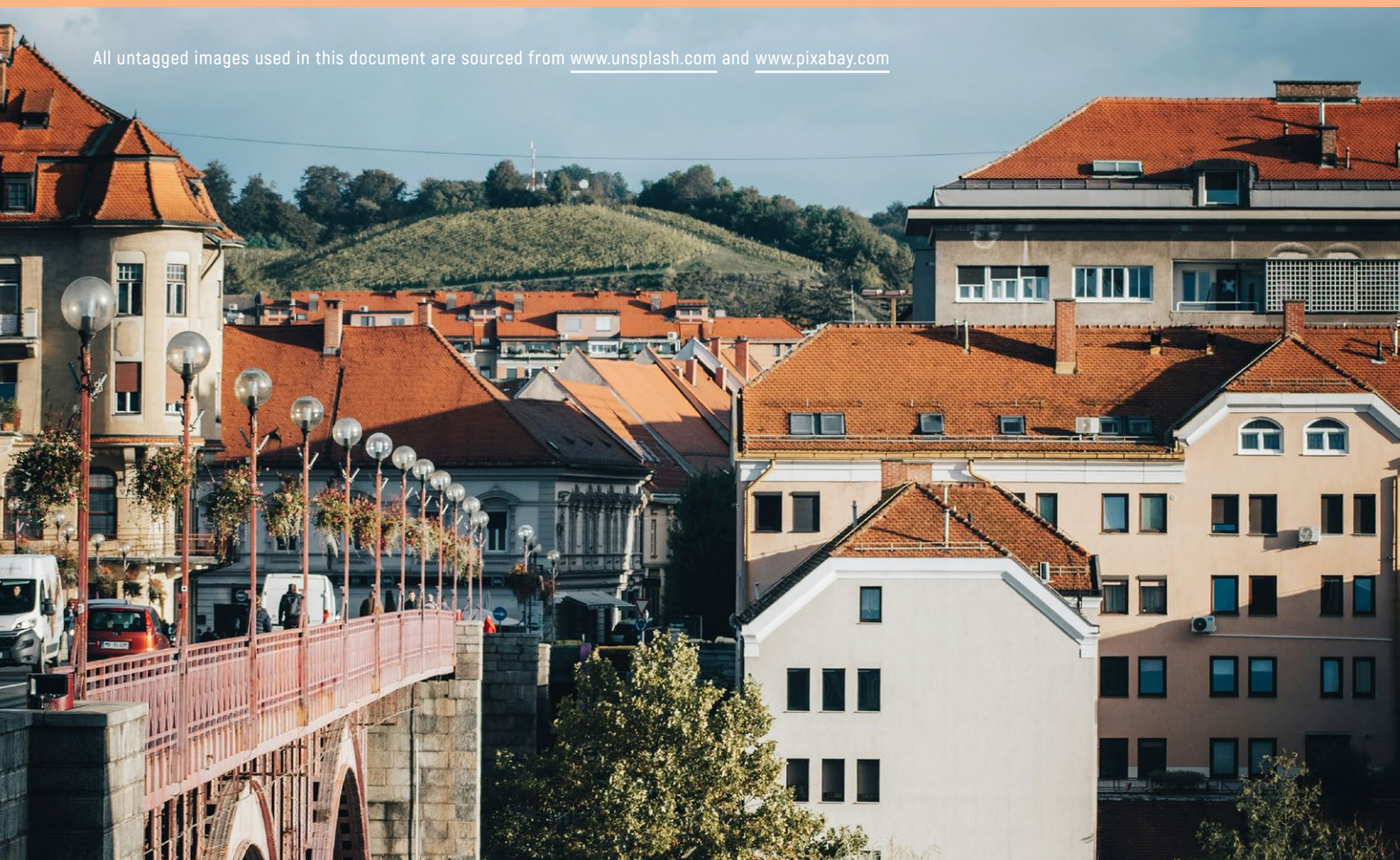


IGNITING COMMUNITY-LED CLIMATE INITIATIVES MANUAL

- ✓ CLIMATE CITIZEN-LED INITIATIVES AT A GLANCE
- ✓ INITIATING COMMUNITY-LED CLIMATE INITIATIVES
- ✓ JOINT IMPLEMENTATION OF PILOT PROJECTS & CATALOGUE OF BEST PRACTICES
- ✓ TRAININGS FOR PARTICIPANTS OF CITIZEN-LED INITIATIVES

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Introduction

Igniting Community-Led Climate Initiatives is a practical guide designed to support citizens, communities NGOs and civil associations in their climate mitigation efforts.

It is aimed to showcase how together with their local governments, business and other organizations, launching and scaling climate action from the ground up is not only feasible, but oftentimes able to yield results faster and more effectively than separate top-down approaches.

Community-led climate initiatives are locally rooted efforts driven by citizens, municipalities, and stakeholders to adapt to and mitigate the effects of climate change through inclusive, participatory, and place-based solutions. These actions are essential for building long-term resilience and enabling a just green transition that responds to real local needs.

This manual presents a collection of experiences, actions, and insights drawn from the Interreg Central Europe project [MISSION CE CLIMATE](#). Over the course of the project, co-creation processes were carried out across six Central European countries (Slovenia, Slovakia, Austria, Germany, Croatia and Italy), fostering collaboration between local governments, sectoral agencies, citizens, academia, businesses, non-governmental institutions and experts. This manual reflects the practical outcomes of these efforts—from targeted trainings and awareness-raising campaigns to the co-development and co-implementation of pilot projects—highlighting diverse pathways for increasing climate resilience at both local and regional levels, adapted to local context.

Each section combines lessons learned from the practical implementation of pilot projects within the established living labs in the cities of Maribor (Slovenia), Košice (Slovakia), Dornbirn (Austria), Pforzheim (Germany), Brač (Croatia) and Lignano Sabbiadoro (Italy).



Climate Citizen-Led Initiatives at a Glance



Citizen-led initiatives (CLIs) refer to grassroots actions and community-driven projects that aim to **address social or environmental challenges outside of traditional governmental frameworks**. In the realm of climate governance, CLIs encompass a diverse array of efforts, such as local energy cooperatives, urban gardening, transition towns, climate assemblies, and direct climate action. These initiatives are often characterized by decentralized decision-making, participatory governance, and a focus on local resilience (Seyfang & Smith, 2007). Unlike top-down policy instruments, CLIs emerge from bottom-up mobilization, driven by citizens who perceive gaps in institutional responses to climate change. They may operate independently or in collaboration with local authorities, NGOs, or international networks. Their core attributes typically include collective ownership, localized knowledge, experimentation, and a commitment to social innovation (Avelino et al., 2019). Community-Led approaches are those that are led not by an organization or other outsiders but by a collective, community process¹. Community-led approaches are distinguished by their bottom-up structure, where residents of a geographically defined area lead the visioning, decision-making, and action process to address community challenges.

Citizen-led initiatives are natural partners to NGOs. They can amplify local voices, offer capacity support, and help scale successful models to other communities. CLIs are a way to build stronger, more connected places while addressing real climate risks. They help communities become not just more sustainable—but also more self-determined.

The future of climate governance can be shaped as much by local communities and civil society as by government decisions. CLIs are moving in promising directions:



Collaborating with Local Authorities - Increasingly, communities are partnering with local governments—through climate roundtables, participatory budgeting, or co-designed policies—to push for climate-friendly outcomes (Ostrom, 2010).



Leading Local Transitions - From food systems to clean energy, CLIs are experimenting with new ways of living and working that reduce emissions and build resilience.



Promoting Climate Justice - Citizen-led groups are often at the forefront of ensuring that the transition to a green future is fair—especially for marginalized communities (Scoones et al., 2015).



Creating Space for Dialogue - Tools like climate assemblies and citizens' juries give people a chance to deliberate and shape local climate responses, rather than being left out of the conversation.



Building Lasting Institutions - As they mature, some initiatives are moving beyond “projects” to become long-term community institutions—such as energy co-ops, eco-villages, and learning hubs.

Depending on their establishment and management, there are various types of community-led initiatives and categorization. One way to define different CLIs approaches is to analyse who holds the decision power. CLIs fully controlled by the community are oftentimes referred to as community-owned CLIs.

Community-driven CLIs include collaborative planning between organizations and the community. Community-shaped CLIs are led by organization(s) and the community has strong inputs in the efforts led by organization(s). Community-shaped CLIs informs and consults the public, but the decision-making power remains within the organization(s) in charge.

Whether directed towards an individual looking to get involved, an NGO seeking impact, or a community network trying to build resilience, CLIs give tools, allies, and a voice in climate governance.

While citizen-led initiatives are not themselves a substitute for strong climate policy—they are a necessary part of the climate solution. They make climate governance more inclusive, resilient, and grounded in real people's lives. As the climate crisis deepens, our ability to support, scale, and sustain these initiatives will shape the future—community by community.

¹ Wessells, 2018, cited in Attygalle, 2020, p. 3



Quick Start

How to Initiate an Informal Community or Citizen-Led Initiative

An informal citizen-led initiative (CLI) does not need a legal structure to begin. Start small, build trust, and focus on one visible, local outcome.

Step 1 Identify a shared local issue (1-2 days): pick one concrete problem people already feel (heat at bus stops, flooding hotspots, schoolyard overheating, water loss, lack of shade, poor data access).

Step 2 Form a core team (3-5 people): include at least one organiser, one communicator, and one person connected to a local institution (school, NGO, municipality, utility, club).

Step 3 Define a “first win” (1 week): choose a low-cost action that proves momentum (a mapping walk, a survey, a workshop, a pilot micro-site, a public talk, or a small demonstration).

Step 4 Invite allies (week 1-2): reach out to local NGOs, municipal departments, schools, businesses, and citizen groups. Use a clear invitation: “We are testing one local solution and need your input.”

Step 5 Run a simple co-design session (week 2): gather ideas, agree on one action, assign roles, and set a date.

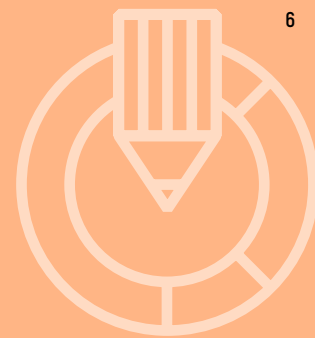
Step 6 Communicate and document (ongoing): share what you are doing, why it matters, and how people can join. Keep notes, photos, and feedback.

Step 7 Connect to long-term structures (after the first win): either (a) remain informal and repeat small actions, or (b) connect your CLI to a CCRM / municipality process for scaling and funding.

