



COMMUNITY TESTING AND VALIDATION REPORT

ClimEmpower Work Package 4, D4.6



Project ClimEmpower: User Driven Climate Applications Empowering
Regional Resilience

Work package 4, Deliverable D4.6

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List of Acronyms

Acronym	Definition
BGI	Blue and Green Infrastructure
CIC	Climate interaction context
CoP	Community of Practice
CSF	Case Study Facilitator / Case Study Facilitators
DRR	Disaster Risk Reduction
GDP	Gross Domestic Product
MU	Mission User / Mission Users
PPS	Purchasing Power Standard
RA	Regional Authority / Regional Authorities
SME	Small and Medium-sized Enterprise
SO	Strategic Objective
TGM	Trial Guidance Methodology
WP	Work Package

Glossary

Term	Definition
BGI	Blue and green infrastructure refers to interconnected networks of natural and semi-natural systems that work together to enhance urban resilience and sustainability. While blue infrastructure focuses on water management through features like rivers, wetlands, and drainage systems, green infrastructure emphasizes the use of plants and green spaces, such as parks, green roofs, and forests, to provide ecosystem services. Together, they manage stormwater, reduce flooding, improve air and water quality, enhance biodiversity, and support climate adaptation in urban environments.
Climate impacts	The consequences of realized risks on natural and human systems, where risks result from the interactions of climate-related hazards (including extreme weather and climate events), exposure, and vulnerability. Impacts generally refer to effects on lives; livelihoods; health and well-being; ecosystems and species; economic, social and cultural assets; services (including ecosystem services); and infrastructure (based on IPCC, 2018)
Climate Resilience	The ability of a system and its component parts to anticipate, absorb, accommodate, or recover from the effects of a hazardous event in a timely and efficient manner, including through ensuring the preservation, restoration, or improvement of its essential basic structures and functions.
Community of Practice	A group of stakeholders sharing a common concern, in this case the challenge of increasing climate resilience, who engage in collective learning by exchanging knowledge and supporting one another

Executive summary (publishable)

Deliverable D4.6 presents the validation of the ClimEmpower platform, co-designed indicators, and regional resilience recommendations tested under real-world planning conditions by municipal technical staff, civil protection officers, and regional planners (**Horizon Europe, Grant Agreement No. 101112728**).

Using the **Trial Guidance Methodology (TGM)**, testing was conducted across five pilot regions (Sicily, Andalusia, Osijek-Baranja, Central Greece, and the Troodos Mountains) and five follower regions (Campania, Costa del Sol, Osijek Follower, Western Greece, and Sitia UNESCO Geopark). Evaluations were analysed across four dimensions—scientific performance [Sci], user experience [UX], user acceptance [Acc], and socio-economic/ethical implications [Soc]—with follower mini-trials adding exploitation [Exp].

The evaluation revealed high strategic value but a consistent **operational readiness gap** for the decision-support platform and some datasets. While praising its support for EU-mandated climate-proofing and emergency flood planning, administrators flagged **three critical barriers** to routine adoption:

- **The Localization Barrier:** The lack of native language support (English-only) and missing cartographic legends or units of measurement on live maps.
- **The Confidence Gap:** A documented gap in user confidence regarding independent risk map interpretation.
- **Interoperability Limits:** The urgent administrative need to export raw vector and raster GIS layers into desktop GIS suites (QGIS/ArcGIS) and council presentations, which simple web-based map visualizers cannot replace.

In contrast, the evaluation through mini-trials with follower regions emphasised the **practical and strategic utility of the ClimEmpower educational platform and its capacity-building resources**. Across multiple follower territories, the educational library and AI-supported training tools were praised as highly intuitive, time-saving, and effective for translating complex climate science for diverse public audiences. A notable highlight emerged from the Sitia Geopark trial, which confirmed the high localized value of non-technical educational materials and requested immediate deployment of the co-designed wildfire awareness **"Fire Detective Guide"** for community outreach.

Moreover, the mini-trials with follower regions confirmed that standardising metrics at the **NUTS administrative scale** ensures high replicability, allowing any EU regional authority to deploy this identical architecture with their own datasets.

Ultimately, this report provides a transparent, evidence-based validation of the **project's** technical, scientific, and governance **achievements** and suggests improvements that must be addressed in the future to make the ClimEmpower services fully ready for routine public administrative use.

It summarises the outcomes of the regional trials carried out in the five case study regions: Sicily (Italy), Andalusia (Spain), Osijek-Baranja County (Croatia), Region of Central Greece (Greece) and Troodos Mountain Area (Cyprus), and assesses the replication potential of the ClimEmpower approach based on exchanges and workshops with follower regions.

The trials were conducted following the Trial Guidance Methodology (TGM), a structured framework ensuring transparency, replicability and scientific rigour in the evaluation of innovative solutions for climate resilience. Each trial engaged the regional Community of Practice (CoP), involving participants across the five regions, including representatives from local and regional authorities, research institutions, civil society organisations and technical experts. Data collection combined pre and post workshop surveys, task observation logs and follow-up interviews, structured around research questions covering four dimensions: scientific and technical performance, user experience, user acceptance and sustainability, and socio-economic and ethical implications.

The results of the trials are presented both at regional level and through a cross-regional analysis, covering technical and scientific test outcomes, community validation findings and platform usability and acceptance.

In the final phase of the project, mini-trials were conducted with five follower regions to test the replicability of the ClimEmpower approach. The findings of this deliverable provide evidence for the long term uptake of ClimEmpower tools and recommendations at regional and European level.

1 ClimEmpower summary

ClimEmpower is a Horizon Europe collaborative research project that addresses the ongoing Climate Crisis in Europe by empowering the regional stakeholders in some of the most vulnerable European regions (Figure 1).

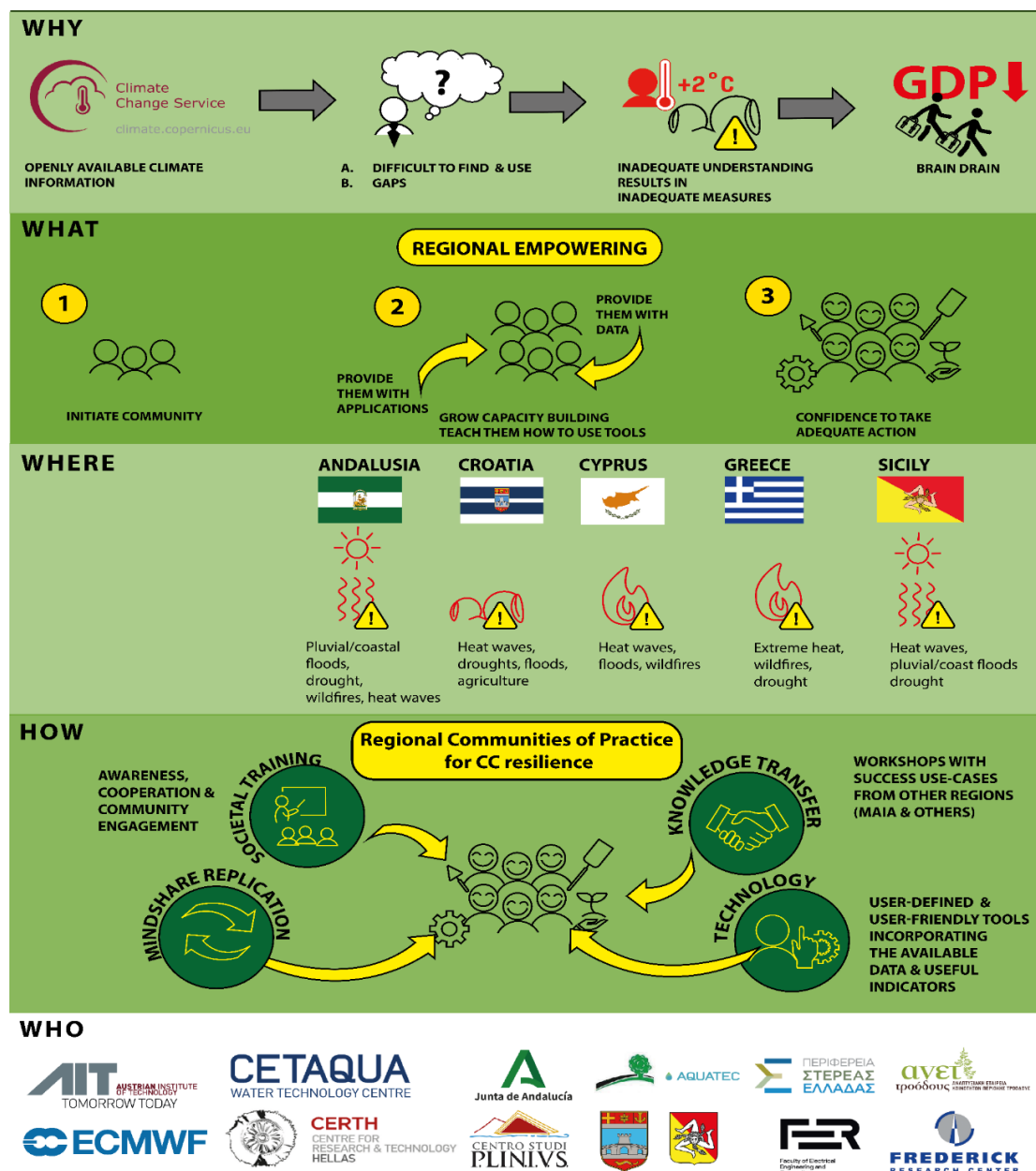


Figure 1: ClimEmpower at a glance: why, what, where, how and who.

