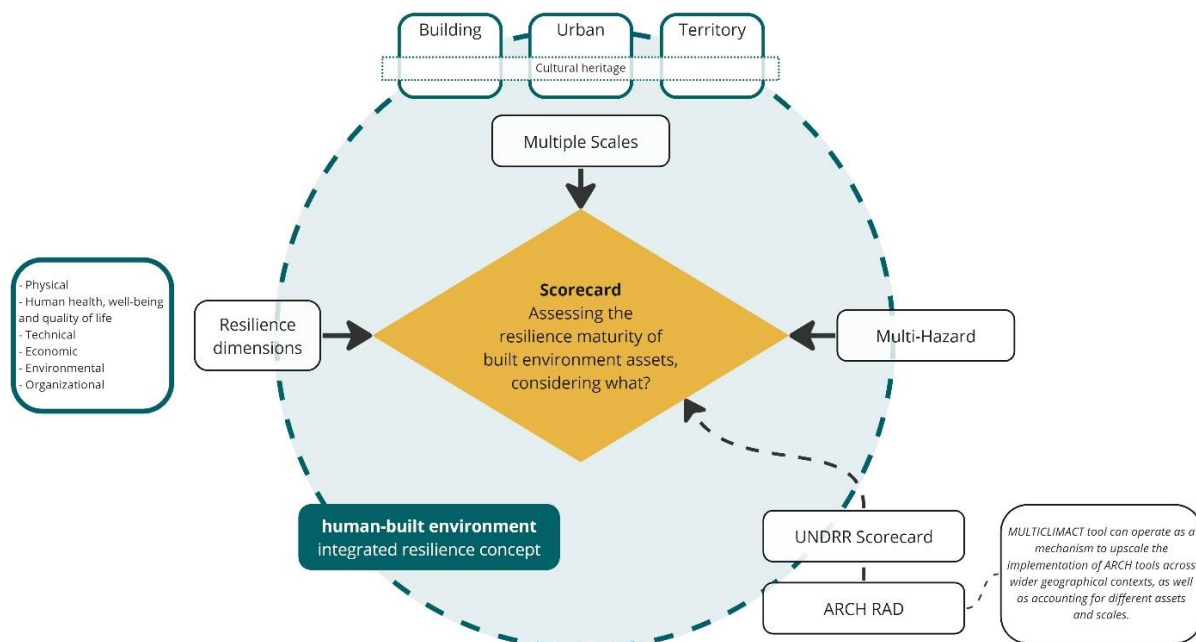


Figure 4 - MULTICLIMACT Scorecard Framework

5.2 THE STRUCTURE

In this section a detailed overview of the structure and functionality of the MULTICLIMACT Resilience Scorecard is provided. Starting by describing the digital support utilised, an exploration of its key features is provided, including the organization based on the 10 Essentials, the types of questions utilized, the multi-scale perspective, the integration of Resilience Dimensions, and the scoring system.

The Scorecard Essentials

As previously explained, the decision was made to adopt a structure for the MULTICLIMACT Resilience Scorecard based on the **Ten Essentials for Making Cities Resilient**⁷. Since the very first draft of the Scorecard, an **Excel-based format** has been utilized, featuring one sheet per Essential.

Furthermore, just like the UNDRR Disaster Resilience Scorecard for Cities and the ARCH Resilience Assessment Dashboard (RAD), the questions are organized into distinct groups known as “**Sub-Essentials**”, which serve to dissect the broader resilience topics into more specific areas, facilitating a more detailed assessment process. The process of aligning the essential and sub-essential structure and content with the objectives of the MULTICLIMACT project also involved screening to ensure compliance with the six environmental objectives and the DNSH climate change requirements. Several questions were included throughout the 10 Essentials to assess areas such as climate change adaptation and mitigation by mapping risks, vulnerabilities, and resilience needs; environmental protection and biodiversity by evaluating ecosystem services, water use, and pollution prevention; and the integration of circular economy principles by focusing on resource efficiency, material reuse, and waste reduction.

An overview of the Sub-Essentials included in the Scorecard is provided in Figure 5 below.

⁷ <https://mcr2030.undrr.org/ten-essentials-making-cities-resilient>

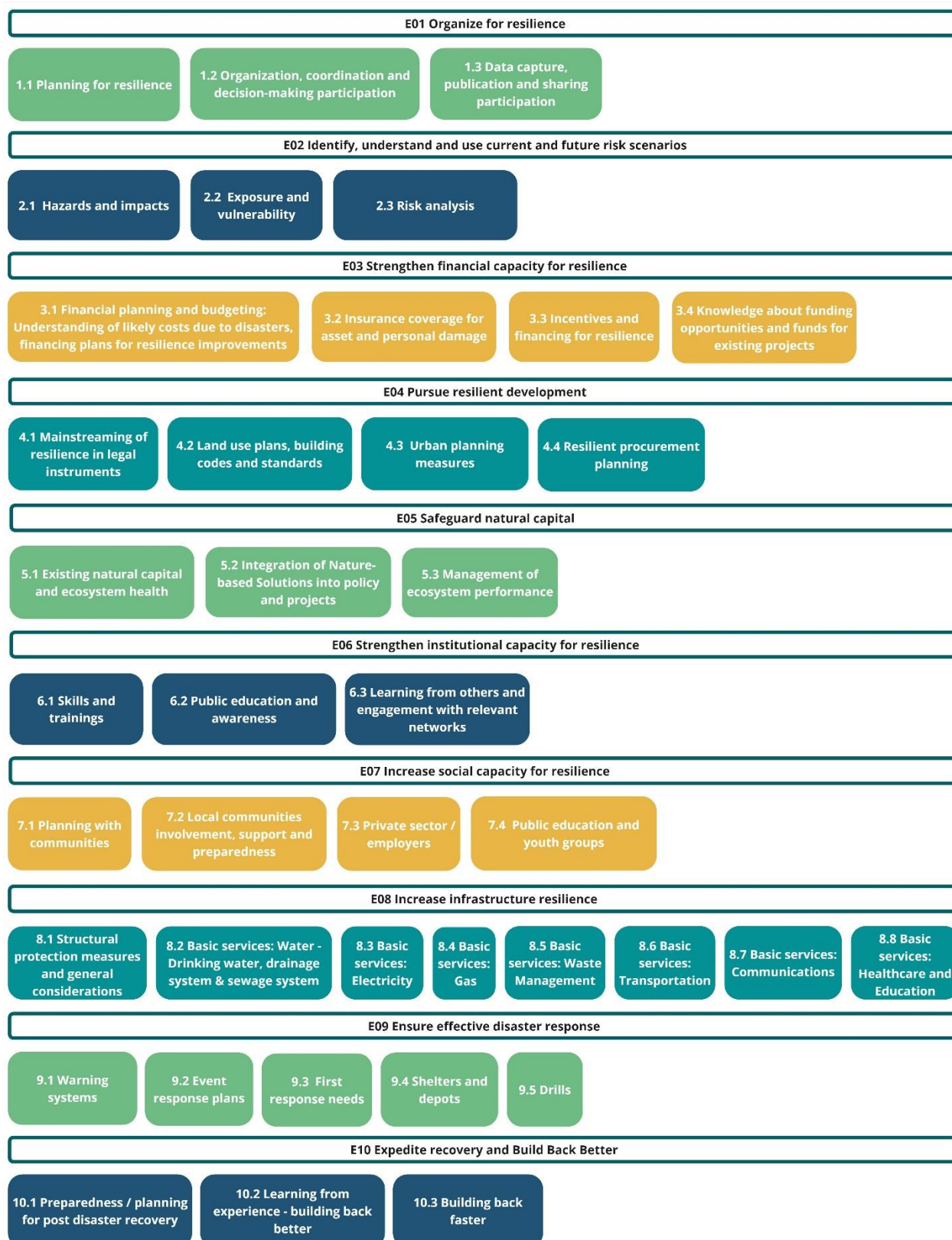


Figure 5 - Overview of Essentials and Sub-Essentials of the MULTICLIMACT Scorecard



Questions at two levels

Initially, the intention was to include around ten questions per Essential. However, as the work advanced, this quantity changed, resulting in each Essential having a different number of questions, tailored to the necessity of delving deeper into specific areas. Moreover, the need to add more depth to certain questions led to the creation of follow-up questions, labelled as "Level 2 Questions", which can only be addressed if the corresponding "Level 1 Question" received a score higher than zero as showed in Figure 6 (further details on the scoring system are provided below). This occurs because, typically, selecting an answer with a lower score indicates that the conditions necessary to respond to the follow-up questions are not met.

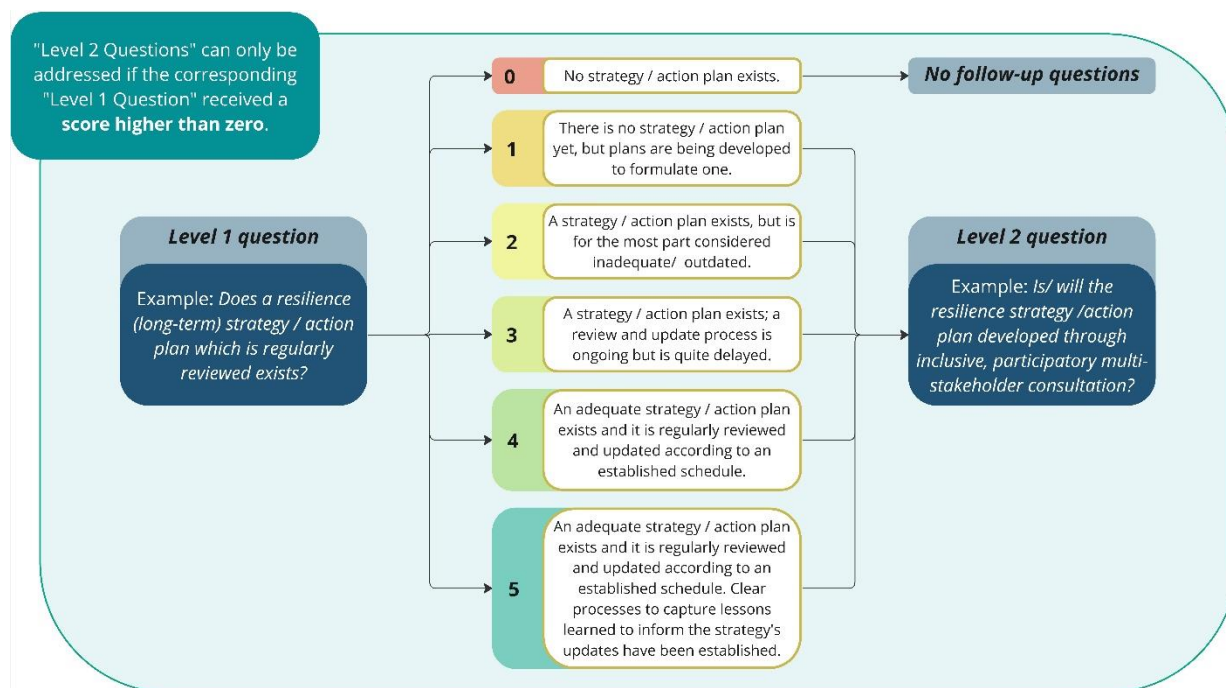


Figure 6 - Diagram explaining the 2 levels questions

Scales

As previously mentioned, the aim of the MULTICLIMACT Scorecard is to serve as a tool for assessing the resilience of assets within the human-built environment across various scales. Given that the Grant Agreement lacked precise specifications regarding the scales and their respective components, a significant effort was dedicated to defining these scales. This process considered several factors:

- **Desk Review Results:** An initial step involved examining the scales considered in the resources analysed during the desk review. The majority of these resources primarily focused on three distinct levels: the building scale and the city scale.
- **References in the Project:** Another aspect considered was the scales of activities planned for implementation in each of the four case studies within the project. This examination revealed four scales: the building scale, the neighbourhood scale, the urban scale, and the territorial scale, which encompasses areas extending beyond municipal boundaries/ strategic territorial infrastructure.
- **Scope and Purpose of the Scorecard:** Recognizing the need for flexibility and adaptability across different contexts beyond the project's case studies, both public and private administrative and managerial structures were taken into account to identify various potential users.



Considering the reflections derived from these considerations, the final decision was to adopt three scales, each encompassing multiple scenarios:

1. **Building scale:** This scale includes individual buildings or groups of buildings, both public and private.
 - *Users: building owners and managers (both public and private).*
2. **Urban scale:** Encompassing municipal districts or neighbourhoods, entire municipalities, metropolitan areas, and local infrastructures.
 - *Users: local administrations (either at district, city, or metropolitan level) including the single departments or units; infrastructures owners and managers (both public and private).*
3. **Territorial scale:** Encompassing administrative areas beyond municipal boundaries (e.g., provinces and regions), landscapes, and strategic large-scale infrastructures.
 - *Users: local administrations (either at provincial or regional level) including the single departments or units; infrastructures owners and managers (both public and private).*

To make the analysis possible for all these scales, the questions have been drafted to be as applicable as possible to all three. However, due to the specific nature of certain topics, some questions may only apply to two scales. This distinction is clearly noted within the scorecard itself to ensure clarity for users when completing it. It is also worth mentioning that while the Scorecard can assess the resilience of assets across all three scales, it can only be completed for **one scale at a time** (see Figure 7).

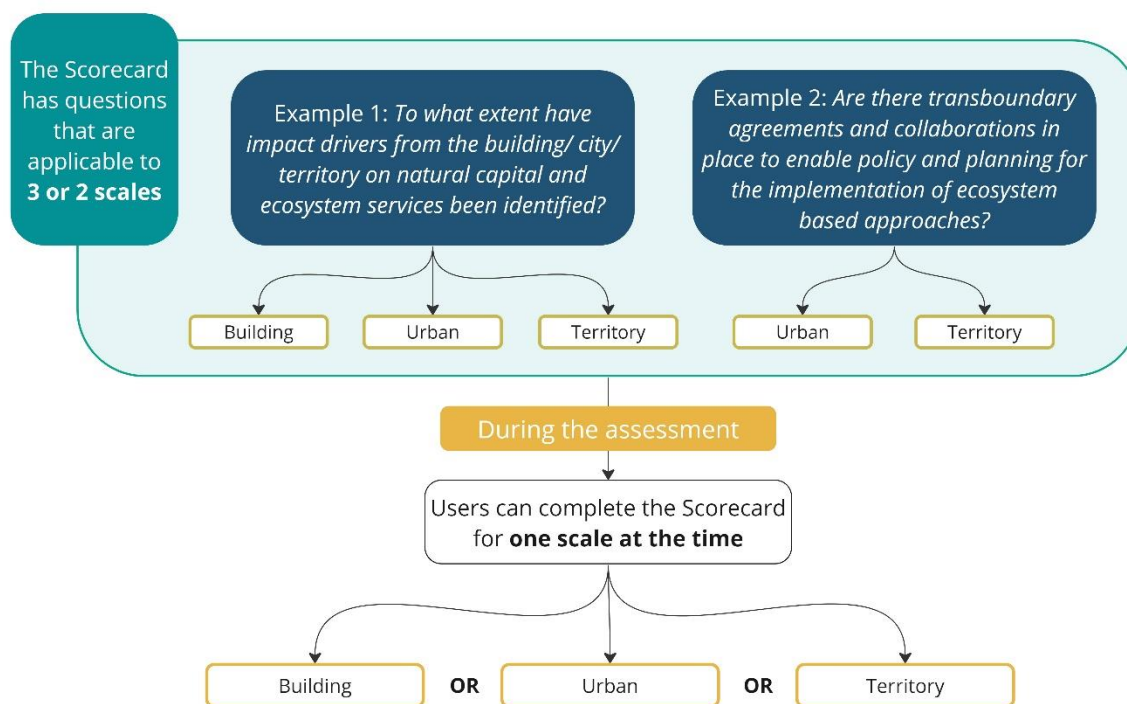


Figure 7 - Diagram showing how scales have been approached in the Scorecard

Resilience dimensions

As noted previously, specific resilience dimensions have been identified to structure the assessment, offering a comprehensive perspective on resilience across various facets of the human-built



environment. These dimensions introduce an additional layer of analysis and enhance alignment with the ongoing development of the CREMA tool within the project.

Incorporating these dimensions into the assessment process allows for a more nuanced understanding of resilience and enables stakeholders to address vulnerabilities and enhance adaptive capacity across multiple dimensions of the built environment. Below a description of what entail each of the 6 dimensions:

- **Physical Resilience:** The physical dimension of resilience focuses on the tangible aspects of the built environment, emphasizing the robustness and durability of structural elements.
- **Human health, well-being and quality of life:** Beyond mere survival, resilience entails maintaining and enhancing overall health, safety, and satisfaction. This dimension encompasses various factors, including social cohesion, community engagement, mental and physical health, education, and cultural well-being. A resilient community fosters strong social bonds, supports access to healthcare and education, and promotes a sense of belonging and purpose among its residents.
- **Technical Resilience:** Technical resilience focuses on the operational aspects of critical systems that underpin modern society. Communication networks, transportation systems, utilities, and other essential services must function reliably, even under adverse conditions. Enhancing the functionality and adaptability of technological infrastructure ensures continuity of services during disruptions, enabling swift recovery and response efforts.
- **Economic Resilience:** Economic stability and social structures are essential for fostering resilience, enabling communities to recover and thrive in the face of adversity. This dimension emphasizes the importance of diverse economic sectors, equitable access to resources, and social support systems that empower individuals and businesses to withstand shocks and adapt to changing circumstances.
- **Environmental Resilience:** Environmental resilience focuses on maintaining ecological balance, protecting natural resources, and minimizing negative environmental impacts.
- **Organisational Resilience:** Organizational resilience hinges on adaptive governance, efficient decision-making processes, and collaboration among stakeholders. Effective coordination within institutions, governance structures, and community organizations is crucial for a coordinated and effective response to challenges. By fostering transparency, accountability, and inclusivity, communities can strengthen their capacity to anticipate and address emerging threats, ensuring resilience in the face of uncertainty.

In the Scorecard, each question is *labelled* with one or more resilience dimensions, allowing the final scores to be evaluated in relation to these dimensions as well.

Scoring system

This section delves into the practical use of the MULTICLIMACT Scorecard, revealing the process of scoring, visualising results and outlining its significance in providing a final quantitative measure of resilience performance.

Through the MULTICLIMACT Scorecard, each question is evaluated to determine the extent to which certain factors are present or implemented (see Figure 8). By selecting an answer, respondents assign a numerical score to each question. The overall resilience score can then be calculated based on the aggregate of scores across all questions, providing a quantitative measure of resilience performance despite the qualitative nature of the questions and answers.



This scoring system, derived from reference projects and practices⁸⁹¹⁰¹¹¹², operates on a six-level scale, ranging from 0 (the worst case) to 5 (the best case), allowing for nuanced evaluation, ensuring that the resilience assessment captures the complexity of each aspect under scrutiny.

Ref. No	Levels	Subject	Question	Indicative measurement scale					
				0 - Worst	1	2	3	4	5 - Best
3.1 Financial planning and budgeting: Understanding of likely costs due to disasters, financing plans for resilience improvements									
3.1.1	Level 1	Understanding of the costs that could result from disasters	Do you have a reliable estimate of the costs that could be incurred in case of a disaster, and are these economic impacts included in the risk analysis?	There is no reliable estimate of the costs of disasters.	No estimate of the costs of disasters, but there are plans to do so.	There are some efforts to estimate the costs of disasters, but they are not comprehensive or reliable, and these economic impacts may not be fully included in the risk analysis.	There is a moderately reliable estimate of the costs of disasters, and these economic impacts are included to some extent in the risk analysis, although there may be major shortcomings.	There is a reliable estimate of the costs of disasters, and these economic impacts are included to some extent in the risk analysis, with minor shortcomings.	There is a highly reliable estimate of the costs of disasters, and these economic impacts are comprehensively included in the risk analysis.

Figure 8 - Sample question with related scoring system

Depending on the scale of the asset analysed, the results are visualised in the dedicated result sheet of the Excel-based file (i.e. building scale, urban scale, or territorial scale). After completing the assessment, users receive both a total score and a segmented score based on groups like Essentials, Sub-Essentials, or Resilience Dimensions, visualised as data bars (see example in Figure 23). This segmentation facilitates the comprehension of resilience strengths and weaknesses across different aspects of the framework. The scores for each group are compared to the maximum possible scores for that group to extract a percentage. To calculate the maximum score, all questions, including the Level 2 questions, as well as unanswered questions, are considered. Unanswered questions are assigned a score of zero in terms of their contribution to the overall scoring, considering that all questions are relevant to obtain a resilience score.

Additionally, the total scores are also visualised through radar charts for comparing scoring across Essentials and Resilience Dimensions (see example in Figure 22).

⁸ <https://smr-project.eu/tools/maturity-model-guide/resilience-maturity-model/>

⁹ <https://toolkit.climate.gov/tool/climate-resilience-evaluation-awareness-tool-creat>

¹⁰ <https://openknowledge.worldbank.org/handle/10986/35039>

¹¹ <https://climate-adapt.eea.europa.eu/en/metadata/tools/the-resilience-maturity-model>

¹² <https://www.unisdr.org/campaign/resilientcities/toolkit/article/disaster-resilience-scorecard-for-cities>



6. WORKSHOPS

6.1. VIRTUAL REVIEW WORKSHOP

One of the key activities reflecting the active involvement of the partners into the Scorecard's development was a virtual review workshop organised for the partners participating in Task 1.1. The decision of involving just the task's partners was made because it was deemed beneficial to involve only those who had a fair understanding of the scorecard features and the progress made thus far. The participation of the partners was commendable, and many valuable inputs were collected. Additionally, this collaborative effort contributed to further enhancing the already strong collaboration among the partners. This collaborative effort was instrumental in advancing towards the finalization of MULTICLIMACT Scorecard.

The two-hour workshop took place online on February 20, 2024, using the MIRO platform. It was scheduled after ICLEI revised the first draft of the Scorecard following the initial review by the task partners. The workshop aimed to achieve the following objectives:

1. Clarifying the Scorecard questions and present the current status of the Scorecard.
2. Assessing the sufficiency and structure of Scorecard essentials.
3. Addressing gaps in essential information and incorporating participant suggestions.
4. Ensuring alignment with MULTICLIMACT project objectives, particularly regarding multi-scale and multi-hazard considerations.
5. Strengthening the focus on human wellbeing and quality of life aspects,
6. Evaluating the treatment of cultural heritage topics within the Scorecard.

Following these objectives, the agenda encompassed various exercises aimed at refining the structure, content, and focus of the Scorecard. Participants were guided through discussions on essential topics, gaps in information, and considerations for integrating user feedback. The session was designed to be informal and highly interactive, allowing everyone to actively participate in the discussions. Utilizing the MIRO platform facilitated this interaction. For the key activities, ICLEI provided each partner with coloured sticky notes, making it easy to identify contributions from each participant for subsequent discussions.

The following activities were undertaken:

Introduction to the Workshop and Starting Points

Participants were introduced to the MULTICLIMACT approach and the objectives of the workshop. They received an overview of the Miro platform, which facilitated collaborative interaction and document sharing.

An initial discussion was held regarding potential users of the scorecard. ICLEI presented some initial ideas, and participants offered additional suggestions for potential users (see Figure 8 below). Various inputs were provided, and some were incorporated into the final version of the Scorecard. However, the diverse range of inputs from the partners revealed a lack of clarity regarding the overall target of the Scorecard. ICLEI acknowledged this observation and took it into consideration for subsequent steps.

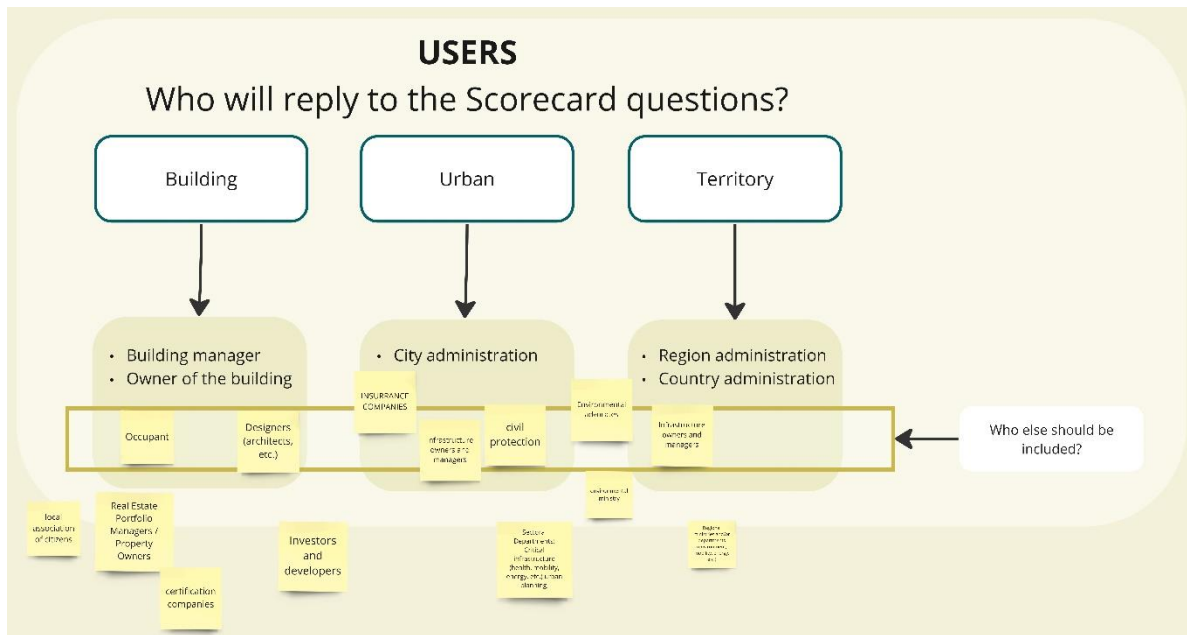


Figure 9 - Users exercise at the virtual Review Workshop.

Exercise 1: Discussion on Scorecard Structure

This exercise consisted of three steps, during which participants reviewed the current structure of the Scorecard. They discussed the two-level question format, the three scales, and the resilience dimensions, respectively. Participants weighed the pros and cons of various aspects of the Scorecard, providing valuable insights and suggestions for enhancement.

Levels of questions: in the first step of this exercise the format used for the Scorecard where some of the questions have follow-ups if answered positively, was discussed (see figure 12 below). The main takeaways were that the method offers benefits such as focusing more deeply on essential goals, reducing the size of the scorecard if necessary, and being time efficient. However, it was noted that it might require careful consideration of the relationship between Level 2 details and KPIs to be developed in Task 1.2, and some aspects may require multiple Level 2 questions.

***ACTION TAKEN:** To tackle this issue, ICLEI reviewed the Scorecard, adjusting the number of Level 2 Questions as necessary. Also, even closer collaboration was undertaken with CMCC (Task 1.2 leader) to better analyse the relationship between the Scorecard and the KPIs to be developed.*

Additionally, one potential drawback is the possibility of respondents simply answering "no" without giving it much thought. This can happen when respondents feel overwhelmed by the number of questions or when they lack motivation to provide thoughtful responses.

***ACTION TAKEN:** To mitigate this, ICLEI reviewed the Scorecard in a more concise and engaging way, ensuring that respondents understand the value of their input and feel motivated to provide meaningful answers.*

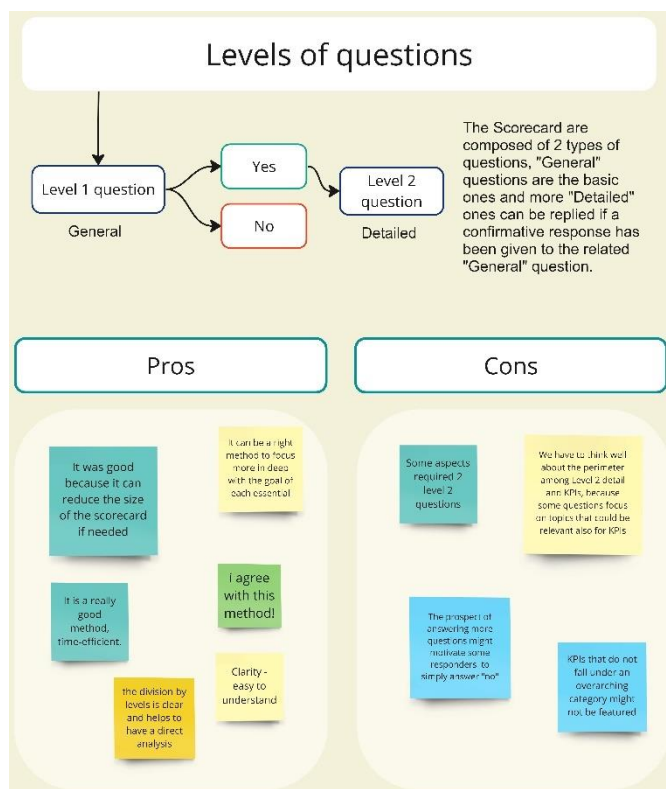


Figure 10 - Level of questions exercise at the virtual Review Workshop

The three scales: The second step of Exercise 1 involved discussing how the three scales are represented in the questions of the Scorecard. However, the focus of this exercise slightly shifted as participants also provided inputs regarding the content of the questions, which was not the primary objective. Nonetheless, it was noticed that more comments were made regarding the cons than the pros.

ACTION TAKEN: This result prompted ICLEI to further reflect on the overall clarity of this structure and to revise some of the questions that might not be clear regarding their applicability to a specific scale.

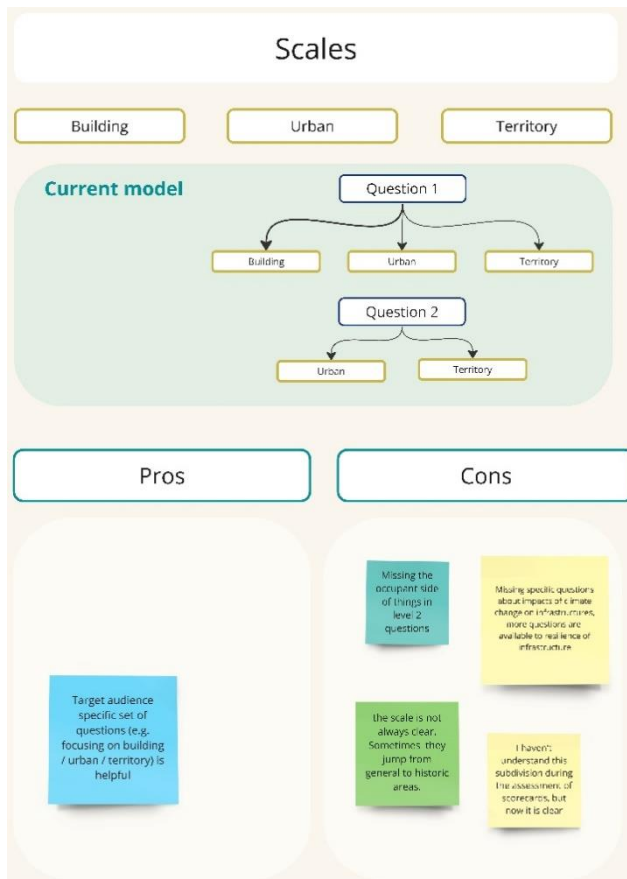


Figure 11 - Scorecard Scales exercise at the virtual Review Workshop

Resilience Dimensions: The final step of Exercise 1 involved discussing the suitability of the resilience dimensions considered for the Scorecard. Discussions revolved around whether certain dimensions could be indirectly included within others, the incorporation of cultural heritage as a separate dimension, and the need for clarity in titles and categorization. Overall, while the categorization and specific scoring of each dimension were appreciated, there were suggestions for further refinement and consideration of certain aspects.