Minimum outputs:

- ▶ **ONE AGREED GOAL**
- ▶ **ONE ACTION PLAN** (WHAT / WHO / WHEN)
- ▶ **ONE PUBLIC EVENT FOR SPREADING THE WORD**
- ▶ **ONE SHORT SUMMARY OF RESULTS AND NEXT STEPS**

Initiating Community-Led Climate Initiatives



The Concept, Establishment and Operating of CCRMs

Community Climate Resilience Missions - Missions or CCRMs for short, are local community-led and community-shaped initiatives that emerged within the [MISSION CE CLIMATE](#) project that bring together a wide range of community actors to build long-term resilience to climate change. Rather than functioning as temporary initiatives or isolated campaigns, the missions are well-established living labs for participatory planning, collaborative governance, and implementation of adaptation strategies at the community level in the project implementing countries.



PICTURE 1

Community Climate Resilience Missions map

Each climate resilience mission is designed around the specific context, needs and specifics of its region. They promote locally driven action by engaging key stakeholders: citizens, NGOs, civil society organizations, local governments, academic institutions, and private sector actors—in co-creating solutions and shaping sustainable futures. As part of developing creative, community-led climate resilience initiatives, the Quintuple Helix Model was chosen to guide collaboration across diverse sectors. This model brings together academia (knowledge and learning), industry (tools and innovation), government (support and policy), civil society (local voices and cultural expression), and the natural environment (the ecological foundation of our work). By involving these five dimensions, it is ensured that the initiatives are not only community-driven and imaginative, but also grounded in evidence, supported by policy, and aligned with environmental sustainability. **The model supports co-creation processes where local creativity and climate action meet through inclusive, cross-sectoral cooperation** (Carayannis & Campbell, 2010).

CCRMs are fundamentally inclusive and encourage participation of different stakeholders across society, reflecting the principles of the Quintuple Helix innovation model. Participants typically include:

- 👤 **Citizens and local communities** (individuals, activists, students), who contribute insights on daily climate challenges and help shape responses that are grounded in lived experience;
- 🏠 **Non-governmental organizations (NGOs) and civil society groups**, which often bring expertise in climate change, social equity, advocacy, and local development;
- 🏛️ **Local and regional authorities**, responsible for integrating resilience strategies into policy and urban planning;
- 🔌 **Utilities and infrastructure providers**, who manage essential systems such as water, energy, and mobility—each central to climate adaptation;
- 🏢 **Sectoral agencies and public service bodies**;
- 🎓 **Research and academic institutions**, which offer scientific knowledge, technical tools, and support for evidence-based decision-making;
- 🏢 **Businesses**, especially those involved in sustainability and innovation, who contribute technological solutions, investment potential, and business-driven resilience models.

The establishment of each mission followed a carefully designed process, rooted in collaboration and local knowledge. It began with stakeholder mapping in each pilot region, identifying key actors who could contribute meaningfully to the mission. Initial engagement took place through bilateral meetings, local workshops, and informal discussions. These early interactions helped in building trust and aligning goals. To formalize participation, a Memorandum of Understanding (MoU) was signed for the establishment of each of the Missions, stating the joint endeavours of its members to promote and mainstream climate governance processes in the local context. Once a core network was in place, each mission moved into co-design activities. Initial activities included public events for launching the missions and raising awareness, thematic discussions, joint preparation of risk and vulnerability assessments, and the joint formulation of priorities for each of the established CCRMs. The process ensured that local knowledge and lived experience informed the mission's trajectory from the outset.

The overarching aim of each community climate resilience mission is to improve the adaptive capacity of its community in the face of climate change. This involves both strategic and practical objectives.

Strategically, the Missions create a shared governance structure where climate risks are assessed collaboratively and priorities are defined transparently. They strengthen relationships across sectors and help institutionalize long-term thinking within local systems.

Practically, the Missions drive forward the development of local action plans, the implementation of pilot projects, and the creation of investment pipelines for climate resilience. They support climate resilience knowledge-building through public engagement, facilitate co-design of solutions, and encourage communities to take an active role in shaping the future of their communities.

It is important to note that the Missions **remain open to new partners over time**. Whether a new NGO, a youth-led movement, a regional agency or some other stakeholder decides to join the mission, the missions are open to evolve and expand over time. This flexibility allows them to grow organically and adapt to changing needs.



CCRM Establishment Checklist

(from idea to functioning mission)

1 | Set the foundation

- Identify the main local climate risks (heat, flooding, drought, coastal erosion, etc.).
- Define the mission purpose and scope (1-2 sentences).
- Choose a coordination lead (host organisation) and a backup.
- Confirm which existing strategies it connects to (e.g., Adaptation Plan, SECAP, Smart City strategy).

2 | Stakeholder mapping (Quintuple Helix Model)

- Local public authority (policy/coordination).
- Academia/research (evidence and tools).
- Business/private sector (implementation capacity/innovation).
- Civil society/NGOs (community outreach/justice lens).
- Environment/natural system actors (public utility companies, land managers, climate agencies).
- Citizens and community groups (lived experience and acceptance).

3 | Engagement and trust-building

- Conduct bilateral meetings with priority stakeholders.
- Agree shared benefits: what each partner gains from participation.
- Define "what success looks like" (3-5 indicators).

4 | Formalise cooperation

- Draft and sign a Memorandum of Understanding (MoU) or equivalent.
- Agree meeting cadence (e.g., monthly/quarterly).
- Set basic governance: roles, decision-making, transparency rules.

5 | Co-design priorities

- Run a launch event + listening session.
- Identify 2-4 priorities for the first cycle (e.g., action plan, pilot, data governance, engagement campaign).
- Select one pilot concept to test.

6 | Operate as a living lab

- Maintain an open invitation for new partners.
- Document decisions, learning, and data.
- Align pilots with municipal processes so results can scale.

CCRM Meeting Agenda Template

Agenda:

1. Welcome + round of updates
2. Climate risk focus (one issue) + evidence
3. Co-design / decisions needed
4. Actions assigned (who/what/when)
5. Communication plan + next engagement moment
6. Next meeting date + close

Minimum meeting outputs

- decisions made,
- clear “to-do” and action list,
- one public communication line (“What we did and what’s next”)



Communication Campaigns

Communication and Promotion Campaigns in Local Communities Preceding the Establishment of the Local CCRMs

The successful establishment of the community climate resilience missions did not happen in isolation—it was **deeply interconnected with the communication campaigns** implemented across the six project regions. From the earliest stages, communication was not simply about informing; it was about activating communities, building networks, and creating a sense of shared ownership. In many cases, the very foundation of the Missions was laid through these campaigns.

The communication campaigns were designed to do more than just raise awareness about local current climate challenges. They served as an open invitation to citizens, NGOs, local institutions, and other stakeholders to step into a more active role in their local Missions. Public launch events, social media outreach, stakeholder dialogues, and media coverage provided both visibility, transparency, inclusiveness and legitimacy to the concept. These activities generated interest and encouraged participation in the local CCRMs.

In Maribor, Slovenia, the communication campaign was centered around the slogan “Green Mission for Climate” (Zelena misija za podnebje), which aimed at promote community-level climate resilience through collaboration, awareness, and innovation. The campaign began with a

series of targeted meetings with key local stakeholders, including NGOs, community representatives, and urban planning institutions. These meetings laid the groundwork for broader public engagement.



PICTURE 2 Green Mission for Climate cover photo. Source: Regional Development Agency Podravje-Maribor

A launch event organized in March 2024 brought together a number of participants: citizens, civil society organizations, sectoral agencies, environmental activists, and municipal officials came together to learn about the mission and explore opportunities for cooperation. The event served not just to present the local Mission but also to facilitate direct networking among participants, who shared their own initiatives and expertise.

The successful campaign in Maribor resulted in the successful establishment of the local CCRM by signing the Memorandum of Understanding between: Regional Development Agency for Podravje – Maribor, the Municipality of Maribor, E-institute, Institute for Comprehensive Development Solutions, Energy and Climate Agency of Podravje and Chamber of Commerce and Industry of Štajerska.

In Dornbirn, Austria, the campaign titled Climate Resilience Mission (Klimaresilienz-Mission) focused on identifying climate risks and fostering community discussion around solutions. The campaign began with bilateral meetings in February 2024 that brought together local stakeholders, community representatives, and public institutions to set up the mission framework. The objective of the CCRM in Dornbirn is to promote climate resilience, to raise awareness and to gain a better understanding of the risks and potential solutions and make this knowledge available to relevant stakeholders outside of the CCRM.

Four organizations formally committed to the Mission by signing Memorandum of Understanding: the Vorarlberg University of Applied Sciences – FHV, the City of Dornbirn, the Energy institute KLAR! Modellregion and the company Weaves which is active in the field of environmental city monitoring platforms and support.

PICTURE 3

Local CCRM meeting in Dornbirn, Austria



PICTURE 4 Natural hazard conference where the Dornbirn CCRM was featured

In **Lignano Sabbiadoro, Italy**, the local campaign was branded under the Lignano Community for Climate Resilience, emphasized direct public engagement from the outset. A public launch event was held on January 2024, drawing in citizens, representatives from environmental NGOs, and community associations, and followed by other meetings. These events were not just informative but interactive, providing opportunities for local people to share their concerns and discuss specific risks facing their coastal town.

Local newspapers like the [Messaggero Veneto](#) published articles to reach wider community audiences, ensuring that even those not digitally connected were made aware of the mission's objectives and events. The campaign helped to foster a strong local dialogue and inspired continued collaboration through the creation of an advisory team of local experts and activists.

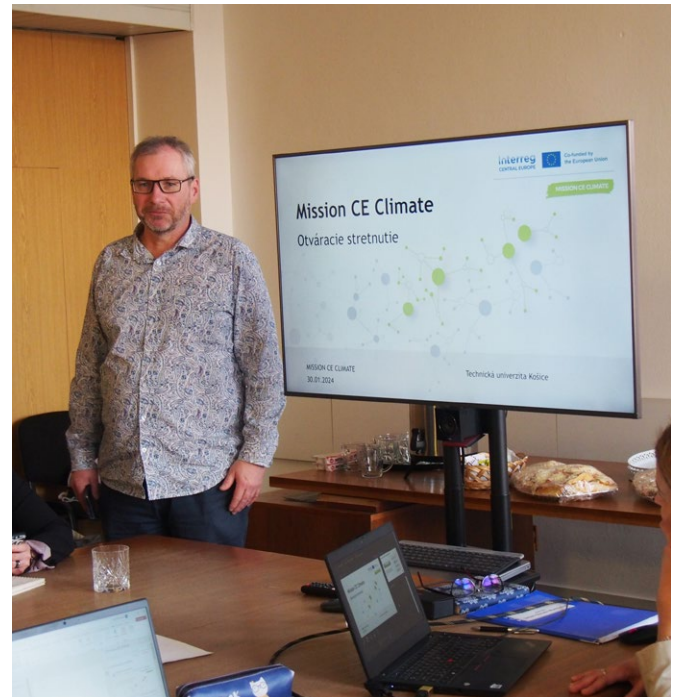
In June 2025, Lignano Sabbiadoro hosted [Lignano 180°](#), a two-days sustainability festival to celebrate its progress towards a climate-resilient future and attended by hundreds.