1.1 Project Context

Climate risks result from a combination of hazard, exposure, and vulnerability (IPCC, 2022), and an effective increase in regional resilience depends on addressing all three. However, exposure, vulnerability, and related aspects, such as adaptive capacity, strongly depend on available knowledge and climate literacy. Consequently, global climate crisis frequently has a higher impact on socioeconomically vulnerable regions, thanks to a higher human and economic potential for addressing the issue in more affluent regions. To maximize its impact, ClimEmpower has therefore chosen to address the EU regions featuring a combination of high potential CC impacts and low and/or stagnant regional GDP/capita. This is mainly the case for regions in South and Southeast Europe (

Figure 2).

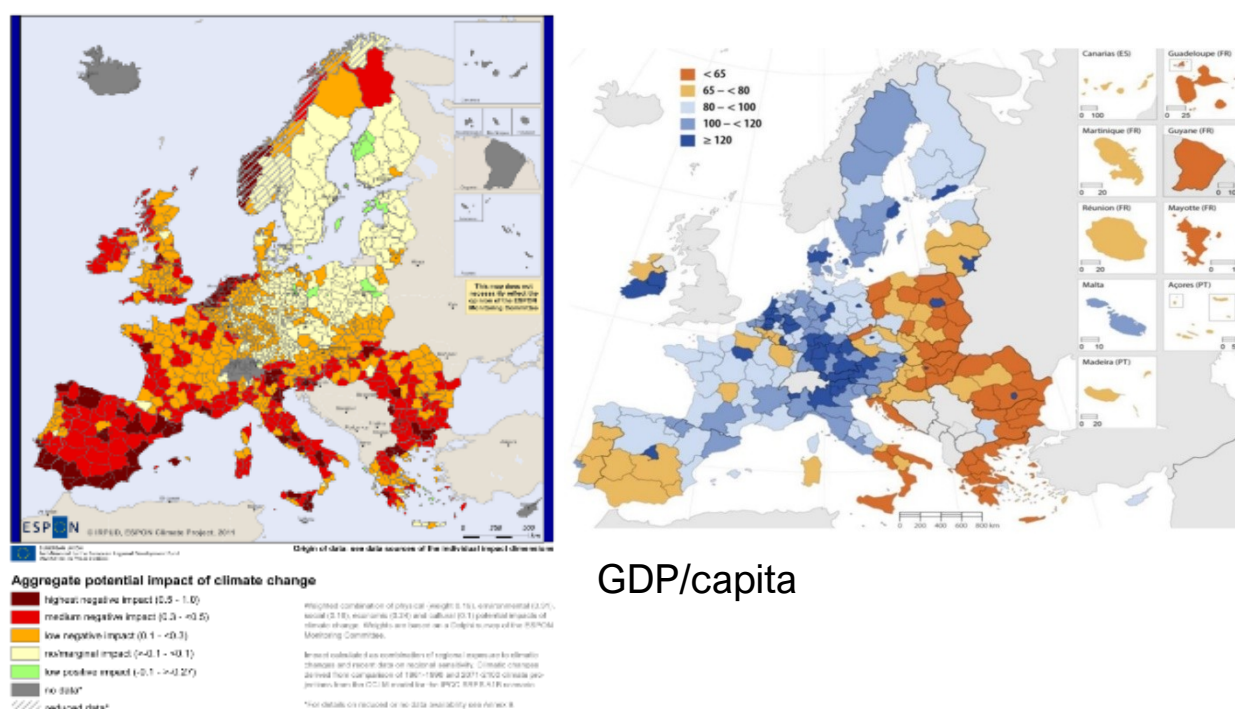


Figure 2.- aggregated potential impact of climate change (<https://www.espon.eu/climate-2012>); GDP/capita (based on <https://ec.europa.eu/eurostat/web/products-eurostat-news/-/ddn-20210303-1>)

The context the project addresses is thus one of an ongoing global warming, high regional vulnerability and low coping capacity of the participating regions, and the **overarching strategic objective of ClimEmpower** is to empower the Regional Authorities (RAs) and other Mission Users (MUs) in five EU-regions featuring a combination of exceptionally high climate hazards and exceptionally low coping capacity by improving their collective understanding of the Climate Change (CC) hazards, risks and resilient development pathways and supporting their knowledge-based regional planning and development through provision of relevant data, knowledge and user-defined and user-friendly decision support applications.

1.2 Project Objectives

To achieve this overarching goal, **ClimEmpower has identified six SMART¹ Strategic Objectives (SO)**, each one related to one or several work packages. The SOs have also been classified according to different categories: societal, contributing to improved dialogue, awareness, cooperation and community engagement as highlighted by the European Climate Pact (SO1, SO5); scientific, corresponding to research activities for advances beyond the state of the art (SO2, SO3); technological, suggesting and/or developing novel solutions, integrating state-of-the art and digital advances (SO4); and outreach, aimed at sharing ClimEmpower results to a broader scientific and non-scientific audience, including additional regions and communities, to maximize project impact (SO6).

- SO1 Understand regional background, challenges and expectation (WP1, societal)
- SO2 Addressing the gaps in availability and usability of CC data and services (WP2 and WP4, scientific)
- SO3 Identification, definition, estimating, and communication of climate impact/resilience indicators suitable for local end-users (WP2 and WP4, scientific)
- SO4 Simplify access to CC data and development of end user applications (WP3, technological)
- SO5 Empower the regions to activate and enhance their potential for addressing the climate change challenge. (WP4, societal)
- SO6 Ensure the use and impact of the ClimEmpower outputs (WP4 and WP5, scientific and societal)

ClimEmpower's key ambition is to **prove beyond doubt that CC-resilience should, and can, be an integral part of regional development** everywhere in EU and beyond it. That is, we anticipate that the regional stakeholders will recognise that CC-resilient development pathways offer multiple benefits to them, including but not limited to **higher quality of life and reviving economy**, and that these can be understood using available **data, tools, and services**. Second key ambition of the project is to **help the regions address the CC resilience** in key community systems addressed in five ClimEmpower trials.

Underlying philosophy of the project is to **"help the regions to help themselves"**. This will be achieved through various mechanisms, including co-creation and mediation of the regional "Communities of Practice", provision of the Climate Change -resilience training materials, as well as in provision and training in use of the user-centric data and services – including those that have already been made available through previous research projects and EU initiatives.

¹ Specific (related to WPs), Measurable (by relevant KPIs), Achievable (the WPs in which they will be achieved are listed), Realistic (since they are referred and explained in the methodology section), and Timebound (each KPI is related to a deliverable and a month of achievement).

2 Introduction

2.1 Deliverable summary

This deliverable contributes to WP4 "Empowering the Regions", with a particular focus on Task 4.4. It builds on the trial design and specifications developed in D4.5 and on the resilience recommendations consolidated in D4.4, bringing together the results of the community testing and validation activities carried out in the five ClimEmpower case study regions and followers.

Building on the Trial Guidance Methodology (TGM) (Fonio, Widera, & the DRIVER+ Consortium, 2020) adopted throughout the project, it presents the outcomes of the five regional trials conducted in Sicily (Italy), Andalusia (Spain), Osijek-Baranja County (Croatia), Region of Central Greece (Greece) and Troodos Mountain Area (Cyprus). The trials engaged the regional Communities of Practice (CoPs) in the structured testing of the ClimEmpower platform, covering indicator visualisation, hazard and risk mapping, resilience recommendations and customisable dashboards. Results are assessed against the trial objectives and research questions defined in D4.5, integrating quantitative and qualitative evidence collected through pre and post workshop surveys, task observation logs and follow up interviews.

This deliverable describes how ClimEmpower tools, services and recommendations have performed in real regional contexts, as assessed by the stakeholders who participated in the trials. It also presents the results of the mini-trials conducted with follower regions, which tested the replication potential of the approach beyond the five case study areas.

2.2 Results and expected impacts

Deliverable D4.6 presents the results of the community testing and validation phase of ClimEmpower, documenting how the project's tools, services and resilience recommendations performed when tested with regional stakeholders across the five case study regions. It is the primary output of Task T4.4 and provides the evidence base for assessing the effectiveness, usability and replication potential of the ClimEmpower approach at the end of the project.