ACTION TAKEN: As a result of this conversation, ICLEI decided not to include cultural heritage as a stand-alone dimension but rather to integrate it throughout the entire Scorecard. Additionally, Economic resilience was designated as a stand-alone dimension, and efforts were made to better define the placement of health issues.

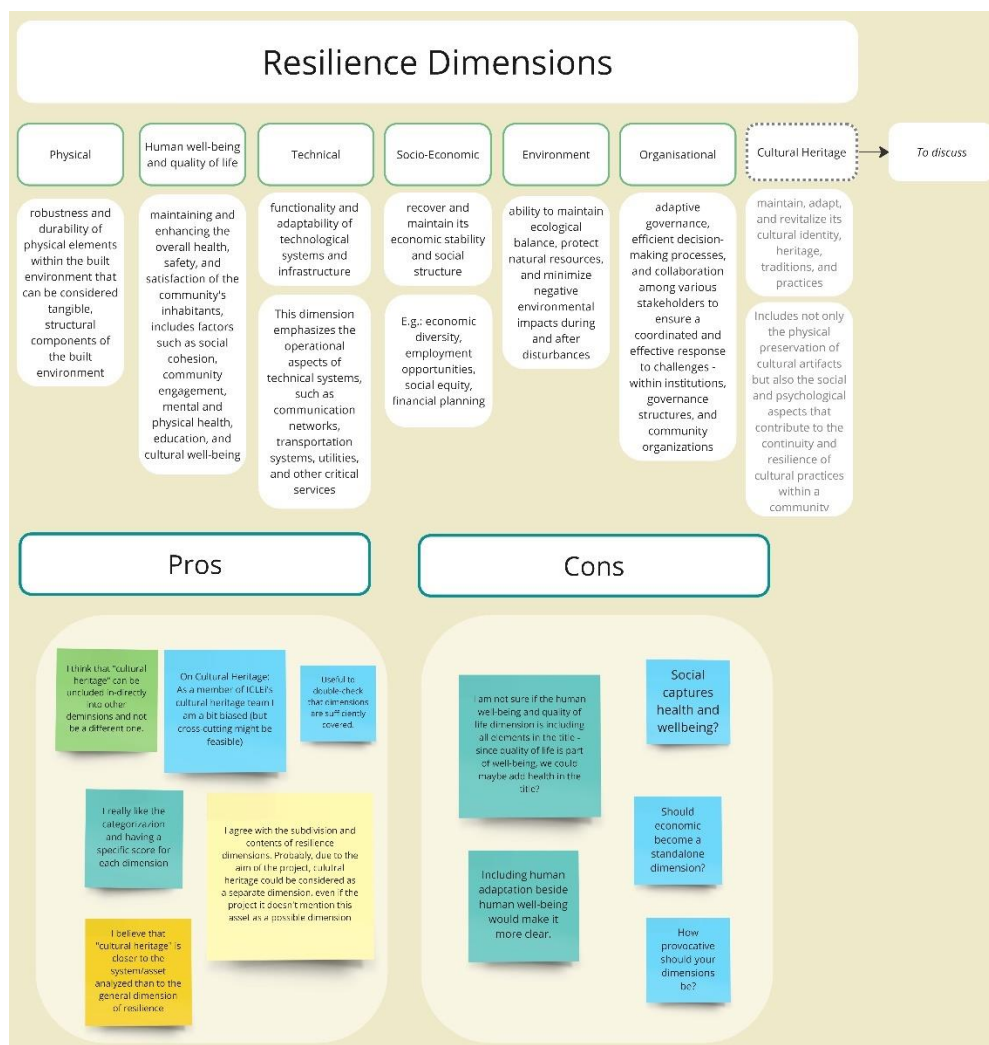


Figure 12 - Resilience Dimensions exercise at the virtual Review Workshop

Exercise a: Identifying Gaps in Topics

Participants collaborated to identify gaps in the Scorecard topics, aiming for comprehensive coverage of relevant subject matter and recognizing emerging challenges and opportunities that have emerged in recent years.

Using sticky notes, participants provided their inputs, which were then discussed collectively and grouped into thematic clusters. The main themes that participants felt were missing - or somewhat weak - included new technological advancements, health issues (including mental health), social inclusion issues, and considerations of different types of crises.

ACTION TAKEN: After thorough consideration and reflection, ICLEI revised the Scorecard questions to address these points more effectively. This involved modifying existing questions or creating new ones to better incorporate these topics.

Exercise 2b: Connecting identified topics with the Essentials

During interactive dialogue, participants assessed which Essential the topics identified in Exercise 2a could be categorized under, while also discussing the adequacy of the existing Scorecard essentials.

The main outcomes of this discussion included the collective decision not to introduce additional Essentials, and deliberation on integrating the emerged new topics with the existing essentials.



ACTION TAKEN: Building upon the results and actions derived from the previous exercise, ICLEI incorporated the partners' suggestions as much as possible when revising the Scorecard questions.

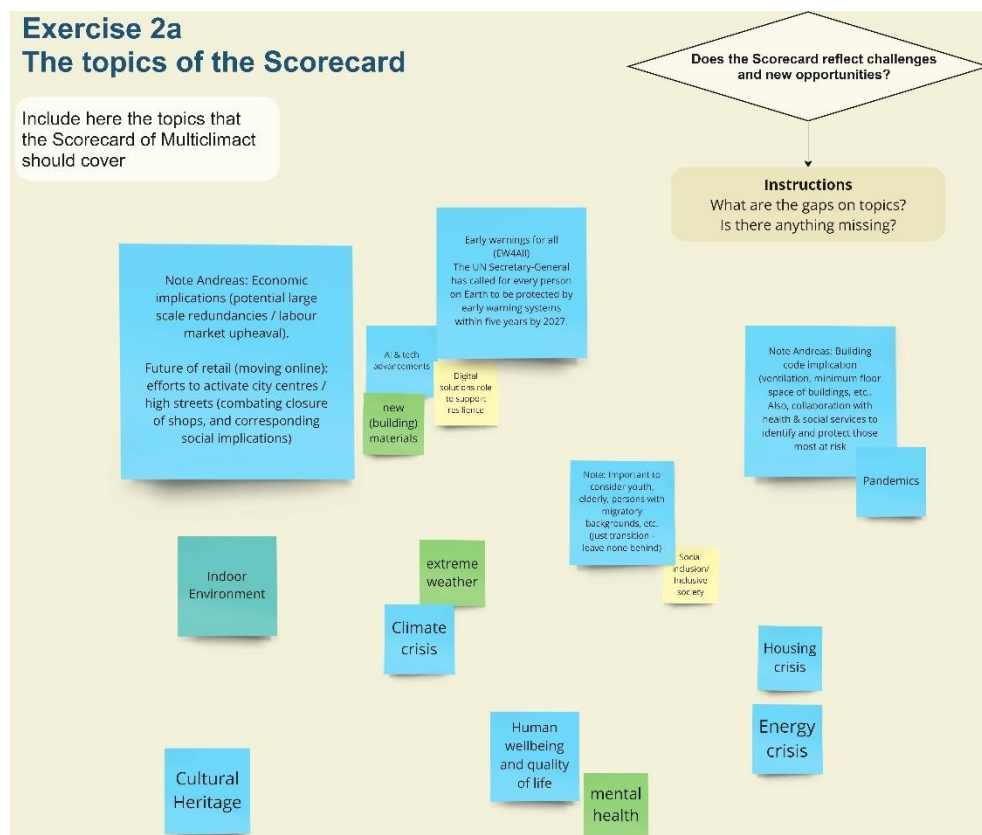


Figure 13 - Scorecard topics exercise at the virtual Review Workshop

Conclusions and Next Steps

The workshop concluded with outlining the upcoming steps and establishing a structured timeline. Additionally, ICLEI clarified our expectations regarding the utilization of the workshop outcomes.

6.2 VIRTUAL VALIDATION WORKSHOP

Once the final draft of the Scorecard had been finalised, an online workshop was organised to validate it with demos representatives, internal partners of Task 1.1, as well as project partners external to Task 1.1. The main objective was to identify any gaps or areas for improvement that may have been overlooked during the development stage, mainly in terms of clarity and usability of the Scorecard.

By involving representatives of the demos, since they will be the first main users of the Scorecard under this project, ICLEI aimed to ensure that the Scorecard is tailored to assess real-world scenarios and applicable to their own scale of governance. Moreover, the aim was to ensure the Scorecard relevance and acceptance within the target user groups, ultimately maximizing its impact and effectiveness.

Conversely, inviting project partners external to Task 1.1. brought fresh perspectives and expertise from different backgrounds.

In advance of the validation workshop, which took place on 27/03/2024 online, ICLEI distributed the most updated version of the scorecard to the invited participants for them to get acquainted with its structure, content, and overall method. Some key-topics and questions guided ICLEI in identifying the objective of the workshop:



Context-relevance

- Is the content of the scorecard relevant in your governance context?
- Can the participant share any specific scenarios where using the scorecard in their context would be practical?
- Are the identified questions applicable to the 3 scales (building, urban, territory)?

Usability

- Is it the scorecard easy to navigate and use? If there are areas that could be improved, what specific adaptations or enhancements would you suggest?

Scoring system

- Are there significant challenges in collecting the necessary information to assess MULTICLIMACT in your context?
- Do the various options provided make it easier to choose one score over another? For instance, do you struggle to decide between selecting a score of 2 or 3? Is it clear for you to discern the appropriate situation for each score?

The following activities were undertaken:

Icebreaker, Introduction to the Workshop and Starting Points

An initial icebreaker activity was conducted, participants were posed the question ***"In what scenarios do you envision the MULTICLIMACT Resilience Scorecard being utilized?"*** via the Slido platform to gather feedback on participants' understanding of the Scorecard's objectives.

As illustrated in Figure 16, most participants expressed that they see the Scorecard as applicable in **urban planning** processes. Moreover, they identified its potential utility in **assessing the capacities of local administrations**, **aiding decision-making phases**, and **prioritizing interventions**, among other contexts.

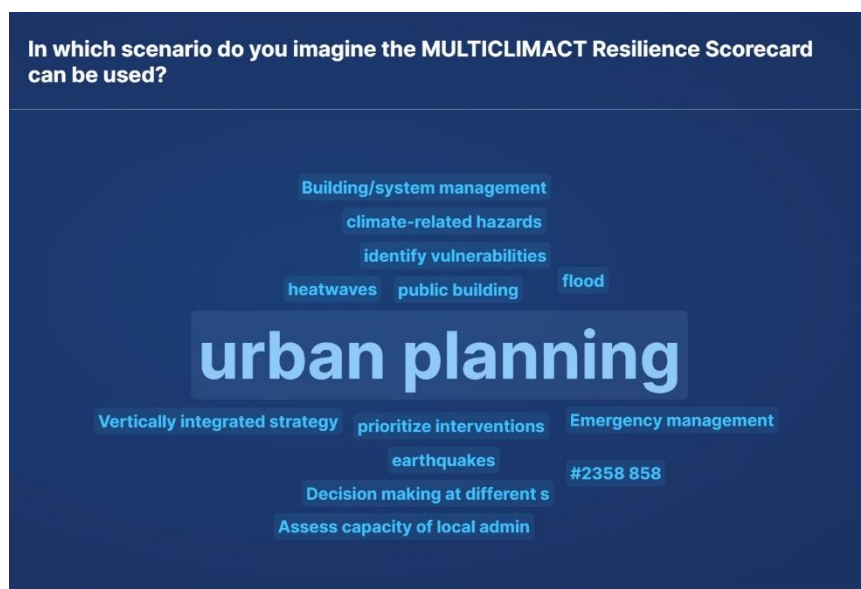


Figure 14 - Results on Slido of the icebreaker exercise

Afterwards, since most of the partners were external to Task 1.1, participants were introduced to the MULTICLIMACT Scorecard approach and the objectives of the workshop. They received an overview of the Miro platform and the link of the Excel with the Scorecard has been shared with them.

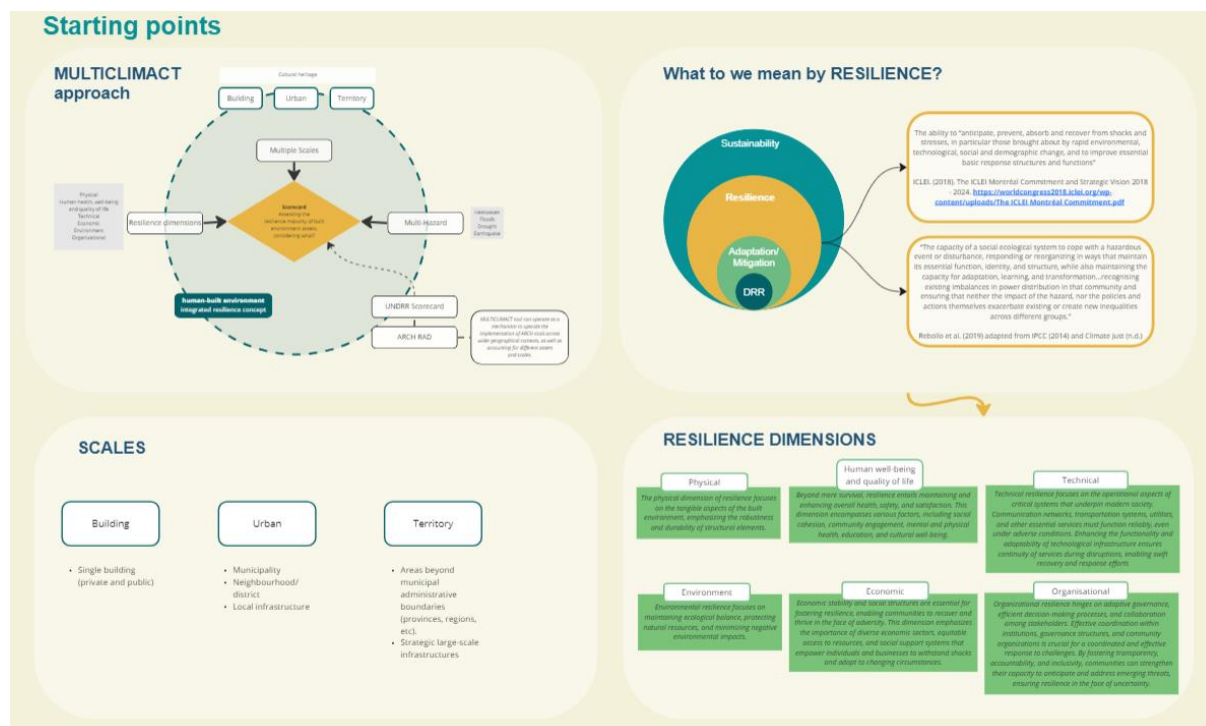


Figure 15 - Overview of MULTICLIMACT Scorecard approach on the Miro platform

Role Playing

Since among the participants there were not just representatives from the demos of the 4 cases studies, a role-playing exercise has been organised to make identify the participant with representatives of one of the 3 scales. Unfortunately, as it is possible to see in Figure 15, no participant identifies with the territorial scale. Nevertheless, during the subsequent exercises, specific questions tackling this scale were posed to the participants to close this gap.

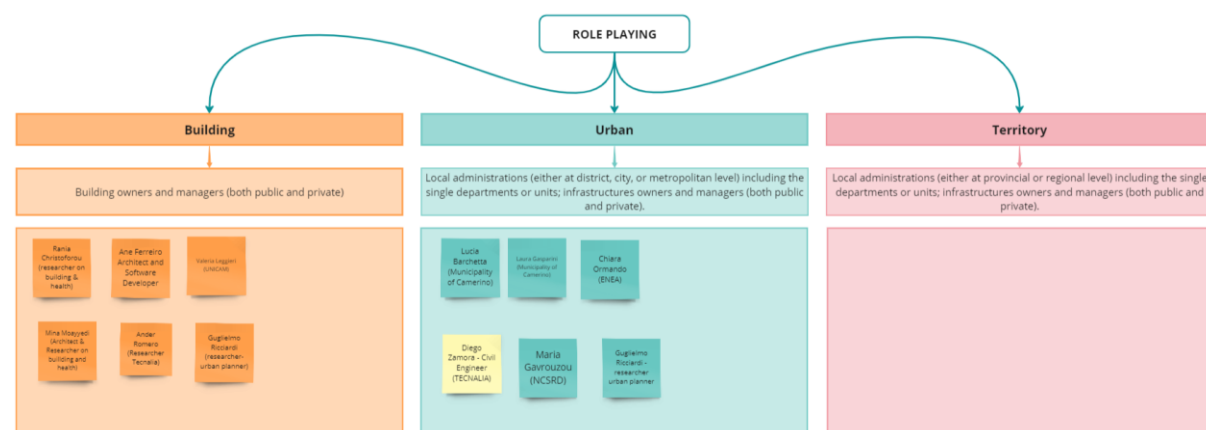


Figure 16 - Role playing exercise at the virtual Validation Workshop

Exercise 1 - Context Relevance

In Exercise 1, three questions from the Scorecard were carefully chosen to cover diverse topics as examples. Participants were tasked with evaluating the relevance and applicability of these questions



to their own scale or the one they represented during the role play. Using sticky notes, participants added inputs regarding *difficulties* and *potential solutions*.

Among the main takeaways, positive feedback was received about one example question regarding the applicability on the Urban scale. Additionally, valuable suggestions were provided for enhancing both question content and potential answer options.

***ACTION TAKEN:** Building upon the results and actions derived from the previous exercise, ICLEI incorporated the partners' suggestions as much as possible when revising the Scorecard scoring system, trying to enhance the clearness of different level of answers.*

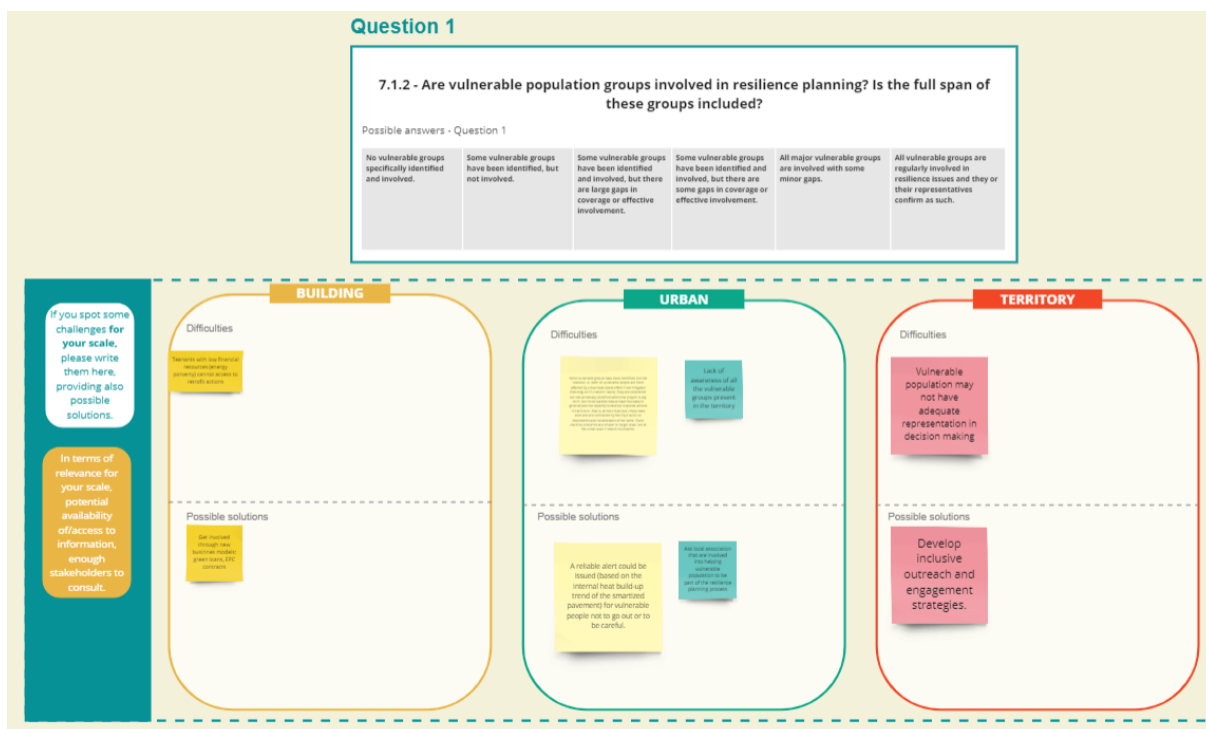


Figure 17 - Context relevance exercise at the virtual Validation Workshop

Exercise 2 - Scoring system

For the second Exercise, three questions with different sets of answers were chosen to ask participant feedback on their clarity. Three key guiding questions were posed:

- Do you encounter some problems in selecting a certain score compared to another one?
- Are the differences among the 6 levels of answers clear enough?
- Is the wording clear?

Feedback received highlighted issues such as an inadequate order of answers, the need to split answers to achieve clearer distinctions, and the necessity to align scores better. Participants also suggested improving the explanation of the differences among levels and providing clearer definitions of what each level precisely signifies.

***ACTION TAKEN:** ICLEI revised all answers of the entire Scorecard to address the received feedback. This involved mostly modifying existing answers.*

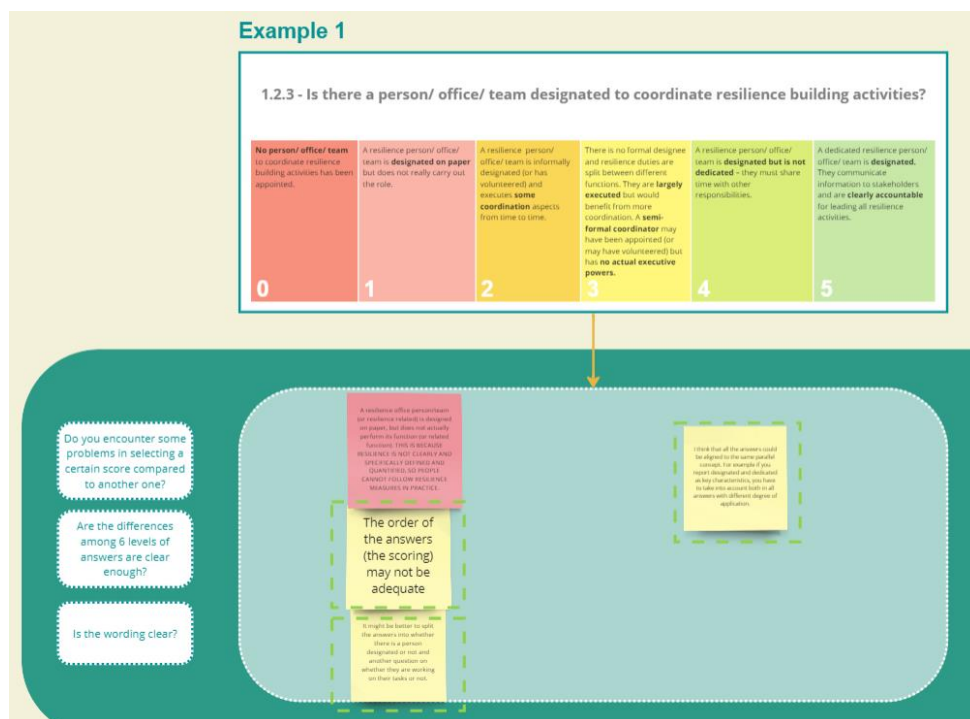


Figure 18 - Scoring system exercise at the virtual Validation Workshop

Exercise 3 - Usability of the Scorecard

During the final exercise, participants assessed the Structure and Usability of the Scorecard tool which has been integrated in an Excel. Additionally, it has been asked if an instruction pdf booklet could be useful for guidance and further information.

Positive feedback regarding the structure and usability of the tool was reported by participants. Furthermore, there was a consensus on the potential value of a guidance booklet for providing additional support and information.

ACTION TAKEN: Structure of Scorecard has been confirmed as a final one and we developed furthermore the Excel tool. Potentially, a booklet will be developed for distribution to external stakeholders and potential Scorecard users, but it will not be part of Deliverable 1.1 due to time constraints.

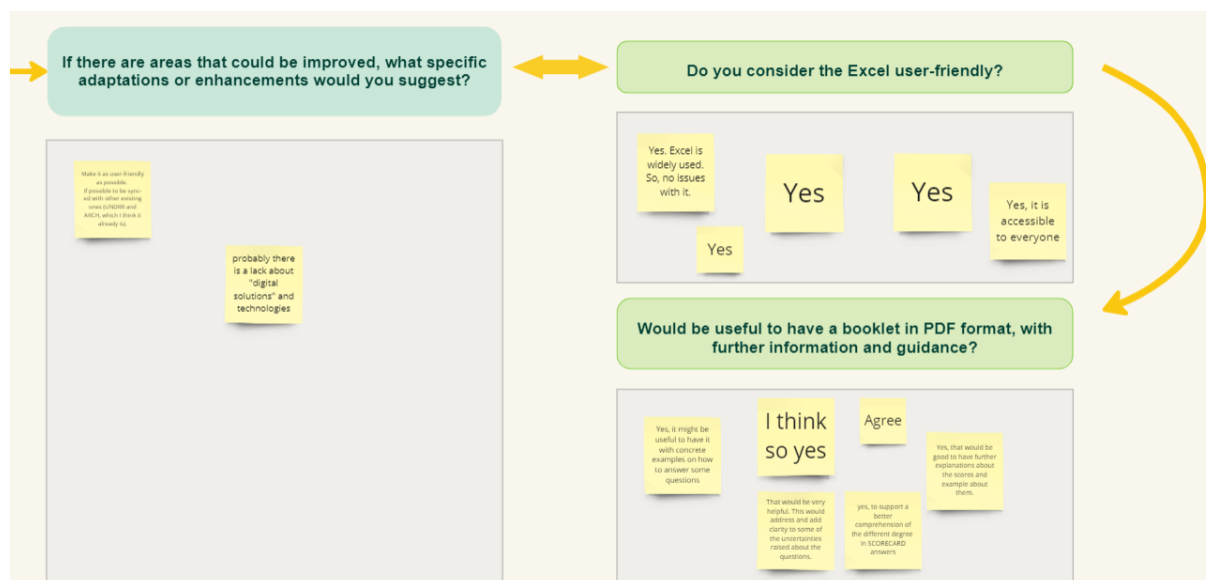


Figure 19 - Scorecard usability exercise at the virtual Validation Workshop

7. MULTICLIMACT RESILIENCE SCORECARD

7.1. THE SCORECARD CONTENT

This chapter is dedicated to presenting the various topics and questions organised within the 10 Essentials. Each Essential is accompanied by a detailed description of its focus and the list of related questions. In Annex B, it is possible to find the entire set of 134 with their potential answers, the corresponding scales and dimensions of resilience.

7.1.1. ESSENTIAL 1 – ORGANIZE FOR RESILIENCE

The first Essential provides questions that aim to assess various aspects of resilience planning, organisation, decision-making, and data management. They cover the existence and effectiveness of strategies for resilience, the adequacy of administrative structures, the integration of resilience considerations into decision-making processes, and the collection, analysis, and sharing of data for resilience purposes. These indicators collectively provide a comprehensive framework for organisational aspects of a building, a local or territorial administration.

Table 2 Questions of Essential 1

Ref N.	Level	Subject	Question
1.1 Planning for resilience			
1.1.1	Level 1	Existence of strategies to achieve, maintain and improve resilience	Does a resilience (long-term) strategy / action plan which is regularly reviewed exist?
1.1.2	Level 2	Consideration of climate change adaptation and mitigation in resilience planning	Are climate change adaptation and mitigation explicitly considered in the resilience strategy / action plan?
1.1.3	Level 2	Consideration of disaster risk management in resilience planning	Are disaster risk management issues explicitly considered in the resilience strategy / action plan?
1.1.4	Level 2	Consultation of stakeholders in plan making	Is the resilience strategy / action plan developed through inclusive, participatory multi-stakeholder consultation?



1.1.5	Level 2	Consideration of social justice and human well-being in resilience planning	Are human well-being and quality of life issues explicitly considered in the resilience strategy /action plan?
1.1.6	Level 2	Consideration of heritage management in resilience planning	Are heritage management issues explicitly considered in the resilience strategy /action plan?
1.2 Organization, coordination and decision-making participation			
1.2.1	Level 1	Adequacy of administrative/ management structure for resilience.	Does the existing administrative/ management structure allow for an effective and integrated implementation of resilience building measures (in terms of availability of resources, definition of responsibilities, required authority, level of coordination, etc.)?
1.2.2	Level 2	Effective vertical multi-level governance	Does the current administrative/management structure effectively enable vertical coordination across various levels of governance authority to implement resilience-building measures?
1.2.3	Level 2	Presence of resilience planning and management focus	Is there a person, office, or team designated to coordinate resilience building activities?
1.2.4	Level 1	Role of resilience as a decision criterion	To what extent are resilience-related issues (disaster risk management, climate change adaptation and mitigation, sustainability) considered and/or updated within standard decision-making procedures?
1.3 Data capture, publication and sharing			
1.3.1	Level 1	Data collection and integration into plans and strategies	Is data regularly collected, analysed for resilience purposes and integrated in resilience plans (e.g., for resilience action plans, decision making processes, implementation of resilience building measures)?
1.3.2	Level 2	Track record and momentum	Have significant improvements been registered as a result of the data collection, analysis and integration into resilience strategies/ plans?
1.3.3	Level 1	Monitoring of the resilience building process	Is there a process that ensures regular monitoring of the resilience building progress?
1.3.4	Level 1	Comprehensive resilience data availability	Is there a singular, comprehensive set of high-quality resilience data that is integrated and available to practitioners, individuals (such as residents and employees), and community organisations?

ESSENTIAL 2 – IDENTIFY, UNDERSTAND AND USE CURRENT AND FUTURE RISK SCENARIOS

The Essential 2 has the objective of identifying and understanding the risks linked to climate change and other types of hazards, taking into consideration impacts on different scales and the combination of hazards. Administrations and building managers need comprehensive views of the evolution of risks. Important points to take into consideration for this essential are future projections and current scenarios; availability of information and capacity to identify and understand context-specific hazards, exposures, vulnerabilities and their implications and interdependencies; the use of this knowledge to inform decision making.

Table 3 Questions of Essential 2

Ref N.	Level	Subject	Question
2.1 Hazards and impacts			
2.1.1	Level 1	Knowledge of hazards (including climate change induced hazards)	Do you have (access to) knowledge about the hazards - both climate-related and non-climate-related hazards - that might strike the building/ city/ territory? Is specific information on climate change induced hazards also available?
2.1.2	Level 1	Availability of data about past impacts and consequences	Is data about past direct and indirect impacts and consequences of all main hazards affecting the building/ city/ territory available?