PICTURE 5 Press review, news on [Messaggero Veneto](#), Feb 4th 2024

In **Košice, Slovakia**, the outreach began with the identification of potential stakeholder organizations, including citizen associations, NGOs, and community development groups. The core of the public campaign was a kick-off meeting held on January 2024. Participants included representatives from local communities, civic organizations, and academia. The event enabled stakeholders to share ideas on the city's climate resilience strategy and helped establish the foundation for more inclusive, cross-sector governance.

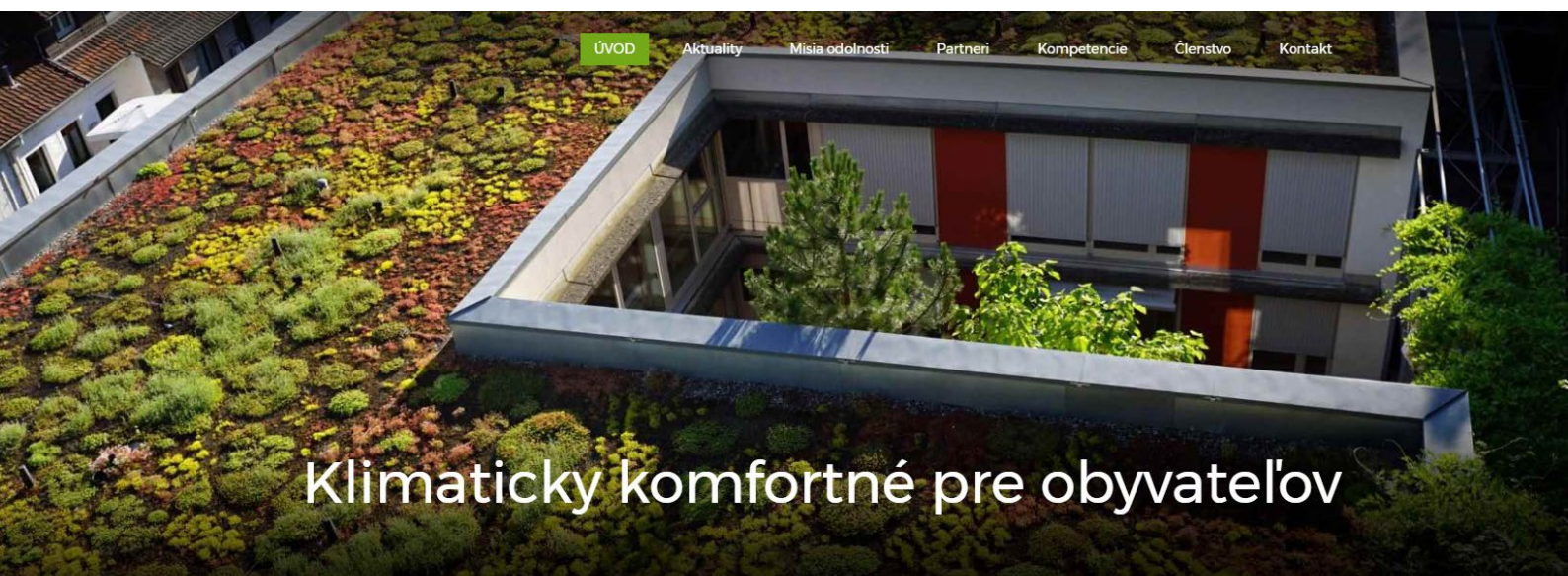
To ensure broader community engagement, a dedicated [website](#) was launched in March 2024. It features stories, updates, and resources tailored for citizens. A PR article was prepared for publication in local print media to reach citizens who are less active online, ensuring inclusivity in outreach.



PICTURE 6 Košice CCRM launch event

PICTURE 7

Snapshot from the Košice CCRM website (www.odolnekosice.sk)



In Brač, Croatia, the local campaign preceding the establishment of the local CCRM centered on updating the island's Sustainable Energy and Climate Action Plan (SECAP) and developing new solutions to address the specific climate risks faced by the local community, particularly regarding water scarcity. Community engagement began with stakeholder meetings in February and March 2024. These meetings included local NGOs, citizen groups, water utility providers, and municipal departments. During a study visit to Vodovod Brač, the local public water supply company, participants—including local experts and civil society members—discussed water conservation and adaptation strategies. This hands-on engagement helped translate technical knowledge into actionable community-led solutions, resulting in the establishment of the local CCRM by: Split-Dalmatia County, Energy Institute Hrvoje Požar, public water company Vodovod Brač, City of Supetar, Municipality of Sutivan and the Local Action Group Brač.

**PICTURE 8**

Coordinative meeting of the Brač CCRM

In the City of Pforzheim and throughout the Northern Black Forest region in Germany, the project team conducted a very community-targeted campaign through a series of “Citizen Dialog” events. These were open public forums organized in four different towns—Nagold, Calw, Freudenstadt, and Pforzheim in April 2024, attended by hundreds of citizens from the area, organized in collaboration with Pforzheim University and the Economic Development Agency of the Northern Black Forest Region (WFG).



PICTURE 9

CCRM presented at a community event in Pforzheim, Germany

Discussions focused on local city transformation and adaptation challenges, with climate resilience as a key topic. Citizens shared their experiences, asked questions, and expressed a strong interest in smart city solutions and technologies for sustainability. Following the successful campaign, the local CCRM was established by the University of Pforzheim, the digital company Krumedia and the Regional Public Authority of Nordschwarzwald (WFG)-representing 10 cities and 2 districts from the region.

The feedback from all of the communication events was overwhelmingly positive. Participants appreciated the opportunity to engage directly with researchers and policy experts, and many expressed interest in continued involvement in mission activities. Information regarding all of the CCRMs establishment, events and activities were communicated through webpage, social media, online local and regional media, and [MISSION CE CLIMATE](#) project channels. In order to reach citizens that have no online presence, articles in local newspapers and other printed media were published to inform and call citizens to action.

These efforts did more than raise awareness—they actively mobilized citizens, built networks, and created a sense of shared ownership across diverse local contexts. Communication served as a foundation for engagement, making the missions more visible, inclusive, and legitimate in the eyes of both the public and institutional stakeholders.

Recommendations for Similar Initiatives

For other citizen-led initiatives looking to strengthen their impact, the following recommendations can serve as guiding principles:

- 🗓️ **Start early and stay consistent** – Engage your community from the very beginning, and keep communication flowing throughout the journey.
- 📱 **Use a mix of tools and channels** – Combine digital outreach with face-to-face meetings, local media, and creative formats to reach as many people as possible.
- 📍 **Make it personal and local** – Focus on issues that resonate with your community and highlight the voices of local people and organizations.

🗨️ **Create spaces for dialogue, not just information**

– Encourage co-creation and open exchange through workshops, forums, and informal gatherings.

🤝 **Build partnerships** – Collaborate with NGOs, schools, institutions, and local associations to strengthen legitimacy and pool resources.

🌟 **Celebrate milestones and share stories** –

Visibility helps build momentum. Share successes and lessons openly to inspire others and keep your community engaged.

Campaign Planning Checklist

(for missions and pilots)

1 | Define the campaign

- What behaviour or action are we trying to trigger? (join, attend, co-design, volunteer, test a pilot, adopt a practice)
- Who is the audience? (citizens, NGOs, youth, schools, businesses, seasonal users/tourists)
- What is the key local message? (link to a lived local risk and benefit)

2 | Plan channels (mix digital + offline)

- Social media + website updates
- Local press / radio / community newsletters
- Posters / flyers / public noticeboards
- In-person events (launch, workshop, citizen dialogue)
- Schools or clubs as multipliers
- Festival / public fair / open day (where relevant)

3 | Design engagement moments

- One “invite” moment (launch)
- One “co-design” moment (workshop)
- One “see results” moment (pilot visit, dashboard demo, public summary)

4 | Make it inclusive

- Provide low-barrier entry points (short events, simple sign-up, accessible times/locations)
- Ensure non-digital reach (print media, community venues)
- Collect feedback (survey / comments / quick interviews)

5 | Measure and learn

- Track participation (numbers, diversity of groups)
- Track actions triggered (sign-ups, volunteers, pilot inputs)
- Track awareness (reach, shares, press mentions)
- Publish a short “what we learned” note after each campaign phase

Make Use of the “Benefit Framing” Communication Technique

Benefit framing in resilient climate governance means describing policies and governance tools in terms of the real-world outcomes they deliver—**reduced climate risks, lower recovery costs, improved health and safety, and more reliable essential services**—rather than listing technical features or institutional steps. For example, instead of saying “establish an interagency resilience committee,” benefit-frame it as “coordinate decisions across departments so responses are faster and residents get consistent information during floods and heatwaves.” Instead of “update building codes for future climate conditions,” say “build and retrofit so homes and public facilities stay safer and functional during extreme weather, reducing repair bills and disruption.” Used consistently, benefit framing helps stakeholders understand why governance changes matter and how resilience actions protect livelihoods, budgets, and community wellbeing.

⊕ **Health and comfort:** cooling, shade, safer public spaces during heatwaves.

○ **Safety and disruption reduction:** better preparedness for floods and storms; fewer service interruptions.

⌚ **Cost and efficiency:** reduced water losses; smarter maintenance and resource use.

♻️ **Quality of life:** greener public spaces, better schoolyards, more liveable neighbourhoods.

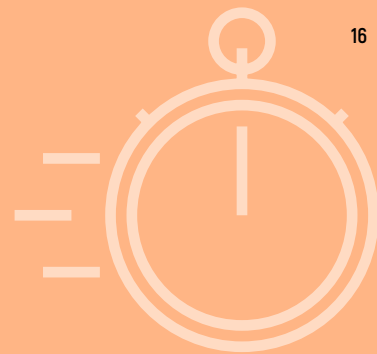
📦 **Education and empowerment:** open data and monitoring that citizens can understand and use.

🏠 **Tourism resilience (where relevant):** protecting natural assets and seasonal infrastructure.

Simple invitation lines

- “Help us co-design one local climate solution.”
- “Join the mission meeting and bring your lived experience.”
- “Test the pilot with us and tell us what works.”
- “See the data, learn the risks, and shape the response.”

Joint Implementation of Pilot Projects & Catalogue of Best Practices



This chapter presents the joint implementation of pilot projects developed within the Community Climate Resilience Missions (CCRMs) and compiles the resulting insights as a catalogue of best practices. Building on the governance and co-creation approach described above, each pilot translates local climate risks into concrete, community-shaped actions—designed and delivered through collaboration between citizens, civil society, local authorities, academia, and the private sector in line with the Quintuple Helix Model.