The trials were conducted following the TGM and engaged CoP members as active evaluators of the platform, recommendations and educational materials, developed throughout the project. Results are assessed against trial objectives covering the usability and plausibility of platform outputs, the ability of ClimEmpower tools to simulate climate change impacts, the capacity of indicators and services to support regional decision making, the contribution of platform functionalities to adaptation planning, the role of educational resources and the platform's ability to facilitate stakeholder collaboration. Data were collected through pre and post workshop surveys, task observation and follow up interviews, integrating quantitative and qualitative evidence into a mixed methods evaluation.

Beyond the five case study regions, the deliverable presents the results of mini-trials conducted with follower regions, which tested the replicability of ClimEmpower solutions in new territorial contexts.

Regarding the project's Strategic Objectives, this deliverable contributes primarily to SO5 Empower the regions to activate and enhance their potential for addressing the climate change challenge, by providing documented evidence that ClimEmpower tools and recommendations

are usable and relevant for regional stakeholders engaged in climate adaptation planning. It contributes to SO3 Identification, definition, estimating and communication of climate impact and resilience indicators suitable for local end users, by documenting stakeholder assessment of the indicator system embedded in the platform, providing direct evidence of its relevance and appropriateness in real decision making contexts. In line with SO6 Ensure the use and impact of ClimEmpower outputs, it provides the evidence required to assess whether project results are credible, transferable and ready for exploitation, and demonstrates the pathways through which they translate into practical governance applications.

The expected impacts operate at two main levels. At regional level, the validation outcomes provide regional authorities with documented evidence of the effectiveness of ClimEmpower tools and recommendations, supporting their integration into planning instruments, investment strategies and governance frameworks beyond the project end, while at project level, this deliverable consolidates the results of the trial phase, connecting the work carried out across the WPs on what the project achieved in real territorial contexts.

2.3 Relation to other work

Deliverable D4.6 is closely connected to the work carried out across all ClimEmpower work packages and represents the convergence point of the project's scientific, technical and participatory activities in the final phase of the project.

The deliverable builds directly on Deliverable D4.5 "ClimEmpower application and trial specifications", which defined the trial objectives, research questions, regional scenarios, data collection instruments and evaluation framework. D4.6 reports the results of those trials as they were actually conducted, documenting outcomes against the criteria and procedures established in D4.5. It also draws on Deliverable D4.4 "Regional CC-resilience recommendations v2", which consolidated the resilience recommendations that were tested and validated during the trial workshops, and on D4.3, which provided the first iteration of those recommendations. The educational materials produced in D4.2 served as training resources during the trial sessions, contributing to the capacity-building dimension of the validation process.

The deliverable draws extensively from the work conducted in WP1, where the Communities of Practice (CoPs) were established and regional vulnerabilities, priorities and stakeholder needs were identified through participatory engagement activities, initially documented in Deliverable D1.2. CoP members who had participated in the project since its early phases were the primary participants in the final trial workshops, ensuring continuity between the co-design and validation phases. Continuous interaction with regional stakeholders through WP4 workshops, training sessions and collaborative exchanges contributed to contextualising the trial activities according to the specific needs, governance challenges and sectoral priorities of each ClimEmpower region.

The deliverable is also closely connected to the work carried out in WP2, particularly the resilience framework and climate resilience indicators developed in Deliverables D2.2 and D2.4. These outputs provided the analytical and methodological basis for understanding regional vulnerabilities, assessing adaptive capacity and defining the scenarios and platform functionalities tested during the trials. The indicators and resilience dimensions developed in WP2 played a central role in the trial and validation activities, enabling stakeholders to assess

the relevance and usability of ClimEmpower tools and recommendations within different territorial and sectoral contexts.

At the same time, the deliverable is linked to WP3, which focused on the development of the ClimEmpower platform, decision-support services, visualisation tools and climate applications. The platform tested during the regional trials integrates the outputs of Deliverables D3.1, D3.2 and D3.3. Feedback from trial participants on platform usability, functionality and relevance is documented in this deliverable and provides direct input for any further technical refinement. The output of this deliverable also support the activities planned within WP5, particularly dissemination, exploitation, stakeholder engagement and replication actions.

2.4 Data, security, and ethics

2.4.1 Data interoperability

Deliverable D4.6 integrates the results of the community testing and validation activities carried out across the five ClimEmpower case study regions, combining quantitative and qualitative data collected through pre and post workshop surveys, task observation and follow up interviews conducted during the regional trial workshops.

Some of the methodological and contextual material used in this deliverable builds upon previous and ongoing EU-funded projects, such as DRIVER+ (DRiving InnoVation in Crisis Management for European Resilience), BINGO (Bringing INnovation to onGOing water management), ESPREssO (Enhancing Synergies for Disaster Prevention in the European Union), ICARIA (Improving Climate Resilience of Critical Assets), KNOWING (Framework for defining climate mitigation pathways based on understanding and integrated assessment of climate impacts, adaptation strategies and societal transformation), and UP2030 (Urban Planning and design ready for 2030). These projects provided insights, methodologies and frameworks relevant to trial design, climate adaptation, resilience planning and stakeholder engagement.

The primary data collected during the trials are structured around the evaluation framework defined in D4.5, covering six trial objectives and a set of research questions addressing scientific validity, user experience, accessibility, social dimensions and exploitation potential. Survey data were collected digitally and processed in accordance with GDPR requirements; participant profiling data are presented in aggregated and anonymised form.

2.4.2 Data accessibility and reuse:

Primary data sources used in the preparation of Deliverable D4.6 and main outputs produced are listed in Table 1-2 below. Most ClimEmpower results are public and available for download under the terms of the CC-BY 4.0 international (deliverables) or CC-BY-NC 4.0 international (specific materials such as ClimEmpower educational reports and policy letters) license, from following locations:

- **ClimEmpower web site:** <https://climempower.eu>
- **CORDIS:** <https://cordis.europa.eu/project/id/101112728>
- **Zenodo:** <https://zenodo.org/communities/climempower/>

Table 1: Data used in preparation of ClimEmpower deliverable D4.6

Data set name	Format	Size	Owner & re-use conditions	Potential Utility within and outside	Unique ID
Deliverable D1.1 Community of Practice organisation and expectations	PDF	10,19 MB	Sensitive	Document is interesting, mainly because it provides information on CoP organisation. It is considered sensitive for privacy and confidentiality reasons.	N/A
Deliverable D1.2 ClimEmpower Scenarios	PDF	5 MB	CC-BY	Documents the needs and expectations of the five ClimEmpower regions. Also provides a simple methodology for assessing the regional resilience. Available on CORDIS and on the ClimEmpower web site	ClimEmpower D1.2
Deliverable D2.1 Climate Change resilience identified data, services, and gaps	PDF	6,02 MB	CC-BY	Documents the available data and services of interest for the ClimEmpower case studies, as well as the data gaps. Available on CORDIS and on the ClimEmpower web site	ClimEmpower D2.1
Deliverable D2.2 Climate Change resilience indicators	PDF	3,73 MB	CC-BY	Documents Climate Change resilience indicators and the methodology for deriving them. Available on CORDIS and on the ClimEmpower web site	ClimEmpower D2.2
Deliverable D3.1 ClimEmpower application architecture	PDF	9,65 MB	CC-BY	Documents ClimEmpower application architecture. Available on CORDIS and on the ClimEmpower web site	ClimEmpower D3.1
Deliverable D4.2 Educational materials for increased regional CC resilience v2	PDF	7,75 MB	CC-BY	Documents the way educational materials were collected and generated by the project. Available on CORDIS and on the ClimEmpower web site	ClimEmpower D4.2
Deliverable D4.4 Regional CC Resilience Recommendation v2	PDF	1,50 MB	CC-BY	Documents ClimEmpower resilience recommendations. Available on CORDIS and on the ClimEmpower web site	• ClimEmpower D4.4
ClimEmpower Climate Change educational resources (Knowledge hubs and educational materials tables)	Microsoft Excel (.xlsx)	150 KB	CC-BY	Two tables, providing a list of "aggregator pages" with (links to) curated educational materials on climate change adaptation and mitigation and examples of different types of educational materials that are resolving some of the educational needs of the ClimEmpower regional stakeholders.	https://doi.org/10.5281/zenodo.13944851
ClimEmpower Policy Letters	PDF	1.9 MB	CC-BY-NC	Available on ClimEmpower web site and Zenodo. Can be reused and adapted by regional authorities and other stakeholders for climate adaptation planning and governance processes.	https://doi.org/10.5281/zenodo.22211630

Table 2. Data produced in preparation of ClimEmpower deliverable D4.6

Data set name	Format	Size	Owner & re-use conditions	Potential Utility within and outside	Unique ID
Trial data (surveys, task logs, follow-up interviews)	XLSX, DOCX, PDF	Few MB	Sensitive GDPR applies. Participant data are anonymised and aggregated.	Available on the project document repository. Raw data behind this report. Useful for evaluating trial methodologies and community validation approaches in future research and replication activities.	N/A

2.4.3 Security and Ethics

The trial and validation activities documented in this deliverable carry significant implications for regional communities and institutions: they involve the collection of data from participants, the assessment of tools and recommendations linked to long term adaptation strategies and the engagement of stakeholders whose climate vulnerabilities may be unevenly distributed across social groups and territories. Addressing this responsibly calls for careful attention to equity and to the protection of participant data.