2.1.3	Level 1	Availability of future projections of impacts	Are future projections of impacts for each relevant hazard and exposed element available?
2.1.4	Level 2	Projections of impact on human well-being	Do the future projections specifically consider impacts on human well-being and quality of life?
2.1.5	Level 1	Consideration of cascading effects	Have impact chains been developed considering the cascading effects of direct and indirect impacts of the main hazards affecting the building/ city/ territory been developed?
2.2 Exposure and vulnerability			
2.2.1	Level 1	Knowledge of exposed elements	Do you have (access to) knowledge of the most exposed elements for each relevant hazards affecting your building/ city/ territory?
2.2.2	Level 1	Knowledge of vulnerability factors	Do you have (access to) knowledge about the vulnerability factors that influence the risk of the building/ city/ territory?
2.3 Risk Analysis			
2.3.1	Level 1	Risk analysis	Has a risk analysis been conducted?
2.3.2	Level 2	Consideration of combined and multi-hazard risks	Does the risk analysis consider combined or multi-hazard risks?
2.3.3	Level 2	Social impact estimates	Are estimates of the impacts on socio-economic aspects included in the risk analysis?
2.3.4	Level 2	Risk data update	Is there a process that ensures frequent and complete updates of the risk analysis, including updates to hazard scenarios, exposure, and vulnerability assessments?
2.3.5	Level 2	Risk data sharing	Is the information contained in risk analysis, including on hazard scenarios, exposure, and vulnerability assessments made available/ regularly shared?

7.1.2 ESSENTIAL 3 – STRENGTHEN FINANCIAL CAPACITY FOR RESILIENCE

This Essential aims at understanding the economic impact of disasters and the need for investment in resilience. Important points to take into consideration for this essential are the management of financial resources for resilience in a way that is aligned to clearly defined needs; the budgeting for the identified resilience needs; the identification, application to, and protection of funds (including the availability of contingency funds); the identification and development of financial mechanisms that can support resilience activities.

Table 4 Questions of Essential 3

Ref N.	Level	Subject	Question
3.1 Financial planning and budgeting: Understanding of likely costs due to disasters, financing plans for resilience improvements			
3.1.1	Level 1	Understanding of the costs that could result from disasters	Do you have a reliable estimate of the costs that could be incurred in case of a disaster, and are these economic impacts included in the risk analysis?
3.1.2	Level 1	Presence of a plan or strategy for financing resilience improvements	Do you have a clear financial plan (both capital and operating), including identified funding mechanisms, for the financing of resilience improvements?
3.1.3	Level 2	Inclusion of relevant stakeholder groups in financial capacity planning	Are relevant stakeholder groups (local communities, NGOs, local businesses, etc) informed and/or involved when drafting the financial plan?
3.1.4	Level 1	Contingency fund(s) for post disaster recovery	Do fund(s) exist that are protected and capable of dealing with impacts of relevant hazard?
3.2 Insurance coverage for asset and personal damage			
3.2.1	Level 1	Engagement of the insurance sector	Are there ongoing processes of engagement with the insurance sector to assess, mitigate and manage risk?
3.2.2	Level 1	Insurance coverage	To what extent are damages to the building/city/territory covered by insurance? (Personal or life coverage is not assessed)



3.3 Incentives and financing for resilience			
3.3.1	Level 1	Incentives to improve resilience - disaster plans, premises etc	Do you have access to any kind of incentive to improve resilience?
3.3.2	Level 2	Assessment of (unintended) effects of incentives	To what extent are incentive mechanisms assessed regularly and in consultation with relevant interest groups for their (potentially unintended) effects?
3.4 Knowledge about funding opportunities and funds for existing projects			
3.4.1	Level 1	Ad-hoc funding opportunities for post disaster recovery	Are there processes that enable ad-hoc/short-term funding opportunities for unforeseen disasters? (at municipal/regional level)
3.4.2	Level 1	Knowledge of possible financing and funding methods to increase resilience	To which extent are available routes / options to close any funding shortfalls researched and understood?

7.1.3 ESSENTIAL 4 – PURSUE RESILIENT DEVELOPMENT

Urban resilience development needs to take into consideration practical actions. Local communities need to be included in planning and consultation for the management of the building/ city/ territory. Heritage values and human vulnerabilities need to be included in development frameworks, which also need to consider appropriate (public-private) partnerships and local management frameworks. Specific mechanisms for coordination of the different stakeholders are required. Lastly, building codes, regulations, and standards that meet or exceed resilience requirements need to be developed (or existing ones need to be adapted). An additional element to take into consideration for this essential is the presence of assessments/ data of the built environment on land use, population, income levels and economic activity, building codes.

Table 5 Questions of Essential 4

Ref N.	Level	Subject	Question
4.1 Mainstreaming of resilience in legal instruments			
4.1.1	Level 1	Promotion of resilient development in legal instruments	Do the legal frameworks/instruments governing your building, city, or territory take into account resilient development?
4.1.2	Level 2	Consideration of human well-being and quality of life into legal instruments	Are human well-being and quality of life considered in legal instruments taking into account resilience?
4.1.3	Level 1	Monument protection law	To what extent does an existing monument protection law promote the resilient development of the historic sites and buildings?
4.2 Land use plans, building codes and standards			
4.2.1	Level 1	Land-use plans	To what extent land use plans and zoning are implemented and enforced?
4.2.2	Level 2	Climate adaptation and mitigation in land-use plans	To what extent do land-use plans and zoning are up-to-date taking climate adaptation and mitigation issues into consideration?
4.2.3	Level 1	Public lands contracts	Are resilience factors integrated into contracts associated with the sale or lease of public land and property?
4.2.4	Level 1	Building codes	Do building codes exist and are regularly reviewed?
4.2.5	Level 2	Sustainable and resilient development in building codes	To what extent do existing building codes promote sustainable and resilient development?
4.2.6	Level 1	Building design standards	Are sustainable building design standards (e.g. REDi, LEED, GreenStar, BREEM, etc.) used to improve resilience?



4.2.7	Level 1	Circularity in construction and renovation	Are measures implemented to promote circularity in construction and renovation (e.g. buildings as material banks; ensuring sufficient capacity of recycling yards to store materials for re-use)?
4.3 Urban planning measures			
4.3.1	Level 1	Public transport development	Does urban planning prioritise public transport-oriented development?
4.3.2	Level 1	Public spaces development	To what extent are public spaces designed and managed to enhance resilience, considering factors such as green spaces, social cohesion, and accessibility for all demographics?
4.3.3	Level 1	Urban heat island strategies	To what extent strategies aim at reducing urban heat island effects been integrated into urban or building-level planning processes?
4.4 Resilient procurement planning			
4.4.1	Level 1	Sustainable procurement	Is sustainable procurement considered at a building/city/territory level?

7.1.4 ESSENTIAL 5 – SAFEGUARD NATURAL CAPITAL

The protective functions offered by natural capital is preserved and enhanced by identifying, protecting, and monitoring critical ecosystem services. The positive impacts of natural capital elements on the wellbeing and quality of life of people living in the built environment at the different scales (building, urban, and territory) also needs to be taken into consideration.

Table 6 Questions of Essential 5

Ref N.	Level	Subject	Question
5.1 Existing natural capital and ecosystem health			
5.1.1	Level 1	Identification of the dependencies on natural capital and ecosystem services	To what extent have the dependencies of the building/ city/ territory on natural capital and ecosystem services been identified?
5.1.2	Level 1	Identification of impact drivers from the building/city/territory on natural capital and ecosystem services	To what extent have impact drivers from the building/ city/ territory on natural capital and ecosystem services been identified?
5.1.3	Level 1	Safeguarding of natural capital	To what extent are measures to secure and safeguard natural capital within the administrative boundaries of the city/territory or in the surroundings of the building implemented?
5.1.4	Level 1	Impact of legal instruments on ecosystem services	Are there legal instruments that may weaken ecosystem services relevant to the building/ city/ territory?
5.2 Integration of Nature-based Solutions into policy and projects			
5.2.1	Level 1	Strategy and planning for Nature-based Solutions	Is a strategy/action plan for Nature-based Solutions (NbS) in place that ensures planning, implementation and maintenance of such solutions?
5.2.2	Level 1	Nature-based Solutions implementation	Have the structures in the building/ city/ territory been equipped with Nature-based Solutions as far as possible, to the extent allowed by relevant rules?
5.3 Management of ecosystem performance			
5.3.1	Level 1	Monitoring of environment and ecosystem services	Is there a person monitoring environmental impact of the building on the circumstances? Is there an environment department inside the municipality/region appointed at monitoring ecosystem services performance?



5.3.2	Level 1	Access to natural capital and ecosystem services by local communities	Do local communities have sustainable and equitable access to natural capital and ecosystem services?
5.3.3	Level 1	Transboundary agreements	Are there transboundary agreements and collaborations in place to enable policy and planning for the implementation of ecosystem-based approaches?

7.1.5 ESSENTIAL 6 – STRENGTHEN INSTITUTIONAL CAPACITY FOR RESILIENCE

Institutional capacity for resilience is ensured at different levels of governance, aiming at vertical and horizontal coordination. At the local scale (e.g., single buildings, cultural heritage sites, infrastructures, etc.), management and relevant stakeholder and community groups have the required skills and relevant information is available as well as accessible. At the regional and national scale, administrations and relevant stakeholders have the capacity to mainstream resilience actions in their territories.

Important points to consider for this essential are the existence of capacities, education levels and specialising trainings on resilience and related topics.

Table 7 Questions of Essential 6

Ref N.	Level	Subject	Question
6.1 Skills and trainings			
6.1.1	Level 1	Existence of skills, experience and knowledge disaster risk management and climate change adaptation	Are skills, experience and knowledge in disaster risk management and climate change adaptation (including cultural heritage management) present in the management/ administration?
6.1.2	Level 2	Inventory of skills, experience and knowledge in disaster resilience and climate change adaptation	Are available skills, experience and knowledge in disaster risk management and climate change adaptation regularly inventoried?
6.1.3	Level 1	Experts consultation	If no specific skill in disaster risk management and climate adaptation is present in the management/administration, are there resource/provisions in place to consult external experts?
6.1.4	Level 1	Continuity and knowledge transfer	In cases of management/ administration changes, are there processes in place to carry out a sound transfer of knowledge to ensure continuity of resilience planning?
6.1.5	Level 1	Availability, take-up of training focussed on Resilience (Professional Training)	Is resilience training offered and regularly updated to the administration or to the building management?
6.1.6	Level 2	Repetition of training	How often are trainings repeated?
6.2 Public education and awareness			
6.2.1	Level 1	Exposure of public to education and awareness materials/ messaging	Do coordinated public relations and education campaign exist on disaster risk management and climate change adaptation, with structured messaging, channels, and delivery?
6.2.2	Level 1	Information - hazard awareness, preparedness and recovery	Are people in the building/ city/ territory made fully aware of all hazards that could occur within the area, how to prepare for these and how to recover from them?
6.2.3	Level 1	Education campaigns about human well-being and hazards to health	Has any action to increase awareness about risks to human well-being caused by the built environment (e.g. pollution, grime, noise pollution, other environmental problems) been taken?
6.3 Learning from others and engagement with relevant networks			
6.3.1	Level 1	Effort taken to learn from what other cities, states and	Are learning and cross-fertilization activities actively pursued with other cities, territories, and organizations to foster knowledge exchange and innovation?



		countries (and companies) do to increase resilience	
6.3.2	Level 1	Engagement in networks	Is the administration/ management actively engaging with relevant working groups, communities of practice, practitioners, and local administration networks to collaborate on shared challenges and advance collective goals?

7.1.6 ESSENTIAL 7 – INCREASE SOCIAL CAPACITY FOR RESILIENCE

It is crucial to ensure understanding and strengthening of societal capacity for resilience in different social groups and understanding its role in the overall effort of building resilience at different scales. Cultivating an environment for social connectedness which promotes a culture of mutual help through recognition of the role of cultural heritage, education in disaster risk reduction, and human well-being and quality of life as basic pillars for resilience.

Table 8 Questions of Essential 7

Ref N.	Level	Subject	Question
7.1 Planning with communities			
7.1.1	Level 1	Engagement of "grass roots" organizations / community groups in climate change adaptation planning	Are nongovernment bodies or community groups actively involved in resilience planning and their inputs are incorporated?
7.1.2	Level 1	Involvement of vulnerable groups of the population	Are vulnerable population groups involved in resilience planning? Is the full span of these groups included?
7.1.3	Level 1	Local communities' engagement	Are local community groups regularly engaged in decision-making processes on resilience planning through participatory methods?
7.1.4	Level 1	Informing the local community about development planning and scope of resident engagement	To what extent have measures been taken to inform the local community about resilience planning? Are overlapping modes of engagement to create repeated and reinforcing message delivery used?
7.2 Local communities' involvement, support and preparedness			
7.2.1	Level 1	Regularity and extent of community engagement	How often are communication and coordination meetings with community organizations involved in Disaster Risk Management, Climate Change Adaptation held and how many representatives are attending these meetings?
7.2.2	Level 1	Community or city resilience assessments	Do mechanisms exist to assess community/users resilience?
7.2.3	Level 1	Official or organized voluntary outreach during a disaster	How likely is it that inhabitants of the surrounding areas/ users of the facility will be contacted during or immediately after an event to confirm safety, issues, needs etc.? How likely they will be contacted again regularly to check on them?
7.2.4	Level 1	Mental health support	Does the administration/ management make the necessary arrangements in order to provide that inhabitants/ communities affected by an event have access to mental health professionals and/or support groups?
7.2.5	Level 1	Mutual support among inhabitants	Can inhabitants of the building/urban area/territory be expected to know who may be vulnerable and need additional help, and to provide assistance?
7.2.6	Level 1	Take advantage of mobile apps (phone/tablet) and web-based "systems of engagement" (for example, crowdsourcing or disseminating data on preparedness).	Are mobile apps or web-based "systems of engagement" used in the building/city/territory?
7.3 Private sector / employers			



7.3.1	Level 1	Involvement of private sector in resilience planning	Is the private sector involved in resilience planning and resilience building activities?
7.3.2	Level 1	Business continuity planning	Is there a diversified economy in the city/territory spanning across different sectors?
7.4 Public education and youth groups			
7.4.1	Level 1	Ensure that the education curriculum within schools, higher education, universities and the workplace to includes disaster awareness and training	In education curricula, is disaster awareness and training included?
7.4.2	Level 1	Engagement with youth groups for resilience	Are youth groups regularly engaged in decision-making processes on resilience planning through participatory methods?

7.1.7. ESSENTIAL 8 – INCREASE INFRASTRUCTURE RESILIENCE

Ensuring the capacity and adequacy of critical infrastructure systems and services with regard to climate-related and non-climate related hazards at different scales is crucial when facing an emergency. Understanding the linkages between critical infrastructure systems as well as considering the impact a service disruption may have on human safety and wellbeing has also to be taken into consideration when assessing the resilience status.

Table 9 Questions of Essential 8

Ref N.	Level	Subject	Question
8.1 Structural protection measures and general considerations			
8.1.1	Level 1	Adequacy of protective structural measures for climate-related hazards	Do protective structural measures for climate-related and non-climate related hazards exist and are regularly maintained?
8.1.2	Level 2	Use of traditional (local) knowledge in protective structural measures	Is traditional local knowledge (processes, materials, etc.) included in design and implementation of protective structural measures?
8.1.3	Level 2	Technological advancements	Are technological advancements regularly checked for solutions to prevent disasters?
8.1.4	Level 1	Digital solutions integration	Are digital solutions included to enhance climatic and non-climatic resilience?
8.2 Basic services: Water - Drinking water, drainage system & sewage system			
8.2.1	Level 1	Extent of loss of service	What is the estimated extent of water supply failure in the face of hazard, also due to damages to critical related assets?
8.2.2	Level 1	Cost of restoration of service	Do you have a reliable estimate of the potential costs of service outage and restoration due to water supply failure?
8.2.3	Level 1	Backup systems	Do the building/urban area/territory have a backup system in case of water supply failure?
8.3 Basic services: Electricity			
8.3.1	Level 1	Extent of loss of service	What is the estimated extent of electrical energy failure in the face of hazard, also due to damages to critical related assets?
8.3.2	Level 1	Cost of restoration of service	Do you have a reliable estimate of the potential costs of service outage and restoration due to electrical energy supply failure?
8.3.3	Level 1	Backup power	Do the building/urban area/territory have a redundant power supply feed and or backup power?
8.3.4	Level 1	Climate control	Do relevant buildings/structures have features that ensure adequate temperature and humidity control during a power outage in peak winter/summer?
8.4 Basic services: Gas			



8.4.1	Level 1	Extent of loss of service	What is the estimated extent of gas failure in the face of hazard, also due to damages to critical related assets?
8.4.2	Level 1	Cost of restoration of service	Do you have a reliable estimate of the potential costs of service outage and restoration due to gas supply failure?
8.4.3	Level 1	Backup power	Do the building/urban area/territory have a redundant backup system in case of gas supply failure?
8.5 Basic services: Waste Management			
8.5.1	Level 1	Waste management - Extent of loss of service	What is the estimated extent of waste management system failure in the face of hazard, also due to damages to critical related assets?
8.5.2	Level 1	Waste management - Cost of restoration of service	Do you have a reliable estimate of the potential costs of service outage and restoration due to waste management failure?
8.5.3	Level 1	Waste management - Alternative system	Do the building/urban area/territory have an alternative system in case of waste management failure?
8.6 Basic services: Transportation			
8.6.1	Level 1	Extent of loss of transportation system service	What is the estimated extent of transportation system failure also due to damages to critical infrastructures?
8.6.2	Level 1	Cost of restoration of service	Do you have a reliable estimate of the potential costs of service outage and restoration due to transportation system failure?
8.7 Basic services: Communications			
8.7.1	Level 1	Extent of loss of communication service and critical assets	What is the estimated extent of communication network failure and loss of critical communication assets?
8.7.2	Level 1	Alternative communication system in case of failure	Are there alternative systems in place to serve as backups in the event of communication system failures?
8.7.3	Level 1	Cost of restoration of service	Do you have a reliable estimate of the potential costs of service outage and restoration due to communication system failure?
8.8 Basic services: Healthcare and Education			
8.8.1	Level 1	Surge capacity for public health infrastructure	In case of a disaster, to what extent are hospitals and emergency care centres able to manage a sudden influx of patients?
8.8.2	Level 1	Continuity of care for those already sick	In case of a disaster, to what extent can care be maintained for those who are already sick or dependent?
8.8.3	Level 1	Continuity of Educational Service	In case of a disaster, to what extent can the continuity of educational schools be ensured?

7.1.8 ESSENTIAL 9 – ENSURE EFFECTIVE DISASTER RESPONSE

The Essential 9 aims at assessing the effectiveness and completeness of disaster preparations at different scales, the coordination among them, and with the relevant stakeholders. This includes the planning, preparation, and training of disaster responses. An important point to take into consideration for this essential is also the presence and scope of early warning systems, emergency management plans and procedures, trainings/drills.

Table 10 Questions of Essential 9

Ref N.	Level	Subject	Question
9.1 Warning systems			
9.1.1	Level 1	Existence of warning systems	Do warning systems exist? Are they for single hazards or multi-hazards?
9.1.2	Level 2	Existence and effectiveness of early warning systems	How sufficient is the warning time and how reliable are warnings - do they allow practical actions to be taken?
9.1.3	Level 2	Reach of warning	Will all people in the surrounding area be reached by the warnings and understand them?



9.1.4	Level 2	Reach of vulnerable population groups	Will warnings reach the vulnerable population groups (children, elderly, people with disabilities, etc.)?
9.2 Event response plans			
9.2.1	Level 1	Existence and completeness of plans	Is there a detailed and up-to-date plan for dealing with disasters - processes, procedures, responsibilities and roles, equipment, communication channels and contents, etc?
9.2.2	Level 1	Accessibility and availability of data. Integration with intersecting plans and capabilities - understanding of others' capabilities	Is the necessary data and guidance regarding hazards/risks and emergency response capabilities obtained from relevant entities? Can the information acquired be effectively utilized to formulate functional emergency plans?
9.3 First response needs			
9.3.1	Level 1	Emergency operations centre	Does an emergency operations centre exist, with participation from all relevant agencies/ entities? Does it have automated standard operating procedures?
9.3.2	Level 1	Definition of first responder and other staffing needs (personnel & knowledge) and regular review of staffing needs & availability	Are first responder, staffing needs and availabilities defined and regularly reviewed?
9.3.3	Level 1	Definition of equipment and supply needs. Regular review of equipment needs & availability	Are equipment and supply needs identified, available and regularly reviewed?
9.4 Shelters and depots			
9.4.1	Level 1	Ability to meet needs for shelter/safe places	How large is the "shelter gap", i.e. the number of persons potentially in need of shelter minus the number of shelter places available within 24 hours?
9.4.2	Level 1	Depot safety and availability	Are depots available and able to withstand disaster events and remain safe and usable?
9.5 Drills			
9.5.1	Level 1	Training for first responders	Do regular drills exist for first responders and are they effective?
9.5.2	Level 1	Disaster drills - involving the public and vulnerable groups	Do regular drills for disasters for the public exist and include all vulnerable groups and are information about these drills freely accessible?

7.1.9. ESSENTIAL 10 – EXPEDITE RECOVERY AND BUILD BACK BETTER

Sufficient plans for post-disaster recovery according to risks identified must be ensured according to this Essential, also taking care that after any disaster, the needs of the affected people are at the centre of recovery and reconstruction, involving them in the design and rebuilding phase adopting Building Back Better approaches.

Table 11 Questions of Essential 10

Ref N.	Level	Subject	Question
10.1 Preparedness / planning for post disaster recovery			
10.1.1	Level 1	Disaster recovery planning	Is there a clear disaster recovery plan (including recovery goals and objectives) for the building/city/territory?
10.1.2	Level 2	Stakeholder consultation for pre-disaster recovery planning	Is the pre-disaster recovery plan drafted in consultation with relevant stakeholders involved in the recovery planning?
10.1.3	Level 2	Socially-just pre-disaster recovery planning	Is the pre-disaster recovery planning considering the local communities, vulnerable groups, minorities, all genders and the different needs of these groups?



10.1.4	Level 1	Defined Post-Disaster Needs Assessment (PDNA) process	Does a clear process for a post-disaster damage and needs assessment (PDNA) exist?
10.1.5	Level 1	Cultural heritage: availability of clear and swift procedure for cultural heritage sites	Do clear and swift procedure for a post-disaster damage and needs assessment (PDNA) exist for cultural heritage sites?
10.2 Learning from experience - building back better			
10.2.1	Level 1	Learning loops from past disasters	Are collected data, best practices and lessons from past disasters / simulations / drills analysed and used for learning opportunities, and made publicly available?
10.2.2	Level 1	Adequacy of prior planning and preparation	Are strategies/plans updated based on vulnerabilities and risks revealed by a (past) disaster?
10.2.3	Level 1	Traditional knowledge, skills and materials	Are traditional knowledge, skills and materials considered and if applicable applied and used in the building back process?
10.2.4	Level 1	Inclusion of local communities and practices	Are local communities and practices considered in the rebuilding efforts?
10.2.5	Level 1	Technological advancements	Are technological advancements considered, applied and used in the building back process?
10.3 Building back faster			
10.3.1	Level 1	Speed of access to funds	Can funding for repairs and reconstruction be accessed in sufficient time to prevent undue loss of functions and economic activity?
10.3.2	Level 1	Speed of access to skills, materials and equipment	Can the necessary skills, materials and equipment be accessed in sufficient time (and independently from higher governance levels) to prevent undue loss of functionalities and economic activity?

7.2 THE EXCEL-BASED TOOL

This sub-chapter is intended to present the main characteristics of the Excel-based tool that was developed for the MULTICLIMACT Scorecard method. The file is intended to be shared with and utilised by the final users. It is composed of three main sections, as follows:

INITIAL GUIDANCE

This section consists of two sheets:

- **Definitions:** offering basic definitions of the scales, the 10 Essentials, and the six resilience dimensions to ensure users have a clear understanding of each.
- **Instructions:** providing details on the structure of sheets containing the questions and guidance on how to score them.

Both sheets are located at the beginning (see Figure 22).



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
3															
4															
5	Ref. No.	Levels	Subject	Question	Indicative measurement scale						Explanation	Score	Scale		
6					0 - Worst	1	2	3	4	5 - Best			Building	Urban	Territorial
7	X.X Here you will find the title of the Sub-Essential														
8	1.1.1	Level 1	Existence of strategies to achieve, maintain and improve resilience	Does a resilience (long-term) strategy / action plan which is regularly reviewed exist?	No resilience strategy /action plan exists.	A resilience strategy /action plan is currently under development .	A resilience strategy /action plan exists, but its review is infrequent or inconsistent .	A resilience strategy /action plan exists and it is reviewed periodically, though not regularly.	A resilience strategy /action plan exists and undergoes regular review, although the process may not be fully	A resilience strategy /action plan exists and is regularly reviewed, with a well-established and consistent process in place	BUILDING SCALE At the building scale, a strategy / action plan can be a document included in the municipality (e.g., building regulations) that considers resilience in the planning and maintenance of the building. Alternatively the		X	X	X
9		↑ Here you will find if the question is a Level 1 or Level 2. You will need to reply to Level 2 questions just if you replied positively to the corresponding (the one above)	↑ This is the title of the resilience-related subject	↑ Here you will find the question you need to answer to complete the assessment	↑ This is the worst case scenario	↑ Here you will find the intermediate scenarios/situations				↑ This is the best case scenario/ situation in relation to the question	↑ Here you will find an explanation related to the question and to the scale you choose to complete the assessment.	↑ Here you need to include your score, a value between 0 and 5	↑ Depending on the chosen scale for assessment, you will see if the question is relevant to that scale. Respond to questions marked with an "X" to complete the assessment.		
10				10	Responding (the one above) Level 1										
							Definitions	Instructions	E01 - Org. f						
										</					

Figure 20 - Screen capture of the MULTICLIMACT Scorecard Excel-based tool. Location of the initial guidance sheets.

THE 10 ESSENTIALS

The 134 questions are divided into 10 sheets, each corresponding to one Essential. In addition to the information provided in the tables above, for each question these sheets provide:

- Six possible answer options.
- An explanation to offer further insights on specific topics when necessary.
- An editable cell to input numerical scores ranging from 0 to 5.
- Indication of the scales applicable to each question.
- Indication of the resilience dimensions considered.
- A cell to include any relevant note the user can have on that specific question, and that can be useful to consider when analysing the results.

In these sheets, users can only modify scores and comments (columns M and V, as illustrated in Figure 23); the rest is locked to prevent errors.

Ref. No.	Subject	Question	0 - Worst	Indicative measurement scale					5 - Best	Explanation	Score	Scales							Comment/notes
				1	2	3	4	6				Building	Urban	Territorial	Physical	Health, well-being and quality	Technical	Economic	
5.1 Existing natural capital and ecosystem health																			
1	5.1.1	Identification of the dependencies on natural capital and ecosystem services	To what extent does the dependency of the building (city territory or ward) on natural capital and ecosystem services affect its resilience?	No identification of dependencies is carried out for ecosystem services.	Minimal identification of dependencies is carried out for ecosystem services, but not systematically or comprehensively.	Some dependencies are identified, but not systematically or comprehensively.	Dependencies are well identified, with a comprehensive understanding of their importance and the potential for ecosystem services to enhance resilience.	Dependencies are well identified, with a comprehensive understanding of their importance and the potential for ecosystem services to enhance resilience.	Dependencies are well identified, with a comprehensive understanding of their importance and the potential for ecosystem services to enhance resilience.	Dependencies are well identified, with a comprehensive understanding of their importance and the potential for ecosystem services to enhance resilience.	5	X	X	X					
		Identification of impact drivers from the building (city territory or ward) on natural capital and ecosystem services	To what extent does impact drivers from the building (city territory or ward) on natural capital and ecosystem services affect its resilience?	No identification of impact drivers is carried out for ecosystem services.	Minimal identification of impact drivers is carried out for ecosystem services, but not systematically or comprehensively.	Some impact drivers are identified, but not systematically or comprehensively.	Impact drivers are well identified, with a comprehensive understanding of their importance and the potential for ecosystem services to enhance resilience.	Impact drivers are well identified, with a comprehensive understanding of their importance and the potential for ecosystem services to enhance resilience.	Impact drivers are well identified, with a comprehensive understanding of their importance and the potential for ecosystem services to enhance resilience.	Impact drivers are well identified, with a comprehensive understanding of their importance and the potential for ecosystem services to enhance resilience.	4	X	X	X					
6	5.1.2	Reprocessing of natural capital	To what extent are measures to access and reprocess natural capital implemented in the building (city territory or ward) to enhance its resilience?	No measures to access and reprocess natural capital are implemented.	Minimal measures to access and reprocess natural capital are implemented, but not systematically or comprehensively.	Some measures to access and reprocess natural capital are implemented, but not systematically or comprehensively.	Measures to access and reprocess natural capital are well implemented, with a comprehensive understanding of their importance and the potential for ecosystem services to enhance resilience.	Measures to access and reprocess natural capital are well implemented, with a comprehensive understanding of their importance and the potential for ecosystem services to enhance resilience.	Measures to access and reprocess natural capital are well implemented, with a comprehensive understanding of their importance and the potential for ecosystem services to enhance resilience.	Measures to access and reprocess natural capital are well implemented, with a comprehensive understanding of their importance and the potential for ecosystem services to enhance resilience.	3		X	X					
		Impact of legal instruments on ecosystem services	Are there legal instruments that may restrict or enhance the building (city territory or ward) to enhance its resilience?	Legal instruments that may restrict or enhance the building (city territory or ward) to enhance its resilience are not identified.	Legal instruments that may restrict or enhance the building (city territory or ward) to enhance its resilience are identified, but not systematically or comprehensively.	Legal instruments that may restrict or enhance the building (city territory or ward) to enhance its resilience are well identified, with a comprehensive understanding of their importance and the potential for ecosystem services to enhance resilience.	Legal instruments that may restrict or enhance the building (city territory or ward) to enhance its resilience are well identified, with a comprehensive understanding of their importance and the potential for ecosystem services to enhance resilience.	Legal instruments that may restrict or enhance the building (city territory or ward) to enhance its resilience are well identified, with a comprehensive understanding of their importance and the potential for ecosystem services to enhance resilience.	Legal instruments that may restrict or enhance the building (city territory or ward) to enhance its resilience are well identified, with a comprehensive understanding of their importance and the potential for ecosystem services to enhance resilience.	Legal instruments that may restrict or enhance the building (city territory or ward) to enhance its resilience are well identified, with a comprehensive understanding of their importance and the potential for ecosystem services to enhance resilience.	4	X	X	X					
5.2 Resilient urban infrastructure and services																			
7	5.2.1	Strategic and planning for urban infrastructure	To what extent are strategic and planning measures implemented in the building (city territory or ward) to enhance its resilience?	No strategic and planning measures are implemented.	Minimal strategic and planning measures are implemented, but not systematically or comprehensively.	Some strategic and planning measures are implemented, but not systematically or comprehensively.	Strategic and planning measures are well implemented, with a comprehensive understanding of their importance and the potential for ecosystem services to enhance resilience.	Strategic and planning measures are well implemented, with a comprehensive understanding of their importance and the potential for ecosystem services to enhance resilience.	Strategic and planning measures are well implemented, with a comprehensive understanding of their importance and the potential for ecosystem services to enhance resilience.	Strategic and planning measures are well implemented, with a comprehensive understanding of their importance and the potential for ecosystem services to enhance resilience.	2	X	X	X					

Figure 21 - Screen capture of the MULTICLIMACT Scorecard Excel-based tool. Highlight on the editable columns in the Essential sheets.