The pilots reflect diverse local contexts and hazard profiles across six regions: **urban heat stress and nature-based cooling solutions** (Maribor), **climate data governance and education through school-based monitoring** (Košice), **participatory regeneration of a flood-prone coastal space** (Lignano Sabbiadoro), **evidence-based assessment of**

nature-based cooling potential through microclimate monitoring (Dornbirn), **smart city and citizen science applications for climate resilience using IoT sensors and dashboards** (Pforzheim), **and water-scarcity resilience through upgraded monitoring, leak detection, and organisational capacity-building in a tourism-sensitive island context** (Brač).

For each region, the chapter provides an overview of the local CCRM, the pilot project rationale, co-creation methods, stakeholder roles, implementation steps and timelines, risks and challenges encountered, and practical recommendations for replication. Together, these examples show how locally grounded experimentation—supported by structured collaboration and continuous learning—can accelerate climate resilience action and strengthen long-term community capacity beyond individual projects.



Pilot Co-Design & Implementation Checklist

(from concept to replication)

1 | Define the pilot

- Local problem statement (one paragraph).
- Pilot goal (one sentence).
- Expected benefits (health, safety, governance, efficiency, awareness).
- How the pilot supports local policy/s strategy (SECAP, adaptation plan, smart city).

2 | Build the co-creation group

- Identify key stakeholders (Quintuple Helix).
- Confirm who decides what (citizen input, technical validation, municipal approval).
- Agree roles and responsibilities.

3 | Co-design the solution

- Run a co-design workshop (or interviews + workshop).
- Select site(s) and include backup sites (to avoid permitting delays).
- Define indicators (technical + social): e.g., temperature, humidity, water losses, participation, perceived comfort.

4 | Plan delivery

- Permissions, procurement, safety measures.
- Maintenance protocol and responsible persons.
- Data governance (where applicable: dashboards, open data, access rules).

5 | Implement + communicate

- Implement the pilot in a visible and learnable way.
- Run a public communication moment (launch/demo).
- Collect citizen feedback (short survey or interviews).

6 | Evaluate and replicate

- Compare baseline vs. results.
- Document lessons learned and bottlenecks.
- Identify scaling requirements (budget, policy change, standards, partners).





Overview of the Maribor CCRM

The establishment of the Community Climate Resilience Mission (CCRM) Maribor – “Green Mission for Climate” – followed a participatory, multi-stakeholder process designed to foster collaboration and shared ownership.

Below is an overview and sequence of activities:

1 | Stakeholder mapping

Key actors from the public, private, research, and civil society sectors were identified during the preparatory phase. This mapping was based on Maribor’s Local Energy and Climate Concept (2021) and other strategic documents.

2 | Early engagements

One-on-one consultations and coordination meetings with potential partners (e.g., Municipality of Maribor, RDA Podravje – Maribor, ENERGAP, E-Institute, Štajerska Chamber of Commerce and Industry) were held to discuss the mission’s scope, expected outcomes, and synergies with ongoing initiatives.

3 | Signing of the Memorandum of Understanding (MoU)

In 2023, five key institutions formalized their cooperation by signing the MoU, confirming their commitment to jointly establish and operate the CCRM Maribor. The CCRM functions as a living lab embedded in the city’s governance framework, coordinated by key partners (Municipality, RDA, ENERGAP, E-Institute). Regular meetings, monitoring, and updates will ensure sustainability beyond the project lifecycle.

4 | Co-design activities

Stakeholders participated in co-creation sessions and the inaugural expert consultation event “Green Mission for Climate” (March 2024), where over 30 representatives from 14 organisations discussed challenges, shared knowledge, and defined next steps.

5 | Priorities set

Partners agreed on joint priorities, including development of a local climate resilience strategy, creation of a local action plan, testing of pilot solutions, and continuous engagement of citizens and additional stakeholders.

The process emphasized cross-sectoral cooperation, transparency, and mutual learning, laying the foundation for a sustainable governance structure of climate resilience in Maribor.

The CCRM Maribor represents a practical application of the Quintuple Helix Model, integrating collaboration across political, economic, academic, environmental, and social systems.

Helix Dimension	Stakeholders / Examples
Political system	Municipality of Maribor, Regional Development Agency for Podravje – Maribor, Environmental Protection Service (Joint Municipal Administration Maribor)
Economic system	E-Institute, Chamber of Commerce and Industry of Štajerska, Public Holding Maribor (JHMB)
Academic system	University of Maribor, University Medical Centre Maribor
Natural environment	Energy and Climate Agency of Podravje (ENERGAP), EIT Climate-KIC Hub Slovenia
Civil society	NGOs: Ekološko-kulturno društvo za boljši svet, Mariborska kolesarska mreža – Društvo za vzpodbujanje kolesarjenja in trajnostnega prometa
Citizens	Engaged through awareness campaigns, participatory workshops, and living lab activities within the CCRM framework

Maribor Pilot Project

The pilot addresses **the growing vulnerability of Maribor to heat stress caused by climate change**. The city faces challenges related to urban heat islands, declining precipitation, and water management. The project focuses on improving coordination among local stakeholders and citizens to strengthen resilience and adaptive capacity

The city of Maribor faces increasingly intense summer heat waves and limited greenery in the city centre. Urban heat islands significantly affect public spaces such as bus stops, where passengers are directly exposed to high temperatures. The Municipality of Maribor launched a pilot project to test **nature-based solutions (NBS)** by greening bus shelters—installing green roofs and adding vegetation—to improve microclimate conditions, enhance well-being, and raise public awareness of climate resilience. Under the MISSION CE CLIMATE project, Maribor developed and began implementing the first green bus shelters in the city.

The pilot focused on a central bus stop at Vetrinjska Street—one of the busiest, with over 324,000 passengers in 2023—and several alternative micro-locations. The intervention included planting greenery on bus shelter roofs and surrounding urban furniture, installing sensor systems to monitor temperature, humidity, and air quality, and engaging citizens through on-site surveys.

Due to administrative and technical constraints, implementation began with greening five shelters at alternative city-centre locations (e.g., Glavni trg, Krekova and Trubarjeva Streets). These served as test sites for vegetation performance, microclimate measurement, and citizen feedback. The pilot brought together municipal departments, public companies (Nigrad, Snaga, Europlakat), private contractors, and the Regional Development Agency for Podravje – Maribor.

challenges

The pilot faced several urban governance and regulatory challenges. Implementing a nature-based solution in a dense city centre revealed a complex web of overlapping competencies and conflicting regulations. The pilot team had to navigate between multiple authorities responsible for traffic, advertising, cultural heritage protection, and urban design. These fragmented responsibilities led to delays in permits, public procurement, and location approval.

Additionally, funding restrictions during the temporary municipal financing period (early 2025) further postponed

site works. The limited space, need for heritage protection consent, and coordination between concessionaires complicated even minor modifications. These factors reflect a broader governance issue: the lack of integrated urban management systems for climate adaptation projects.

Despite obstacles, strong interdepartmental coordination and the municipality's flexibility were key to sustaining progress. The project team adapted by identifying alternative sites and maintaining compliance with technical standards. Parallel communication campaigns, citizen engagement, and testing across several locations helped maintain momentum and collect valuable data for future replication.

methods and inclusion

Co-creation methods used: **workshops, expert consultations, regular stakeholder meetings, participatory planning, and co-design sessions for local action and resilience strategies.**

Citizens are engaged through **awareness campaigns, consultations, and involvement in pilot implementation and evaluation.** Their participation is key for testing adaptive solutions and ensuring long-term ownership.

Implementation steps & timeline of the Maribor pilot:

2023–2024: Stakeholder mapping and MoU signing.

March 2024: Inauguration event "Green Mission for Climate".

2024–2025: Development of local action plan and pilot testing.

2025 onwards: Expansion, replication, and long-term governance of resilience measures, continuous stakeholder dialogue.

Cooperation between the City of Maribor, RDA Podravje, and public service providers enabled practical compromises—such as focusing on greening new shelters already.

The use of existing stakeholder infrastructure (predominantly RDA premises and municipal support), combined with the project-funded activities via Interreg Central Europe – MISSION CE CLIMATE project and in-kind contributions from partners (expertise, data, venues) were the main pillars of the Maribor pilot.

The risk & safety considerations in regard to this pilot were mainly in terms of climate and weather events during outdoor events, stakeholder engagement fatigue, as well as the need for transparent governance to avoid overlapping initiatives.

recommendations

Recommendations for shaping similar initiatives:

- **Integrate early:** Involve all relevant municipal departments and concessionaires from the start to reduce approval bottlenecks.
- **Plan flexible sites:** Anticipate location-specific constraints and prepare backup sites for pilot implementation.

• **Secure cross-departmental leadership:**

Designate a coordinating unit for climate resilience projects to avoid fragmented responsibilities.

• **Combine technical and social monitoring:**

Pair environmental measurements with citizen surveys to assess holistic benefits.

- **Institutionalize learning:** Use pilot data to update municipal urban design and maintenance standards for broader NBS integration.



Overview of Košice CCRM

Košice, the second-largest city in Slovakia, faces increasing impacts of climate change. The following are its key climate change challenges:

- **Heat waves**, the effects of which are amplified by the effect of urban heat island;
- **Surface flooding**, which is caused by heavy and torrential rainfalls, when the ground rainfall is more than 20 mm per hour;
- **Prolonged periods of drought** as a secondary impact of irregular rainfall patterns.

In the group of hazard indicators, the city of Košice is particularly vulnerable due to two indicators:

- Observed trends in the **frequency of meteorological droughts**.
- Moderate risk with increasing tendency is posed by the **risk of floods and torrential rains**, which are interrelated with each other

CCRM setup process in the initial phase took into consideration identified challenges of the area based on the preliminary results of the vulnerability assessment and on the already adopted Adaptation plan of the City of Košice for Climate Change 2022-2030. The Mission is established with the assumption of a long-term operation beyond the period of individual climate-oriented projects and initiatives on the territory of the city, communication will focus on further engagement and mobilisation of local

community members with identified potential to contribute to a systematic increase in the community climate resilience. Community Climate Resilient Missions are integrated, cross-sectoral and transdisciplinary networks. Due to this peculiarity, in this kind of context climate resilience processes can find fertile ground for developing.

A mechanism for providing permanent flexibility and openness as well as simplicity was established for continuous cooperation by signing the Memorandum of Understanding – first signed by the two founding members, the City of Košice and the Technical University – TUKE, and then by the partners, the sectoral Agency for Economic Development and the Vychodne pobrezie civic association, providing sectoral diversity.

The objective of the Košice CCRM is to support local community in becoming climate resilient and enable them to react with coordinated response to the impacts caused by climate change through acting beyond sectoral approach and introducing cross-sectoral governance. Under the CCRM umbrella, Košice received a durable cooperation system for joint community actions and inclusive climate resilience projects.