All data collected during the regional trials, including survey responses, task observation logs and follow up interview records, were handled in accordance with GDPR requirements. Participation was voluntary and informed consent was obtained from all participants. Profiling data, including information on organisation, role, professional background and demographic characteristics, are presented exclusively in aggregated and anonymised form throughout this deliverable.

In line with the ClimEmpower project's objectives, the validation activities were assessed against a Just Transition framework to ensure they are consistent with the principles of fairness, inclusivity and social equity. The participatory character of the trial process, in which CoP members directly contributed to evaluating and prioritising ClimEmpower tools and recommendations, reinforces this commitment. The region specific design of the trials further supports this aim, since each trial was adapted to the social, economic and territorial conditions of the respective region.

This process reflects the project's commitment to climate adaptation measures that strengthen resilience while also promoting a fair distribution of the burdens and benefits associated with the transition to a climate-resilient society.

3 Trial Overview

This chapter summarises the methodological framework, objectives, research questions and data collection instruments that structured the ClimEmpower regional trials and minitrials. Full trial specifications are documented in Deliverable D4.5 "ClimEmpower application and trial specifications", to which in possible to referred for regional scenarios, solution selection and execution planning.

3.1 Trial objectives

The **overarching objective agreed by all five trial teams was to simplify access to climate data and deliver user-driven decision-support tools** that empower local and regional authorities to design tailored climate adaptation measures that enhance co-benefits for resilience, sustainability and emission reduction. This shared ambition provided a common reference point across all five regions, while leaving room for each trial team to contextualise the work according to local needs and priorities.

Six specific objectives were defined in accordance with the SMART principle (Specific, Measurable, Achievable, Reasonable and Time-bound) and linked directly to the trial gaps identified in D4.5.

The first two objectives (O1 and O2) focus on the scientific and technical validation of platform outputs: **O1 addresses the usability and plausibility of ClimEmpower outputs** including hazard maps, climate and resilience indicators, and resilience recommendations; **O2 addresses the platform's ability to simulate the impacts of long-term climate change on regional vulnerabilities**, covering hazards such as heatwaves, droughts, floods and compound events. The following two objectives (O3 and O4) address the decision-support dimension: **O3 assesses whether ClimEmpower data, indicators and services can support regional and local authorities** in evaluating climate vulnerability and resilience at multiple spatial scales; **O4 assesses whether platform functionalities**, including micro-services, customisable dashboards and educational resources, **can improve climate adaptation planning and decision-making** in operational contexts. The final two objectives (O5 and O6) address the capacity-building and collaborative dimensions of the trial: **O5 assesses whether ClimEmpower educational resources enhance the ability of CoP members** to interpret climate data, understand risks and identify feasible adaptation options; **O6 assesses whether the platform facilitates stakeholder collaboration, knowledge-sharing and joint decision-making** for climate resilience planning.

3.2 Trial Guidance Methodology

The trials were designed and conducted following the Trial Guidance Methodology (TGM), originally developed by the DRIVER+ project and adopted by ClimEmpower as the framework for testing innovative solutions in real regional contexts. TGM combines principles from Design Thinking and AGILE development with a structured preparation process, defined roles and systematic evaluation tools, ensuring that the trial phase is both transparent and replicable across different territorial contexts.

Within ClimEmpower, the methodology was organised into three phases. The Preparation phase involved seven steps: contextualisation of the trial gap and regional context; definition of objectives; formulation of research questions; data collection planning; selection of

evaluation criteria and metrics; scenario building; and solution selection. The Execution phase involved the implementation of the trial scenario with CoP members, preceded by a dry run to test logistics and ensure that all participants and team members were familiar with their roles. The Evaluation phase covered the analysis of collected data, documentation of lessons learned and formulation of recommendations for improving the tested solutions.

The trials represented Phase 3 of the broader CoP engagement process developed over the course of the project, building directly on stakeholder activation, needs and gap identification, and indicator prioritisation carried out in WP1 and WP2. Participants in the trial workshops were therefore stakeholders who had been involved in ClimEmpower since its early phases, ensuring continuity between the co-design work and the final validation activities.

3.3 Research questions

The research questions operationalise the trial objectives and provide the specific points of enquiry against which data collection and evaluation were structured. They are grouped into four dimensions, each addressing a distinct aspect of the trial.

The **scientific and technical dimension [Sci]** addresses the accuracy, reliability and performance of platform outputs. Questions in this group explore whether ClimEmpower indicators and recommendations align with established climate datasets, whether maps and outputs are reliable for local decision-making, how effectively the toolbox integrates different data sources, and whether recommendations are actionable and technically feasible in real regional contexts.

The **user experience dimension [UX]** addresses the usability of the platform for non-specialist users. It covers the intuitiveness and navigability of the interface, the time required to become proficient, user satisfaction with visualisations and reports, the ease of customising the platform to specific regional needs, and the degree to which users feel confident in interpreting outputs independently.

The **user acceptance and sustainability dimension [Acc]** assesses whether stakeholders perceive the platform as genuinely useful and likely to be adopted in their work beyond the trial period. Questions explore whether outputs effectively support real-world decision-making, what factors influence willingness to adopt ClimEmpower, and how compatible the platform is with existing tools and institutional procedures.

The **socio-economic and ethical dimension [Soc]** captures the broader implications of platform adoption. It addresses the socio-economic benefits and challenges stakeholders anticipate, the ethical dimensions of relying on platform recommendations for adaptation decisions, the potential influence on local economic planning and resource allocation, and the longer-term consequences for institutional practices and governance capacity.

3.4 Data collection instruments

Data collection was structured around three main instruments, used in combination to capture both quantitative and qualitative evidence across the different phases of each trial.

A pre-workshop survey was administered to participants before the trial event. Its purpose was to establish a baseline understanding of participants' professional background, familiarity with climate resilience concepts and indicators, current use of digital tools for adaptation planning, and initial expectations of the platform. The survey combined Likert-scale questions, multiple-choice items and open-ended responses, and was designed to take approximately 10/15 minutes to complete.

Participant and observer task logs were used during the trial workshop itself. The participant log was designed to be concise and straightforward, enabling participants to record their actions, task duration, difficulties encountered and overall impressions in real time, without requiring specialist evaluation experience. The observer log, completed by team members monitoring the trial, required a higher level of detail, documenting task completion, participant behaviours, errors and points of confusion. Together, the two logs provided a multi-perspective account of the trial execution that complemented the self-reported data from participants. In several regions, interactive polling tools were used during the workshop to collect immediate quantitative feedback on platform usability, perceived relevance and anticipated socio economic benefits, providing an additional layer of real-time evidence alongside the task logs.

Follow-up interviews were conducted after each workshop to gather deeper qualitative insights on participants' experience of the platform, their assessment of its usability and relevance, and their views on the potential for adoption in their regional context. Interview questions were structured around the research question dimensions defined in Section 3.3.

All instruments were completed digitally to ensure consistent data capture and comparability across regions. Questionnaires included a "cannot assess" response option, allowing the evaluation team to distinguish between cases where participants lacked sufficient information to respond and cases where the trial itself did not provide adequate evidence for an informed assessment. All data were handled in accordance with GDPR requirements; profiling information is presented in aggregated and anonymised form throughout this deliverable.

4 Results of Regional Trials

This chapter presents the results of the five regional trials conducted in June 2026 in the ClimEmpower case study regions. Each section describes the context and profile of participants, the structure and conduct of the trial event and the main quantitative and qualitative findings emerging from the data collection instruments. All five sections are based on trial reports produced by the respective regional teams.

4.1 Sicily (Italy)

The ClimEmpower trial for the Sicily case study was held on 11 June 2026 in Palermo, organised by PLINIVS Research Centre of the University of Naples Federico II. The event brought together 12 participants, drawn predominantly from local and regional public administration (9), with further representation from policy and government bodies (1) and other professional backgrounds (2). No participants from research, academia, private sector or civil society organisations were present, reflecting the deliberately operational focus of the event: the workshop was designed to engage the public servants who would be the primary users of ClimEmpower tools in real institutional contexts.