THE RESULTS

Three distinct types of sheets are available for the results, one for each scale. Each sheet displays automatically the results in the following formats:

- **Total score for the scale:** Shows the total score compared to the maximum possible score for that scale.
- **Radar charts:** Simultaneously visualize the scores of the 10 Essentials and the six resilience dimensions.

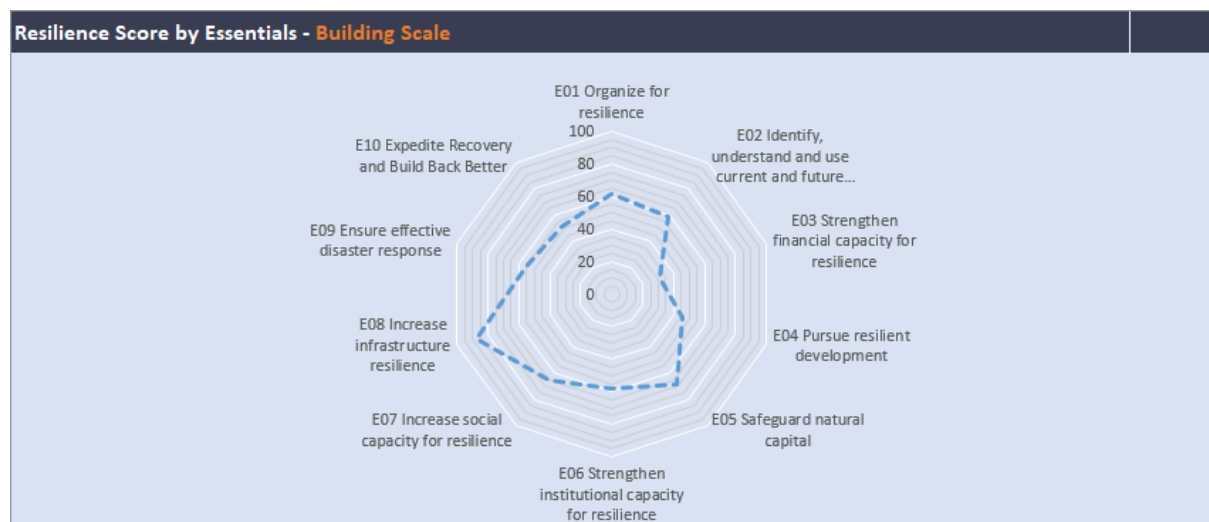


Figure 22 - Example of radar chart with resilience score by Essential.

- **Data bars:** Display partial scores by Essential/sub-Essential and by resilience dimension.



Figure 23 - Example of data bars with scores by Essential/ Sub-Essential.



NOTE: It is important to highlight that when completing the assessment for a specific scale, only the result sheet for that specific scale should be consulted, as the others will not display accurate results.

The three result sheets can be found at the end (see Figure 24 below).

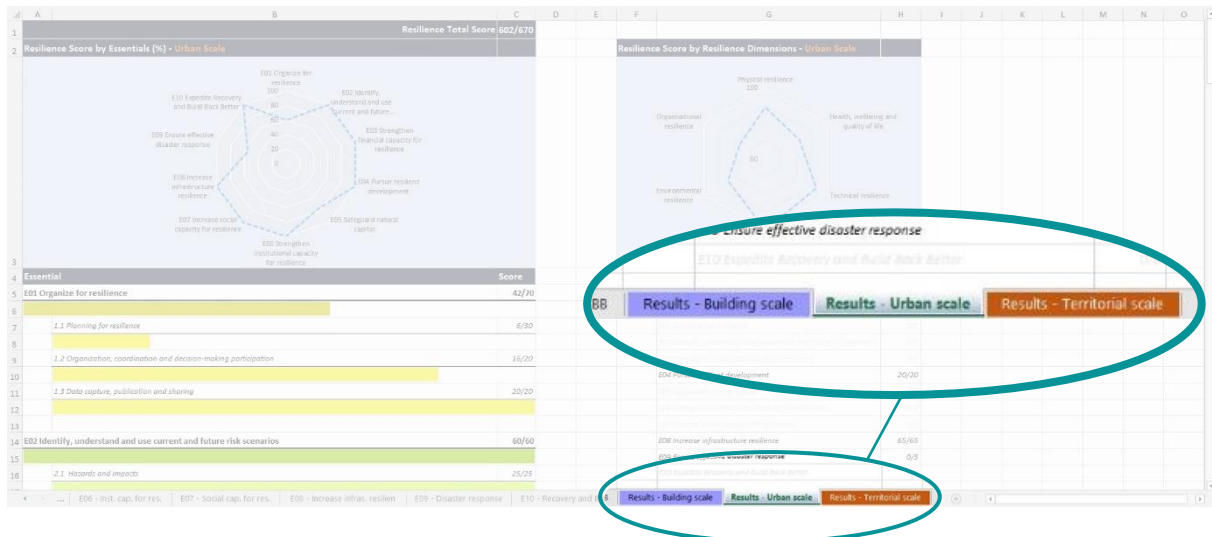


Figure 24 - Screen capture of the MULTICLIMACT Scorecard Excel-based tool. Location of the results sheets.



8. WAY FORWARD

In the broader context of resilience assessments, the MULTICLIMACT Scorecard brings innovation due to its integration among built environment scales, such as buildings, cities, and territories. Unlike traditional assessments that often focus on singular aspects or specific scales, the Scorecard adopts a multi-dimensional approach, acknowledging the interconnectedness and interdependencies within built environment systems. By encompassing diverse scales, the Scorecard provides a comprehensive understanding of resilience across various contexts, fostering adaptive responses and holistic solutions.

Throughout the development process, the Scorecard has remained aligned with the overall project scope and objectives. By mapping the needs and requirements related to climate change, the Scorecard addresses current and future climate challenges effectively, building resilience against evolving threats and cascading impacts.

In terms of usability, the Scorecard can be utilised both as a standalone tool and as a component feeding into the CREMA tool developed in Work Packages 1 and 7. This dual functionality ensures flexibility and compatibility with existing resilience assessment frameworks, maximising its usability across various contexts.

Looking ahead, the way forward for the MULTICLIMACT Scorecard involves rigorous validation and collaboration to ensure its relevance, usability, and impact. By engaging with stakeholders, conducting real-world case studies, and integrating with existing frameworks, the Scorecard can be refined and tailored to meet the diverse needs of communities and organizations worldwide.

Additionally, during the development phase of the scorecard it has been acknowledged the importance of widening the various aspects of resilience to a focus on human wellbeing and quality of life. Integrating this human-built environment concept is one of the main innovation the MULTICLIMACT Scorecard wants to bring in the landscape of resilience assessment and it will be crucial to adopt it in more projects to prioritise interventions that enhance overall human wellbeing in the first place. The inclusion of questions targeted to assess specific aspects related to the cultural heritage perspective contributed to provide a more comprehensive approach to the MULTICLIMACT Scorecard method.

In conclusion, while the development of the MULTICLIMACT Scorecard has been a significant achievement, there might potentially still work to be done to fully realise its potential. By addressing limitations, capitalising on strategic opportunities, and engaging with stakeholders, the Scorecard can serve as a valuable tool for building resilient communities and enhancing sustainability in the face of diverse hazards and challenges.



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ANNEX A DESK REVIEW

Table 12 List of resources analysed during the Desk Review

#	Author(s)	Title	Year of publication	Publisher	Link	Typology
1	Malecha, M, Masterson, J.H, Yu, S & Burke, P.	Plan Integration for Resilience Scorecard Guidebook: Spatially evaluating networks of plans to reduce hazard vulnerability - Version 2.0.	2019	College Station, Texas: Institute for Sustainable Communities, College of Architecture, Texas A&M University	https://planintegration.com/get-started/	Scorecard guidelines
2	Rockefeller Foundation, Australian Government	Building Resilience Index	2022	International Finance Corporation	https://www.resilienceindex.org/	Rating system
3	US Green Building Council	Resilience Leadership Program User Guide to Mandatory Requirements (RELI)	2021	US Green Building Council	https://www.gbci.org/reli-user-guide-provides-detailed-guidance-accelerate-resilience	Certification
4	Arup, Rockefeller Foundation	City Resilience Index	2017	Arup, Rockefeller Foundation	https://www.cityresilienceindex.org/#/resources	Toolkit
5	UNDRR	Disaster Resilience Scorecard for Cities: Public Health System Resilience - Addendum	2020	UNDRR	https://www.unisdr.org/campaign/resilientcities/toolkit/article/public-health-system-resilience-scorecard.html	Scorecard tool
6	u.s. Resiliency Council	USRC Building Performance Ratings	2020	u.s. Resiliency Council	https://www.usrc.org/usrc-rating-system/	Rating system
7	Fraunhofer Institute for High-Speed Dynamics, Ernst-Mach-Institut, EM	Analysis of the cascade effects in supply networks – software tool CAESAR	N/A	Fraunhofer Institute for High-Speed Dynamics, Ernst-Mach-Institut, EM	https://www.emi.fraunhofer.de/en/business-units/security/research/analysis-of-the-cascade-effects-in-supply-networkssoftwaretool-c.html	Toolkit
8	Global Facility for Disaster Reduction and Recovery (GFDRR)	The CityStrength Diagnostic: Promoting Urban Resilience	2014	World Bank	https://www.worldbank.org/en/topic/urbandevelopment/brief/citystrength	toolkit
9	World Resource Institute	Urban Community Resilience Assessment	2018	World Resource Institute	https://www.wri.org/initiatives/urban-community-resilience-assessment	toolkit
10	ARCH	ARCH Resilience Assessment Dashboard RAD		N/A	https://arch.iais.fraunhofer.de/	scorecard tool

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11	Climate Emergency UK	Council Climate Action Scorecards	2022	N/A	https://councilclimatescorecards.uk/	Scorecard tool
12	Building Research Establishment Ltd (BRE)	BREEAM Communities technical manual	2012	Watford: BRE Global Ltd	https://www.breeam.com/discover/technicalstandards/communities/	Rating system
13	Center for Active Design, Inc.	Fitwel Community Scorecard (CM)	2020	Center for Active Design, Inc.	https://www.fitwel.org/standard/	Rating system
14	Blue Zones, LLC	Blue Zones Project®	2008	Blue Zones, LLC	https://info.bluezonesproject.com/home#:~:text=Blue%20Zones%20Project%20is%20a%20community%20well-being%20improvement,which%20people%20spend%2090%20percent%20of%20their%20lives	Rating system
15	Center for Active Design, Inc.	Assembly: Civic Design Guidelines: Promoting Civic Life Through Public Space Design	2018	Fitwel (formerly Center for Active Design, Inc.)	https://www.fitwel.org/resources/p/assembly-civic-design-guidelines-1	Design guide
16	Barcelona Institute for Global Health (ISGlobal)	5 Keys to Healthier Cities	2018	ISGlobal	https://www.isglobal.org/en/ciudadesquequeremos	Design guide
17	Japan Sustainable Building Consortium (JSBC) and Institute for Building Environment and Energy Conservation (IBEC)	CASBEE for Urban Development	2014	Japan Sustainable Building Consortium (JSBC) and Institute for Building Environment and Energy Conservation (IBEC)	https://www.ibec.or.jp/CASBEE/english/downloadEhtml	Rating system
18	Green Building Initiative	Green Globe for new construction	2021	Green Building Initiative	https://thegbi.org/green-globes-new-construction/	Rating system
19	City Development Initiative for Asia	City Development Initiative for Asia - Project Screening Tool	2017	City Development Initiative for Asia	https://cdia.asia/2017/03/20/towards-building-the-resilience-of-asian-cities-cdia-makes-available-its-project-screening-tool-online/	Toolkit
20	Institute for Sustainable Infrastructure	ENVISION	2020	Institute for Sustainable Infrastructure	https://sustainableinfrastructure.org/news-events/	rating system
21	UN-Habitat	City Resilience Action Planning (CityRAP) tool	2018	UN-Habitat	https://dimsur.org/3-cityrap-tool/	Toolkit
22	UN-Habitat	City Resilience Profiling Tool	2018	UN-Habitat	https://unhabitat.org/guide-to-the-city-resilience-profiling-tool	Toolkit

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23	Department of Design and Construction et al.	Active Design Guidelines: Promoting Physical Activity and Health in Design	2010	City of New York	nyc.gov/assets/planning/download/pdf/plans-studies/active-design-guidelines/adguidelines.pdf	Design guide
24	US Green Building Council	Cities and Communities Existing. Getting started guide for beta participants	2021	US Green Building Council	https://www.mwcg.org/file.aspx?SA%2B%2BYQLFpZBzicPbjCPSLPT9icOYJ5Z11%2BZSDv3X%3D	Rating system
25	STAR Communities	Technical Guide to the STAR Community Rating System Version 2.0	2016	STAR Communities	https://www.usgbc.org/resources/star-community-rating-system-technical-guide-v2	Rating system
26	UN-Habitat and World Health Organization	Integrating Health in Urban and Territorial Planning: A Sourcebook	2020	UN-Habitat and World Health Organization	https://apps.who.int/iris/handle/10665/331678	Design guide
27	Transport of London	Guide to the Healthy Streets Indicators. Delivering the Healthy Streets Approach.	2017	Transport of London	https://content.tfl.gov.uk/guide-to-the-healthy-streets-indicators.pdf	Design guide
28	WHO Western Pacific Region	Healthy Cities. Good health is good politics. Toolkit for local governments to support healthy urban development.	2015	WHO Western Pacific Region	https://iris.who.int/bitstream/handle/10665/208242/WPR_2015_DNH_004_eng.pdf?sequence=1	Toolkit
29	European Commission	Level(s) European framework for sustainable buildings	2021	Directorate General for the Environment	https://environment.ec.europa.eu/topics/circular-economy/levels_en	Rating system
30	United States Global Change Research Program	US Climate Resilience Toolkit	2021	United States Global Change Research Program	https://toolkit.climate.gov/content/about	Toolkit
31	European Commission, Directorate-General for Climate Action	EU-LEVEL TECHNICAL GUIDANCE ON ADAPTING BUILDINGS TO CLIMATE CHANGE	2023	EC	https://climate-adapt.eea.europa.eu/en/metadata/guidances/eu-level-technical-guidance-on-adapting-buildings-to-climate-change/	Technical Guidance
32	Swiss Re	CatNet® - Our proprietary location intelligence tool		N/A	https://www.swissre.com/reinsurance/property-and-casualty/solutions/property-solutions/catnet.html	Scorecard tool
33	UNDRR - MCR2030	Disaster Resilience Scorecard for Cities	2017	N/A	https://mcr2030.undrr.org/disaster-resilience-scorecard-cities	Scorecard tool
34	Philip Barke, Galen Newman, Jaekyung Lee, Tabitha Combs, Carl Kolosna & David Salvesen	Evaluation of Networks of Plans and Vulnerability to Hazards and Climate Change: A Resilience Scorecard	2015	Journal of the American Planning Association	https://doi.org/10.1080/01944363.2015.1093954	Scorecard

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35	Torrens Resilience Institute	The Community Disaster Resilience Scorecard Toolkit (TS)	2015	Torrens Resilience Institute	https://d2kpbja3hey01t.cloudfront.net/uploads/2018/10/Torrens-Resilience-Institute-Toolkit-and-Scorecard-Version-2.pdf	Toolkit
36	UNDRR Private Sector Alliance for Disaster Resilient Societies (ARISE)	Disaster Resilience Scorecard for Industrial and Commercial Buildings For Use by Building Owners, Operators and Managers	2020	N/A	https://www.preventionweb.net/files/69845_undrrbuildingscorecardfinalv1.3.pdf	Scorecard
37	Deltares	Climate Resilient City Toolbox	2017	Deltares	https://kbs.toolbox.nl/en_us/	Toolkit
38	Arup	RED Rating System Resilient Design for the Next Generation of Buildings	2022	Arup	https://www.redi.arup.com/redi-download	Rating system
39	Partnership	Partnership for Resilience and Preparedness (PREP)	2016	Partnership	https://prepdata.org/	toolkit
40	World Green Building Council	Climate Change Resilience in the Built Environment guide	2022	N/A	https://worldgbc.org/article/climate-change-resilience-in-the-built-environment-guide/	Guidelines on climate resilience of built environment
41	Urban Land Institute	Building Healthy Places Toolkit: Strategies for Enhancing Health in the Built Environment	2015	Urban Land Institute	https://uli.org/wp-content/uploads/ULI-Documents/Building-Healthy-Places-Toolkit.pdf	Toolkit
42	Gehl Institute	Inclusive Healthy Places. A Guide to Inclusion & Health in Public Space. Learning Globally to Transform Locally.	2018	Gehl Institute	http://ihp.gehlpeople.com/	Design guide
43	International WELL Building Institute (IWBI)	WELL Community Standard, Q2 2021	2021	International WELL Building Institute (IWBI)	https://v2.wellcertified.com/	Rating system
44	Project for Public Spaces, Inc.	The Case for Healthy Places Improving health outcomes through placemaking.	2016	Project for Public Spaces, Inc.	https://www.pps.org/article/pps-releases-new-report-the-case-for-healthy-places-how-to-improve-health-through-placemaking	Toolkit
45	DGNB GmbH	DGNB System Districts Criteria Set. Version 2020	2020	DGNB GmbH	https://www.dgnb-system.de/de/quartiere/index.php	Rating system
46	US Green Building Council	LEED v4 for NEIGHBORHOOD DEVELOPMENT	2018	US Green Building Council	https://www.usgbc.org/resources/leed-v4-neighborhood-development-current-version	Rating system

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47	BRE Global	BREEAM Communities	2012	BRE Global	https://tools.breeam.com/filelibrary/BREEAM%20Communities/Introduction.to.BREEAM.Communities.pdf	Rating system
48	World Bank Group	Resilience Rating System A methodology for building and tracking resilience to climate change	2021	World Bank Group	https://elibrary.worldbank.org/doi/epdf/10.1596/35039	Rating system



ANNEX B MULTICLIMACT SCORECARD

Essential 1 - Organize for resilience

Ref. No	Levels	Subject	Question	Indicative measurement scale						Explanation	Score	Classification												
				0 - Worst	1	2	3	4	5 - Best			Scale			Resilience Dimension									
												Building	Urban	Territorial	Physical	Health, wellbeing and quality of life	Technical	Economic	Environmental					
1.1 Planning for resilience																								
1.1.1	Level 1	Existence of strategies to achieve, maintain and improve resilience	Does a resilience (long-term) strategy / action plan which is regularly reviewed exists?	No resilience strategy /action plan exists.	A resilience strategy/action plan is currently under development.	A resilience strategy /action plan exists, but its review is infrequent or inconsistent.	A resilience strategy /action plan exists and it is reviewed periodically, though not regularly.	A resilience strategy /action plan exists and undergoes regular review, although the process may not be fully established.	A resilience strategy /action plan exists and is regularly reviewed, with a well-established and consistent process in place to ensure its relevance and effectiveness over time.	BUILDING SCALE At the building scale, a strategy / action plan can be a document included in the municipality (e.g., building regulations) that considers resilience in the planning and maintenance of the building. Alternatively the private stakeholders involved use internal standard document that include resilience standards. URBAN / TERRITORY SCALE A strategy / action plan does not need to be a standalone document, it can be included in other documents. Such a strategy / action plan can be available at municipal/regional level. It might also be that a strategy / action plan exists and is regularly updated, but is not available to / shared with the team internal to the administration working on resilience. Strategies to increase or maintain resilience will include reviews of updated data and assumptions on hazards and exposures, changes in usage patterns, changes in land use, updates to key infrastructure serving the area, and so on.		X		X		X								
1.1.2	Level 2	Consideration of climate change adaptation and mitigation in resilience planning	Are climate change adaptation and mitigation being explicitly considered in the resilience strategy/ action plan?	Climate change adaptation and mitigation are not considered in the resilience strategy/action plan.	There is minimal consideration of climate change adaptation and mitigation in the resilience strategy/ action plan, with limited or no explicit measures.	Some efforts are made to explicitly consider climate change adaptation and mitigation in the resilience strategy/ action plan, but they are inconsistent or incomplete.	Climate change adaptation and mitigation are moderately considered in the resilience strategy/ action plan, with some explicit measures and initiatives in place.	The resilience strategy/action plan substantially considers climate change adaptation and mitigation, with significant explicit measures and initiatives aimed at addressing these challenges.	Climate change adaptation and mitigation are comprehensively considered in the resilience strategy/ action plan, with robust measures and initiatives ensuring effective adaptation and mitigation strategies are integrated into the plan.	Refer to 1.1.1 for the definition of resilience strategy/action plan. In the resilience strategy, consideration of climate change mitigation and adaptation measures can include climate analysis of the territory, GHG reduction strategy, potential climate adaptation solutions.		X		X		X								X
1.1.3	Level 2	Consideration of disaster risk management in resilience planning	Are disaster risk management issues being explicitly considered in the resilience strategy/ action plan?	Disaster risk management issues are not considered in the resilience strategy/ action plan.	There is minimal consideration of disaster risk management issues in the resilience strategy/action plan, with limited or no explicit measures.	Some efforts are made to explicitly consider disaster risk management issues in the resilience strategy/ action plan, but they are inconsistent or incomplete.	Disaster risk management issues are moderately considered in the resilience strategy/ action plan, with some explicit measures and initiatives in place.	The resilience strategy/ action plan substantially considers disaster risk management issues, with significant explicit measures and initiatives aimed at addressing these challenges.	Disaster risk management issues are comprehensively considered in the resilience strategy/ action plan, with robust measures and initiatives ensuring effective management of disaster risks.	Refer to 1.1.1 for the definition of resilience strategy/action plan. Adequate consideration of disaster risk management issues can include earthquake resistant structures, land use planning, emergency plans, etc.		X		X		X				X				



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Ref. No	Levels	Subject	Question	Indicative measurement scale						Explanation	Score	Classification											
				0 - Worst	1	2	3	4	5 - Best			Scale			Resilience Dimension								
												Building	Urban	Territorial	Physical	Health, wellbeing and quality of life	Technical	Economic	Environmental	Organisational			
1.1.4	Level 2	Consultation of stakeholders in plan making	Is the resilience strategy/ action plan developed through inclusive, participatory multi-stakeholder consultation?	The resilience strategy/action plan is developed without any inclusive, participatory multi-stakeholder consultation .	There is minimal inclusion of stakeholders in the development of the resilience strategy/ action plan, but a stakeholder mapping has been undertaken to develop an engagement plan.	Some efforts are made to include stakeholders in the development process (including the development of a stakeholders engagement plan), but the consultation is inconsistent or incomplete .	The resilience strategy/ action plan is developed through inclusive, participatory multi-stakeholder consultation, but focusing only on primary stakeholders .	The resilience strategy/ action plan is developed through inclusive, participatory multi-stakeholder consultation, with significant representation and involvement of all main stakeholders .	The resilience strategy/ action plan is developed through inclusive, participatory multi-stakeholder consultation, with robust engagement and representation of all relevant stakeholders who now receive regular bulletins on the progress of the plan and are regularly contacted for the strategy/ action plan updates.	Refer to 1.1.1 for the definition of resilience strategy/action plan. Potential stakeholders who could be consulted in the development of a resilience strategy: - Local, regional, national authorities - Technical staff - Emergency & security services - Academia and research facilities - Civil society - Private & finance sector - Critical infrastructure managers - Building & landowners - Media outlets - neighbouring areas, cities, governments		X	X	X		X							
1.1.5	Level 2	Consideration of social justice and human well-being in resilience planning	Are human well-being and quality of life issues being explicitly considered in the resilience strategy/ action plan?	Human well-being and quality of life issues are not considered in the resilience strategy/ action plan.	There is minimal consideration of human well-being and quality of life issues in the resilience strategy/ action plan, with limited or no explicit measures .	Some efforts are made to explicitly consider human well-being and quality of life issues in the resilience strategy/ action plan, but they are inconsistent or incomplete .	Human well-being and quality of life issues are moderately considered in the resilience strategy/ action plan, with some explicit measures and initiatives in place.	The resilience strategy/ action plan substantially considers human well-being and quality of life issues, with significant explicit measures and initiatives aimed at enhancing them.	Human well-being and quality of life issues are comprehensively considered in the resilience strategy/ action plan, with robust measures and initiatives ensuring the improvement of overall well-being and quality of life.	Refer to 1.1.1 for the definition of resilience strategy/action plan. BUILDING SCALE Human wellbeing and quality of life considerations can be referred to situations in which human needs in interior spaces are accomplished also in a new resilience plan. It can be referred also to the social connections established in the building and spaces dedicated to social interactions. URBAN/TERRITORY SCALE Human wellbeing and quality of life considerations can include access to public spaces and natural resources such as clean air, water and energy, as well as nutritious food and social resources.		X	X	X		X							
1.1.6	Level 2	Consideration of heritage management in resilience planning	Are heritage management issues being explicitly considered in the resilience strategy/ action plan?	Heritage management issues are not considered in the resilience strategy/ action plan.	There is minimal consideration of heritage management issues in the resilience strategy/ action plan, with limited or no explicit measures .	Some efforts are made to explicitly consider heritage management issues in the resilience strategy/ action plan, but they are inconsistent or incomplete .	Heritage management issues are moderately considered in the resilience strategy/ action plan, with some explicit measures and initiatives in place.	The resilience strategy/ action plan substantially considers heritage management issues, with significant explicit measures and initiatives aimed at preserving and promoting heritage.	Heritage management issues are comprehensively considered in the resilience strategy/ action plan, with robust measures and initiatives ensuring the preservation and integration of heritage into resilience efforts.	Refer to 1.1.1 for the definition of resilience strategy/action plan. BUILDING SCALE Heritage management can involve implementing specific protection measures tailored to safeguarding individual structures within the heritage of the city. URBAN/TERRITORY SCALE Heritage management considerations can include special protection measures to large heritage infrastructures or historical centers.		X	X	X		X							
Total score for sub-Essential 1.1											0												
1.2 Organization, coordination and decision-making participation																							



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Ref. No	Levels	Subject	Question	Indicative measurement scale						Explanation	Score	Classification									
				0 - Worst	1	2	3	4	5 - Best			Scale			Resilience Dimension						
												Building	Urban	Territorial	Physical	Health, wellbeing and quality of life	Technical	Economic	Environmental	Organisational	
1.2.1	Level 1	Adequacy of administrative/ management structure for resilience.	Does the existing administrative/ management structure allow for an effective and integrated implementation of resilience building measures (in terms of availability of resources, definition of responsibilities, required authority, level of coordination, etc.)?	No, the administrative/ management structure is totally unsuitable for the implementation of resilience building measures.	The administrative/ management structure is not ready yet , but some restructuring is planned to be undertaken in the near future.	A restructuring of the administrative/ management structure for an effective and integrated implementation of resilience building measures is ongoing .	The administrative/ management structure is well organised on paper, but there are some challenges for its effective functioning.	The administrative/ management structure is well organised and resilience building measures are being implemented , although coordination across sectors/ departments/ stakeholders is still missing .	The administrative/ management structure is well organised and resilience building measures are being implemented with a good level of coordination across sectors/ departments/ stakeholders.	BUILDING SCALE This question aims at exploring whether the management in charge of the building construction or the one in charge of the facility management have the skills and resources to implement resilience building measures such as, for example, structural reinforcement, integration of advanced technology for early warning systems, establishment of emergency response protocols. URBAN/TERRITORY SCALE This question seeks to assess whether the governing bodies overseeing urban development or those responsible for territorial management possess the requisite expertise and resources to enact resilience-building measures on a broad scale. These measures may include urban planning strategies for mitigating risks such as flooding or seismic activity, development of green infrastructure to enhance resilience to climate change, and establishment of collaborative frameworks for emergency response coordination across diverse sectors.		X	X	X							X
1.2.2	Level 2	Effective vertical multi-level governance	Does the current administrative/ management structure effectively enable vertical coordination across various levels of governance authority to implement resilience-building measures?	No, there is a complete lack of coordination among different levels of governance authority hindering the implementation of resilience-building measures.	Coordination across various levels of governance authority is extremely limited (few attempts at coordination made in the past), significantly impeding the implementation of resilience-building measures.	There are some attempts at coordination across different levels of governance authority, but it is largely ineffective in facilitating the implementation of resilience-building measures.	The administrative/ management structure generally facilitates vertical coordination with just another level of governance authority, but there are notable gaps or challenges .	The administrative/ management structure demonstrates effective coordination across different levels of governance authority. However, there may still be some areas for improvement .	The administrative/ management structure promotes vertical coordination across different levels of governance authority, with optimal resource allocation, clear responsibilities, and robust coordination mechanisms in place.	Vertical multi-level governance refers to a system of governance in which authority and decision-making responsibilities are distributed across multiple levels of government, spanning from local to regional, national, and international levels. This approach recognizes that different levels of government possess varying degrees of power and jurisdiction over certain issues, and emphasizes collaboration, coordination, and cooperation among these levels. BUILDING SCALE This entails coordination with the relevant municipality where the building is located, engagement with the higher levels of the organizational hierarchy responsible for the building's ownership, and potential collaboration with relevant ministries overseeing related regulatory matters. URBAN/TERRITORY SCALE It can include the coordination with local, regional and national administrations.		X	X	X							X
1.2.3	Level 2	Presence of resilience planning and management focus	Is there a person, office, or team designated to coordinate resilience building activities?	No, there is no person, office, or team responsible for coordinating resilience building activities.	While there is a recognition of the need for coordination , there is no designated person, office, or team currently assigned to coordinate resilience building activities.	Efforts are underway to designate a person, office, or team for coordinating resilience building activities, but it is not yet fully established or functional.	There is a designated person, office, or team responsible for coordinating resilience building activities, but their effectiveness is limited due to resource constraints or other challenges.	A person, office, or team is designated and actively coordinating resilience building activities with moderate effectiveness, albeit while balancing other responsibilities. There is potential for improvement in their coordination efforts.	There is a highly effective designated person, office, or team leading the coordination of resilience building activities, demonstrating strong leadership and facilitating comprehensive and efficient collaboration among stakeholders.	In the BUILDING SCALE, a person is assigned during the construction and maintenance about the resilience of the construction and surroundings. In the administration of the URBAN OR TERRITORIAL SCALE, people is assigned individually or in team to work on resilience achievements.		X	X	X						X	