Košice Quintuple Helix Model matrix:

Institution name	Target Group Category	Quintuple helix category	Competencies & Responsibilities
Technical University of Košice, Faculty of Economics	Higher education and research organization	Education system	Climate Adaptation Science, Solution Design, Climate Resilience Research, Change Management
City of Košice	Local public authority	Political system	Leadership, Decision Making, Climate Change Science, Strategy & Planning, Risk Assessment, Climate-informed Professional Practice, Vulnerability & Impact Analysis
Regional Development Agency of Košice Region	Sectoral agency - Regional economic social development	Economic system	Economic Analysis, Risk Assessment, Climate Adaptation Science, Building Capability
Východné pobrežie	Interest group / NGO / network / association	Civil society	Cultural Agility, Climate Communication, Climate Change Science, Facilitation, Climate Adaptation Science
Technical University of Košice, Faculty of Civil Engineering	Higher education and research organisation	Education system	Climate Resilience Research, Climate Change Science, Climate Adaptation Science, Building Capability
Institute of Geography Faculty of Science, Pavol Jozef Šafárik University in Košice	Higher education and research organisation	Education system	Climate Change Science, Climate Resilience Research, Vulnerability & Impact Analysis
Klíma ťa potrebuje	Interest group / NGO / network / association	Civil society	Cultural Agility, Climate Communication, Climate Change Science, Facilitation, Climate Adaptation Science

The Košice pilot places schools at the center of community climate action by turning schools into long-term monitoring points for local air quality and heat-related indicators. By openly publishing data from seven elementary schools on the city's Open Data platform and using it directly in classrooms, the pilot connects children, teachers, families, and city planners around shared evidence. This "measure-learn-act" approach helps communities

understand how heat waves or air pollution affect daily life. While the pilot is digitally driven, it intentionally guides communities toward future nature-based responses based on measured local climate conditions. By connecting classrooms, households, and planners through shared data, Košice translates climate concern into community-owned knowledge that supports both education and informed local decision-making.

methods and inclusion

Co-creation methods used: **Mapping of relevant locations for sensor placement, regular consortium meetings to gain comments and recommendations to pilot implementation and local Community Climate Mission meetings to discuss the relevance of the interventions.**

Creative workshops for creation of data use scenarios: **pedagogical, strategic, community, and spatial. Co-design sessions for local education plan preparation within the local community. Collaborative meeting for designing of platform for data visualization.**

Citizens are engaged through awareness campaigns and communication activities as well as through the education curriculum within the educational process in the schools.

Implementation steps & timeline:

2023-2024: Stakeholder mapping and MoU signing.

2024: Pilot design and Analysis activities in cooperation with stakeholders from CCRM and other stakeholders.

2025: Implementation of pilot activities within the pilot area, communication activities to public, collaboration with local stakeholders and communities.

The existing stakeholder infrastructure (Municipality office experts, education and technical know-how from TUKE experts) was put in use for the successful implementation of the pilot, combined with the project-funded activities via the Interreg Central Europe – [MISSION CE CLIMATE](#) project.

The main risks for this pilot are connected with the hardware installation issues and digital platform performance, and were addressed by establishing maintenance protocol and responsible personnel for technical and data quality assurance.

The pilot solution design was accepted by 4 regional stakeholders and pilot solution is aligned with implementation of 2 climate adaptation strategies or policies on local/regional level. The long-term sustainability of the pilot digital solution is ensured by officially described maintenance process. Cross-Platform Compatibility is ensured by development of digital dashboard for gathering and interpretation of climate data compatible with Open Data Košice platform by providing technical description. Analytical activities for sensor placement and selection were executed and documented in all 7 schools participating in the pilot implementation by installing and operating 7 sensors in their facilities. Thematic education program for climate data reading and operating was created and implemented in the 7 schools.

The output converts scattered climate concerns into a routine, evidence-based practice. City of Košice gains continuous, high-resolution readings (schoolyards) and human-centred signals (e.g., perceived heat, health relevance). This enables timely micro-decisions (activity timing, shading, ventilation) and strategic choices (where to plant trees, cool routes, permeable surfaces). Continuous data monitoring will serve educational purposes. Integrating data from sensors into Open Data Košice dashboard allows the general public to access the data.

The flow of climate data to related digital platform – [Open Data Košice dashboard](#) will continue to be managed by designated project partner organization (City of Košice). The municipality committed to long-term institutional support, ensuring continued accessibility and maintenance

of the platforms. The maintenance of sensor network for the data collection will be ensured by these organizations through identified sensor network providers.

Best practice within the implementation activities

The Technical University of Košice and City of Košice, in cooperation with representatives of elementary schools, prepared an innovative educational program focused on the use of data from climate sensors installed directly in school premises. The aim of the program is to **combine modern technologies, environmental education, and practical teaching of natural sciences**. During the Curriculum Development workshops in 2025, 4 different approaches to data usage have been identified. Teachers and TUKE experts gathered in co-creating educational content for preparation of environmental curriculum for 2025/2026 school year.

The aim is to use climate data in school subjects like Physics, Biology, Chemistry, Civic Education. Teaching worksheets have been developed for these subjects, instructing teachers on how to incorporate data from climate sensors into teaching in the given subject.

The educational program supports the development of students' digital, environmental, and analytical skills, while enabling teachers to innovate their teaching using real data and project-based learning.

challenges

Time constraints associated with implementing the educational program in classrooms were noted, as working with the relevant data is time-consuming and needs to be structured to follow the school year cycle. Furthermore, summer months will not be observed in real time due to school vacation period. In order to be successful in climate data monitoring, students need to be taught how to use the dashboard correctly to complete the assigned tasks in a narrow timeframe.

To simplify access to the right data, specific links have been created that provide students with relevant data for individual tasks directly on school dashboards.

recommendations

Always design educational programs together with those for whom they are intended, so that their needs and specificities are reflected. Collect their feedback and implement improvements to make the work effective and time efficient.



Overview of the Lignano Sabbiadoro CCRM

The City of Lignano Sabbiadoro is a very tourist-oriented area, with one of its peculiarities being that the population increases exponentially during the summer season, reaching up to 100,000-150,000 people staying in the city, which is more than 20 times increase from the general population of 6.800 inhabitants outside the summer season. From a climate perspective, the greatest influence comes from the presence of the Adriatic Sea, a shallow sea, the Marano Lagoon and the Tagliamento River delta. Coastal erosion affects the coastline. In the area facing the lagoon, the greatest criticality is due to sea flooding and high tides. As a matter of fact, **flooding** – pluvial, coastal and river – caused by extreme weather events is another critical climate risk. On top of this, the analysis of current and projected climate trends shows that **sea level rise and heat waves** add on the overall frame of the climate hazards that need to be taken into consideration, as well as wildfires.

The establishment of the Community Climate Resilient Mission (CCRM) in Lignano Sabbiadoro was initiated by the Municipality as part of its commitment to implementing the Sustainable Energy and Climate Action Plan (SECAP) adopted in 2022. The Mission aims to enhance community

engagement in the city's pathway towards climate resilience, in line with local objectives for awareness-raising and participatory governance by 2030. The process followed a structured sequence. The Municipality, in collaboration with APE FVG, conducted a comprehensive stakeholder mapping based on the Quintuple Helix approach, identifying key actors relevant to the local climate transition. Initial engagement activities involved stakeholders previously contributing to the SECAP under the Interreg IT-HR RESPONSe project, namely LISAGEST and the Civil Protection office, selected for their operational knowledge of local climate impacts. Afterwards, other local stakeholders were contacted and engaged in the CCRM and to formalise the Mission establishment a Memorandum of Understanding (MoU) was signed between the Municipality of Lignano Sabbiadoro, APE FVG, Civil Protection unit, the Lignano Rowing Club, the Lignano Yacht Club and Lignano Sabbiadoro Gestioni (LISAGEST).

Subsequently, co-design activities were launched through meetings aimed at identifying shared priorities and defining the pilot actions under the Mission CE Climate project.

As a result, the CCRM defined three main priorities: **updating and enhancing local adaptation tools** (revising adaptation measures); testing for the first time a **public space co-design process** involving citizens and stakeholders, to be replicated in future circumstances; and **strengthening awareness-raising and capacity-building actions targeting residents and tourists**.

As mentioned before, the Lignano Sabbiadoro CCRM fully reflects the Quintuple Helix Model, integrating actors across diverse systems and with peculiar competences:

- **Public authorities**, which provide institutional leadership and coordination.
- **Business actors** contribute with operational expertise and a direct link with tourism and coastal management.
- **Academic and expert stakeholders**, including professionals engaged in the RVA updating, support evidence-based approaches and climate knowledge transfer.
- **Civil society** and NGOs participate in awareness and co-design activities, ensuring inclusiveness and community ownership.
- Finally, **citizens and tourists** are directly engaged through outreach and participatory processes, fostering shared responsibility and behavioural change towards a more climate-resilient Lignano Sabbiadoro.

Lignano Sabbiadoro Pilot Project

Porto Casoni, a flood-prone area in Lignano Sabbiadoro, faces increasing vulnerability due to sea level rise and storm surges. The area is used by diverse stakeholders - from sports clubs to restaurants - and holds significant ecological and social value. These factors prompted the municipal administration of Lignano and APE FVG to launch the local activities of the MISSION CE CLIMATE project, starting from this area. Porto Casoni is, in fact, the first demonstration action of this pilot project and was therefore aimed at regenerating the space through a participatory process designed to ensure climate resilience and community ownership.

Lignano Sabbiadoro faces increasing climate risks including **sea level rise, coastal erosion, heat waves, and flooding from extreme weather events**. The pilot project addressed the urgent need to enhance climate governance by fostering civic participation, co-designing adaptation measures, and raising awareness among residents and tourists.

The pilot in Lignano Sabbiadoro exemplifies the Quintuple Helix Model by actively involving actors across **five key domains**:

Public sector: Municipality of Lignano Sabbiadoro as coordinator, promoter and catalyst of the initiative; competent Regional Authority bodies and Civil Protection.

Private sector: business stakeholders and public-owned maritime concessionaires contributed operational expertise and insights into tourism and coastal management.

Academia and experts: University of Udine, University of Trieste, OGS provided technical support and climate risk data, and facilitation of participatory processes.

Civil society: local sports associations, arts & culture groups, and environmental NGOs played a vital role in co-design activities and awareness campaigns.

Citizens: Residents, tourists, and citizen representatives were engaged through consultations, public events, and the Lignano 180° Festival, fostering shared responsibility and behavioral change.

To achieve this, the Municipality, supported by APE FVG, launched a **co-design process** involving 16 stakeholder groups through interviews, public events, and consultation meetings. A facilitator guided the participatory process, which culminated in the **development of a Masterplan integrating stakeholders' inputs**. The plan was approved by the City Council in October 2024 and is now seeking funding for implementation. The process was transparent and inclusive, and marked the first time the local administration adopted such approach.