The trial was structured around two parts. The first presented the PLINIVS methodology for climate verification (the mandatory procedure for infrastructure investments financed by European funds under Regulation (EU) 2021/1060 (European Parliament and Council of the European Union, 2021)) and illustrated how ClimEmpower outputs integrate into screening and detailed analysis phases. The second part introduced the ClimEmpower platform, its component library and dashboard and the educational materials available through the project, followed by a hands-on task session in which participants worked directly with the platform.

Quantitative results, collected through the Mentimeter polling tool during the workshop, showed a generally positive assessment of the project's relevance and outputs. Participants rated the relevance of the results to their daily work at 8.4 out of 10, and the platform's capacity to support action planning at 8.1 out of 10. The ability to instil confidence in decision-making processes was rated 8.0. Ease of understanding and interpretation received a lower score of 6.9, and the ability to reveal surprising insights was rated 6.1. In terms of platform perception, satisfaction with the workshop organisation was rated 8.6, perceived improvement in local resource allocation 7.4, overall satisfaction with ClimEmpower 6.8, support for ethical decision-making 6.5, and perceived improvement in local economic planning 6.5. In terms of anticipated socio-economic benefits, support for planning and priority setting was identified as the most significant benefit (12 votes), followed by activation of regional stakeholder knowledge (8 votes) and reduction of losses from cascading climate risks (8 votes).

The qualitative feedback gathered through the workshop and the subsequent follow-up interview with regional representative highlighted several critical areas. Participants found it difficult to interpret the platform's metrics, citing the absence of colour legends on maps, unclear definitions of displayed indexes, and unspecified units of measurement as significant barriers. They requested map overlay capabilities, distinct indicator labelling, and the ability to export maps and recommendations for use in planning documents. Future scenario projections and the ability to model distinct planning and design hypotheses were identified as particularly desirable functionalities. High interest was expressed in educational materials concerning surface permeability, water treatment, and climate-resilient construction materials,

although several participants noted they had not yet had sufficient time to evaluate the training documentation.

The interview with the responsible person provided sharper institutional context. He framed the platform as a macro-advisory tool useful for problem framing rather than a site-specific planning instrument and emphasised that its long-term adoption would require active sponsorship from the Region of Sicily, sustained promotion among local municipalities and the development of site-specific extensions tailored to individual Functional Urban Areas. He also clarified that for public officials, ethical decision-making is understood as scientific validation, the ability to defend planning decisions on robust methodological grounds.

4.2 Andalusia (Spain)

The ClimEmpower trial for the Andalusia case study was held on 16 June 2026 at the Aguas de Torremolinos premises. The event was organised as a Community of Practice trial session combining presentations of hazard mapping methodologies with a hands-on platform testing workshop and a stakeholder survey. Participants included technical staff from local and municipal authorities, emergency management professionals, and representatives from environmental and civil protection organisations, reflecting the operational orientation of climate adaptation planning in the region.

The trial opened with presentations on the methodologies developed for flood hazard and risk mapping, followed by sessions on heatwave, drought and wildfire risk maps. The platform testing phase then invited participants to interact directly with the ClimEmpower application. The session concluded with an open discussion and the administration of the participant survey.

Feedback on the hazard mapping methodologies was broadly positive. Flood mapping products were judged useful, practical and directly applicable to municipal risk management and planning activities. Participants showed strong interest in the pedestrian and vehicle hazard classification criteria, which they considered particularly valuable for municipalities and emergency planning. Questions were raised regarding the climate projections used, specifically whether the maps were based on the IPCC Sixth Assessment Report and whether future updates would incorporate newer assessment frameworks. The replicability of the Andalusian methodology in other regions was also discussed, generating interest in understanding the technical requirements and costs of transfer. The heatwave, drought and wildfire risk maps were positively received, particularly for their transferability and applicability.

Feedback on the platform was more mixed. The most frequently mentioned issue was the absence of multilingual support: participants noted that the platform is currently available only in English, which could limit adoption among municipal technical staff, particularly in smaller municipalities. The platform was generally judged as too complex for some intended users, with requests for a simplified interface presenting a limited number of key functionalities relevant to legally required municipal plans and procedures. Technical terminology and the density of available information were identified as barriers to usability for non-specialist users. On decision-support capabilities, participants expressed strong interest in linking adaptation measures directly to risk indicators, so that users can select a resilience or adaptation measure and immediately assess its potential impact on risk levels, a functionality that would significantly strengthen the platform's role in resilience planning. The need to establish clearer links between risk maps, emergency plans and operational procedures was also emphasised.

In the participant survey, platform intuitiveness was rated "fairly intuitive" by the majority of respondents (7 out of 12), with 3 selecting "slightly intuitive" and 1 each for "not intuitive" and "very intuitive". Report generation emerged as the most challenging feature (8 votes), followed by scientific terminology and platform navigation (5 votes each). In terms of overall evaluation, the value of project results for the organisation was rated 4.3 out of 5, overall satisfaction with ClimEmpower 4.1, perceived impact on decision-making 3.3, and compatibility with existing organisational tools and procedures 2.4. The low score on compatibility confirms that integration into current municipal workflows remains a significant challenge. Satisfaction with the event organisation was rated 4.5 out of 5.

The main recommendations emerging from the trial were: improving platform usability through simplification of terminology, navigation and visualisation; developing multilingual support; strengthening the link between risk maps, indicators, adaptation measures and emergency planning processes; exploring mechanisms for assessing the impact of adaptation measures on risk indicators; updating map legends and visualisation elements; and conducting additional pilot workshops with municipal technicians from municipalities of different sizes to better understand operational needs.

4.3 Osijek-Baranja County (Croatia)

The ClimEmpower trial for the Osijek-Baranja County case study was held on 17 June 2026 in Osijek. The event engaged 24 participants, the largest attendance across the five regional trials. The participant profile was dominated by public administration representatives (10, 41.7%), followed by members of the academic community (7, 29.2%), agriculture and forestry professionals (4, 16.7%) and other backgrounds (3, 12.5%). No participants from industry or utility services attended, a gap noted in the analysis as limiting coverage of sectors critical to infrastructure, water supply and energy.

The trial followed the structured scenario developed for the Croatian case study, involving a demonstration and guided testing of the ClimEmpower platform. A second Mentimeter session was administered after the testing phase to capture participants' responses once they had direct experience of the tool. Data collection also included observer questionnaires completed by the monitoring team.

The overall assessment was predominantly positive. Participants perceived ClimEmpower primarily as a planning and decision-support instrument rather than a general information platform, with support for decision-making emerging as the most frequently cited expectation. The most interesting components of the tool were ranked in the following order: resilience recommendations, risk maps, display of regional resilience indicators, additional components. The thematic priorities identified for Osijek-Baranja County were drought, floods, water regimes and agriculture, a professionally expected outcome given the strong connection between climate risks and agricultural production, water management and rural development in the region.

Qualitative responses confirmed the high potential attributed to the tool while highlighting the need for locally relevant, up-to-date and credible data, and clearer explanations of graphs, indicators and methodology. Open-ended responses emphasised that participants were not looking only for general information but for tools that can be integrated into local and regional planning processes, connecting climate data, spatial risks, vulnerable sectors, concrete adaptation measures and investment prioritisation. The event organisation received extremely

high ratings. The presence of a single respondent expressing rejection of the scientific consensus on anthropogenic climate change was noted in the analysis and was considered a reminder of the importance of careful communication strategies in outreach activities.

The comparative analysis of Mentimeter responses and the observer questionnaire, produced by the Croatian team, confirmed that the strongest interest was concentrated in operational and planning applications of the platform, and that the academic participants contributed a more methodological perspective, with questions focused on data quality, indicator design and scientific robustness. The absence of industry and utility service representatives was identified as a limitation to be addressed in future engagement activities.

4.4 Region of Central Greece

The ClimEmpower trial for the Region of Central Greece case study was held on 2 July 2026 at the Department of Environment of the Region of Central Greece in Lamia, organised by the regional team. The event served as the concluding stakeholder engagement activity for the Greek case study, combining a presentation of the main project outputs with a hands-on platform testing session. The professional background of participants combined academic expertise with experience from regional public administration, reflecting the institutional context in which ClimEmpower tools would be expected to operate.

The session was structured around three main activities: a presentation of the key outputs produced during the project, with particular focus on results relevant to the Region of Central Greece and especially its agricultural areas; a demonstration and hands-on testing of the ClimEmpower platform, with participants invited to navigate the application independently; and an open discussion session. The agenda also included a presentation of the CLIMAAX programme and illustrative risk maps for a case study in the Thessaloniki Metropolitan Area, providing additional context for the discussion of climate-related risks. The trial followed a structured scenario in which participants were divided into groups, with one operator per computer and one or two observers and worked through a step-by-step tutorial based on the specific needs of the region.