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Ref. No	Levels	Subject	Question	Indicative measurement scale						Explanation	Score	Classification										
				0 - Worst	1	2	3	4	5 - Best			Scale			Resilience Dimension							
												Building	Urban	Territorial	Physical	Health, wellbeing and quality of life	Technical	Economic	Environmental	Organisational		
1.2.4	Level 1	Role of resilience as a decision criterion	To what extent are resilience-related issues (<i>disaster risk management, climate change adaptation and mitigation, sustainability</i>) considered and/or updated within standard decision-making procedures?	Resilience-related issues are never considered within standard decision-making procedures.	Resilience-related issues receive minimal consideration within standard decision-making procedures and are rarely updated .	Resilience-related issues are occasionally considered within standard decision-making procedures, but updates are infrequent and inconsistent .	Resilience-related issues are moderately integrated into standard decision-making procedures, with some effort made to consider and update them, although this may not be systematic .	Resilience-related issues are fairly well integrated into standard decision-making procedures, with regular consideration and updates being made, though there may be room for improvement in consistency and depth.	Resilience-related issues are comprehensively integrated into standard decision-making procedures, with thorough consideration and regular updates being a standard practice, ensuring resilience is consistently prioritized and addressed in decision-making at all levels.			X	X	X								X
Total score for sub-Essential 1.2											0											
1.3 Data capture, publication and sharing																						
1.3.1	Level 1	Data collection and integration into plans and strategies	Is data regularly collected, analysed for resilience purposes and integrated in resilience plans (e.g. for resilience action plans, decision making processes, implementation of resilience building measures)?	No data is collected, analyzed, or integrated for resilience purposes.	Data collection, analysis, and integration for resilience purposes are minimal or non-existent , with little to no incorporation of data in resilience plans.	There are sporadic efforts to collect, analyze, and integrate data for resilience purposes, but these activities are inconsistent and not fully integrated into resilience plans.	Data collection, analysis, and integration for resilience purposes occur to a moderate extent, with some regularity , but there are gaps or limitations in how effectively data is utilized in resilience plans.	Data collection, analysis, and integration for resilience purposes are fairly well-established and regularly conducted , contributing significantly to the development and implementation of resilience plans, though there may be areas for improvement .	Data collection, analysis, and integration for resilience purposes are comprehensive and systematic , with regular updates allowing resilience activities to be always "data-driven" .	The question refers to data supporting the resilience building activities. Examples of data Spatial data, data on economic and social conditions or demographic data. It may also include data about risk, exposure and vulnerability.		X	X	X				X			X	
1.3.2	Level 2	Track record and momentum	Have significant improvements been registered as a result of the data collection, analysis and integration into resilience strategies/ plans?	No significant improvements have been registered.	Very few, if any , significant improvements have been registered as a result of data collection, analysis, and integration into resilience strategies/plans.	There have been some minor improvements , but overall, the impact of data collection, analysis, and integration into resilience strategies/plans is limited.	Moderate improvements have been registered as a result of data collection, analysis, and integration into resilience strategies/plans, although the impact may vary across different areas.	Significant improvements have been observed in several key areas as a result of data collection, analysis, and integration into resilience strategies/plans, although there may still be some areas for improvement .	There have been substantial and measurable improvements across multiple domains as a direct result of data collection, analysis, and integration into resilience strategies/plans, demonstrating the effectiveness and importance of data-driven approaches to resilience-building efforts.	Examples of improvements: - Structural updates or other physical mitigation measures; - Improved planning and governance; - Improved understanding of risk (that has been acted upon); - Improved internal or external stakeholder liaison; - Improved skills, drills and training; - Improved emergency and post-event response capabilities		X	X	X			X			X		
1.3.3	Level 1	Monitoring of the resilience building process	Is there a process that ensures regular monitoring of the resilience building progress?	There is no process in place for monitoring resilience building progress.	There is no process yet , but existing processes are being reviewed for their applicability or new processes are being established .	While there are attempts at monitoring resilience building progress, the process is not consistently implemented or lacks defined procedures for regular monitoring.	There is a process for regular monitoring of resilience building progress, but it may not be fully standardized or comprehensive, with some gaps or inconsistencies in monitoring activities.	A structured process is in place for regular monitoring of resilience building progress, contributing to a systematic approach to tracking and assessing resilience initiatives, although there may be areas for improvement .	There is a rigorously effective process in place for regular monitoring of resilience building progress, ensuring comprehensive and consistent assessment of resilience initiatives and facilitating continuous improvement in resilience efforts.	The adequacy of the monitoring process may be determined by the following aspects: - implementation in consultation with stakeholders - definition of goals and objectives - definition of output-oriented indicators for monitoring the implementation process - definition of regular update intervals		X	X	X						X		

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Ref. No	Levels	Subject	Question	Indicative measurement scale						Explanation	Score	Classification									
				0 - Worst	1	2	3	4	5 - Best			Scale			Resilience Dimension						
												Building	Urban	Territorial	Physical	Health, wellbeing and quality of life	Technical	Economic	Environmental		
1.3.4	Level 1	Comprehensive resilience data availability	Is there a singular, comprehensive set of high-quality resilience data that is integrated and available to practitioners, individuals (such as residents and employees), and community organisations?	There is no singular, comprehensive set of high-quality resilience data available.	The available resilience data is very little, if any, and it is not comprehensive, high-quality, or easily accessible .	While there are some resilience data sources available, they are not comprehensive or consistently high-quality, and accessibility is limited resulting in gaps and inconsistencies that hinder their usefulness.	There is a moderate amount of resilience data available with efforts made to ensure its quality and accessibility, but it is not fully integrated or standardized .	A comprehensive set of high-quality resilience data is integrated and available to a considerable extent, although there may be areas for improvement .	There is a singular, comprehensive set of high-quality resilience data that is fully integrated and readily available enabling effective planning, implementation, and collaboration in resilience-building efforts.	The question assesses whether a unified and comprehensive dataset is available at each of the scales. It examines also the openness of data sharing with external organizations, community stakeholders, and the public. A dataset may encompass a wide range of data points related to various aspects of resilience, such as socio-economic indicators, infrastructure data, environmental factors, governance structures, and other relevant information that can help assess and measure the resilience of a system or community to various shocks and stresses.		X	X	X			X				
Total score for sub-Essential 1.3											0	Scores by resilience dimension			0	0	0	0	0		
Total score for Essential 1											0										



Essential 2 - Identify, understand and use current and future risk scenarios

Ref. No	Levels	Subject	Question	Indicative measurement scale						Explanation	Score	Classification									
				0 - Worst	1	2	3	4	5 - Best			Scale			Resilience Dimension						
												Building	Urban	Territorial	Physical	Health, wellbeing and quality of life	Technical	Economic	Environmental		
2.1 Hazards and impacts																					
2.1.1	Level 1	Knowledge of hazards (including climate change induced hazards)	Do you have (access to) knowledge about the hazards - both climate-related and non-climate-related hazards - that might strike the building/ city/ territory? Is specific information on climate change induced hazards also available?	No (access to) knowledge about hazards.	Knowledge about hazards is limited or not readily accessible , and specific information on climate change-induced hazards is scarce.	Some knowledge about relevant hazards is available, but might be outdated and not comprehensive of specific information on climate change induced hazards.	Knowledge about relevant hazards is available , but it has major shortcomings in terms of when last updated or coverage of relevant hazards (including climate change induced hazards).	Comprehensive knowledge about relevant hazards is available, but information on climate change induced hazards may not be exhaustive .	Comprehensive knowledge about relevant hazards is available, including climate change induced hazards; this information is updated regularly and systematically , and is based on reliable up-to-date scenarios.	The term "knowledge" describes having access to, for example, a record of historic events, reports, narratives from local population, hazard maps, etc. Non-climate-related hazards can be classified according to the Hazard Definition & Classification Review (UNDRR, 2020a) into geological, environmental, technological, biological, chemical and societal hazards (UNDRR, 2022. Technical Guidance on Comprehensive Risk Assessment and Planning in the Context of Climate Change). Climate change induced hazards include hazards that are slow in their onset (such as sea-level rise, changes in temperature and precipitation leading to droughts, or agricultural losses) as well as hazards that happen more suddenly, such as extreme winds, tropical storms and floods (UNFCCC).	2	X	X	X				X		X	
2.1.2	Level 1	Availability of data about past impacts and consequences	Is data about past direct and indirect impacts and consequences of all main hazards affecting the building/ city/ territory available?	No data available.	Data about past impacts and consequences of hazards is limited or not readily accessible , making it difficult to assess their full extent.	There are some efforts to collect data about past impacts and consequences of hazards but it is just for one or few hazards and considering mainly direct impacts.	Some data about past impacts and consequences of hazards is available, covering some main hazards , although it may not capture all relevant aspects.	There is a substantial amount of data available about past impacts and consequences of hazards, covering most main hazards .	Comprehensive data about past impacts and consequences of hazards is available, encompassing all main hazards , providing detailed insights for proactive measures and resilience planning.	The term impact refers to the effects on natural and human systems of extreme weather and events related to climate change. Impacts generally refer to effects on lives, livelihoods, health, ecosystems, economies, societies, cultures, services and infrastructure due to the interaction of hazardous events occurring within a specific time period and the vulnerability of an exposed society or system" (Connelly & Carter, 2016). Direct impacts refer to the immediate consequences of extreme weather events and climate-related hazards, such as physical damage to infrastructure, loss of life, injuries, and immediate disruptions to services and livelihoods. Indirect impacts include the secondary or cascading effects that occur as a result of the direct impacts. These can include long-term economic losses, social disruptions, environmental degradation, health impacts, and changes to ecosystems and biodiversity. Indirect impacts often unfold over time and may be less visible or immediately apparent than direct impacts but can have significant and far-reaching consequences.	3	X	X	X				X		X	
2.1.3	Level 1	Availability of future projections of impacts	Are future projections of impacts for each relevant hazard and exposed element available?	No future projection of impacts available.	Future projections of impacts is limited or not readily accessible , making it difficult to assess their full extent.	There are some efforts to develop future projections of impacts, but but it is just for one or few hazards/ exposed elements and considering mainly direct impacts.	Some future projections of impacts is available, covering some main hazards and exposed elements , although it may not capture all relevant aspects.	There is a substantial amount of future projections of impacts available, covering most main hazards and exposed elements .	Comprehensive future projections of impacts are available, encompassing all main hazards and exposed elements , providing detailed insights for proactive measures and resilience planning.	Please refer to 2.1.2 for the definition of impact. For a BUILDING LEVEL they can be referred to the building material reaction to certain hazards. While for the URBAN and TERRITORY scale, future projection can give an overview to the changes of landscape and natural elements.	3	X	X	X				X			



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Ref. No	Levels	Subject	Question	Indicative measurement scale						Explanation	Score	Classification											
				0 - Worst	1	2	3	4	5 - Best			Scale			Resilience Dimension								
												Building	Urban	Territorial	Physical Health, wellbeing and quality of life	Technical	Economic	Environmental					
2.1.4	Level 2	Projections of impact on human well-being	Do the future projections specifically consider impacts on human well-being and quality of life?	Impacts on human well-being and quality of life are not considered .	Impacts on human well-being and quality of life are not considered but there are plans to update future projections of impacts to include them.	Future projections are currently being updated to include impacts on human well-being and quality of life.	Future projections consider human well-being and quality of life impacts but there are major shortcomings .	Future projections consider human well-being and quality of life impacts, with some minor shortcomings .	Future projections fully considers human well-being and quality of life impacts providing detailed insights for proactive measures and resilience planning that prioritize the welfare of individuals and communities.	Please refer to 2.1.2 for the definition of impact. Future projection should include human well-being and quality of life issues such as long-term economic losses, social disruptions, environmental degradation, health impacts.	4	X	X	X		X	X						
2.1.5	Level 1	Consideration of cascading effects	Have impact chains been developed considering the cascading effects of direct and indirect impacts of the main hazards affecting the building/ city/ territory been developed?	No impact chains have been developed.	No impact chains have been developed, but there are plans to do so .	Some efforts have been made to develop impact chains, but considering just one hazard and direct impacts only .	Impact chains have been developed considering cascading effects of just direct impacts of some main hazard (or presenting other major shortcomings).	Impact chains have been developed considering cascading effects of direct and indirect impacts of most main hazard , with some minor shortcomings .	Impact chains considering cascading effects of direct and indirect impacts of all hazards have been comprehensively developed, and the most affected sectors/ elements have been identified.	Impact chains can be formulated in an analysis document where cascading risks are described. Cascading refers to the relation that link a certain hazard to another one.	5	X	X	X			X						
Total score for sub-Essential 2.1											17												
2.2 Exposure and vulnerability																							
2.2.1	Level 1	Knowledge of exposed elements	Do you have (access to) knowledge of the most exposed elements for each relevant hazards affecting your building/ city/ territory?	No (access to) knowledge about the most exposed elements.	Knowledge about the most exposed elements is limited or not readily accessible .	Some knowledge about relevant exposed elements is available, but might be outdated and not comprehensive of all relevant hazards.	Knowledge about relevant exposed elements is available , but it has major shortcomings in terms of when last updated or coverage of relevant hazards.	Comprehensive knowledge about relevant exposed elements is available, with some minor shortcomings in terms of when last updated or coverage of relevant hazards.	Comprehensive knowledge about relevant exposed elements for each relevant hazards is available; this information is updated regularly and systematically .	The term " knowledge " describes having access to one or more of the following exemplary information: record of historic events, reports, narratives from local population, maps. Comprehensive knowledge of exposed elements includes the consideration of all parts/dimensions of the social-ecological system. " Exposure " can be defined as the "The presence of people, livelihoods, species or ecosystems, environmental services and resources, infrastructure, or economic, social, or cultural assets in places that could be adversely affected" (IPCC, 2014). BUILDING SCALE It considers elements can be the building structural parts most affected by the main hazards. URBAN/TERRITORY SCALE Exposed elements can refer to infrastructures, natural capital, areas next to natural elements, etc...	1	X	X	X			X						
2.2.2	Level 1	Knowledge of vulnerability factors	Do you have (access to) knowledge about the vulnerability factors that influence the risk of the building/ city/ territory?	No (access to) knowledge about vulnerability factors.	Knowledge about vulnerability factors is limited or not readily accessible .	Some knowledge about relevant vulnerability factors is available, but might be outdated .	Knowledge about relevant vulnerability factors is available , but it has major shortcomings in terms of when last updated or coverage of relevant factors.	Knowledge about relevant vulnerability factors is available , but this has minor shortcomings in terms of when last updated.	Comprehensive knowledge about relevant vulnerability factors is available; this information is updated regularly and systematically .	Vulnerability refers to the "propensity or predisposition to be adversely affected. Vulnerability encompasses a variety of concepts including sensitivity or susceptibility to harm and lack of capacity to cope and adapt" (IPCC, 2014).	4	X	X	X			X						
Total score for sub-Essential 2.2											5												
2.3 Risk Analysis																							



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				0 - Worst	1	2	3	4	5 - Best			Scale			Resilience Dimension					
												Building	Urban	Territorial	Physical	Health, well-being and quality of life	Technical	Economic	Environmental	Organisational
2.3.1	Level 1	Risk analysis	Has a risk analysis been conducted?	No risk analysis has been conducted.	Minimal or incomplete risk analysis has been conducted, lacking comprehensive coverage or depth.	Some efforts have been made to conduct a risk analysis, but might be outdated and not comprehensive.	A risk analysis exists but it has major shortcomings in terms of when last updated, external review, or level of acceptance by relevant actors.	A risk analysis exists but it has minor shortcomings in terms of when last updated, external review, or level of acceptance by relevant actors.	A full updated risk analysis exist, which was reviewed by a third party, and accepted by all relevant actors.	A risk analysis is a documents that include the determination of the likelihood of an event (probability) and the consequences of its occurrence (impact) for the purpose of comparing possible risks and making risk management decisions (Région Alsace et al., 2007). Definition "risk": "The potential for consequences where something of value is at stake and where the outcome is uncertain, recognizing the diversity of values. Risk is often represented as probability of occurrence of hazardous events or trends multiplied by the impacts if these events or trends occur. Risk results from the interaction of vulnerability, exposure, and hazard" [IPCC, 2014].	3	X	X	X			X			X
2.3.2	Level 2	Consideration of combined and multi-hazard risks	Does the risk analysis consider combined or multi-hazard risks?	The risk analysis does not consider combined/ multi-hazard risks.	The risk analysis does not consider combined/ multi-hazard risks but there are plans to update the risk analysis to include these.	The risk analysis is currently being updated to include combined/ multi-hazards risks.	The risk analysis considers some combined/ multi-hazards risks but there are major shortcomings.	The risk analysis extensively considers combined/ multi-hazards risks, with some minor shortcomings.	The risk analysis fully considers combined/ multi-hazards risks, providing detailed insights into all relevant combinations of hazards, enabling effective proactive risk management strategies..	Refer to 2.3.1 for the definition of risk analysis.	2	X	X	X			X			
2.3.3	Level 2	Social impact estimates	Are estimates of the impacts on socio-economic aspects included in the risk analysis?	The risk analysis does not consider socio-economic impacts.	The risk analysis does not consider socio-economic impacts but there are plans to update the risk analysis to include these.	The risk analysis is currently being updated to include socio-economic impacts.	Socio-economic impacts are mentioned but not thoroughly integrated into the risk analysis.	Socio-economic impacts are considered in the risk analysis, but there is room for improvement in integration and detail.	The risk analysis fully considers socio-economic impacts.	Refer to 2.3.1 for the definition of risk analysis.	5	X	X	X		X	X	X		
2.3.4	Level 2	Risk data update	Is there a process that ensures frequent and complete updates of the risk analysis, including updates to hazard scenarios, exposure, and vulnerability assessments?	No process in place.	Updates to the risk analysis are infrequent and incomplete.	There are some efforts to update the risk analysis, but it is not frequent or comprehensive, with updates to hazard scenarios, exposure, and vulnerability assessments lacking in completeness.	A process exists, but it has major shortcomings in terms of frequency, thoroughness or actor involvement.	A process exists, with minor shortcomings in terms of frequency, thoroughness, or actor involvement.	There is an rigorous process in place that ensures frequent and complete updates of the risk analysis. These updates are comprehensive, timely, and meticulously conducted, ensuring that the risk analysis remains highly relevant and accurate at all times.	Refer to 2.3.1 for the definition of risk analysis. Since risk evolves in time and space, it is necessary to have a process to update hazard scenarios.	2	X	X	X			X		X	
2.3.5	Level 2	Risk data sharing	Is the information contained in risk analysis, including on hazard scenarios, exposure, and vulnerability assessments made available/ regularly shared?	Data is not made available or regularly shared.	Some data is available, but often is not shared with relevant stakeholders.	Some data is available, but it is shared with a limited number of relevant stakeholders.	Most data is available, but it is shared just with primary stakeholders.	Comprehensive data is available and shared with all relevant stakeholders upon request.	Comprehensive data is available and regularly shared with all relevant stakeholders, the data are open sources with free access.	Refer to 2.3.1 for the definition of risk analysis. BUILDING SCALE Relevant stakeholders can be considered the people living or using a specific building. URBAN/TERRITORY SCALE Potential stakeholders can include people living or visiting a particular area.	1	X	X	X		X	X		X	
Total score for sub-Essential 2.3											13	Scores by resilience dimension								
Total score for Essential 2											35				0	10	35	5	5	6



Essential 3 - Strengthen financial capacity for resilience

Ref. No	Levels	Subject	Question	Indicative measurement scale						Explanation	Score	Classification									
				0 - Worst	1	2	3	4	5 - Best			Scale			Resilience Dimension						
												Building	Urban	Territorial	Physical	Health, wellbeing and quality of life	Technical	Economic	Environmental	Organisational	
3.1 Financial planning and budgeting: Understanding of likely costs due to disasters, financing plans for resilience improvements																					
3.1.1	Level 1	Understanding of the costs that could result from disasters	Do you have a reliable estimate of the costs that could be incurred in case of a disaster, and are these economic impacts included in the risk analysis?	There is no reliable estimate of the costs of disasters.	No estimate of the costs of disasters, but there are plans to do so.	There are some efforts to estimate the costs of disasters, but they are not comprehensive or reliable , and these economic impacts may not be fully included in the risk analysis.	There is a moderately reliable estimate of the costs of disasters, and these economic impacts are included to some extent in the risk analysis, although there may be major shortcomings .	There is a reliable estimate of the costs of disasters, and these economic impacts are included to some extent in the risk analysis, with minor shortcomings .	There is a highly reliable estimate of the costs of disasters, and these economic impacts are comprehensively included in the risk analysis.	The costs that could be incurred in a disaster include e.g., costs due to physical damages of the built and natural environment as well as the infrastructure, costs due to injuries, ambulance and fire brigade costs, insurance costs. Indirect costs might also be considered, which include "all losses that are not provoked by the disaster itself, but by its consequences; they are spanning over a longer period of time than the event, and they affect a larger spatial scale or different economic sectors" (Hallegatte, 2015). Refer to 2.3.1 for the definition of risk analysis.		X	X	X				X			
3.1.2	Level 1	Presence of a plan or strategy for financing resilience improvements	Do you have a clear financial plan (both capital and operating), including identified funding mechanisms, for the financing of resilience improvements?	There is no clear financial plan or identified funding mechanisms for resilience improvements.	There is a generalized capital improvement fund , but this is not focused on resilience as an issue in its own and availability varies from year to year.	Some planning has taken place for funds to meet resilience needs, and some funds may have been allocated, but the overall requirement is not clear and funds are not protected from year to year.	A plan exists but is not reliably executed from year to year due to pressures of other priorities on funds. Multi-year fund allocations are not possible.	A plan exists and is being executed but has some shortfalls (< 10%), relative to what is known or suspected to be required. Funding is however protected from year to year.	A plan exists that is sufficient for all known and foreseeable resilience needs (see Essential 2), and the plan is being executed.	A financial plan encompasses the strategic allocation of resources to achieve specific objectives and goals. It includes budget planning, resource allocation, and contingency fund arrangements to enhance resilience in the face of uncertainties and risks. Capital Financial Plan: it focuses on long-term investments in physical assets and infrastructure Operating Financial Plan: it addresses ongoing operational expenses required for the day-to-day functioning of an organisation or project. BUILDING SCALE A financial plan can include maintenance and potential structure upgrading. URBAN / TERRITORY SCALE A financial plan at a public municipal or regional administrative level can include the foreseen costs and investments in resilience building measures implementation such as climate adaptation and mitigation solutions at a territorial level.		X	X	X				X			
3.1.3	Level 2	Inclusion of relevant stakeholder groups in financial capacity planning	Are relevant stakeholder groups (local communities, NGOs, local businesses, etc) informed and/or involved when drafting the financial plan?	No involvement of stakeholder groups.	Some stakeholder groups are informed , but none are involved in financial capacity planning.	Main stakeholder groups are informed , but none are involved in financial capacity planning.	All relevant stakeholder groups are informed , but just some are involved in financial capacity planning.	All relevant stakeholder groups are informed , and most are involved in financial capacity planning.	All relevant stakeholder groups are informed and involved in financial capacity planning.	Refer to 3.1.2 for the definition of financial plan. Including different stakeholders when drafting the financing plan can benefit transparency and equitable distribution of funds.		X	X	X		X		X			
3.1.4	Level 1	Contingency fund(s) for post disaster recovery	Do fund(s) exist that are protected and capable of dealing with impacts of relevant hazard?	No funds available.	Funds to deal with the impacts of relevant hazards are minimal or insufficiently protected .	There are some funds available , but they are not fully protected or may not be adequate to address the impacts of relevant hazards.	Funds exist that are moderately protected and capable of addressing some impacts of relevant hazards, but may be diverted to other purposes.	There are protected funds available that are capable of dealing with significant impacts of relevant hazards, providing a substantial buffer against adverse effects.	Highly protected funds exist, specifically designated to deal with impacts of relevant hazards, providing comprehensive coverage and robust financial resilience against adverse effects.	Protected funds are the ones locked and only available in case of hazardous events.		X	X	X				X			

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				0 - Worst	1	2	3	4	5 - Best			Scale			Resilience Dimension							
												Building	Urban	Territorial	Physical Health, wellbeing and quality of life	Technical	Economic	Environmental	Organisational			
Total score for sub-Essential 3.1											0											
3.2 Insurance coverage for asset and personal damage																						
3.2.1	Level 1	Engagement of the insurance sector	Are there ongoing processes of engagement with the insurance sector to assess, mitigate and manage risk?	No process in place.	The need for engagement with the insurance has been recognised, but no discussions have taken place yet.	Discussions have been initiated.	Engagement is happening, but only for the cities critical assets.	Some engagement but missing a thorough process for cross sector engagement.	Very substantial engagement for some years, city is actively collaborating.	A good engagement with the insurance sector is identified when: - At a BUILDING SCALE, insurance solutions and companies for protecting the building assets have been identified and contacted. At a building level, coverage of insurance may include built environment, content of a building (e.g. materials, furniture stored in the building), e.g. causing property damage. - At a URBAN-TERRITORIAL scale, insurance solutions and companies have been identified to protect infrastructures, services and critical areas.		X	X	X						X		
3.2.2	Level 1	Insurance coverage	To what extent are damages to the building/city/territory covered by insurance? (Personal or life coverage is not assessed)	There is no insurance coverage for damages.	Coverage for damages is minimal or insufficient.	Some damages are covered by insurance, but coverage may be limited or inadequate for comprehensive protection.	Damages are moderately covered by insurance, providing some protection but with potential gaps.	The majority of damages are covered by insurance, offering significant financial protection in case of disasters or accidents with minimal gaps.	Insurance coverage is extensive and comprehensive, ensuring that nearly all potential damages to the building/city/territory are covered, providing robust financial protection.	Please refer to 3.2.1		X	X	X					X			
Total score for sub-Essential 3.2											0											
3.3 Incentives and financing for resilience																						
3.3.1	Level 1	Incentives to improve resilience – disaster plans, premises etc	Do you have access to any kind of incentive to improve resilience?	No incentives.	Access to incentives for improving resilience is minimal or nonexistent.	Some limited incentives exist for improving resilience, but they are not widely accessible or substantial.	There are moderate incentives available to improve resilience, although they may not cover all aspects comprehensively.	Access to incentives for improving resilience is substantial, offering significant support and encouragement for resilience-enhancing measures with some minor shortcomings.	There are comprehensive incentives available to improve resilience, providing extensive support and encouragement for a wide range of resilience initiatives.	BUILDING SCALE: Incentives can be reduction of taxes relating to certain structure improvement, for example to reduce energy loss in interior spaces. URBAN/TERRITORIAL SCALE: Incentives can be related to the use to public transport instead of private one, or use of bikes. Results monitoring will need an assessment process in place to check the results achievement.		X	X	X					X			
3.3.2	Level 2	Assessment of (unintended) effects of incentives	To what extent are incentive mechanisms assessed regularly and in consultation with relevant interest groups for their (potentially unintended) effects?	No assessment process in place.	Assessment of incentive mechanisms is minimal or sporadic, with little to no consultation with relevant interest groups for potential unintended effects.	There are some efforts to assess incentive mechanisms, but it is not done regularly or comprehensively, and consultation with relevant interest groups is limited.	Incentives are regularly assessed, but with major shortcomings in terms of frequency, and/or consultation of some interest groups.	Incentives are regularly assessed, with only minor shortcomings in terms of frequency, and/or consultation of most interest groups.	Incentives are regularly and frequently assessed, with extensive consultation with relevant interest groups for potential unintended effects, ensuring that they are continuously refined and optimized to achieve their intended goals.	Incentives needs to be regularly and frequently assessed since they can result in unforeseen effects, e.g. subsidising climate-damaging behaviour or incentivising processes/structures that discriminate against vulnerable population groups such as low-income households. The effects of incentives should be regularly assessed in consultation with all interest groups who might benefit (or be harmed) by incentives.		X	X	X		X		X				
Total score for sub-Essential 3.3											0											
3.4 Knowledge about funding opportunities and funds for existing projects																						



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				0 - Worst	1	2	3	4	5 - Best			Scale			Resilience Dimension							
												Building	Urban	Territorial	Physical	Health, wellbeing and quality of life	Technical	Economic	Environmental	Organisational		
3.4.1	Level 1	Ad-hoc funding opportunities for post disaster recovery	Are there processes that enable ad-hoc/short-term funding opportunities for unforeseen disasters? (at municipal/regional level)	There are no processes in place.	Processes that enable ad hoc funding opportunities are minimal or nonexistent .	Processes that enable ad hoc funding opportunities are available, but only covering a small share of the costs .	Processes that enable ad hoc funding opportunities are available and cover a medium share of the costs .	Processes that enable ad hoc funding opportunities are available and cover a significant share of the costs .	Processes that enable ad hoc funding opportunities are available and cover all costs .	Examples: Emergency Budget Reserves Disaster Relief Funds Emergency Declarations Inter-governmental Assistance External Grants and Donation Public-Private Partnerships (PPPs)			X	X				X		X		
3.4.2	Level 1	Knowledge of possible financing and funding methods to increase resilience	To which extent are available routes/ options to close any funding shortfalls researched and understood?	Available routes/options to close funding shortfalls have not been researched .	There has been minimal research into available routes/options.	Some effort has been made to research available routes/options, but understanding is limited .	Available routes/options to close funding shortfalls are moderately researched and understood , although there may be gaps in knowledge or efficiency .	Extensive research has been conducted, but not all of them have been approached and understood.	Available routes/options to close funding shortfalls have been exhaustively researched and completely understood , allowing for informed decision-making and proactive planning.	Research is closely tied to the exploration of potential funding opportunities within the contexts of building, city, or territory development. This research scope encompasses seeking funding from various sources including regional, national, and European Union (EU) levels. Furthermore, effective management entails having individuals with expertise in navigating funding applications and adeptly monitoring new potential funding opportunities.		X	X	X				X				
Total score for sub-Essential 3.4											0	Scores by resilience dimension			0	0	0	0	0	0		
Total score for Essential 3											0											



Essential 4 - Pursue resilient development

Ref. No	Levels	Subject	Question	Indicative measurement scale						Explanation	Score	Classification									
				0 - Worst	1	2	3	4	5 - Best			Scale			Resilience Dimension						
												Building	Urban	Territorial	Physical	Health, well-being and quality of life	Technical	Economic	Environmental		
4.1 Mainstreaming of resilience in legal instruments																					
4.1.1	Level 1	Promotion of resilient development in legal instruments	Do the legal frameworks/instrument s governing your building, city, or territory take into account resilient development?	No legal instruments exist concerning development planning.	Legal instruments exist, but they do not consider resilient development.	Resilient development is considered in legal instruments, but is only implemented to a limited extent in practice.	Resilient development is considered in legal instruments and largely implemented in practice.	Resilient development is considered in legal instruments and implemented in practice, but the regulations are not regularly updated.	Resilient development is considered in legal instruments and implemented in practice, and regulations are regularly updated.	Resilient development can be defined as an approach to sustainable development that focuses on building the capacity of communities, cities, and regions to withstand, adapt to, and recover from shocks, stresses, and uncertainties. It involves integrating principles of resilience into all aspects of development planning, policy-making, and implementation to enhance the ability of societies to thrive in the face of challenges such as hazardous events, climate change, economic disruptions, and social upheaval. Examples of legal instruments may include building codes, urban plans, a land-use plan, a mobility plan, etc.		X	X	X							
4.1.2	Level 2	Consideration of human well-being and quality of life into legal instruments	Are human well-being and quality of life considered in legal instruments taking into account resilience?	Human well-being and quality of life are not considered.	Somewhat mentioned in one or very few legal instruments, but no concrete measures are established.	Mentioned in a fair number of legal instruments, but no concrete measures are established.	Mentioned in a fair number of legal instruments, but very few concrete measures are established.	Mentioned in a good number of legal instruments, and the established concrete measures have minor shortcomings.	Clearly considered as contributing to strengthen the resilience of the communities in all relevant legal instruments establishing a comprehensive set of concrete measures.	Human well-being and quality of life is considered in legal instruments when: - At a BUILDING level, building codes take into consideration for example air and light minimum standards - At a URBAN/TERRITORY level, urban planning regulations incorporate provisions for public spaces, green areas, transportation infrastructure, and accessibility for people with disabilities, among other factors, to enhance livability and ensure equitable access to resources and amenities		X	X	X		X					
4.1.3	Level 1	Monument protection law	To what extent does an existing monument protection law promote the resilient development of the historic sites and buildings?	There is no existing monument protection law in place.	A monument protection law exists, but it does not consider the resilient development of historic sites and buildings.	Resilient development of historic sites and buildings is considered in a monument protection law, but is only implemented to a limited extent in practice.	Resilient development of historic sites and buildings is considered in a monument protection law and largely implemented in practice.	Resilient development of historic sites and buildings is considered in a monument protection law and implemented in practice, but the regulations are not regularly updated.	Resilient development of historic sites and buildings is considered in a monument protection law and implemented in practice, and regulations are regularly updated.	Please refer to 4.1.1 for the definition of resilient development		X	X	X		X					
Total score for sub-Essential 4.1											0										
4.2 Land use plans, building codes and standards																					
4.2.1	Level 1	Land-use plans	To what extent land use plans and zoning are implemented and enforced?	No land use plans and zoning exist.	Land use plans and zoning are barely implemented and enforced.	Land use plans and zoning are implemented and enforced just in some parts of the target area.	Land use plans and zoning are implemented and enforced in most of the target area, with some exception.	Land use plans and zoning are fairly implemented and enforced.	Land use plans and zoning are widely implemented and enforced.	Land use plans are long-term, strategic documents that outline a vision for the future development of an area. These plans typically cover large geographical areas, such as cities, counties, or regions, and provide a framework for guiding growth, development, and land use decisions over a specified period, often 10 to 20 years or more. Zoning is a regulatory tool used to implement land use plans at a more detailed and specific level. Zoning divides land into different zones or districts, each with its own set of regulations governing permissible land uses, building densities, heights, setbacks, and other development standards.			X	X							