The second demonstration action focused on the **development of a Green Management Plan** aimed at enhancing the municipality's climate resilience. The Plan, developed by external consultancy and approved by the City Council, represents a **strategic tool to guide the long-term and sustainable management of urban green areas across the city**. Urban green management plays a critical role in enhancing climate resilience, biodiversity, and quality of life in cities. It refers to the planning, maintenance, and sustainable use of green infrastructure to provide ecological, social, and economic benefits.

In parallel with the drafting process, the Municipality and the consultancy team planned a dissemination and engagement strategy to ensure that the objectives, results, and foreseen actions of the Plan and the Regulatory Framework were shared with local stakeholders, particularly the general public. To this end, awareness-raising activities with local schools and a free arboriculture course for citizens (4 lessons, 10 hours in total), delivered with the involvement of a forestry expert as instructor, were organized at the end of 2025.

The third demonstration action focused on promoting **climate awareness, sustainable urban transformation, and civic engagement** through a sustainability festival to celebrate the city progress towards a climate-resilient future: held in June 13 and 14, 2025, **Lignano 180°** was conceived as a space for dialogue, participation, and collective imagination about the future of coastal cities in a changing climate, bringing together technical experts, researchers, public administrators, urban designers, local citizens and tourists. The name "180°" symbolizes the

need for change – a radical shift in how we think about and shape our urban environments. The festival aimed to promote a new mindset that embraces sustainability, inclusiveness, and resilience as guiding principles in planning the city of tomorrow. It also served as a platform to showcase recent initiatives led by the Municipality to address climate challenges, improve urban liveability, and protect the city's rich coastal and ecological heritage, alongside the results achieved throughout the MISSION CE CLIMATE project. In this context, guided study visits were also organized, allowing participants to explore firsthand key sites involved in Lignano's transformation. The 2025 Festival is intended as a first edition, as the administration aims to establish it as an annual event for citizens.

The co-creation methods used so far to engage the local community during the pilot's climate governance activities are the following:

- Stakeholder mapping and bilateral interviews
- Public hearings and consultation events
- Participatory design workshops
- Festival panels and guided study tours
- Coordination meetings with facilitators and experts.

In particular, citizens acted as co-creators in the regeneration of Porto Casoni, were actively involved in informative events on topics linked with the Green Management Plan, and participated in the Lignano 180° Festival. Their input influenced planning decisions, validated priorities, and built ownership of climate resilience strategies.

Hereafter are listed the implementation steps and related timeline per each demo activity completed under the Pilot:

1 | Porto Casoni co-design activity

Oct 2023: **Design of engagement process for the regeneration of Porto Casoni**

Jan–May 2024: **Stakeholder consultations and Masterplan of Porto Casoni development**

Oct 2024: **Masterplan approved by City Council**

2 | Green Management plan drafting and regulatory framework

Nov 2024–Apr 2025: **Green Management Plan drafted and approved**

Feb–Sep 2025: **Regulatory framework and civic engagement strategy developed**

Nov–Dec 2025: **Events targeting the citizens**

3 | Festival Lignano 180°

Jan–Jun 2025: **Design and planning of Lignano 180° Festival**

Jun 2025: **Lignano 180° Festival**

Pilot activities were finalized by December 2025 and long-term activities have been planned for proceeding beyond the project end.

Pilot activities have been co-funded by the Interreg Central Europe – MISSION CE CLIMATE project and the City of Lignano Sabbiadoro's budget (with total costs amounting at around 100 000 €).

Implemented activities have taken into account risk and safety aspects, including a flood risk analysis for the Porto Casoni area and the definition of safety protocols for public events and site visits.

In terms of progress, the Porto Casoni Masterplan has been approved by the City Council and the Green Management Plan adopted. Moreover, the Sustainability Festival has been successfully launched and implemented, serving as a key moment for engagement and awareness-raising.

Among the main results and early outcomes, three integrated demo actions have been completed: over 800 participants have been engaged through the Festival, 60–70 stakeholders have taken part in the Porto Casoni consultation process, a total of 10 people have participated in the arboriculture course, and 250–280 students have been involved in the awareness-raising activities implemented in schools (200–220 from primary schools and 50–60 from middle schools). These activities have contributed to increasing public awareness and institutional commitment, laying the foundations for long-term climate governance.

For the post-pilot phase, the Municipality will continue implementing the Green Management Plan and seek additional funding for the construction works at Porto Casoni. The Lignano 180° Festival is planned as an annual event, while civic engagement activities will continue beyond the pilot to consolidate participatory governance practices within future climate initiatives.

challenges

One major challenge was coordinating diverse interests – recreational users, businesses, environmental groups – in a redesign process of a flood-prone area with competing priorities and clashing interests. Another was ensuring meaningful participation within tight project timelines and limited prior experience with inclusive climate governance.

Success stemmed from early stakeholder mapping, dedicated facilitation, and strong institutional commitment. The Mayor and Councillor actively participated, reinforcing trust among the stakeholders and the local community. A communications secretariat ensured consistent outreach, while technical data from APE FVG grounded the process in climate evidence.

recommendations

- Start with thorough stakeholder mapping and needs assessment.
- Engage professional facilitators to guide co-design.
- Ensure political leadership is visible and consistent.
- Combine technical planning with cultural and civic engagement.
- Use festivals or public events to amplify visibility and connect actions.



Overview of the Dornbirn CCRM

The main challenges for the state of Vorarlberg and the city of Dornbirn are the **increasing temperature, changes of precipitation patterns, floods, and landslides** (APCC, 2014; Hiebl & Orlik, 2023; Mauran, Knevels, & Misha, 2022). These, in turn, have various and often interrelated consequences. The focus of this mission lies on environmental resilience with considerations and inclusion of social, environmental, and economic resilience as they are highly interconnected with all the other aspects of the climate resilience.

The Dornbirn's local CCRM enables **a cross-sectoral and interdisciplinary collaboration**, with stakeholders from different backgrounds invited to join the formation of the CCRM. First, a key stakeholder mapping occurred to define who should be invited to gain a better understanding of climate risks from different perspectives. The CCRM-Vorarlberg aims at understanding climate risks better and

drawing informed recommendations for climate resilience from them. To kick-off this CCRM, a half day workshop (focus group) was organized to understand climate hazards from different perspectives and map the interdependencies between them and secondly, the focus was put on possible solutions.

Key stakeholders that have signed the MoU for joining the CCRM: The city of Dornbirn, Vorarlberg University of Applied Sciences, Weavs and Energieinstitut Vorarlberg.

Dornbirn Quintuple Helix Model matrix:

Institution name	Target Group Category	Quintuple helix category	Competencies
City of Dornbirn	Local public authority	Political system	Climate change communication; engagement of citizens; strategy & planning; leadership and decision-making; policy & governance
University of Applied Sciences	Higher education and research organisation	Educational system	Climate change adaptation; research & analysis; climate resilience research; climate change communication
Weavs	Service providers / private sector	Economic System	Development of digital solutions for monitoring climate change impacts to enable climate change adaptation
Energieinstitut Vorarlberg	Sectoral Agency	Natural System	Expertise in climate change adaptation and energy-related topics, research; experience with collaboration of diverse stakeholder groups

Dornbirn Pilot Project

The main goal of the pilot project is to **demonstrate the temperature reduction potential of nature-based solutions**. Specifically, different climate data indicators (surface and air temperature, humidity) are collected to compare the perceived temperature on different surface types, as well as on places with and without shade from trees. To minimize external influences on the microclimate, all data collection for different surfaces and shading conditions will be conducted within the same park, ensuring consistent general weather conditions for accurate comparison.

Heat islands are a pressing issue for the city of Dornbirn and nature-based solutions such as tree planting can reduce the heat island effect. This preliminary pilot study focuses on exploring the potential impact of trees and different surfaces on temperature reduction. The aim is to quantify the extent of temperature reduction achievable through nature-based solutions. The sensor network in place measures the cooling effect of trees. By using sensors, data is gathered on surface and air temperature, as well as humidity levels.

Subsequently, the perceived temperature (heat index) is calculated, enabling an assessment of the actual reduction in perceived temperature. This pilot can be described as a digital solution, supporting the decision for nature-based solutions through climate data results.

The primary objective is to gain insights into the potential of nature-based solutions and unsealed surfaces to improve urban microclimate by mitigating the heat island effect. A secondary objective of the pilot project is to raise **public awareness** and **educate citizens**. Additionally, the pilot project aims to support the city of Dornbirn's existing climate action plan by providing data-driven evidence on the importance of nature-based solutions and temperature-reducing surfaces. The third objective is to provide data-driven insights to strengthen Dornbirn's climate action plan. The project results are integrated into the [Citymonitor dashboard](#) for transparency and informed decision-making. The city of Dornbirn ensured continuation of the pilot study and maintenance of the sensor network after pilot completion.

methods and inclusion

Co-creation happened through several bilateral meetings where climate risks were discussed not only in terms of climate hazards, but also in terms of their social, environmental, and economic consequences. A specialized risk workshop was organized for the members of the local CCRM.

Citizens were informed about the pilot project through media, newspapers and through our participation at conferences.

Implementation steps & timeline of the Dornbirn pilot project:

2023–2024: Stakeholder mapping, MoU signing, Pilot planning.

January 2025: Risk Workshop

2024–2025: Development of action plans

Spring 2025: Implementation of Pilot study

Fall 2025: Natural hazards conference

2025 onwards: Scale-up of the pilot study

All pilot activities were funded by the Interreg Central Europe – [MISSION CE CLIMATE](#) project.

challenges

Challenges and delays happened in the search and finding a suitable location for the on-field pilot activities and obtaining the needed permissions for setting up the equipment. Nevertheless, intersectoral and joint close collaboration, being open to changes and focusing on the shared objective proved crucial for the timely and successful completion of this pilot project.

or pilot to ensure flexibility and adaptability to project changes without losing the overall objective out of sight.

recommendations

- Involve relevant stakeholders from the beginning.
- Make sure that all stakeholders involved have the same understanding of the purpose of the project, initiative,

- Be flexible and open to changes.
- Clear division of responsibilities.



Overview of Pforzheim CCRM

The city district of Pforzheim is affected by climate change in many ways. Trends that can already be observed will intensify in the future. Both the number and duration of **heatwaves** will increase significantly. **Due to the increased amount of water vapour in the air, heavy precipitation will be more intense in the future.** An increase in **thunderstorms and hailstorms** with grains larger than 2 cm in diameter is to be expected (Schröder 2019, Rädler et al. 2019). Examples of priority climate impacts include the increased cooling requirements of buildings in summer (construction and housing action area) or the increase in dry and drought periods (forestry and agriculture areas). The increase in heat stress in Pforzheim was also identified as a priority for various fields of action (tourism and leisure, citizen wellbeing and public health).