The quantitative results from the user questionnaire were broadly positive. The initial perception of the platform was described as combining a sense of practical value with genuine interest in its capabilities. Navigation was assessed as very user-friendly, with no major usability barriers emerging during initial exploration. The platform was considered a high-value core tool for organisational decision-making, positioned as more than a supplementary information source. The strongest shared use cases identified by participants were long-term climate adaptation planning and public awareness and stakeholder communication, with further potential noted for civil protection, emergency threat mapping, spatial planning, infrastructure risk assessment and regulatory reporting. Compatibility with existing digital tools and GIS platforms received a cautiously positive assessment, with the caveat that organisations without comparable systems may find it difficult to assess interoperability in advance. The most consistent challenge identified was the limited availability of high-resolution local data, which constrains planning use. Overall, mobilising the knowledge of regional stakeholders was identified as the clearest anticipated benefit, followed by providing an objective basis for planning and prioritising climate adaptation actions.

The observer questionnaire, completed from the perspective of a services-sector participant from the Region, confirmed the positive overall assessment. The dashboard was evaluated as

easy to use and navigate, and the Mashup function was considered user-friendly. Risk maps received positive ratings for clarity, reliability and usefulness for local and regional decision-making. Resilience indicators and their charts were considered distinguishable, usable and sufficiently reliable for supporting local decisions. The connection between resilience indicators and corresponding recommendations was rated especially highly, confirming that the platform successfully links diagnosis with possible action. However, independent interpretation of maps, indicators and recommendations received neutral ratings across all dimensions, indicating that explanatory guidance, metadata and plain-language definitions remain important gaps. A specific limitation was noted regarding recommendations presented in languages other than English, which can reduce accessibility for non-English-speaking users. Overall satisfaction was rated at four out of five.

The Mentimeter consultation confirmed the generally positive reception. Expectations for the event were described as high, with strong interest in outputs that could move beyond research and support practical climate adaptation at regional level. The presented results were considered very interesting, and the programme was viewed as meeting expectations so far. The main long-term contribution anticipated by participants was the more systematic use of climate data in regional decision-making, together with stronger cooperation between policymakers and the scientific community. The expected effect on local planning and resource allocation was assessed as limited or uncertain, with participants noting that the link between project results and formal planning and budgeting processes has not yet been fully demonstrated. The platform's results were considered useful to very useful for the region, with their primary value identified in supporting climate-risk awareness and institutional capacity-building. Overall satisfaction with the results was rated as very high.

The follow-up interview with the Parliamentary Office in Evia described the platform as useful for obtaining an initial overview of an area and for identifying problems, while noting that the absence of local data would prevent its use for formal planning purposes at this stage; highlighted the value of the platform's combined map-based data and recommendations, which reduce the time needed to gather and synthesise relevant material. He considered the platform scalable to other regions of Greece, while emphasising that each region has different characteristics and needs and that results should not be adopted without contextualisation and adaptation. He identified reliable and up-to-date data as the primary condition for effective institutional adoption and noted that map export functionality would significantly improve compatibility with existing institutional communication practices, including presentations at council and committee meetings. On the question of socio-economic impact, he described the platform as a prevention tool with positive long-term potential for protecting citizens and safeguarding the primary sector, while acknowledging that its influence on formal economic planning and resource allocation would take time to become visible. He indicated that civil protection departments at regional level would be the most immediate institutional beneficiaries, and that municipal departments could also benefit if the platform were enriched with local data.

4.5 Troodos Mountain Area (Cyprus)

The ClimEmpower trial for the Troodos Mountain Area case study was held on 9 June 2026 at the Atsas Educational Centre in Skouriotissa, jointly organised by the Troodos Development Company, ANET and the Frederick Research Center, FRC. The event served as the third and final Community of Practice meeting for the Cyprus case study, bringing together 11 participants representing local and regional authorities (5), non-governmental organisations

and civil society (3), academic and research organisations (2), and civil protection and risk management (1).

The meeting was structured around three main activities: an overview of the ClimEmpower project and its Community of Practice process, a presentation of the ClimEmpower website and platform application by the project's technical coordinator via online connection, and a presentation of quantitative findings on current and projected climate risks in the Troodos Geopark by the Frederick Research Center. An interactive Mentimeter consultation was conducted throughout the event to collect participants' feedback, and an open discussion and a follow-up interview with the Mayor of Kyperounta concluded the session.

The quantitative risk assessment presented during the meeting provided a detailed picture of the climate pressures affecting the Troodos region. Temperature trends show a clear upward trajectory, with mean annual temperature increasing by approximately 0.38°C per decade and mean maximum temperature by approximately 0.53°C per decade, alongside an increase of approximately 4.85 hot days per decade. Wildfire exposure was identified as the most severe risk factor: approximately 71.45% of the Geopark was classified as having very high exposure to combustible fuel, with the fuel exposure index estimated at 0.838 and the ecosystem exposure index at 0.839. Forests and shrubland together account for approximately 72% of the Geopark area, confirming the strongly natural character of the landscape and its high sensitivity to fire. The overall preliminary climate risk index was estimated at 0.601, placing the region at the boundary between moderate and high risk. Access to emergency medical services was identified as a significant social vulnerability: only 22.21% of the population is located within approximately five minutes of a first-aid service or hospital, with specific communities including Kato Pyrgos, Kampos, Lemithou, Gerakies and Mylikouri identified as particularly exposed due to ageing population structures and limited accessibility.

Mentimeter results indicated a broadly positive reception of the project. Seven out of 11 respondents stated that ClimEmpower had met their expectations, while four found it slightly below their expectations. The most frequently anticipated long-term contributions were more systematic use of climate data (6 responses), stronger connection between science and policy (5), greater participation of local actors (5) and exchange of knowledge and experience (5). The usefulness of the presented information for the region received the strongest positive ratings: 5 out of 10 respondents rated it as having very high value and 4 as having high usefulness. The expected impact on ethical decision-making was unanimously positive, with 7 respondents indicating a rather positive impact and 4 a positive impact, and no neutral or negative responses. The perceived impact on local economic planning and resource allocation was more cautious, with 7 out of 11 respondents indicating no direct impact anticipated, though without negative assessments.

The open discussion confirmed the overall positive reception while identifying important limitations. Participants noted that several outputs remained relatively general and called for more detailed and locally specific analysis, particularly regarding risk maps and spatial outputs. The need for tailored educational material usable in schools, training activities and awareness-raising initiatives was strongly expressed. Participants indicated a preference for depth over breadth in future analysis, fewer aspects examined in greater detail, with specific priorities including local wildfire exposure, heat-related vulnerability of individual communities, water stress and emergency access.

The follow-up interview with the Mayor of Kyperounta, provided a grounded institutional perspective. He described the platform as a good starting point for understanding the general picture but noted that maps and outputs were not yet sufficiently precise for local decision-making, where small differences in altitude, vegetation, road access or distance from services significantly affect risk profiles. He indicated that the platform's value would be much higher if outputs were simple, practical and linked to the real needs of communities, and emphasised that it should support decision-making rather than replace the local knowledge of those who know the territory well. He identified trust, accuracy, simplicity and usefulness as the key factors for institutional adoption and noted that long-term use would depend on the platform's ability to produce locally relevant outputs, factsheets, maps and summaries directly usable in municipal documents and presentations.

5 Mini-Trials and Follower Regions

This chapter presents the mini-trial activities conducted with follower regions in the final phase of the ClimEmpower project. Mini-trials are simplified versions of the full regional trials designed to assess the replication potential of the ClimEmpower approach in territorial contexts beyond the five case study regions. Unlike the full trials, which engaged established Communities of Practice in hands-on platform testing, the mini-trials were conducted with follower region stakeholders who had not participated in the co-design process and were encountering the ClimEmpower tools and outputs for the first time.

The mini-trial methodology was adapted to this context. Rather than a hands-on testing session, each event combined a presentation of project results and platform capabilities with a demonstration of the ClimEmpower application, an interactive Mentimeter consultation, and a one-to-one interview with a regional representative. Data collection covered three main areas: **(i) the educational library and AI-supported learning environment, (ii) the platform demonstration and mapping interface, and (iii) demographic and social inclusion dimensions** as required under the Horizon Europe framework. The evaluation framework followed the same research question dimensions used in the full trials, adapted to assess perceived potential, scalability and transferability rather than direct user experience. Although the mini-trials retained the same overall evaluation logic as the full trials, their emphasis was deliberately different. Rather than validating intensive hands-on use by an established Community of Practice, they focused on first-time user perception, transferability and exploitation potential. Particular attention was therefore given to the educational library and AI-supported learning environment as potentially replicable project assets, alongside the demonstration of the mapping and decision-support platform. The depth of evaluation of these components varied between follower regions according to the participants' institutional profile and local priorities.

The data collection instruments used in the mini-trials were: a structured questionnaire administered after the event, covering the educational library, the platform demonstration and demographic information; an interactive Mentimeter consultation conducted during the event, structured around five question groups covering participant expectations, initial reactions to project results, impressions of the platform demonstration, socio-economic research questions, and overall satisfaction; and a one-to-one interview with a follower region representative, addressing scientific, acceptance, socio-economic and exploitation dimensions.