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Ref. No	Levels	Subject	Question	Indicative measurement scale						Explanation	Score	Classification										
				0 - Worst	1	2	3	4	5 - Best			Scale			Resilience Dimension							
												Building	Urban	Territorial	Physical	Health, wellbeing and quality of life	Technical	Economic	Environmental	Organisational		
4.2.2	Level 2	Climate adaptation and mitigation in land-use plans	To what extent do land-use plans and zoning are up-to-date taking climate adaptation and mitigation issues into consideration?	Land-use plans and zoning do not consider climate adaptation and mitigation issues, and they are not up-to-date .	Land use plans and zoning are obsolete but there are plans for an update in the near future to incorporate climate adaptation and mitigation.	Some efforts have been made to incorporate climate adaptation and mitigation into land-use plans and zoning, but updates are incomplete or infrequent.	Climate adaptation and mitigation issues are moderately considered in relatively up-to-date land-use plans and zoning, but there are major shortcomings .	Land-use plans and zoning are fairly up-to-date and consider climate adaptation and mitigation issues with minor shortcomings .	Land-use plans and zoning are up-to-date and comprehensively incorporate climate adaptation and mitigation considerations, reflecting current knowledge and best practices.	Please refer to 4.2.1 for the definition of land use plans and zoning.				X	X						X	
4.2.3	Level 1	Public lands contracts	Are resilience factors integrated into contracts associated with the sale or lease of public land and property?	Resilience factors are not integrated into public sale or lease contracts.	Integration of resilience factors into public sale or lease contracts is minimal or sporadic .	There are some efforts to integrate resilience factors into public sale or lease contracts, but it is not comprehensive or consistent .	Resilience factors are moderately integrated into public sale or lease contracts, though there may be gaps or inconsistencies .	Resilience factors are fairly integrated into public sale or lease contracts, contributing significantly to resilience enhancement.	Resilience factors are comprehensively integrated into public sale or lease contracts, ensuring that resilience considerations are central to all transactions, and promoting sustainable development.	Integrating resilience factors into contracts associated with the sale or lease of public land and property helps promote sustainable development by encouraging environmentally conscious land use practices . This way, governments can ensure that development projects align with broader goals of environmental sustainability, social equity, and economic viability.		X	X	X						X		Y
4.2.4	Level 1	Building codes	Do building codes exist and are regularly reviewed?	No building code exists.	There are no building codes yet, but plans are being developed to formulate them.	Building codes exist, but is for the most part considered inadequate/ outdated .	Building codes exist; a review and update process is ongoing but is delayed.	Building codes exist; a review and update process is in its final stage .	Adequate building codes exist and are regularly reviewed and updated .	Building codes are a set of regulations and standards that govern the design, construction, and occupancy of buildings. They are intended to ensure the safety, health, accessibility, and sustainability of structures, as well as to protect occupants and the surrounding environment.		X	X	X	X							X
4.2.5	Level 2	Sustainable and resilient development in building codes	To what extent do existing building codes promote sustainable and resilient development?	Existing building codes do not promote sustainable and resilient development.	Promotion of sustainable and resilient development in existing building codes is minimal or negligible .	There are some provisions in existing building codes for promoting sustainable and resilient development, but they are limited in scope or effectiveness .	Existing building codes moderately promote sustainable and resilient development, with some provisions aimed at enhancing sustainability and resilience.	Existing building codes fairly promote sustainable and resilient development, with significant provisions aimed at enhancing sustainability and resilience.	Existing building codes comprehensively promote sustainable and resilient development, with robust provisions aimed at enhancing sustainability and resilience across all aspects of building design and construction.	Building codes play a critical role in promoting sustainable and resilient development by incorporating for example provisions that address energy efficiency, green building practices, hazard mitigation and adaptation, resilient design and construction, and community resilience. They should be regularly updated with new rising risks.		X	X	X	X					X		Y
4.2.6	Level 1	Building design standards	Are sustainable building design standards (e.g. REDi, LEED, GreenStar, BREEM, etc.) used to improve resilience?	No awareness or interest in using sustainable building design standards.	There is interest in using sustainable building design standards, but no action has been taken.	There is interest in using sustainable building design standards, and there are plans to take action soon/ process started .	Sustainable building design standards are used and the minimum level of certification has been achieved.	Sustainable building design standards are used, and while the minimum level of certification has been achieved, work is being done to achieve a higher level .	Sustainable building design standards are used and the maximum level of certification has been achieved.	Please refer to 4.2.3 for the definition of building codes.		X	X	X	X					X		Y
4.2.7	Level 1	Circularity in construction and renovation	Are measures implemented to promote circularity in construction and renovation (e.g. buildings as material banks; ensuring sufficient capacity of recycling yards to store materials for re-use)?	No measures implemented to promote circularity.	Measures to promote circularity in construction and renovation are minimal or sporadic .	There are some efforts to promote circularity, but they are not comprehensive or consistent .	Measures to promote circularity are moderately implemented , though there may be gaps or inconsistencies .	Measures to promote circularity are fairly implemented , contributing significantly to circular economy principles.	Measures to promote circularity are comprehensively implemented , ensuring that circular economy principles are central to construction and renovation processes, and promoting sustainable resource management.	Circularity measures aim to transform the construction industry from a linear model, where materials are extracted, used, and disposed of, to a circular model, where materials are reused, recycled, or repurposed at the end of their life cycle.		X	X	X	X			X	X		Y	

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				0 - Worst	1	2	3	4	5 - Best			Scale			Resilience Dimension				
												Building	Urban	Territorial	Physical Health, wellbeing and quality of life	Technical	Economic	Environmental	
Total score for sub-Essential 4.2											0								
4.3 Urban planning measures																			
4.3.1	Level 1	Public transport development	Does urban planning prioritise public transport-oriented development?	Public transport is not a priority .	There is minimal prioritization of public transport-oriented development in urban planning, with limited initiatives or support	Some efforts are made to prioritize public transport-oriented development in urban planning, but the focus is inconsistent or incomplete	Public transport-oriented development is moderately prioritized in urban planning, with some initiatives and support in place.	Urban planning substantially prioritizes public transport-oriented development, with significant initiatives and support aimed at enhancing public transport infrastructure and accessibility.	Urban planning comprehensively prioritizes public transport-oriented development, with robust initiatives and support ensuring that public transport plays a central role in shaping urban growth and	Public transport-oriented development seeks to maximize the accessibility and usability of public transit while minimizing reliance on private cars, reducing traffic congestion, air pollution, and greenhouse gas emissions, and promoting economic vitality, social equity, and environmental sustainability.			X	X		X		X	
4.3.2	Level 1	Public spaces development	To what extent are public spaces designed and managed to enhance resilience, considering factors such as green spaces, social cohesion, and accessibility for all demographics?	Public spaces are not designed or managed to enhance resilience , lacking consideration such as green spaces, social cohesion, and accessibility.	There are minimal efforts to design and manage public spaces for resilience, with limited incorporation of green spaces, social cohesion initiatives, and accessibility measures.	Some efforts are made to design and manage public spaces for resilience, but the consideration of factors like green spaces, social cohesion, and accessibility is inconsistent or incomplete .	Public spaces are moderately designed and managed to enhance resilience, with some initiatives to incorporate factors such as green spaces, social cohesion, and accessibility, although improvements are needed .	Public spaces are fairly designed and managed to enhance resilience, with significant efforts to incorporate factors such as green spaces, social cohesion, and accessibility for all.	Public spaces are comprehensively designed and managed to enhance resilience, with robust initiatives ensuring ample green spaces, strong social cohesion, and accessibility measures that cater to all.	Public spaces enhance resilience when they promote social cohesion, community engagement, and collective action in preparing for and responding to various shocks and stresses.			X	X		X		X	
4.3.3	Level 1	Urban heat island strategies	To what extent have strategies aiming at reducing urban heat island effects been integrated into urban or building-level planning processes?	Strategies to reduce urban heat island effects have not been integrated into planning processes.	Integration of strategies to reduce urban heat island effects into planning processes is minimal or sporadic .	There are some efforts to integrate strategies to reduce urban heat island effects, but they are not comprehensive or consistent .	Strategies to reduce urban heat island effects are moderately integrated into planning processes, with some initiatives and efforts underway, although improvements are needed .	Strategies to reduce urban heat island effects are fairly integrated into planning processes, with significant initiatives and efforts contributing to mitigation measures.	Strategies to reduce urban heat island effects are comprehensively integrated into planning processes, with robust initiatives and efforts ensuring effective mitigation of heat island effects.	Urban heat island effects refer to the phenomenon where urban areas experience higher temperatures compared to their surrounding rural areas. This temperature difference is primarily caused by human activities and the modification of land surfaces, which alter the thermal properties of urban environments.	X	X			X			X	
Total score for sub-Essential 4.3											0								
4.4 Resilient procurement planning																			
4.4.1	Level 1	Sustainable procurement	Is sustainable procurement considered at a building/city/territory level?	Sustainable procurement is not considered .	Consideration of sustainable procurement is minimal or sporadic .	There are some efforts to consider sustainable procurement, but they are not comprehensive or consistent .	Sustainable procurement is moderately considered , with some initiatives and efforts underway, although improvements are needed .	Sustainable procurement is fairly considered , with significant initiatives and efforts contributing to sustainable practices.	Sustainable procurement is comprehensively considered with robust initiatives and support at all levels of procurement practices.	Sustainable procurement is a strategic approach to purchasing goods, services, and works that integrates environmental, social, and economic considerations into procurement processes and decisions. It aims to minimize negative impacts on the environment, promote social responsibility, and support economic development while meeting the organization's needs and objectives.	X	X	X				X	X	
Total score for sub-Essential 4.4											0	Scores by resilience dimension							
Total score for Essential 4											0	0	0	0	0	0	0	0	0



Essential 5 - Safeguard natural capital

Ref. No.	Levels	Subject	Question	Indicative measurement scale						Explanation	Score	Classification								
				0 - Worst	1	2	3	4	5 - Best			Scale			Resilience Dimension					
												Building	Urban	Territorial	Physical	Health, well-being and quality of life	Technical	Economic	Environmental	Organisational
5.1 Existing natural capital and ecosystem health																				
5.1.1	Level 1	Identification of the dependencies on natural capital and ecosystem services	To what extent have the dependencies of the building/ city/ territory on natural capital and ecosystem services been identified?	No identification of dependencies on natural capital or ecosystem services.	Minimal identification of dependencies, with little understanding or acknowledgment of their significance.	Some dependencies have been identified, but the understanding is fragmented and incomplete.	Dependencies on natural capital and ecosystem services have been moderately identified, with a growing awareness of their importance.	Dependencies are well-identified, with a comprehensive understanding of their significance and integration into planning processes.	Dependencies on natural capital and ecosystem services have been thoroughly identified and understood, with proactive measures in place to preserve and enhance these resources.	Natural capital is used to refer to aspects of the natural environment that directly and indirectly provide value to people, now and into the future. While Natural capital refers to the 'stock' - or natural assets - that provide value, while ecosystem services refer to the flow of benefits (goods and services) that stock provides (Fluck & Holyoak, 2017). Examples of possible dependencies may include: - water (fresh water, sea water) - energy (solar, wind, hydro, etc.) - materials (wood fiber, metals, minerals, plant and animal materials) - regulation of physical environment (e.g. water quality regulation) - regulation of biological environment (e.g. pollination)		X	X	X						X
5.1.2	Level 1	Identification of impact drivers from the building/city/territory on natural capital and ecosystem services	To what extent have impact drivers from the building/ city/ territory on natural capital and ecosystem services been identified?	No identification of impact drivers on natural capital or ecosystem services.	Minimal identification of impact drivers, with little recognition of their potential consequences.	Some impact drivers have been identified, but understanding of their implications is limited.	Impact drivers on natural capital and ecosystem services have been moderately identified, with a growing understanding of their potential consequences.	Impact drivers are well-identified, with a comprehensive understanding of their implications and integration into decision-making processes.	Impact drivers on natural capital and ecosystem services have been thoroughly identified and understood, with proactive measures in place to mitigate negative effects and promote sustainable practices.	An impact driver is a measurable quantity of a natural resource that is used as an input to an activity (e.g., volume of sand and gravel used in construction) or a measurable non-product output of an activity (e.g., a kilogram of NOx emissions released into the atmosphere by a manufacturing facility). Impact drivers may include: e.g. water use, terrestrial/fresh water/marine ecosystem use, GHG-emissions, non-GHG emissions, water pollutants, soil pollutants, solid waste and any further extreme disturbances such as noise or light (Natural Capital Coalition, 2016).		X	X	X		X				X
5.1.3	Level 1	Safeguarding of natural capital	To what extent are measures to secure and safeguard natural capital within the administrative boundaries of the city/territory or in the surroundings of the building implemented?	No measures to safeguard natural capital are implemented.	No measures have yet been taken to safeguard natural capital, but there are plans to do so.	Some measures are implemented, but their coverage and effectiveness are limited.	Measures to secure and safeguard natural capital are moderately implemented, with efforts to expand coverage and effectiveness.	Many measures for safeguarding natural capital have been implemented and additional measures are being planned.	A comprehensive set of measures to secure and safeguard natural capital is in place and future measures are being planned.	Measures to secure and safeguard natural capital may include the implementation of general natural preservation policies and their supplementation by specific local measures.				X	X				X	
5.1.4	Level 1	Impact of legal instruments on ecosystem services	Are there legal instruments that may weaken ecosystem services relevant to the building/ city/ territory?	Legal instruments (or lack thereof) may lead or have led to complete destruction of critical ecosystem services.	Legal instruments (or lack thereof) inflict generalized degradation on ecosystem services.	Legal instruments (or lack thereof) may lead or have led to damage to one or more critical ecosystem services.	Legal instruments are broadly supportive but are not fully enforced.	Legal instruments are strongly supportive of critical ecosystem services and are generally enforced.	Legal instruments are strongly supportive of critical ecosystem services and are fully enforced.	Please refer to 5.1.1 for the definition of ecosystem services.		X	X	X					X	
Total score for sub-Essential 5.1											0									
5.2 Integration of Nature-based Solutions into policy and projects																				

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				0 - Worst	1	2	3	4	5 - Best			Scale			Resilience Dimension								
												Building	Urban	Territorial	Physical Health, wellbeing and quality of life	Technical	Economic	Environmental	Organisational				
5.2.1	Level 1	Strategy and planning for Nature-based Solutions	Is a strategy/action plan for Nature-based Solutions (NbS) in place that ensures planning, implementation and maintenance of such solutions?	No strategy/ action plan in place.	No strategy/ action plan is in place yet, but there are plans to do so.	Some elements of a strategy/ action plan for NbS are in place, but they lack coherence or comprehensive coverage.	A strategy/ action plan for NbS has been developed, but it has major shortcomings in terms of planning, implementation and maintenance.	A strategy/ action plan for NbS has been developed, with minor shortcomings in terms of planning, implementation and maintenance.	A robust strategy/ action plan for NbS is thoroughly developed and implemented , ensuring effective planning, implementation, and long-term maintenance of nature-based solutions.	Nature-based Solutions (NbS) are actions to protect, sustainably use, manage and restore natural or modified ecosystems, which address societal challenges, effectively and adaptively, providing human well-being and biodiversity benefits (IUCN, 2016). NbS are solutions that are “inspired and supported by nature, which are cost-effective, simultaneously provide environmental, social and economic benefits and help build resilience. Such solutions bring more, and more diverse, nature and natural features and processes into cities, landscapes and seascapes, through locally adapted, resource-efficient and systemic interventions” (European Commission).			X	X	X						X		
5.2.2	Level 1	Nature-based Solutions implementation	Have the structures in the building/ city/ territory been equipped with Nature-based Solutions as far as possible, to the extent allowed by relevant rules?	No structures have been equipped with Nature-based Solutions, and relevant rules do not allow for their implementation.	Some minor applications for Nature-based Solutions have been identified but not implemented and/or relevant rules severely limit their implementation.	Some structures have been equipped with Nature-based Solutions, but compliance with relevant rules restricts their extent and effectiveness.	Structures have been moderately equipped with Nature-based Solutions, within the constraints of relevant rules, but there is only ad hoc monitoring and no metrics are recorded.	Nature-based Solutions have been implemented and are monitored and outcomes recorded to a defined set of KPIs – but they are in some respects less than would be allowed.	Nature-based Solutions have been implemented to the maximum extent allowed and are monitored and outcomes recorded to a defined set of KPIs.	Please refer to 5.2.1 for the definition of Nature-based solution.			X	X	X				X		X		
Total score for sub-Essential 5.2											0												
5.3 Management of ecosystem performance																							
5.3.1	Level 1	Monitoring of environment and ecosystem services	Is there a person monitoring environmental impact of the building on the circumstances? Is there an environment department inside the municipality/region appointed at monitoring ecosystem services performance?	There are no responsibilities and it is not under consideration.	A responsible person/team is under consideration as an idea.	A description of the responsibilities and funding requirements are in preparation .	Responsible position/s is/are funded , and the process of personnel selection is under way.	A responsible person/team is in place and has initiated work in year 1 .	A responsible person/team is in place and has provided quarterly performance monitoring reports and made corrective actions as needed.	Monitoring the environmental impact of a building involves assessing its influence on various aspects of the surrounding environment and circumstances. This monitoring typically involves: - Energy Usage - Water Consumption - Waste Generation and Management - Indoor Air Quality - Greenhouse Gas Emissions - Ecological Footprint - Occupant Health and Well-being: - Compliance with Regulations and Standards			X	X	X							X	
5.3.2	Level 1	Access to natural capital and ecosystem services by local communities	Do local communities have sustainable and equitable access to natural capital and ecosystem services?	Local communities do not have access to natural capital and ecosystem services.	Local communities do not have access to natural capital and ecosystem services, but corresponding policies are being developed .	Sustainable and equitable access by local communities to natural capital and ecosystem services is promoted and implemented by specific policies only to a very limited extent .	Sustainable and equitable access by local communities to natural capital and ecosystem services is partly promoted and implemented by specific policies.	Sustainable and equitable access by local communities to natural capital and ecosystem services is largely promoted and implemented by specific policies.	Sustainable and equitable access by local communities to natural capital and ecosystem services is fully promoted and implemented by specific policies.	BUILDING SCALE: It can refer to the provision of green spaces in the vicinity for the residents, enhancing their quality of life and wellbeing. URBAN SCALE: It can entail ensuring accessible and equitable distribution of green spaces throughout the municipality, fostering community well-being and environmental sustainability.			X	X	X			X			X		

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				0 - Worst	1	2	3	4	5 - Best			Scale			Resilience Dimension					
												Building	Urban	Territorial	Physical	Health, wellbeing and quality of life	Technical	Economic	Environmental	
5.3.3	Level 1	Transboundary agreements	Are there transboundary agreements and collaborations in place to enable policy and planning for the implementation of ecosystem-based approaches?	There are no transboundary agreements or collaborations in place for ecosystem-based approaches.	No transboundary agreements exist but it is on the agenda to undertake such an assessment.	Minimal efforts towards the establishment of transboundary agreements or collaborations exist, and they are largely ineffective.	The responsible entity / city has identified the need to establish transboundary agreements and is in process of deciding next steps.	Some agreements in place with some organisations; further examples are currently being identified.	All transboundary agreements and collaborations are in place with relevant organisations and implemented where required, according to findings of risk assessment.	A transboundary agreement refer to a an agreement that goes beyond political borders to manage a certain asset. At a urban level can be used to manage a protected nature areas where different municipalities are responsible for. At a territorial level, transboundary agreements can refer to water management in basin-level cooperation.			X	X					X	
Total score for sub-Essential 5.3											0	Scores by resilience dimension			0	0	0	0	0	0
Total score for Essential 5											0									



D1.1 - MULTICLIMACT Resilience Scorecard Method

Essential 6 - Strengthen institutional capacity for resilience

Ref. No	Levels	Subject	Question	Indicative measurement scale						Explanation	Score	Classification									
				0 - Worst	1	2	3	4	5 - Best			Scale		Resilience Dimension							
												Building	Urban	Territorial	Physical	Health, wellbeing and quality of life	Technical	Economic	Environmental		
6.1 Skills and trainings																					
6.1.1	Level 1	Existence of skills, experience and knowledge disaster risk management and climate change adaptation	Are skills, experience and knowledge in disaster risk management and climate change adaptation (including cultural heritage management) present in the management/ administration?	There are no skills, experience, or knowledge in disaster risk management or climate change adaptation.	Minimal skills, experience, or knowledge exist in disaster risk management or climate change adaptation, but they are inadequate for effective action.	Some skills , experience, and knowledge in disaster risk management and climate change adaptation are present, but they are limited and require further development.	There is a moderate level of skills, experience, and knowledge in disaster risk management and climate change adaptation, contributing to some degree of effectiveness .	Skills, experience, and knowledge in disaster risk management and climate change adaptation are present at a sufficient level .	The management/ administration possesses extensive skills , experience, and knowledge in disaster risk management and climate change adaptation, including cultural heritage management, ensuring robust capabilities in addressing related challenges.	Possessing skills, experience, and knowledge in disaster risk management, climate change adaptation, and cultural heritage management is crucial for effective governance and administration. It enables management/administration to develop proactive strategies, protect valuable cultural assets, integrate interdisciplinary approaches, engage stakeholders, and implement policies that foster resilience and sustainability in the face of evolving environmental challenges.		X	X	X							X
6.1.2	Level 2	Inventory of skills, experience and knowledge in disaster resilience and climate change adaptation	Are available skills, experience and knowledge in disaster risk management and climate change adaptation regularly inventoried?	Key skills, experience and knowledge are not inventoried .	Key skills, experience and knowledge are not inventoried , but corresponding plans are being developed to do so.	Some key skills , experience and knowledge are inventoried, but not updated regularly .	Most key skills , experience and knowledge are inventoried, but not updated regularly .	Most key skills , experience and knowledge are inventoried and updated regularly .	All available key skills , experience and knowledge are inventoried and regularly updated.	"Inventory" refers to an information pool in which all key skills, experience and knowledge are collected and made available. The skills etc. might be collected through a survey (Who has which background? Wo has which level of familiarity?). The aim is to find out which skills are available that are needed, for example, after a disaster. Skills might include: land planning, energy, environmental, water and structural engineering, logistics, debris disposal, healthcare, law and order, project planning and management, etc.		X	X	X							X
6.1.3	Level 1	Experts consultation	If no specific skill in disaster risk management and climate adaptation is present in the management/ administration, are there resource/ provisions in place to consult external experts?	There are no resources or provisions in place to consult external experts in disaster risk management and climate adaptation.	There are minimal resources or provisions available to consult external experts, but they are rarely utilized or insufficient to address the needs adequately.	Some resources or provisions are in place to consult external experts, but they are not consistently utilized or may be limited in scope .	Resources and provisions to consult external experts in disaster risk management and climate adaptation are moderately available , and efforts are made to utilize them when needed.	There are significant resources or provisions in place to consult external experts.	Extensive resources or provisions are available to consult external experts, ensuring access to a wide range of expertise in disaster risk management and climate adaptation, allowing for comprehensive support and guidance.	Resources can refer to: - human resources: there are people that can hire external consultants? - financial resources: are funds available to hire external experts - process as resources: are accessible and fast process in place to hire external experts? Experts may include architects, builders, climate change adaptation consultants, disaster risk managers, etc.		X	X	X							
6.1.4	Level 1	Continuity and knowledge transfer	In cases of management/ administration changes, are there processes in place to carry out a sound transfer of knowledge to ensure continuity of resilience planning?	No processes are in place at all. The new team members will have to recreate the entire resilience planning and process structure.	Minimal processes exist for transferring knowledge during management/ administration changes, but they are ad hoc and ineffective in ensuring continuity of resilience planning.	Some processes are in place for transferring knowledge during management/ administration changes, but they are not consistently applied , resulting in gaps in resilience planning continuity.	Processes for transferring knowledge during management/ administration changes are moderately established , contributing to some degree of continuity in resilience planning.	There are significant processes in place for transferring knowledge/ administration changes, ensuring relatively smooth continuity in resilience planning.	Comprehensive processes are established for transferring knowledge during management/ administration changes, facilitating seamless continuity in resilience planning and ensuring that institutional memory is preserved effectively.	It is important to have processes in place for a sound transfer of knowledge to ensure the continuity, effectiveness, and long-term success of resilience planning efforts, particularly in the context of political change of administrations or management teams.		X	X	X							
6.1.5	Level 1	Availability, take-up of training focused on Resilience (Professional Training)	Is resilience training offered and regularly updated to the administration or to the building management?	No resilience training is offered to the administration or building management.	Resilience training courses are currently under development .	Some resilience training is offered, but it is not consistently updated .	Resilience training is occasionally offered and updated, providing basic knowledge and skills to the administration or building management.	Resilience training is regularly offered but it is updated at very long intervals .	Comprehensive and regularly updated resilience training is systematically offered to the administration or building management.	Resilience training refers to training that aim to improve skills in resilience-related activities, for example in ecosystems protection, disaster risk management and climate change adaptation.		X	X	X							



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												Building	Urban	Territorial	Physical health, wellbeing and livelihoods	Technical	Economic	Environmental	Organisational					
6.1.6	Level 2	Repetition of training	How often are trainings repeated?	Trainings are never repeated .	Trainings are repeated very rarely , with long intervals between sessions.	Trainings are repeated occasionally , with inconsistent intervals between sessions.	Trainings are repeated periodically , with some regularity in scheduling.	Trainings are repeated regularly , with consistent intervals between sessions.	Trainings are repeated frequently and consistently , ensuring continuous learning and reinforcement of	Please refer to 6.1.5.		X	X	X										
Total score for sub-Essential 6.1											0													
6.2 Public education and awareness																								
6.2.1	Level 1	Exposure of public to education and awareness materials/messaging	Do coordinated public relations and education campaign exist on disaster risk management and climate change adaptation, with structured messaging, channels, and delivery?	There are no coordinated public relations and education campaigns .	Minimal efforts are made towards coordinated campaigns, but they lack structure, consistent messaging, and effective delivery channels.	Campaign uses a very limited number of channels ; with a focus on less informative channels such as radio and poster ads.	Some coordinated public relations and education campaigns exist, but they use just some of the channels available; with a focus on less informative channels such as radio and poster ads.	Coordinated public relations and education campaigns exist, and they use most channels available, including one with a focus on neighbourhood mobilization and schools outreach.	Comprehensive and well-structured coordinated public relations and education campaigns exist using all channels available , with a focus on neighbourhood mobilization, and schools outreach.	"Channels" are defined as methods/means of communication and may include TV and radio; websites; social media; presentation of posters on buildings, buses, trains, city offices; schools outreach; neighbourhood mobilisation (e.g. neighbourhood groups and trainings) or/and information center about resilience.		X	X	X		X								
6.2.2	Level 1	Information – hazard awareness, preparedness and recovery	Are people in the building/ city/ territory made fully aware of all hazards that could occur within the area, how to prepare for these and how to recover from them?	No communication strategy in place.	Minimal communication efforts are made, but they are sporadic (or available just upon request) and ineffective .	Some communication efforts exist, but they lack consistency and depth , resulting in limited awareness among people about hazards, preparations, or recovery actions.	Communication efforts are moderate , with periodic updates and discussions informing people about hazards, preparations, or recovery actions, but there are some major shortcoming .	Communication efforts are fairly regular and comprehensive , with few minor shortcomings .	Communication efforts are highly effective , with comprehensive strategies, ongoing discussions, and regular updates ensuring that people are fully aware of all relevant hazards , required preparations, and recovery actions.	Ensuring that people are fully aware of hazards, preparedness measures, and recovery processes is essential for enhancing individual and community resilience, reducing vulnerabilities, and minimizing the impacts of disasters on lives, livelihoods, and infrastructure.		X	X	X		X								
6.2.3	Level 1	Education campaigns about human well-being and hazards to health	Has any action to increase awareness about risks to human well-being caused by the built environment (e.g. pollution, grime, noise pollution, other environmental problems) been taken?	No action has been taken.	Minimal efforts have been made to increase awareness, but they are sporadic and ineffective .	Some actions have been taken to increase awareness, but they lack consistency and depth .	Actions to increase awareness are moderate , with periodic initiatives addressing risks to human well-being caused by the built environment, but there are some major shortcoming .	Actions to increase awareness are fairly regular and structured , with few minor shortcomings .	Comprehensive actions have been taken to increase awareness, with ongoing initiatives, educational programs, and campaigns ensuring that people are fully aware of risks to human well-being caused by the built environment.	Education campaigns play a critical role in increasing awareness about the risks to human well-being posed by the built environment. By informing individuals, and promoting behaviour change, these campaigns contribute to protecting public health, advancing environmental justice, and fostering long-term resilience.		X	X	X		X					X			
Total score for sub-Essential 6.2											0													
6.3 Learning from others and engagement with relevant networks																								
6.3.1	Level 1	Effort taken to learn from what other cities, states and countries (and companies) do to increase resilience	Are learning and cross-fertilization activities actively pursued with other cities, territories, and organizations to foster knowledge exchange and innovation?	No learning or cross-fertilization activities are pursued with other entities.	There are minimal efforts towards learning or cross-fertilization activities, which are sporadic and largely ineffective .	Some learning and cross-fertilization activities exist, but they lack consistency and depth , resulting in limited knowledge exchange and innovation.	Learning and cross-fertilization activities are moderately pursued , with periodic exchanges and collaborations, but there are some major shortcomings .	Learning and cross-fertilization activities are fairly regular and comprehensive , with few minor shortcomings , fostering considerable knowledge exchange and innovation.	Learning and cross-fertilization activities are highly effective , with comprehensive strategies, ongoing collaborations, and regular exchanges ensuring significant knowledge exchange and innovation, thereby enhancing overall development.	This question emphasizes the execution of learning and cross-fertilization activities aimed at exchanging knowledge and practices with external entities such as other cities, territories, and organizations. Learning exchange can happen through conference, cities network, join programmes, etc.			X	X										