The initial set of stakeholders to be involved in the local CCRM had already been identified during the preparation phase of the MISSION CE CLIMATE project and builds on solid existing partnerships in Pforzheim and the Northern Black Forest region. This was confirmed by the signing of the MoU in April 2024.

Since the beginning of the project, it was agreed that the activities of the CCRM would be aligned with the overall Smart City strategy of the City of Pforzheim. Under the Comprehensive Climate Resilience Management (CCRM) umbrella, a series of activities were defined, focusing on enhancing the capabilities of Stadtwerke Pforzheim in implementing smart solutions and fostering knowledge among citizens to mobilize them effectively.

The following priorities have been defined for the local CCRM:

Development of Smart City Infrastructure

This action involves deploying IoT devices and other information and communication technology (ICT) infrastructure to monitor and manage the city's climate risk mitigation efficiently. The data collected will be used to inform decision-making, optimize resource allocation, and improve climate risk mitigation.

Community engagement

This action involves organizing communication and awareness-raising activities to inform and engage the community about climate resilience initiatives. Activities may include public campaigns, community events, and educational programs.

The following stakeholders from the Quintuple Helix Model are included in the Pforzheim CCRM:

Institution name	Target Group Category	Quintuple helix category	Competencies
Hochschule Pforzheim	Higher education and research organisation	Educational system	Climate change adaptation; research & analysis; climate resilience research; climate change communication Development of digital solutions for monitoring climate change impacts to enable climate change adaptation
krumedia	Service providers / private sector	Economic System	Development of digital solutions for monitoring climate change impacts to enable climate change adaptation
WFG Nordschwarzwald	Sectoral agency – Regional economic social development	Economic System / Political system	Climate change communication; engagement of citizens; strategy & planning; leadership and decision-making; policy & governance
City of Calw	Local public authority	Political system	
City of Bad Teinach			
City of Mühlacker			
District of Calw			
Enz district			
City of Knittlingen			
City of Nagold			
City of Niefern-Öschelbronn			
City of Maulbronn			
City of Pforzheim			
City of Illingen			

Pforzheim Pilot Project

The pilot addresses the challenge of enhancing climate resilience in Pforzheim and the Northern Black Forest by empowering citizens with practical tools and smart city-based solutions. It seeks to overcome barriers to effective

climate action, such as limited public engagement and fragmented access to relevant information, by fostering active participation and collaboration among local communities.

methods and inclusion

Municipal staff, citizens, students, SMEs, and the regional development agency were engaged from design to rollout. Co-design sessions defined use cases and data needs; students built and installed sensor packs, wrote decoders, and configured dashboards. Municipal teams hosted pilots (flood sites, green areas, traffic spots) and tested alerts in daily operations. Citizens participated in placements and data interpretation via workshops and realized public event together with feedback surveys drove iterative updates and governance choices.

The most prominent example of the use of a co-creation method in the pilot is the joint definition of use cases, which was made through the interaction of the students at Pforzheim University with the representatives of the utility company of the city of Pforzheim. They jointly developed potential use cases, decided on the locations where to place the sensors and the definition of feedback mechanisms to trigger a reaction to the measures and data collected. Citizens participated via interaction during public events and related consultations, and pilot projects.

Implementation steps of the Pforzheim pilot project:



Feasibility - The project includes the development and deployment of sensor boxes designed for environmental monitoring. A comprehensive data acquisition and processing workflow has been established to ensure efficient collection and analysis of sensor data. Field tests were conducted using eight sensors to evaluate their performance under real-world conditions. Additionally, procedures for data acquisition and storage have been implemented to securely manage the collected environmental data.



Prototype Development - Based on the identified objectives, stakeholders collaborate to develop prototypes of the IoT sensor technology and the Citizen Toolkit. This involves designing and testing sensor configurations, as well as drafting instructional materials for the Citizen Toolkit.



Pilot Testing - Once prototypes were developed, pilot testing was conducted in the designated pilot area within the Pforzheim community. This involved deploying IoT sensors in real-world environmental monitoring scenarios and assessing their functionality, usability, and effectiveness.



Data Collection and Analysis - Throughout the pilot testing phase, data is collected from the deployed IoT sensors to monitor environmental parameters such as air quality, temperature, and humidity. This data is then analysed to evaluate the performance of the sensors and assess their impact on environmental monitoring efforts.



Iterative Improvement - Based on the findings from pilot testing and data analysis, stakeholders iterate on the design of the IoT sensors and the Citizen Toolkit to address any identified issues or areas for improvement. This iterative process ensures that the final products meet the needs and expectations of end-users.



Documentation and Reporting - Throughout the implementation and testing phase, comprehensive documentation is maintained to track progress, record findings, and document lessons learned. This documentation serves as a valuable resource for future initiatives and informs the final reporting of project results.

recommendations

One of the most significant lessons is the symbiotic relationship between technological advancement and societal involvement. Technology alone cannot drive meaningful or lasting change in urban sustainability.

The ongoing analysis and visualization of sensor data through user-centric dashboards proved essential for turning raw numbers into actionable intelligence. For example, continuous records of air quality, soil moisture, traffic density, and public-space occupancy allowed both municipal authorities and everyday citizens to track trends, benchmark progress, and intervene with timely, sustainability-minded actions.

Beyond the technical realm, **the integration of citizen science emerged as a crucial ingredient for project success** and for realizing a deeper dimension of sustainability. Engaging citizens—both as data collectors and informed users—transformed the project from a purely technological exercise into a participatory movement. Citizens actively contributed by installing sensors in their homes, gardens, and workplaces, as well as by responding to emergent insights from the dashboard data. For instance, real-time alerts regarding flood risks or road salt depletion empowered local communities to take preemptive, sustainable actions. The “Do It Yourself” instructions, which were initially devised during the first campaign, enabled broader public participation and enhanced the project’s reach and impact.

The citizen science approach also enriched the educational process, as students and non-experts gained hands-on experience in sensor deployment, data analysis, and digital literacy. This democratization of technology resulted in increased public awareness of sustainability challenges and

It is the convergence of innovative tools with motivated, informed citizens that has brought about palpable results—from optimized salt logistics and more resilient flood prevention to improved public resource management and greener mobility.

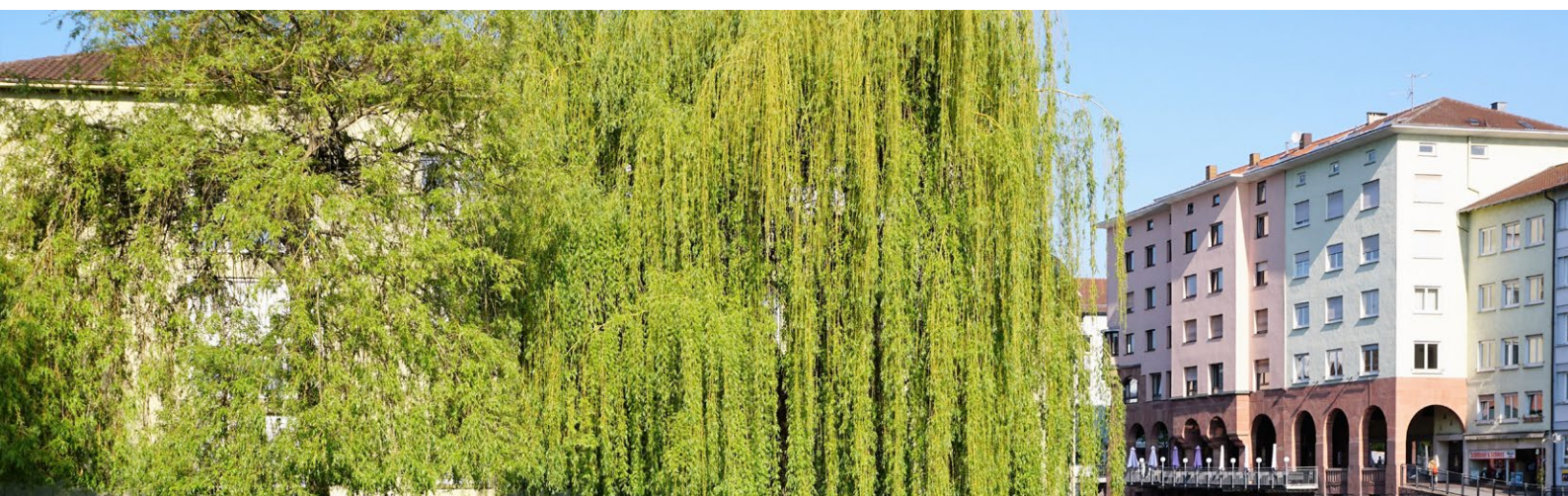
the value of open data. Participants developed a sense of ownership and agency, recognizing that environmental impact is not solely the domain of experts but something shaped by everyday actions and informed decisions.

On the operational side, several valuable lessons surfaced. The effectiveness of collaboration between stakeholders was amplified by clear communication and well-defined roles from the very beginning.

challenges

Routine data collection worked best when both technological and human factors were given equal attention. Challenges—such as the theft of water level sensors—underscored the need for robust security measures and contingency planning. In response, future deployments will emphasize sensor protection and rapid replacement strategies.

The implementation of the pilot was funded by the Interreg Central Europe MISSION CE CLIMATE project. In-kind contribution was obtained from Pforzheim University professors and students, as well as in-kind participation from the utility company of the city of Pforzheim. Some public events organised by the city were used to communicate about the pilot.



Overview of the Brač CCRM

The Island of Brač in Croatia faces rising climate risks driven by **hotter, drier summers, more frequent heatwaves, and unreliable rainfall, all of which directly intensify drought and water scarcity concerns across the island**. Brač is a tourism-dependent island with limited freshwater sources and a seasonal population surge, which places additional pressure on its water supply system. The old water supply system is contributing to high water losses, but the water supply company, Vodovod Brač, is now responding through modernisation efforts—including the replacement of outdated metering technology, leak-detection upgrades, and the creation of a dedicated water loss reduction team—to strengthen resilience.

The establishment of the Community Climate Resilient Mission (CCRM) on the island of Brač was initiated by the **Split Dalmatia County (SDC)** and **Energy Institute Hrvoje Požar (EIHP)** as part of its commitment to implementing equipment procured during the Mission CE Climate project and to implement the Sustainable Energy and Climate Action Plan (SECAP). The objective of the CCRM is to support **the Island of Brač to become climate resilient and enable a coordinated response to the local challenges of climate change**. The process followed a structured sequence. The SDC and the EIHP conducted a comprehensive stakeholder mapping based on the Quintuple Helix approach, followed by consultation rounds with local government, public utilities and community actors to identify shared priorities and identify key actors relevant to the local climate transition.