The exploitation dimension (Exp) was included as an additional research question category specific to the mini-trials, covering the scalability and transferability of ClimEmpower solutions, the likelihood of recommending the framework to peer institutions and neighbouring regions, the institutional conditions required for sustained adoption, and the potential for embedding ClimEmpower or similar tools into official local mandates or long-term planning frameworks.

A total of five mini-trials were conducted with follower regions: Campania (Italy), Costa del Sol (Spain), Osijek-Baranja County follower region (Croatia), Region of Western Greece (Greece), and Sitia UNESCO Global Geopark, Crete (Cyprus follower).

Each event combined a presentation of project results and platform capabilities with a demonstration of the ClimEmpower application, an interactive Mentimeter consultation and,

where applicable, a follow-up interview with a regional representative. Data collection covered three main areas: the educational library and AI-supported learning environment, the platform demonstration and mapping interface, and demographic and social inclusion dimensions. The evaluation framework followed the same research question dimensions used in the full trials, adapted to assess perceived potential, scalability and transferability rather than direct user experience.

5.1 Campania (Italy)

The Italian mini-trial was held on 8 July 2026 and organised by PLINIVS, hosted online for a duration of approximately 90 minutes. The session targeted municipal decision-makers and technical officers responsible for spatial planning, GIS management and climate adaptation policies within local authorities in the Campania region, with participation from the urban planning department of the Municipality of Naples. The session evaluated three core components: downscaled multi-hazard mapping covering heatwaves, pluvial flooding and drought risks at urban scale; the ClimEmpower decision-support platform, including its modular dashboard and widget library; and the educational library and AI assistant. Methodological presentations detailed downscaled climate metrics including the Standardised Precipitation Index, pluvial flood levels and projected heatwave days to 2058 and 2070. The platform demonstration covered Copernicus dataset integration, NASA FIRMS fire data and the RAG AI assistant. Feedback from the single respondent, an urban planning and GIS specialist from municipal administration, was broadly positive. The educational library was described as promising in potential and quite intuitive, with AI-generated formats including presentations, mind maps and simplified summaries all rated as very useful. The most confusing aspect was understanding the relationship between project deliverables and educational content. The platform was described as functional and quite intuitive, with spatial planning and infrastructure risk assessment identified as the primary institutional contexts for use. Map reliability was assessed as moderate, with the absence of local data identified as the main limiting factor for planning applications. Technical interoperability with existing desktop GIS environments was identified as the primary adoption barrier, with participants emphasising that web visualisers cannot replace GIS software such as QGIS or ArcGIS and that direct API export of vector and raster layers is an essential requirement. Additional requests included temporal climate projection sliders for intermediate horizons aligned with municipal planning cycles. The platform was considered partially compatible with existing GIS tools, requiring minor adaptations. Continued free and open-source access was identified as a condition for future institutional adoption.

The mini-trial identified two primary replication pathways: publication of downscaled risk layers in regional open geospatial archives to overcome user inertia and grant official status to outputs; and targeted training on exporting spatial data directly into desktop GIS environments. Overall satisfaction with the session was positive, with equal opportunity for participation rated at 4 out of 5.

5.2 Costa del Sol (Spain)

The Andalusian mini-trial was held on 7 July 2026 as an online session via Google Meet, organised by the Andalusian trial team with support from the Málaga Province Council and regional administration. Seven participants attended, including three from regional government, one from local administration and three from the private sector. The session combined methodological presentations on hazard mapping, a guided platform demonstration,

a review of educational resources, a live Mentimeter survey and an open discussion. The Mentimeter results provided a concise quantitative picture of participant perceptions. Platform visualisation clarity was rated at an average of 3.3 out of 5, indicating a generally positive but improvable assessment of the communication of results. Perceived reliability of maps and outputs received an average score of 3.8 out of 5. The socio-economic impact of the project in the Costa del Sol area was assessed more cautiously, with an average score of 2.8 out of 5, reflecting uncertainty about the broader economic implications rather than a negative assessment. When asked what would increase confidence in the results, the most frequently selected factor was the use of local data (6 responses), followed by clear metadata and validation with historical events (4 each), institutional endorsement (3) and an explanation of uncertainties (3). Participants indicated they would primarily use ClimEmpower for climate adaptation, spatial planning and public communication. The most frequently mentioned barrier to adoption was the lack of technical staff or specialised knowledge, followed by organisational resistance to change. The platform's contribution was rated most highly for better risk management (4.2 out of 5) and improved climate planning (3.8), with lower scores for improved coordination among actors (2.7).

The open discussion highlighted that crowdsourcing data were currently outdated and that participants expected them to be updated in near real time once the platform became fully operational. Future climate scenarios for drought, heatwave and wildfire risk maps were requested for horizons beyond 2026. The actionability of the resilience recommendations received moderate assessment, with participants indicating that further operational detail would be needed to support implementation. Regarding replication, participants confirmed that the hazard mapping results would be published in REDIAM, the regional environmental data repository of the Regional Government of Andalusia, an important step for reducing barriers to uptake and providing the outputs with an official institutional status that could facilitate their use by local authority staff.

5.3 Osijek-Baranja County Follower Region (Croatia)

The Croatian mini-trial was held on 17 July 2026 as an online session, organised by the Croatian trial team. Thirteen participants attended, drawn from the Faculty of Electrical Engineering and Computing, the Austrian Institute of Technology, the Croatian Agency for Agriculture and Food, the Society for Permaculture, the Faculty of Agrobiotechnical Sciences, the Department for Biology and Croatian Water Management. The session was organised at a challenging time given summer holiday schedules, which limited participation compared to the full trial. The session opened with the presentation of the main results of the ClimEmpower project. The platform's objectives and case-study logic were summarised, with particular emphasis on the long-term usability of outputs, their transferability beyond the original case study regions and the combination of digital, data-driven and educational resources. An updated version of the platform was demonstrated, allowing participants to observe improvements made since the full trial held a month earlier. The educational materials were also presented in detail, covering their location, structure, available topics and interactive possibilities. The discussion that followed focused on exploitation and further use of the platform and deliverables. The overall conclusion reached by participants was that ClimEmpower tools should be used by communities when preparing climate-related plans, strategies and projects, each organisation applying the outputs within its own field of expertise, at minimum as an auxiliary resource. The most consistent feedback was that the platform

needed to be easier to use, more regularly updated and continuously maintained, while being recognised as a strong foundation for future development.

5.4 Region of Western Greece (Greece)

The Greek mini-trial was held on 22 July 2026 as an online session via Google Meet, organised by the Central Greece trial team. The follower region selected for the mini-trial was the Region of Western Greece. The session presented the project's educational materials and the ClimEmpower application, and data were collected through a structured Mentimeter consultation and a follow-up interview with Stefanos Papazisimou, from the Department of Environment, Climate Resilience and Spatial Planning of the Region of Western Greece. The Mentimeter results indicated a broadly positive assessment. The educational library created a positive first impression, was considered intuitive and was judged particularly valuable for saving time when searching for relevant information and for adapting content for different audiences. Presentation and slide formats were rated as the most useful AI-generated formats. The main difficulty identified was understanding how to interact with the AI tools. The mapping platform was assessed as fairly intuitive, with no major navigation difficulties, and maps and model outputs were considered mainly reliable for supporting local decision-making, though users noted they should be used as a supporting evidence base rather than as a substitute for local analysis. The most likely applications identified were long-term climate adaptation planning, policy support, spatial planning, infrastructure risk assessment and public awareness. The main barriers to adoption were identified as limited internal technical expertise, possible interoperability issues with existing GIS systems, lack of high-resolution local data and time-consuming internal procedures. Continued free access was identified as the primary condition for future adoption, and local data upload and integration was identified as the most important priority for future development.

The follow-up interview provided an institutional perspective on replication potential. The platform giving a good overall picture of climate risks, while noting that each Greek region has its own Regional Climate Change Adaptation Plan and that platform outputs would need to be aligned with regional priorities and supplemented by local municipal data before being used for formal planning purposes. The platform is also considered scalable and transferable as a methodology, while emphasising that data collection and customisation would require additional work for each region. Key factors influencing adoption were identified as data availability and quality, ease of use, compatibility with existing systems, staff time requirements and free or publicly funded access; with those aspects the platform could influence local economic planning and resource allocation by helping identify the most exposed areas and providing an objective basis for prioritising adaptation actions, provided that results were formally connected to regional plans and established budgeting procedures. The interview ended with the willingness to recommend ClimEmpower to peer institutions and neighbouring regions, with the qualification that regional customisation and use alongside local expertise and existing planning tools would be essential.