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				0 - Worst	1	2	3	4	5 - Best			Scale			Resilience Dimension						
												Building	Urban	Territorial	Physical Health, well-being and sustainable life	Technical	Economic	Environmental	Organisational		
6.3.2	Level 1	Engagement in networks	Is the administration/ management actively engaging with relevant working groups, communities of practice, practitioners, and local administration networks to collaborate on shared challenges and advance collective goals?	No engagement is happening.	Networking is limited, resulting in constrained collaboration potential.	There are occasional exchanges, more ad hoc in nature, with diffuse impact and benefits that are harder to identify.	Reliance is mainly on individual practitioners networking with their peers in other organizations, with frequent exchanges and some attempt to capture and implement learnings.	Regular exchanges occur, often within other meetings, leading to sharing of best practices as a side-effect. Outcomes are captured, and some impact is identified on disaster preparedness.	Annual exchanges with other cities and regions specifically to share resilience best practices, responses, and learnings. Changes made in the city as a result are evident. Additionally, regular peer-to-peer contacts with practitioners in other organizations supplement these efforts.	This question highlights the engagement of the administration or management with specific groups and networks, both internal and external, to foster collaboration, knowledge sharing, and collective problem-solving.			X	X							
Total score for sub-Essential 6.3											0	Scores by resilience dimension									
Total score for Essential 6											0				0	0	0	0	0	0	



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Essential 7 - Increase social capacity for resilience

Ref. No	Levels	Subject	Question	Indicative measurement scale						Explanation	Score	Classification									
				0 - Worst	1	2	3	4	5 - Best			Scale			Resilience Dimension						
												Building	Urban	Territorial	Physical	Health, wellbeing and quality of life	Technical	Economic	Environmental	Organisational	
7.1 Planning with communities																					
7.1.1	Level 1	Engagement of "grass roots" organizations / community groups in climate change adaptation planning	Are nongovernment bodies or community groups actively involved in resilience planning and their inputs are incorporated?	Nongovernment bodies or community groups are not involved in resilience planning.	There is minimal involvement of nongovernment bodies or community groups in resilience planning, and their inputs are sporadically considered .	Some nongovernment bodies or community groups are involved in resilience planning, but their inputs are not consistently incorporated .	Nongovernment bodies or community groups are moderately involved in resilience planning, and their inputs are considered to some extent .	Nongovernment bodies or community groups are actively involved in resilience planning, and their inputs are consistently incorporated and valued.	Nongovernment bodies or community groups are extensively involved in resilience planning, and their inputs play a central role in shaping strategies and actions , ensuring inclusive and effective planning processes.	In this question, actively involved refers to a comprehensive stakeholder engagement process that aims at a long-term integration of inputs from nongovernment bodies and community groups. A mapping process of the mentioned stakeholders will be needed to ensure most of the organisation working on a territory are included in these processes.		X	X	X		X				X	X
7.1.2	Level 1	Involvement of vulnerable groups of the population	Are vulnerable population groups involved in resilience planning? Is the full span of these groups included?	No vulnerable population groups specifically identified and involved.	Some vulnerable population groups have been identified, but not involved.	Some vulnerable population groups and some efforts are made to involve them, but this is inconsistent and does not cover the full span of these groups.	Most vulnerable population groups have been identified and involved, but there are some major gaps in coverage or effective involvement.	All major vulnerable population groups are involved with some minor gaps in coverage or effective involvement.	All vulnerable population groups are actively and comprehensively involved in resilience planning, and efforts made to ensure their full participation and representation.	Vulnerable groups may include, for example, population in areas of high poverty/population with low income, elderly, children, women, people with disabilities, non-native language speakers, population with lower educational degrees. The specific groups to be considered are highly dependent on the local situation and the hazard(s) that are to be considered.		X	X	X		X				X	
7.1.3	Level 1	Local communities' engagement	Are local community groups regularly engaged in decision-making processes on resilience planning through participatory	No engagement of local community groups.	The inclusion of local community groups is not realized yet, but there are plans to do so in the future.	Local community groups are partially involved , but no attention is paid to representation of different population groups.	Local communities are involved, but not all population groups are equally represented.	Local communities are involved, and the majority of population groups are represented.	Local communities are regularly involved, and all population groups are equally represented .	A crucial part in a participatory process is to have a good representation from all the community groups. In this way, all the interests will be brought to the discussion of decisions.			X	X		X				X	
7.1.4	Level 1	Informing the local community about development planning and scope of resident engagement	To what extent have measures been taken to inform the local community about resilience planning? Are overlapping modes of engagement to create repeated and reinforcing message delivery used?	No measures have been taken to inform the local community about development planning. No overlapping modes of engagement are used.	No measures have yet been taken to inform the local community about development planning, but corresponding concepts are being worked out . Only a limited number of modes of engagement is used.	Only a very limited number of measures have been taken to inform the local community about development planning. Some modes of engagement are used, but they are not complementary (i.e. don't serve to reach different groups of population.)	Some measures have been taken to inform the local community about development planning. Some modes of complementary engagement are used.	Many measures have been taken to inform the local community about development planning. A high number of complementary modes of engagement are used.	A comprehensive set of measures has been taken to inform the local community about development planning and all possible modes of engagement are used.	Exemplary measures to inform the local community include TV and radio; websites; social media; presentation of posters on buildings, buses, trains, city offices; etc. Complementary modes of engagement shall be used to create repeated and reinforcing message delivery that reach a significant portion of resident and different population groups. Examples for this can be reoccurring newsletters, messages for residents, social media content, workshops, events etc.			X	X						X	
Total score for sub-Essential 7.1											0										
7.2 Local communities involvement, support and preparedness																					
7.2.1	Level 1	Regularity and extent of community engagement	How often are communication and coordination meetings with community organizations involved in Disaster Risk	No meetings.	Ad hoc meetings of a few interested parties.	Regular meetings, but with significant gaps in coverage of responsibilities and number of attendees.	Regular meetings, but with some gaps in coverage of responsibilities and number of attendees.	Regular meetings, most responsibilities present and a sufficient number of attendees participates regularly.	Regular meetings, all responsibilities present and a high number of attendees participates regularly.	Meetings may include the exchange about problems and issues with regard to the resilience of the area and related activities.			X	X		X			X	X	

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Ref. No	Levels	Subject	Question	Indicative measurement scale						Explanation	Score	Classification									
				0 - Worst	1	2	3	4	5 - Best			Scale			Resilience Dimension						
												Building	Urban	Territorial	Physical	Health, wellbeing and quality of life	Technical	Economic	Environmental	Organisational	
7.2.2	Level 1	Community or city resilience assessments	Do mechanisms exist to assess community/ users resilience?	No mechanisms exist for assessing community/ user resilience.	There are minimal mechanisms for assessing community/ user resilience, but they are not widely implemented or utilized .	Some efforts have been made to establish mechanisms for assessing community/ user resilience, but their implementation is inconsistent or limited in scope.	Mechanisms for assessing community/ user resilience are moderately developed and implemented , but there are gaps or limitations in their effectiveness.	Mechanisms for assessing community/ user resilience are fairly well-established and implemented , with some areas for improvement .	Comprehensive mechanisms exist for assessing community/ user resilience, with robust implementation and continuous improvement efforts in place.	Having mechanisms to assess community or users' resilience is critical for building resilient communities. By understanding the strengths and vulnerabilities of communities, stakeholders can work together to strengthen resilience and promote long-term well-being.		X	X	X							
7.2.3	Level 1	Official or organized voluntary outreach during a disaster	How likely is it that inhabitants of the surrounding areas/ users of the facility will be contacted during or immediately after an event to confirm safety, issues, needs etc.? How likely they will be contacted again regularly to check on them?	Inhabitants will not be contacted during or immediately after an event or it is extremely unlikely that this will happen. Further check on them are unlikely to happen.	It is likely that a very limited number of inhabitants will be contacted during, immediately and supported regularly after an event.	It is likely that a small number of inhabitants will be contacted during, immediately and supported regularly after an event.	It is likely that a medium number of inhabitants will be contacted during, immediately and supported regularly after an event.	It is likely that most inhabitants/ users will be contacted during, immediately and supported regularly after an event.	There is "reasonable confidence" that all inhabitants will be contacted during, immediately and supported regularly after an event.	Here, the term "inhabitants of the surrounding area" refers to all people living or working in the building or surrounding areas, in the urban area or in the territory i.e. those who can realistically be expected to form a community. Social connectedness has been shown to have a major impact in reducing fatalities from disasters, and also in reducing opportunistic crime following an event. For this assessment, you should take into account official organisations/administrative units responsible for emergency response and disaster assistance as well as volunteers from community or grass-roots organisations, as well as social fabric of the historic area itself (e.g. if there is a history/track records of people in the historic area meaningfully helping each other after previous events).This can also be covered by a strong fabric of community organizations in general, even if not focused on resilience in the first instance.		X	X	X				X			X
7.2.4	Level 1	Mental health support	Does the administration/ management make the necessary arrangements in order to provide that inhabitants/ communities affected by an event have access to mental health professionals and/or	No arrangements in place.	There are no arrangements in place yet, but preliminary discussions on the topic have been held.	Some arrangements are in place, but they are not consistently available or accessible to all affected individuals.	Basic arrangements are in place, but there may still be some gaps in coverage or accessibility.	Arrangements are in place and they are accessible for the majority of inhabitants/ communities.	All arrangements are in place and accessible to everyone, especially to vulnerable groups.				X	X		X				X	
7.2.5	Level 1	Mutual support among inhabitants	Can inhabitants of the building/urban area/territory be expected to know who may be vulnerable and need additional help, and to provide assistance?	Inhabitants have limited social connectivity and would not have the resources to organize additional help.	Inhabitants probably would not have the resources to know who is vulnerable and who may need additional help. Most vulnerable people are likely to be overlooked .	Inhabitants may or may not have the resources to know who needs extra help, depending on personal acquaintanceships only. High probability that some vulnerable people will be overlooked .	Inhabitants generally have the resources to know who may need additional help, but there may be some gaps in their knowledge – it is not systematic.	Inhabitants can be expected to have the resources to know who needs help, but not to provide much beyond incidental assistance .	Inhabitants can be expected to have the resources to know who among them may be vulnerable and need additional help (for example if elderly or disabled), and to provide some of that help.	"Having the resources" refers to the level of community organization and capacity to give support, e.g. through the availability of community groups, meetups, spaces to organize, etc.		X	X	X		X				X	



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				0 - Worst	1	2	3	4	5 - Best			Scale			Resilience Dimension						
												Building	Urban	Territorial	Physical	Health, wellbeing and quality of life	Technical	Economic	Environmental		
7.2.6	Level 1	Take advantage of mobile apps (phone/tablet) and web-based “systems of engagement” (for example, crowdsourcing or disseminating data on preparedness).	Are mobile apps or web-based “systems of engagement” used in the building/city/territory?	They are not utilized .	There are minimal efforts to utilize mobile apps or web-based “systems of engagement”, but their implementation is sporadic or ineffective .	Some mobile apps or web-based “systems of engagement” are used, but their adoption is limited , and they may not cover all necessary aspects.	Mobile apps or web-based “systems of engagement” are moderately utilized , with efforts to incorporate them into various aspects of community engagement, although there may be some limitations in functionality or accessibility .	Mobile apps or web-based “systems of engagement” are fairly well-implemented , covering a range of services and engagement opportunities, but there may be some areas for improvement or expansion .	Mobile apps or web-based “systems of engagement” are extensively used , providing comprehensive access to information, services, and community engagement opportunities across various platforms and devices.			X	X	X		X	X				
Total score for sub-Essential 7.2											0										
7.3 Private sector / employers																					
7.3.1	Level 1	Involvement of private sector in resilience planning	Is the private sector involved in resilience planning and resilience building activities?	The private sector is not involved in resilience planning and resilience building activities.	Plans to involve the private sector exist.	Occasional involvement of the private sector, but rather ad hoc and not systematic.	Some private sector stakeholders are involved, but major omissions in private sector involvement exist.	Most relevant private sector stakeholders are involved, with some minor omissions.	All relevant private sector stakeholders are involved.	Involvement of private sector stakeholders may consist of making comprehensive MoUs (Memorandum of Understanding) with private companies to provide resources such as food, storage facilities, data centres and vehicles, and perhaps skilled employees to respond to emergencies. There are regular meetings between disaster risk reduction stakeholders and local companies to update on local risks (ARCH RAD).		X	X	X		X		X			
7.3.2	Level 1	Business continuity planning	Is there a diversified economy in the city/territory spanning across different sectors?	The economy of the city/territory is heavily reliant on a single sector, lacking diversification .	There is minimal diversification across sectors, with limited presence in other sectors beyond one or a few dominant ones.	Some efforts have been made to diversify the economy of the city/territory, but it remains heavily reliant on one or a few sectors , with limited expansion.	There is a moderately diversified economy with presence across multiple sectors, although there may still be significant reliance on one or a few key	There is fairly good diversification , with a balanced presence across multiple sectors, reducing dependence on any single sector.	The economy is highly diversified , with robust activity spanning across various sectors, ensuring resilience and sustainability in the face of economic challenges.	A business continuity plan is “documented information that guides an organization to respond to a disruption and resume, recover and restore the delivery of products and services consistent with its business continuity objectives” [ISO, no date][ARCH RAD).			X	X				X			
Total score for sub-Essential 7.3											0										
7.4 Public education and youth groups																					
7.4.1	Level 1	Ensure that the education curriculum within schools, higher education, universities and the workplace to includes disaster awareness and training	In education curricula, is disaster awareness and training included?	Not included in education curricula.	There is minimal inclusion , with limited content or focus.	Some efforts are made to include disaster awareness and training in education curricula, but the coverage is inconsistent or incomplete.	Disaster awareness and training are moderately included in education curricula, providing some foundational knowledge and skills.	Disaster awareness and training are normally included in education curricula, offering good knowledge.	Disaster awareness and training are fully integrated into education curricula, providing comprehensive knowledge and skills development opportunities to prepare students for emergencies and disasters.	By incorporating disaster awareness and training into education curricula, schools can play a crucial role in preparing students to understand, mitigate, and respond effectively to disasters, thereby building resilient and empowered communities for the future. Disaster awareness and training could include: case studies about potential hazards, emergency preparedness, and response strategies, hands-on training in partnership with local emergency management agencies and community organizations, etc.			X	X		X			X		

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				0 - Worst	1	2	3	4	5 - Best			Scale			Resilience Dimension							
												Building	Urban	Territorial	Physical	Health, well-being and quality of life	Technical	Economic	Environmental			
7.4.2	Level 1	Engagement with youth groups for resilience	Are youth groups regularly engaged in decision-making processes on resilience planning through participatory methods?	No engagement of youth groups.	There are minimal efforts to engage youth groups in decision-making processes on resilience planning, and their involvement through participatory methods is sporadic or ineffective .	Some youth groups are engaged in decision-making processes on resilience planning through participatory methods, but their involvement is not consistent or comprehensive .	Youth groups are moderately engaged in decision-making processes on resilience planning through participatory methods, with efforts made to include their perspectives, although there may be limitations in their participation.	Youth groups are fairly regularly engaged in decision-making processes on resilience planning through participatory methods, with their perspectives being actively sought and considered in planning efforts.	Youth groups are extensively and consistently engaged in decision-making processes on resilience planning through participatory methods, with their input playing a significant role in shaping policies and initiatives.	Regularly engaging youth groups in decision-making processes on resilience planning through participatory methods is essential for building inclusive, effective, and sustainable resilience strategies that address the needs and priorities of all members of the community. This could be done by: creating dedicated youth advisory committees, organizing regular meetings or workshops to gather input and feedback, utilizing digital platforms for virtual participation, providing capacity-building opportunities, etc.												
Total score for sub-Essential 7.4											0	Scores by resilience dimension										
Total score for Essential 7											0											



Essential 8 - Increase infrastructure resilience

Ref. No	Levels	Subject	Question	Indicative measurement scale						Explanation	Score	Classification									
				0 - Worst	1	2	3	4	5 - Best			Scale			Resilience Dimension						
												Building	Urban	Territorial	Physical	Health, wellbeing and quality of life	Technical	Economic	Environmental	Social	
8.1 Structural protection measures and general considerations																					
8.1.1	Level 1	Adequacy of protective structural measures for climate-related hazards	Do protective structural measures for climate-related and non-climate related hazards exist and are regularly maintained?	There are no protective structural measures in place.	Very few protective structural measures exist, but they are limited in scope and effectiveness , and there are hardly ever maintained .	Some protective structural measures are in place, but maintenance is inconsistent .	Protective structural measures are moderately present and maintained , though there may be occasional lapses or deficiencies .	There is a significant and regularly maintained array of protective structural measures, with minor maintenance issues being addressed promptly.	Protective structural measures are extensive and comprehensive for both climate-related and non-climate-related hazards, with robust maintenance protocols in place to ensure continual effectiveness and resilience.	Climate-related hazards comprise extreme cold, extreme warm, severe wind, thunderstorms, extreme precipitation, etc. Non-climate related hazards comprise earthquakes, volcano eruptions, tsunamis, dry mass movements. Examples of protective structural measure against climate-related hazards might be: - levees and flood barriers; - flood basins; - sea walls; - shelters; - storm drains and storm water holding tanks; - wetlands and mangroves; - shock absorption capabilities fitted to infrastructure to deal with earthquakes (ARCH RAD).		X	X	X	X	X	X				
8.1.2	Level 2	Use of traditional (local) knowledge in protective structural measures	Is traditional local knowledge (processes, materials, etc.) included in design and implementation of protective structural measures?	No inclusion of traditional local knowledge.	There are minimal efforts to incorporate traditional local knowledge into the design and implementation of protective structural measures, but these efforts are sporadic or ineffective .	Some attempts are made to include traditional local knowledge into the design and implementation of protective structural measures, but they are not consistently applied or fully integrated .	Traditional local knowledge is moderately included in the design and implementation of protective structural measures, with efforts to incorporate relevant processes, materials, etc., though there may be some gaps or limitations .	There is a fairly good integration of traditional local knowledge into the design and implementation of protective structural measures, with significant efforts to incorporate relevant processes, materials, etc., and some areas for further improvement .	Traditional local knowledge is extensively and effectively integrated into the design and implementation of protective structural measures, ensuring that relevant processes, materials, etc., are utilized to enhance resilience and sustainability based on local wisdom and practices.	Traditional local knowledge in construction can include building techniques, specific architectural layouts, use of traditional seeds or farming practices, etc.		X	X	X		X	X				
8.1.3	Level 2	Technological advancements	Are technological advancements regularly checked for solutions to prevent disasters?	Technological advancements to prevent disasters are not regularly checked .	There are minimal efforts to regularly check technological advancements for solutions to prevent disasters, but these efforts are sporadic or ineffective .	Some attempts are made to regularly check technological advancements for solutions to prevent disasters, but they are not consistently applied or fully integrated .	Technological advancements are only checked ad-hoc for disaster prevention, with efforts to incorporate relevant innovations, though there may be some gaps or limitations.	A significant array of technological advancements is regularly checked for disaster prevention, providing meaningful contributions to reducing disaster risks.	Technological advancements are extensively checked and updated regularly for disaster prevention, ensuring proactive measures and innovative solutions to reduce disaster risks comprehensively.			X	X	X	X		X				



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Ref. No	Levels	Subject	Question	Indicative measurement scale						Explanation	Score	Classification										
				0 - Worst	1	2	3	4	5 - Best			Scale			Resilience Dimension							
												Building	Urban	Territorial	Physical	Health, wellbeing and quality of life	Technical	Economic	Environmental	Organisational		
8.1.4	Level 1	Digital solutions integration	Are digital solutions implemented to enhance climatic and non-climatic resilience?	No digital solution implemented.	Digital solutions are minimally implemented to enhance resilience, with very limited application and effectiveness.	Some digital solutions are implemented, but their deployment may be inconsistent or incomplete .	Digital solutions are moderately implemented to enhance resilience.	A significant array of digital solutions is implemented to enhance resilience.	Digital solutions are extensively implemented to enhance resilience comprehensively, providing innovative and adaptive approaches to address both climatic and non-climatic resilience needs.	Examples of digital solutions: - Climate Modeling and Prediction - Digital infrastructure, including smart sensors, meters, and control systems - Digital design tools like Building Information Modeling (BIM) - Digital mapping and Geographic Information Systems (GIS) - Digital platforms and social media to facilitate community engagement and participation - Early Warning Systems - Advanced analytics and decision support tools		X	X	X				X			X	
Total score for sub-Essential 8.1											0											
8.2 Basic services: Water - Drinking water, drainage system & sewage system																						
8.2.1	Level 1	Extent of loss of service	What is the estimated extent of water supply failure in the face of hazard, also due to damages to critical related assets?	Failure is expected to be widespread and severe in the face of hazards, with significant damages to critical related assets leading to prolonged disruptions .	There is a substantial estimated extent of failure, with notable disruptions anticipated as a result of damages to critical related assets.	The estimated extent of failure is moderate , with some disruptions foreseen due to damages to critical related assets.	Failure is estimated to be limited , with only minor disruptions expected as a result of damages to critical related assets.	There is a minimal estimated extent of failure, with little to no disruptions anticipated despite damages to critical related assets.	There is insignificant estimated failure expected in the face of hazards, and damages to critical related assets are projected to be effectively mitigated.	The extent of water supply failure may be estimated from the number of days to restore regular service area-wide and the percentage of user accounts affected.		X	X	X				X				
8.2.2	Level 1	Cost of restoration of service	Do you have a reliable estimate of the potential costs of service outage and restoration due to water supply failure?	No reliable estimate available.	There are minimal efforts to estimate the potential costs of service outage and restoration, and the estimates available are unreliable or incomplete .	Some attempts have been made to estimate the potential costs of service outage and restoration, but they may not be comprehensive or fully reliable .	There is a moderate estimate available for the potential costs of service outage and restoration, although there may be some uncertainty or limitations in the estimates.	The potential costs of service outage and restoration are fairly well-estimated , with efforts to quantify the impacts and associated expenses, though there may be some areas for improvement .	There is a comprehensive and highly reliable estimate available for the potential costs of service outage and restoration, with comprehensive assessments of the impacts and expenses, facilitating effective planning and mitigation strategies.			X	X	X					X			
8.2.3	Level 1	Backup systems	Do the building/urban area/territory have a backup system in case of water supply failure?	No backup in case of water supply failure exist.	Only a partial backup system exists and it is significantly exposed to the disaster for which it may be required.	A backup system exists only to support critical functions and for 24 hours . The backup elements may not be comprehensive or fully reliable .	A backup system exists only to support critical functions and for 72 hours . The backup elements may not be comprehensive or fully reliable .	A backup system exists to support all functions for at least 24 hours . The backup elements are located safely.	A backup system exists to support all functions for at least 72 hours . The backup elements are located safely.	Elements of a backup system may include water tanks, chemical toilets, drinking water, water for fire-fighting.		X	X	X				X				
Total score for sub-Essential 8.2											0											
8.3 Basic services: Electricity																						



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				0 - Worst	1	2	3	4	5 - Best			Scale			Resilience Dimension							
												Building	Urban	Territorial	Physical	Health, well-being and quality of life	Technical	Economic	Environmental	Organisational		
8.3.1	Level 1	Extent of loss of service	What is the estimated extent of electrical energy failure in the face of hazard, also due to damages to critical related assets?	Failure is expected to be widespread and severe in the face of hazards, with significant damages to critical related assets leading to prolonged disruptions .	There is a substantial estimated extent of failure, with notable disruptions anticipated as a result of damages to critical related assets.	The estimated extent of failure is moderate , with some disruptions foreseen due to damages to critical related assets.	Failure is estimated to be limited , with only minor disruptions expected as a result of damages to critical related assets.	There is a minimal estimated extent of failure, with little to no disruptions anticipated despite damages to critical related assets.	There is insignificant estimated failure expected in the face of hazards, and damages to critical related assets are projected to be effectively mitigated.	The extent of electrical energy supply failure may be estimated from the number of days to restore regular service area-wide and the percentage of user accounts affected. The impact classification ("disastrous" to "insignificant") is taken from the Method of Risk Analysis for Civil Protection, see potential helpful tools. More information on the potential definition of threshold values can be found there.		X	X	X	X		X		X	X		
8.3.2	Level 1	Cost of restoration of service	Do you have a reliable estimate of the potential costs of service outage and restoration due to electrical energy supply failure?	No reliable estimate available.	There are minimal efforts to estimate the potential costs of service outage and restoration, and the estimates available are unreliable or incomplete .	Some attempts have been made to estimate the potential costs of service outage and restoration, but they may not be comprehensive or fully reliable .	There is a moderate estimate available for the potential costs of service outage and restoration, although there may be some uncertainty or limitations in the estimates.	The potential costs of service outage and restoration are fairly well-estimated , with efforts to quantify the impacts and associated expenses, though there may be some areas for improvement .	There is a comprehensive and highly reliable estimate available for the potential costs of service outage and restoration, with comprehensive assessments of the impacts and expenses, facilitating effective planning and mitigation strategies.			X	X	X	X		X	X	X	X		
8.3.3	Level 1	Backup power	Do the building/urban area/territory have a redundant power supply feed and/or backup power?	No backup power supply.	Partial backup power via secondary supply or renewable sources for some functions; this is significantly exposed to the disaster for which it may be required.	Reliable backup power supply for critical functions only, for 24 hours and is also exposed in its own right.	Reliable backup power supply for critical functions only, for 72 hours ; it may not be entirely safely located.	A backup power supply to support all functions for at least 24 hours exists. The supply is itself located safely.	A backup power supply to support all functions for at least 72 hours exists. The backup supply is itself located safely.			X	X	X	X		X		X	X		
8.3.4	Level 1	Climate control	Do relevant buildings/structures have features that ensure adequate temperature and humidity control during a power outage in peak winter/summer?	No alternative/ redundant systems in place.	The available alternative/ redundant heating/ cooling/ humidity measures that would probably fail to deal with foreseeable temperatures and foreseeable maximum outage durations.	The available alternative/ redundant heating/ cooling/ humidity measures have significant weaknesses in dealing with foreseeable temperatures and maximum outage durations.	There are alternative/ redundant heating/ cooling/ humidity measures for several relevant buildings/structures, in different temperature conditions, and through most foreseeable outages .	Alternative/ redundant heating/ cooling/ humidity measures to maintain moderate temperatures are in place, with some minor exceptions, through any foreseeable outage .	Relevant buildings/structures have extensive and effective features ensuring adequate temperature and humidity control during a power outage in peak winter/summer, ensuring comfort and safety for occupants even under adverse conditions.	Examples may include building structural and design features that help to maintain adequate temperatures. Additionally, air conditioning and heating could be included.		X	X	X	X		X		X	X		
Total score for sub-Essential 8.3											0											
8.4 Basic services: Gas																						

8.4 Basic services: Gas



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Ref. No	Levels	Subject	Question	Indicative measurement scale						Explanation	Score	Classification									
				0 - Worst	1	2	3	4	5 - Best			Scale			Resilience Dimension						
												Building	Urban	Territorial	Physical	Health, well-being and quality of life	Technical	Economic	Environmental	Organisational	
8.4.1	Level 1	Extent of loss of service	What is the estimated extent of gas failure in the face of hazard, also due to damages to critical related assets?	Failure is expected to be widespread and severe in the face of hazards, with significant damages to critical related assets leading to prolonged disruptions .	There is a substantial estimated extent of failure, with notable disruptions anticipated as a result of damages to critical related assets.	The estimated extent of failure is moderate , with some disruptions foreseen due to damages to critical related assets.	Failure is estimated to be limited , with only minor disruptions expected as a result of damages to critical related assets.	There is a minimal estimated extent of failure, with little to no disruptions anticipated despite damages to critical related assets.	There is insignificant estimated failure expected in the face of hazards, and damages to critical related assets are projected to be effectively mitigated.	The extent of gas supply failure may be estimated from the number of days to restore regular service area-wide and the percentage of user accounts affected.		X	X	X	X		X		X	X	
8.4.2	Level 1	Cost of restoration of service	Do you have a reliable estimate of the potential costs of service outage and restoration due to gas supply failure?	No reliable estimate available.	There are minimal efforts to estimate the potential costs of service outage and restoration, and the estimates available are unreliable or incomplete .	Some attempts have been made to estimate the potential costs of service outage and restoration, but they may not be comprehensive or fully reliable .	There is a moderate estimate available for the potential costs of service outage and restoration, although there may be some uncertainty or limitations in the estimates.	The potential costs of service outage and restoration are fairly well-estimated , with efforts to quantify the impacts and associated expenses, though there may be some areas for improvement .	There is a comprehensive and highly reliable estimate available for the potential costs of service outage and restoration, with comprehensive assessments of the impacts and expenses, facilitating effective planning and mitigation strategies.			X	X	X			X		X		
8.4.3	Level 1	Backup systems	Do the building/urban area/territory have a redundant backup system in case of gas supply failure?	No backup power supply.	Partial backup power via secondary supply or renewable sources for some functions; this is significantly exposed to the disaster for which it	Reliable backup power supply for critical functions only, for 24 hours and is also exposed in its own right.	Reliable backup power supply for critical functions only, for 72 hours ; it may not be entirely safely located.	A backup power supply to support all functions for at least 24 hours exists. The supply is itself located safely.	A backup power supply to support all functions for at least 72 hours exists. The backup supply is itself located safely.			X	X	X	X		X		X	X	
Total score for sub-Essential 8.4											0										
8.5 Basic services: Waste Management																					
8.5.1	Level 1	Waste management - Extent of loss of service	What is the estimated extent of waste management system failure in the face of hazard, also due to damages to critical related assets?	Failure is expected to be widespread and severe in the face of hazards, with significant damages to critical related assets leading to prolonged disruptions .	There is a substantial estimated extent of failure, with notable disruptions anticipated as a result of damages to critical related assets.	The estimated extent of failure is moderate , with some disruptions foreseen due to damages to critical related assets.	Failure is estimated to be limited , with only minor disruptions expected as a result of damages to critical related assets.	There is a minimal estimated extent of failure, with little to no disruptions anticipated despite damages to critical related assets.	There is insignificant estimated failure expected in the face of hazards, and damages to critical related assets are projected to be effectively mitigated.	The extent of gas supply failure may be estimated from the number of days to restore regular service area-wide and the percentage of user accounts affected.		X	X	X	X		X		X	X	
8.5.2	Level 1	Waste management - Cost of restoration of service	Do you have a reliable estimate of the potential costs of service outage and restoration due to waste management failure?	No reliable estimate available.	There are minimal efforts to estimate the potential costs of service outage and restoration, and the estimates available are unreliable or incomplete .	Some attempts have been made to estimate the potential costs of service outage and restoration, but they may not be comprehensive or fully reliable .	There is a moderate estimate available for the potential costs of service outage and restoration, although there may be some uncertainty or limitations in the estimates.	The potential costs of service outage and restoration are fairly well-estimated , with efforts to quantify the impacts and associated expenses, though there may be some areas for improvement .	There is a comprehensive and highly reliable estimate available for the potential costs of service outage and restoration, with comprehensive assessments of the impacts and expenses, facilitating effective planning and mitigation strategies.			X	X	X			X		X		