5.5 Sitia UNESCO Global Geopark, Crete

The Crete mini-trial was held on 20 July 2026 as a focused online expert validation session, and involving expert stakeholder, the Coordinator of the Sitia UNESCO Global Geopark and Deputy Head for Geopark and Sports at the Municipality of Sitia. The session presented the ClimEmpower project context, principal outputs and deliverables, the website and digital application, the approach to climate-risk assessment and resilience planning, and selected

educational material including the Fire Detective Guide, a 33-page awareness resource designed for children aged 10 to 14. The Mentimeter consultation collected the expert participant's assessment across 13 questions. The climate phenomena perceived as most intensely observed in the local area were drought, coastal erosion and floods, providing a locally specific priority signal for any future adaptation of ClimEmpower outputs to the Sitia context. The ClimEmpower results were rated as very relevant to local climate challenges, and a similar initiative was considered extremely useful for the area. The presentation met expectations, and the overall impression of project results and deliverables was described as quite impressed. Both the ClimEmpower application and website were rated as very useful. Transferability to Sitia was considered feasible but requiring significant adaptation to local data. The main barriers identified were lack of infrastructure, weak cooperation among stakeholders and policy gaps. The three outputs considered most useful were the digital application, climate and environmental data, and educational and information material. The participant confirmed definite organisational interest in using or testing a similar climate-resilience tool in the future.

The mini-trial discussion confirmed that the educational guide attracted particular interest from the participant, who described the material as very interesting and requested the full document for potential future use within the Geopark. The discussion reinforced the Mentimeter finding that educational and informational outputs are among the project's outputs with the greatest perceived local value in a geopark management context, where public engagement, geodiversity education and environmental communication are core institutional functions. The mini-trial report notes that the results reflect the professional judgement of a single expert stakeholder and should not be generalised, but identifies a concrete stakeholder environment in which a future locally adapted pilot or co-design activity could be developed.

6 Cross-regional analysis and lessons learnt

This chapter synthesises the trial results across the five case study regions. The analysis draws on quantitative data from participant surveys and interactive polling sessions, qualitative findings from observer questionnaires and follow-up interviews. Where relevant, findings are presented across the four research question dimensions defined in Chapter 3: scientific and technical performance (Sci), user experience (UX), user acceptance and sustainability (Acc), and socio-economic and ethical implications (Soc).

6.1 Regional trial findings at a glance

To facilitate cross-regional comparison, the table below summarises the main validation findings across the five pilot regions. Since the trials used different data collection instruments and response scales, the 1–5 ratings should be interpreted as an evidence-based synthesis of the reported quantitative and qualitative results rather than as pooled statistical averages. Their purpose is to make the main patterns easier to compare, while the region-specific sections retain the underlying evidence and original scores.

Table 3. Comparative summary of findings from the five regional trials

Region	Strategic relevance	Platform usability	Independent interpretation	Operational integration	Main constraint
Sicily	4.0/5	3.5/5	3.5/5	3.0/5	Missing legends/units, export functions and local specificity
Andalusia	4.5/5	3.5/5	3.0/5	2.5/5	Language, complexity and compatibility with municipal workflows
Osijek-Baranja	4.0/5	4.0/5	2.5/5	2.5/5	Low confidence in independent interpretation and need for clearer data provenance
Central Greece	4.0/5	4.0/5	3.0/5	3.0/5	Local data integration, explanatory guidance and export functions
Troodos Mountains	4.5/5	3.0/5	2.5/5	2.5/5	Local-scale precision, complex topography and need for directly usable outputs

Overall finding. Across all five pilot regions, perceived strategic relevance was consistently higher than operational readiness. Stakeholders recognised the value of ClimEmpower for climate-risk awareness, planning and decision support, but routine institutional use remains conditional on better interpretability, localisation, local data integration and compatibility with existing administrative and GIS workflows.

6.2 Follower-region findings at a glance

The follower-region results show that replication potential does not depend on transferring the entire ClimEmpower suite unchanged. Different territories identified different components as their most immediately useful entry point. The comparative ratings below therefore summarise perceived value and transferability rather than direct operational performance. As for the pilot scorecard, they are evidence-based synthesis ratings and not harmonised survey averages.

Table 4. Comparative summary of findings from the five follower-region mini-trials

Follower region	Educational AI value	/ Digital platform value	Replication potential	Main condition for uptake
Campania	4.0/5	4.0/5	3.0/5	Direct GIS export/API access, local data and continued open access
Costa del Sol	3.0/5	3.5/5	3.5/5	Local data, transparent metadata, historical validation and sufficient technical capacity
Osijek-Baranja follower	3.5/5	3.5/5	3.5/5	Simpler use, regular updates and long-term maintenance
Western Greece	4.5/5	4.0/5	4.0/5	Local data integration, interoperability and continued free/publicly funded access
Sitia Geopark	5.0/5	4.5/5	3.5/5	Adaptation to local conditions and stronger institutional cooperation

Overall finding. The mini-trials indicate that ClimEmpower is most transferable when treated as a modular set of resources rather than as a single fixed product. Technical administrations tended to prioritise local data, GIS interoperability and integration with existing planning systems, whereas educational and outreach-oriented institutions placed particularly high value on the educational library, AI-supported content generation and locally relevant awareness materials. The Sitia mini-trial illustrates this distinction particularly clearly, with the Fire Detective Guide emerging as an immediately exploitable output.

6.3 Key cross-regional findings

1) Strategic value exceeds operational readiness.

Across the pilot regions, stakeholders consistently recognised ClimEmpower as relevant for climate-risk awareness, planning and evidence-based decision support. However, this positive strategic assessment did not consistently translate into confidence in independent day-to-day use.

2) Trust is an interpretability and transparency issue as much as a scientific one.

Users need to understand what a map represents, which data and assumptions it is based on, when the data were updated and what uncertainty or spatial limitations apply. Clear metadata, legends, units and methodological explanations are therefore essential for both usability and trust.

3) Institutional adoption depends on integration rather than additional features.

The recurring requests were not primarily for more platform functions, but for localisation, local data, GIS interoperability, exportable outputs and stronger links with existing plans and administrative procedures. The next development priority should therefore be operational integration rather than functional expansion.

4) Replication can follow different pathways.

The follower regions confirmed that the full technical platform is not necessarily the most valuable entry point in every context. Educational resources, AI-supported learning tools, risk maps, recommendations and awareness materials can each provide independent replication pathways depending on institutional needs.

6.4 Lessons learnt and priority actions

The regional trials point to five priorities for further development:

Lesson learnt	Priority action
1. Design for interpretation, not only access. Users need sufficient context to understand and trust outputs.	Provide persistent legends, units, plain-language definitions, methodological explanations and localisation.
2. Local data become increasingly important as use moves from screening to operational planning.	Facilitate integration of municipal and regional datasets and communicate spatial limitations clearly.
3. Transparency supports institutional trust.	Make provenance, reference periods, update dates, assumptions, uncertainty and validation evidence accessible.
4. Tools need to complement existing workflows.	Strengthen GIS interoperability, export/reporting and integration with administrative processes.
5. Decision support is more valuable when evidence is connected to action.	Make links between indicators, vulnerabilities, recommendations and adaptation measures more explicit.
6. Institutional embedding is essential for sustained use.	Align outputs with existing planning, budgeting, emergency-management and environmental-data processes.
7. Different users require different exploitation pathways.	Preserve the modularity of ClimEmpower and support different entry points for technical, planning, educational and outreach users.

Overall implication: the trials demonstrate that ClimEmpower has practical value and significant replication potential, while also identifying the conditions required for sustained institutional uptake.

7 Conclusions

This deliverable reports the results of the community testing and validation phase of ClimEmpower, building on the stakeholder engagement initiated through the Communities of Practice and developed through needs identification, indicator prioritisation, and the subsequent testing and validation activities. The trials provided an opportunity to assess the project's tools, services and resilience recommendations in real regional contexts and with stakeholders involved throughout this process.

Overall, the **results provide strong evidence that ClimEmpower addresses relevant institutional needs**. Across the pilot regions, stakeholders recognised the value of the platform, hazard mapping methodologies, resilience indicators and recommendations for climate-risk awareness, planning and decision support. The follower-region mini-trials further demonstrated that the ClimEmpower approach can be transferred to different territorial and institutional contexts, with different components offering value to different types of users.

The trials also showed that **relevance does not automatically translate into routine use**. While the strategic value of ClimEmpower was consistently rated positively, operational use remains dependent on factors such as local relevance, interpretability, data transparency and integration with existing institutional workflows. These findings provide an important evidence base for the project's exploitation, sustainability and replication activities.

The overall conclusion is therefore positive: **ClimEmpower has demonstrated both practical value and replication potential, while the trials have also identified the conditions needed to realise this potential beyond the project**. The priority for the next phase is not simply to expand the functionality of the platform, but to consolidate its existing results, strengthen their usability and local relevance, and embed them in the institutional contexts where climate adaptation decisions are made.

8 References

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