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Ref. No	Levels	Subject	Question	Indicative measurement scale						Explanation	Score	Classification									
				0 - Worst	1	2	3	4	5 - Best			Scale			Resilience Dimension						
												Building	Urban	Territorial	Physical	Health, wellbeing and quality of life	Technical	Economic	Environmental	Organisational	
8.5.3	Level 1	Waste management - Alternative system	Do the building/urban area/territory have an alternative system in case of waste management failure?	No alternative systems in place to serve as backups	There are minimal alternative systems in place as backups, but they are insufficient to fully mitigate waste management failures.	Some alternative systems are in place to serve as backups in case of waste management failures, but they may not cover all necessary functions adequately.	Alternative systems are moderately implemented as backups, providing reasonable redundancy to address waste management failures.	A significant array of alternative systems is in place as backups, offering robust redundancy to effectively manage waste management failures.	Alternative systems are extensively implemented as backups, ensuring comprehensive redundancy and continuity of waste management functions.	Alternative waste management systems may include: - Emergency Waste Collection Services - Temporary Storage Facilities - Waste Reduction and Recycling Programs - Resource Recovery and Waste-to-Energy Facilities:		X	X	X	X		X		X	X	
Total score for sub-Essential 8.5											0										
8.6 Basic services: Transportation																					
8.6.1	Level 1	Extent of loss of transportation system service	What is the estimated extent of transportation system failure also due to damages to critical infrastructures?	Failure is expected to be widespread and severe in the face of hazards, with significant damages to critical related assets leading to prolonged disruptions .	There is a substantial estimated extent of failure, with notable disruptions anticipated as a result of damages to critical related assets.	The estimated extent of failure is moderate , with some disruptions foreseen due to damages to critical related assets.	Failure is estimated to be limited , with only minor disruptions expected as a result of damages to critical related assets.	There is a minimal estimated extent of failure, with little to no disruptions anticipated despite damages to critical related assets.	There is insignificant estimated failure expected in the face of hazards, and damages to critical related assets are projected to be effectively mitigated.	Transportation systems includes routes that can be used by car/bus, train, bicycle and on foot. Critical assets regarding the transportation system may include critical access and evacuation routes. The extent of the loss of critical assets may be estimated from: - carrying capacity (vehicles per hour) of evacuation/emergency supply routes at risk of becoming impassable after event - number of days estimated before reopening - carrying capacity (vehicles per hour) of all designated critical evacuation/emergency supply routes			X	X	X		X		X	X	
8.6.4	Level 1	Cost of restoration of service	Do you have a reliable estimate of the potential costs of service outage and restoration due to transportation system failure?	No reliable estimate available.	There are minimal efforts to estimate the potential costs of service outage and restoration, and the estimates available are unreliable or incomplete .	Some attempts have been made to estimate the potential costs of service outage and restoration, but they may not be comprehensive or fully reliable .	There is a moderate estimate available for the potential costs of service outage and restoration, although there may be some uncertainty or limitations in the estimates.	The potential costs of service outage and restoration are fairly well-estimated , with efforts to quantify the impacts and associated expenses, though there may be some areas for improvement .	There is a comprehensive and highly reliable estimate available for the potential costs of service outage and restoration, with comprehensive assessments of the impacts and expenses, facilitating effective planning and mitigation strategies.			X	X			X		X			
Total score for sub-Essential 8.6											0										
8.7 Basic services: Communications																					
8.7.1	Level 1	Extent of loss of communication service and critical assets	What is the estimated extent of communication network failure and loss of critical communication assets?	Failure is expected to be widespread and severe in the face of hazards, with significant damages to critical related assets leading to prolonged disruptions .	There is a substantial estimated extent of failure, with notable disruptions anticipated as a result of damages to critical related assets.	The estimated extent of failure is moderate , with some disruptions foreseen due to damages to critical related assets.	Failure is estimated to be limited , with only minor disruptions expected as a result of damages to critical related assets.	There is a minimal estimated extent of failure, with little to no disruptions anticipated despite damages to critical related assets.	There is insignificant estimated failure expected in the face of hazards, and damages to critical related assets are projected to be effectively mitigated.	Critical communications assets might include, for example: - Police or armed forces communications systems; - Water and energy sensing systems; - Traffic control systems; - Communication towers, transmitters, switches and other nodal components of public phone systems; - Data- and switching-centres routing internet traffic (UNDRR).		X	X	X	X		X		X	X	



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				0 - Worst	1	2	3	4	5 - Best			Scale			Resilience Dimension							
												Building	Urban	Territorial	Physical	Health, wellbeing and quality of life	Technical	Economic	Environmental	Social		
8.7.2	Level 1	Alternative communication system in case of failure	Are there alternative systems in place to serve as backups in the event of communication system failures?	No alternative systems in place to serve as backups.	There are minimal alternative systems in place as backups, but they are insufficient to fully mitigate communication system failures.	Some alternative systems are in place to serve as backups in case of communication system failures, but they may not cover all necessary functions adequately.	Alternative systems are moderately implemented as backups, providing reasonable redundancy to address communication system failures.	A significant array of alternative systems is in place as backups, offering robust redundancy to effectively manage communication system failures.	Alternative systems are extensively implemented as backups, ensuring comprehensive redundancy and continuity of communication functions in the event of system failures.	Here some examples of alternative communication systems : - Satellite communication - Radio Communication - Mesh Networks - Community-based Communication - Emergency Broadcast Systems -Backup Power Systems:		X	X	X	X		X					
8.7.3	Level 1	Cost of restoration of service	Do you have a reliable estimate of the potential costs of service outage and restoration due to communication system failure?	No reliable estimate available.	There are minimal efforts to estimate the potential costs of service outage and restoration, and the estimates available are unreliable or incomplete .	Some attempts have been made to estimate the potential costs of service outage and restoration, but they may not be comprehensive or fully reliable .	There is a moderate estimate available for the potential costs of service outage and restoration, although there may be some uncertainty or limitations in the estimates.	The potential costs of service outage and restoration are fairly well-estimated , with efforts to quantify the impacts and associated expenses, though there may be some areas for improvement .	There is a comprehensive and highly reliable estimate available for the potential costs of service outage and restoration, with comprehensive assessments of the impacts and expenses, facilitating effective planning and mitigation strategies.			X	X	X				X				
Total score for sub-Essential 8.7												0										
8.8 Basic services: Healthcare and Education																						
8.8.1	Level 1	Surge capacity for public health infrastructure	In case of a disaster, to what extent are hospitals and emergency care centers able to manage a sudden influx of patients?	No surge capacity identified .	Surge capacity is theoretically available but has never been assessed or tested.	Surge capacity exists but is known to have significant shortcomings in geographical coverage or type of service available, and can only be activated within 12 hours or longer .	Surge capacity exists with identified shortcomings in geographical coverage or type of service available, and can be activated within 6-12 hours .	Surge capacity exists with minor shortcomings in geographical coverage or type of service available, and can be activated within 3-6 hours .	Surge capacity exists to deal with additional health needs and is tested either via actual events or practice drills – can be activated within 0-3 hours , ensuring rapid response to patient influx.	Surge capacity refers to the ability of a healthcare system, such as hospitals and emergency care centers, to rapidly expand their resources, including staff, equipment, and infrastructure, to effectively manage a sudden and significant increase in the demand for medical care during emergencies or disasters.		X	X	X		X						
8.8.2	Level 1	Continuity of care for those already sick	In case of a disaster, to what extent can care be maintained for those who are already sick or dependent?	Care of existing patients would fail completely or almost completely.	There are some efforts to maintain care for those who are already sick or dependent during a disaster, but resources and support are insufficient .	Measures are in place to partially maintain care for those who are already sick or dependent in the event of a disaster, but gaps exist in preparedness and response.	Care for those who are already sick or dependent is moderately maintained during a disaster.	Efforts are made to ensure substantial care for those who are already sick or dependent in the event of a disaster.	Care for those who are already sick or dependent is fully ensured during a disaster, with comprehensive and robust plans, resources, and protocols in place to provide uninterrupted support and meet their needs comprehensively.	Potential stakeholder who could ensure care are healthcare providers, emergency responders, community organizations, caregivers, and individuals themselves.		X	X	X		X						

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				0 - Worst	1	2	3	4	5 - Best			Scale			Resilience Dimension									
												Building	Urban	Territorial	Physical Health, wellbeing and quality of life	Technical	Economic	Environmental	Organisational					
8.8.3	Level 1	Continuity of Educational Service	In case of a disaster, to what extent can the continuity of educational schools be ensured?	The continuity of educational schools is minimally ensured in the event of a disaster, with little to no contingency plans or preparations in place.	There are some efforts to ensure the continuity of educational schools during a disaster, but they are insufficient to guarantee uninterrupted operations.	Measures are in place to partially ensure the continuity of educational schools in the event of a disaster, but gaps exist in preparedness and response.	The continuity of educational schools is moderately ensured during a disaster, with adequate contingency plans and preparations to maintain essential functions.	Efforts are made to ensure the substantial continuity of educational schools in the event of a disaster, with comprehensive plans and resources to maintain operations.	The continuity of educational schools is fully ensured during a disaster, with comprehensive and robust plans, resources, and protocols in place to guarantee uninterrupted operations and support the well-being of students and staff.			X	X	X		X								
Total score for sub-Essential 8.8											0	Scores by resilience dimension			0	0	0	0	0	0				
Total score for Essential 8											0													



Essential 9 - Ensure effective disaster response

Ref. No	Levels	Subject	Question	Indicative measurement scale						Explanation	Score	Classification									
				0 - Worst	1	2	3	4	5 - Best			Scale		Resilience Dimension							
												Building	Urban	Territorial	Physical	Health, wellbeing and quality of life	Technical	Economic	Environmental		
9.1 Warning systems																					
9.1.1	Level 1	Existence of warning systems	Do warning systems exist? Are they for single hazards or multi-hazards?	No warning system exists.	There are plans to include warning systems but they still don't exist.	Warning systems exist for just one hazard.	Warning systems exist for few hazards.	Warning systems exist and are in function for all the hazards hitting the territory.	Warning systems exist, are in function for all the hazard hitting the territory and they regularly monitored for the function.	An (early) warning system is an "integrated system of hazard monitoring, forecasting and prediction, disaster risk assessment, communication and preparedness activities systems and processes that enables individuals, communities, governments, businesses and others to take timely action to reduce disaster risks in advance of hazardous events" (UNDRR). Warning alarms and messages can be transmitted via different channels and media and conducted e.g. via siren systems, mobile warning apps, mobile text messages, mobile loudspeakers on emergency cars, phones, radio, TV, web etc. Warnings should be delivered over the maximum possible notice periods.		X	X	X				X			
9.1.2	Level 2	Existence and effectiveness of early warning systems	How sufficient is the warning time and how reliable are warnings – do they allow practical actions to be taken?	The warning time is insufficient, providing little to no opportunity for practical actions to be taken.	There is minimal warning time provided, and warnings are unreliable, thus likely to be ignored.	Warning time is shorter than required and there may also be some false positives making it challenging to take practical actions.	There is moderate warning time provided, and warnings are generally reliable, allowing for some practical actions to be taken, although there may be occasional shortcomings.	The warning time is fairly sufficient, and warnings are mostly reliable, enabling practical actions to be taken in a timely manner, although there may be minor issues.	There is ample warning time provided, and warnings are highly reliable, allowing for practical actions to be taken effectively and ensuring preparedness for potential hazards.	Please refer to 9.1.1 for the definition of early warning systems.		X	X	X				X			
9.1.3	Level 2	Reach of warning	Will all people in the surrounding area be reached by the warnings and understand them?	People will not be reached by warnings or it is extremely unlikely that this will happen.	It is likely that a very limited number of people will be reached.	It is likely that a small number of people will be reached.	It is likely that a medium number of people will be reached.	It is likely that a most of people will be reached.	There is "reasonable confidence" that all people will be reached.	Please refer to 9.1.1 for the definition of early warning systems.		X	X	X		X	X				
9.1.4	Level 2	Reach of vulnerable population groups	Will warnings reach the vulnerable population groups (children, elderly, people with disabilities, etc.)?	The vulnerable population will not be reached by warnings or it is extremely unlikely that this will happen.	It is likely that a very limited proportion of the vulnerable population will be reached.	It is likely that a small proportion of the vulnerable population will be reached.	It is likely that a medium proportion of the vulnerable population will be reached.	It is likely that a most of the vulnerable population will be reached.	There is "reasonable confidence" that the whole vulnerable population will be reached.	Please refer to 9.1.1 for the definition of early warning systems. Vulnerable population might include, for example, population in areas of high poverty / population with low income, the elderly, children, women, people with disabilities, non-native language speakers, population with lower educational degrees.		X	X	X		X	X				
Total score for sub-Essential 9.1											0										
9.2 Event response plans																					
9.2.1	Level 1	Existence and completeness of plans	Is there a detailed and up-to-date plan for the building/ city/ territory for dealing with disasters – processes, procedures, responsibilities and roles, equipment, communication channels and contents, etc?	No plans.	Plans exist but may be outdated or incomplete. may be outdated or incompletehave significant deficiencies, in terms of coverage, fitness for purpose, detail/ specificity and obsolescence.	Plans exist but may not cover all necessary aspects or be fully up-to-date.	Plans exist with efforts to establish processes, procedures, responsibilities and roles, equipment, communication channels and contents, etc., although there may be some gaps or areas for improvement.	Plans which are fairly detailed and up-to-date, covering a range of processes, procedures, responsibilities and roles, equipment, communication channels and contents, etc. exist, although may not be reviewed annually.	Fully detailed and up to date plans exist that address all impacts and are critically reviewed at least annually, and it includes a potential historic areas emergency plan.	Emergency response plans might need to cover: Command and control - coordination with other agencies and cities, roles and responsibilities; evacuations; communication systems; critical asset management; integration of private sector utilities covering energy, water / sanitation, trash collection, communications etc; medical response; law and order response; fire and rescue response; public information; triage policies; incorporation of contributions.		X	X	X							



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9.2.2	Level 1	Accessibility and availability of data. Integration with intersecting plans and capabilities – understanding of others’ capabilities	Is the necessary data and guidance regarding hazards/ risks and emergency response capabilities obtained from relevant entities? Can the information acquired be effectively utilized to formulate functional emergency plans?	Necessary data and guidance regarding hazards/ risks and emergency response capabilities are not obtained from relevant entities, which have not been identified.	There is minimal utilization of data and guidance regarding hazards/ risks and emergency response capabilities obtained from relevant entities, hindering the formulation of functional emergency plans.	Some efforts are made to utilize data and guidance regarding hazards/ risks and emergency response capabilities obtained from relevant entities.	Data and guidance regarding hazards/ risks and emergency response capabilities obtained from relevant entities are moderately utilized to formulate functional emergency plans.	Data and guidance regarding hazards/ risks and emergency response capabilities obtained from relevant entities are substantially utilized to formulate functional emergency plans.	Necessary data and guidance regarding hazards/ risks and emergency response capabilities are effectively obtained from all relevant entities and comprehensively utilized to formulate functional emergency plans.	Relevant entities can include: - Government Agencies - Disaster Management Organizations: - Research Institutions and Universities: - - International Organizations (such as UNDRR, WHO, etc) - Private Sector and Industry Associations: - Community Stakeholders		X	X	X			X																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									

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				0 - Worst	1	2	3	4	5 - Best			Scale			Resilience Dimension											
												Building	Urban	Territorial	Physical health, well-being and quality of life	Technical	Economic	Environmental	Organisational							
9.4.2	Level 1	Depot safety and availability	Are depots available and able to withstand disaster events and remain safe and usable?	All depots are assessed as unlikely to withstand the event.	A large number of depots is assessed as unlikely to withstand the event.	A medium number of depots is assessed as unlikely to withstand the event.	A small number of depots is assessed as unlikely to withstand the event.	Only a very limited number of depots is assessed as unlikely to withstand the event.	All depots are assessed as likely to withstand the event.	Depots can be safer and usability can be ensured by conducting risk analyses for the depots and e.g. choosing safe locations, construction materials etc (ARCH RAD).			X	X	X											
Total score for sub-Essential 9.4											0															
9.5 Drills																										
9.5.1	Level 1	Training for first responders	Do regular drills exist for first responders and are they effective?	No drills in the last two years.	Ad hoc partial exercises - not all scenarios tested, most relevant entities not included, or not realistic.	Drills do not happen annually and may not be complete or realistic (scenarios, relevant entities). Performance is not reported.	Regular tests and drills but they may not include a number of relevant entities. Performance is not reported.	Regular (at least annual) drills take place to generally test all emergency response and test interoperability with at least some relevant entities. Performance may not be assessed and reported.	Regular (at least annual) drills take place to fully test all emergency response plans and skills, and test interoperability with all other relevant entities. Performance is assessed and reported. All professional and public participants in drills show strong evidence of having absorbed training.	Please refer to 9.2.2 for examples of relevant entities.		X	X	X		X										
9.5.2	Level 1	Disaster drills - involving the public and vulnerable groups	Do regular drills for disasters for the public exist and include all vulnerable groups and are information about these drills freely accessible?	No drills in the last two years.	Ad hoc partial exercises - not all scenarios tested, only a small part of the public is involved.	Drills do not happen regularly and may not be complete or realistic (scenarios, relevant entities) and only a part of the public is involved.	Regular tests and drills but they may not include a large part of the public.	Regular drills take place to generally test all emergency response aspects and is accessible to almost the whole public.	Regular drills take place to fully test all relevant emergency response plans and skills and test interoperability with all other relevant entities. The public including all vulnerables groups is included and information about the drills can be easily accessed.	Vulnerable groups might include, for example, population in areas of high poverty / population with low income, the elderly, children, women, people with disabilities, non-native language speakers, population with lower educational degrees.			X	X		X										
Total score for sub-Essential 9.5											0	Scores by resilience dimension			0	0	0	0	0	0						
Total score for Essential 9											0															



Essential 10 - Expedite Recovery and Build Back Better

Ref. No.	Levels	Subject	Question	Indicative measurement scale						Explanation	Score	Classification									
				0 - Worst	1	2	3	4	5 - Best			Scale			Resilience Dimension						
												Building	Urban	Territorial	Physical	Health, wellbeing and quality of life	Technical	Economic	Environmental	Organisational	
10.1 Preparedness / planning for post disaster recovery																					
10.1.1	Level 1	Disaster recovery planning	Is there a clear disaster recovery plan (including recovery goals and objectives) for the building/ city/ territory?	No plan exists.	Only a rudimentary attempt at disaster recovery planning.	No integrated disaster recovery plan, just multiple separate policies and procedures that between them leave significant gaps.	A detailed disaster recovery plan exists but from experience or expert review it has major shortcomings.	A detailed disaster recovery plan exists but it either has never been tested or it may have minor shortcomings.	A fully detailed disaster recovery plan exists and has been tested successfully either after a real disaster or as part of a simulation/drill.	Disaster recovery plans may include, but are not limited to arrangements for: - Safety and structural inspections; - Insurance liaison; - Restarting of critical services and equipment; - Interim arrangements for when critical services and equipment are unavailable for longer than expected; - Cleaning and restoration; - Preferred contractors for repairs; - Stockpiles of spare parts for key equipment; - Expedited permitting; - Engagement with city government and utilities for factors such as debris removal, road clearance, and services restoration; - Helping workers address issues at home or school; - Resettlement of business and residential tenants back into their houses; - Obtaining building supplies; - Re-booting supply chains (for production, if applicable); Recovery objectives and goals may relate to such factors as: - Time to restore basic infrastructure; - Time to resettle occupants; - Time to execute repairs; - Extent of interaction with/support for the community; - Costs from loss of business.		X	X	X					X		X
10.1.2	Level 2	Stakeholder consultation for pre-disaster recovery planning	Is the disaster recovery plan drafted in consultation with relevant stakeholders involved in the recovery planning?	The disaster recovery plan is developed with no involvement of relevant stakeholder.	There is minimal inclusion of stakeholders in the development of the disaster recovery plan, but a stakeholder mapping has been undertaken to develop an engagement plan.	Some efforts are made to include stakeholders (including the development of a stakeholders engagement plan), but the consultation is inconsistent or incomplete.	The disaster recovery plan is developed through inclusive, participatory multi-stakeholder consultation, but focusing only on primary stakeholders.	The disaster recovery plan is developed through inclusive, participatory multi-stakeholder consultation, with significant representation and involvement of all main stakeholders.	The disaster recovery plan is developed through inclusive, participatory multi-stakeholder consultation, with robust engagement and representation of all relevant stakeholders who now receive regular bulletins on the progress of the plan and are regularly contacted for the plan updates.	Potential stakeholders that might be relevant: - Local, regional, national authorities - emergency & security services - academia and research facilities - civil society - private & finance sector - critical infrastructure managers - building & landowners - media outlets - neighbouring areas, cities, governments - technical staff		X	X	X		X					X



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				0 - Worst	1	2	3	4	5 - Best			Scale			Resilience Dimension								
												Building	Urban	Territorial	Physical	Health, wellbeing and quality of life	Technical	Economic	Environmental	Organisational			
10.1.3	Level 2	Socially-just pre-disaster recovery planning	Is the disaster recovery planning considering the local communities, vulnerable groups, minorities, all genders and the different needs of these groups?	No considerations.	Consideration is at best ad hoc and not systematic.	Disaster recovery planning considers social justice needs, but only covers the needs of some communities, vulnerable groups, minorities, or genders and is not updated with changing needs of these groups.	Disaster recovery planning considers social justice needs and covers the needs of most communities, vulnerable groups, minorities, or genders, but is not updated with changing needs of these groups.	Disaster recovery planning considers social justice needs and covers the needs of all communities, vulnerable groups, minorities, or genders, but is not updated with changing needs of these groups.	Disaster recovery planning considers social justice needs and covers the needs of all communities, vulnerable groups, minorities, or genders; these plans are updated in line with changing needs of these groups.	Social justice broadly means "Full and equal participation of all groups in a society that is mutually shaped to meet their needs. Social justice includes a vision of society in which the distribution of resources is equitable' and all members of a space, community, or institution, or society are "physically and psychologically safe and secure." (Adams et al., 2016). Vulnerable groups might include, for example, population in areas of high poverty / population with low income, the elderly, children, women, people with disabilities, non-native language speakers, population with lower educational degrees.		X	X	X		X							
10.1.4	Level 1	Defined Post-Disaster Needs Assessment (PDNA) process	Does a clear process for a post-disaster damage and needs assessment (PDNA) exist?	No PDNA process.	A PDNA process exists, but it may be vague or incomplete.	A PDNA process exists, but it may not be fully developed or widely implemented.	An up-to-date PDNA process exists, with efforts made to define procedures and responsibilities, although there may be some gaps or inconsistencies.	A full PDNA process exists, with well-defined procedures and responsibilities, although there may be minor areas for improvement.	A post-disaster damage and needs assessment process exists and is updated regularly, ensuring swift and accurate evaluations of post-disaster damages and needs.	Post-disaster damage and needs assessment (PDNA): standardised and comprehensive assessment in the post disaster period. Such an assessment must be multi-sectoral, addressing recovery needs related to infrastructure, shelter, livelihoods, and social and community services in a balanced and comprehensive manner (UNDP).		X	X	X			X						
10.1.5	Level 1	Cultural heritage: availability of clear and swift procedure for cultural heritage sites	Do clear and swift procedure for a post-disaster damage and needs assessment (PDNA) exist for cultural heritage sites?	No PDNA process tailored for cultural heritage sites.	A PDNA process exists for cultural heritage sites, but it may be vague or incomplete.	A PDNA process exists for cultural heritage sites, but it may not be fully developed or widely implemented.	An up-to-date PDNA process exists for cultural heritage sites, with efforts made to define procedures and responsibilities, although there may be some gaps or inconsistencies.	A full PDNA process exists for cultural heritage sites, with well-defined procedures and responsibilities, although there may be minor areas for improvement.	A post-disaster damage and needs assessment process specifically designed for cultural heritage sites exists and is updated regularly, ensuring swift and accurate evaluations of post-disaster damages and needs.	Please refer to 10.1.4 for the definition of PDNA.		X	X	X			X						
Total score for sub-Essential 10.1											0												
10.2 Learning from experience - building back better																							
10.2.1	Level 1	Learning loops from past disasters	Are collected data, best practices and lessons from past disasters / simulations / drills analysed and used for learning opportunities, and made publicly available?	They have not been analysed or used for learning opportunities.	There is minimal analysis of collected data, best practices, and lessons learnt, and their availability is very limited.	Some analysis of collected data, best practices, and lessons learnt is conducted, but their availability is inconsistent or incomplete.	Collected data, best practices, and lessons learnt are moderately analyzed, and efforts are made to make them available for learning opportunities, although improvements could be made.	Collected data, best practices, and lessons learnt are analyzed, and they are made readily available for learning opportunities.	Collected data, best practices, and lessons from past disasters/ simulations/ drills are comprehensively analysed, and they are actively and widely disseminated for learning opportunities, ensuring continuous improvement and preparedness enhancement	This process could be the one used for usual learning and review after drills and practices. This learning is critical in helping a city understand how it can 'build back better' and also in improving comprehension of risks. New risks, learning from real events can be reincorporated into to city risk management framework.		X	X	X			X						

D1.1 - MULTICLIMACT Resilience Scorecard Method



Ref. No.	Levels	Subject	Question	Indicative measurement scale						Explanation	Score	Classification										
				0 - Worst	1	2	3	4	5 - Best			Scale			Resilience Dimension							
												Building	Urban	Territorial	Physical	Health, wellbeing and quality of life	Technical	Economic	Environmental	Organisational		
10.2.2	Level 1	Adequacy of prior planning and preparation	Are strategies/ plans updated based on vulnerabilities and risks revealed by a (past) disaster?	No attempt to learn from available information about vulnerabilities or past disasters.	Significant vulnerability and planning issues are known but remain unaddressed.	Vulnerabilities and risks revealed by past disasters are acknowledged, but efforts to update strategies/ plans are inconsistent or incomplete, with only limited revisions made to address shortcomings.	Efforts are made to update strategies/ plans with moderate success in addressing shortcomings and making necessary revisions, although there may be some areas where updates are lacking or incomplete.	With one or two minor exceptions, knowledge about vulnerabilities is up-to-date and shortcomings in plans and preparations have been addressed through revisions to these.	The knowledge about vulnerabilities is up-to-date and shortcomings in plans and preparations have been addressed through revisions to these.	Updates to strategies and plans can derive from the increase of rainfalls or higher intensity of earthquakes.		X	X	X				X				X
10.2.3	Level 1	Traditional knowledge, skills and materials	Are traditional knowledge, skills and materials considered and if applicable applied and used in the building back process?	No information about traditional knowledge.	Some information about traditional knowledge (e.g. construction procedures, useful materials, traditional procedures and habits, etc.) is available.	Information about traditional knowledge (e.g. construction procedures, useful materials, traditional procedures and habits, etc.) is available and attempts are taken to incorporate this knowledge into building back processes.	Information about traditional knowledge (e.g. construction procedures, useful materials, traditional procedures and habits, etc.) is available, partially analysed and attempts are taken to incorporate this knowledge into building back processes.	Information about traditional knowledge (e.g. construction procedures, useful materials, traditional procedures and habits, etc.) is available, mostly analysed and if applicable incorporated into building back processes.	Information about traditional knowledge and useful construction methods and materials is fully available and analysed and if applicable applied and used in the building back processes.	Examples: Traditional knowledge, skills and traditionally used materials for construction. This includes building techniques, specific architectural layouts, use of traditional seeds or farming practices, etc.		X	X				X				X	
10.2.4	Level 1	Inclusion of local communities and practices	Are local communities and practices considered in the rebuilding efforts?	No consideration.	Only some local communities are included in the rebuilding effort, their practices are not considered in the rebuilding efforts.	Some local communities as well as local practices are considered in the rebuilding efforts.	Most local communities are included in the rebuilding efforts, but only some local practices are considered.	Most local communities and local practices are considered in the rebuilding efforts, but there exist some minor gaps.	The local communities, their needs and local practices are fully considered in the rebuilding efforts.	This goes beyond the techniques, knowledge and skills in the previous question and aims at specific practices of communities (e.g. special gatherings, forms of community organisation, etc.) that not only help the rebuilding effort but also help the people affected by a disaster to regain their sense of place and belonging. Local communities may include indigenous people, religious groups, cultural associations, local residents, etc.		X	X	X		X	X				X	
10.2.5	Level 1	Technological advancements	Are technological advancements considered, applied and used in the building back process?	Technological advancements are not considered, applied, or utilised in the building back process.	There is minimal consideration and application of technological advancements in the building back process.	Some technological advancements are considered and applied in the building back process.	Technological advancements are moderately considered, applied, and used in the building back process.	Technological advancements are substantially considered, applied, and utilized in the building back process.	Technological advancements are extensively considered, applied, and integrated into the building back process.	Examples: - Building Information Modeling (BIM) - 3D Printing - Prefabrication and Modular Construction - Smart Building Systems - Renewable Energy Solutions - Advanced Materials - Data Analytics and Predictive Modeling		X	X				X					
Total score for sub-Essential 10.2											0											
10.3 Building back faster																						
10.3.1	Level 1	Speed of access to funds	Can funding for repairs and reconstruction be accessed in sufficient time to prevent undue loss of functions and economic activity?	No funding identified.	It is known from direct experience or suspected that funding will significantly delay repairs or reconstruction.	It appears likely that loss adjustment and bureaucratic delays will delay funding accessibility, but internal funds are available to cover the delay.	There is some reason to believe that funding will be accessible in sufficient time, but realistically, delays may be anticipated.	There is sound reason to believe, from the contractual obligations of funders, that funding will be accessible in sufficient time after a disaster – but this has not yet been tested.	There is sound reason to believe, from direct experience of the past performance of funders, that funding will be accessible in sufficient time after a disaster.	This question is focused on access to any type of relevant funding after a disaster to finance the rebuilding and recovery process.		X	X	X			x	X			X	

D1.1 - MULTICLIMACT Resilience Scorecard Method



Ref. No.	Levels	Subject	Question	Indicative measurement scale						Explanation	Score	Classification									
				0 - Worst	1	2	3	4	5 - Best			Scale			Resilience Dimension						
												Building	Urban	Territorial	Physical	Health, wellbeing and quality of life	Technical	Economic	Environmental		
10.3.2	Level 1	Speed of access to skills, materials and equipment	Can the necessary skills, materials and equipment be accessed in sufficient time (and independently from higher governance levels) to prevent undue loss of functionalities and economic activity?	No attention paid to skills, materials and equipment availability.	It is known from direct experience or suspected that access to skills, materials and equipment will significantly delay repairs or reconstruction.	It appears likely that skills, material and equipment will be in short supply due to competition for their use, and hence access will be delayed.	There is some reason to believe that skills, materials and equipment will be accessible rapidly, but realistically, delays may be anticipated.	There is sound reason to believe, from resources available in the area or internally, that skills, materials and equipment will be accessible rapidly and seamlessly after a disaster – but this has not yet been tested	There is sound reason to believe, from direct experience of past disasters, that skills, materials and equipment will be accessible rapidly and seamlessly after a disaster.			X	X	X			X				
Total score for sub-Essential 10.3											0	Scores by resilience dimension									
Total score for Essential 10											0		0	0	0	0	0	0	0	0	0