These interactions led to the signing of a Memorandum of Understanding between core stakeholders:

- Split-Dalmatia County
- Energy Institute Hrvoje Požar
- Vodovod Brač

▲ The City of Supetar

- The Municipality of Sutivan
- Local Action Group Brač

The Memorandum formalized collaboration and responsibility-sharing and enabled the launch of co-design activities under the Climate Mission framework. Through workshops, technical exchanges and participatory meetings, stakeholders co-identified **water scarcity, heat risks and infrastructure vulnerability as priority resilience topics**, leading to the upgrading of Brač's water distribution system. The mission unites multiple sectors, with representation from public institutions (regional and municipal authorities), science and research (EIHP), public utilities (Vodovod Brač), local development organizations (LAG Brač), and community representatives.

Brač Pilot Project

The pilot relies on the Quintuple Helix Model by involving actors from government, public utilities, research, civil society, and the local economy. Regional and local public authorities—Split-Dalmatia County, the City of Supetar and the Municipality of Sutivan—provided governance, political support and access to local knowledge. Vodovod Brač, the publicly owned water utility, served as the technical

implementer, installing equipment and creating a leak-detection team. EIHP contributed scientific and technical expertise in project design, monitoring and validation. Citizens were included indirectly through events and community engagement activities, while the Local Action Group Brač represented civil society and acted as a bridge between community actors and institutions.

methods and inclusion

- Stakeholder mapping
- Bilateral interviews with stakeholders
- Coordination meetings with core team (SDC, Vodovod Brač, EIHP)

- Coordination meetings and knowledge exchange with stakeholders
- Participation at local festival to raise awareness about climate change
- Distribution of educational materials

Citizens participated primarily through awareness and behaviour-change activities—adjusting consumption habits, learning how to use water more efficiently, and supporting adaptation actions identified in the SECAP. Outreach events, including the Mission CE Climate presentation and public guidance materials, equipped residents and seasonal users with practical water-saving measures. Over time, residents are expected to help shape demand management and provide feedback on system improvements.

Project implementation followed a clear timeline:

2023 – early 2024: early scoping and equipment planning

Mar 2024: stakeholder mapping and MoU signing

Mid-late 2024: procurement of technical equipment by Vodovod Brač and Split-Dalmatia County

Sep 2024 – Apr 2025: installation of data loggers and meters

Early 2025: establishment and training of a three-person leak-detection team

May 2025 – present: active monitoring and verification

Sep – Oct 2025: public dissemination, including local presentations and stakeholder events



The procured equipment, consisting of 15 magnetic-inductive meters, 10 data loggers, 1 remote water flow detector, and Vibrophone MTC, was funded partially by the SDC, through the Mission CE Climate project, and partially by direct investment of Vodovod Brač. The total investment is valued at approximately 70.000 euros. EIHP contributed technical consultancy, and the SDC supported coordination and administrative processes.

Key risks centered on equipment installation in functioning water facilities, working during night or winter periods to avoid service disruption, especially during tourist season, and ensuring the safe handling of pressurized infrastructure. Operational risks included service interruptions, limited access due to tourism traffic and differences in material costs compared to initial market research.

As of late 2025, all planned equipment had been delivered and installed, and the pilot entered full operational testing. A new loss-detection team was established, monitoring systems are live, and data is being verified in structured phases.

As expected, the most tangible result has been a reduction in water losses. Additional outcomes include the formation of a dedicated water-efficiency team, improved system transparency through real-time monitoring, increased institutional capacity across municipal stakeholders, and

community awareness increase by producing materials, including a household water and energy guide to support broader climate and drought resilience.

Vodovod Brač is responsible for the continued operation, now equipped with modern tools and human capacity to maintain and manage the upgraded system. Monitoring will continue beyond the project period, and findings are expected to potentially be replicated on other Adriatic islands. Split-Dalmatia County and EIHP will maintain advisory roles through ongoing regional planning processes, while LAG Brač and municipalities will continue community engagement.

The pilot focused on **upgrading leak detection and management capabilities** within Vodovod Brač's water supply system. The installation of new equipment was paired with the formation of a dedicated leak-detection unit—three employees trained to operate the new equipment, analyse data and intervene rapidly when losses were detected. Monitoring began gradually, with staged verification periods aligning with procurement, testing and full rollout, enabling the utility to transition from manual estimation to real-time system insight. In parallel, project partners, Split-Dalmatia County and EIHP, coordinated planning, reporting and communication, ensuring that municipalities and civil society actors remained informed.

challenges

The initiative encountered administrative and technical barriers. Procurement planning was complicated by price changes, forcing partners to adjust purchase lists and split procurement responsibilities between SDC and Vodovod Brač. Technically, installation had to be conducted while ensuring uninterrupted drinking-water delivery, often requiring nighttime or off-season work to avoid tourist-season disruptions. These constraints lengthened installation timelines.

Close cooperation, adaptation and flexibility among partners were decisive in overcoming these challenges. Splitting procurement tasks, securing additional investment from the utility and forming a specialised internal team ensured both continuity and ownership. Working during low-demand seasons and coordinating calendars with residents and tourism cycles allowed installations to progress without compromising service. Strong communication between partners sustained momentum and kept delays manageable.

recommendations

- Anticipate cost changes and design procurement plans with flexible scopes or phased purchasing options
- Align technical work with community rhythms in your area (peak tourism, school holidays or seasonal workloads)

- Combine technological upgrades with organisational change—hardware alone is insufficient without trained staff and monitoring routines.
- Treat pilots as learning platforms—monitor data, document lessons, create public materials and communicate results



Pilot Draft Template

Pilot title:

Location(s):

Local climate risk addressed:

Goal:

Co-creation method used:

(e.g., workshop, interviews, citizen dialogue,
school curriculum co-design)

Key stakeholders:

(Quintuple Helix list)

Implementation steps + timeline:

Data/indicators:

(technical, economic, social, etc.)

Risks and safety considerations:

Maintenance and sustainability plan:

Replication notes:

(sustainability, what must be in place to upscale or mirror in other
initiative or within a different context)

Participatory Tools for Community-Led Initiatives and Co-Designing Pilot Projects with Citizens

This toolbox provides practical methods used across the CCRMs and pilots in this manual. Each tool includes purpose, when to use it, and minimum outputs so communities can apply it immediately.



Tool 1: **Stakeholder mapping** (Quintuple Helix Model)

Purpose: Identify who must be involved for legitimacy, knowledge, implementation, and community ownership.

When to use: Before forming a CCRM, launching a campaign, or designing a pilot.

How: List actors under the five helix categories; then prioritise by influence and willingness.

Minimum outputs: Stakeholder list + contact points + engagement plan (who to meet first and why).

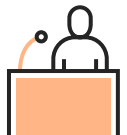


Tool 2: **Bilateral interviews / one-to-one meetings**

Purpose: Build trust early, surface concerns, and identify resources and constraints.

When to use: Before workshops; when dealing with sensitive topics or fragmented responsibilities.

Minimum outputs: Short notes capturing (a) needs, (b) offers, (c) risks, (d) decision constraints.



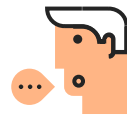
Tool 3: **Launch event + networking session**

Purpose: Make the mission visible, invite participation, and connect actors who do not normally collaborate.

When to use: At the start of a CCRM or pilot cycle.

Good practice: Combine short presentations with small-group discussion and a clear “how to join” step.

Minimum outputs: Attendance list, top priorities, sign-ups for next meeting/workshop.



Tool 4: **Citizen dialogue / open forum**

Purpose: Collect lived experience (heat, flooding, mobility constraints, seasonal pressures) and validate priorities.

When to use: Early in problem definition; when trust and inclusion are key.

Minimum outputs: List of issues, locations, and community ideas; agreement on one focus area.



Tool 5: **Co-design workshop** (solution shaping)

Purpose: Move from problems to a feasible solution design with shared ownership.

When to use: Once a priority is chosen; before procurement/permissions.

Format: 60–120 minutes. Use a simple canvas: Problem → Users → Ideas → Constraints → Actions → Roles.

Minimum outputs: One selected solution concept, roles, timeline, and next steps.



Tool 6: **Participatory mapping** (risk and opportunity)

Purpose: Identify hotspots (heat islands, flood-prone streets, overheated schoolyards, water-loss areas) and feasible pilot sites.

When to use: When location matters (most adaptation pilots).

Methods: Mapping walk, printed map session, or digital map tool.

Minimum outputs: Priority locations + site notes + backup options.

**Tool 7:****Surveys and rapid feedback** (on-site or online)

Purpose: Capture user experience and perceived benefits (comfort, safety, usability, acceptance).

When to use: During or after pilot implementation (e.g., at bus stops, schools, public events).

Minimum outputs: 3-8 key questions, response summary, and at least 2 actionable improvements.

**Tool 8:****Living lab routine** (regular mission meetings)

Purpose: Maintain momentum beyond one-off events and projects.

When to use: Throughout the CCRM lifecycle.

Good practice: Keep meetings short; publish decisions; rotate hosts; invite new partners periodically.

Minimum outputs: Action list, decision log, one outward-facing update message.

**Tool 9:****Risk and vulnerability workshop**

(expert + community)

Purpose: Understand hazard interdependencies and prioritise responses.

When to use: For complex hazards (heat + flooding + landslides; coastal risks; infrastructure vulnerability).

Minimum outputs: Priority risk list, interdependencies, and recommended adaptation actions.

**Tool 10:****Data and dashboard co-design**

(open data for climate action)

Purpose: Make climate data usable for citizens, schools, and municipal decision-making.

When to use: When using sensors, monitoring, or open data platforms.

Steps: Define use cases → choose indicators → design visualisation → test with users → refine.

Minimum outputs: Agreed indicators, user-friendly dashboard layout, maintenance protocol.

**Tool 11:****Education co-creation**

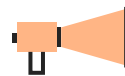
(schools as climate hubs)

Purpose: Convert monitoring into learning and community awareness.

When to use: When schools can host sensors or climate learning modules.

Good practice: Co-create content with teachers; align with the school year; simplify data access with direct links.

Minimum outputs: Lesson plan(s), worksheets, and a simple student task tied to local data.

**Tool 12:****Public festivals / open days** (amplification tool)

Purpose: Scale visibility and engagement beyond "already involved" groups.

When to use: After pilots or major milestones; in tourism-heavy locations for seasonal outreach.

Minimum outputs: Engagement numbers, key messages delivered, sign-ups, and feedback.

**Tool 13:****Implementation coordination**

(multi-competence management)

Purpose: Reduce delays caused by fragmented responsibilities (permits, heritage protection, concessionaires, utilities).

When to use: Urban pilots and infrastructure-linked pilots.

Minimum outputs: Named coordination lead, responsibility matrix, and a "permissions/procurement" timeline.

**Tool 14:****Learning capture and replication note**

Purpose: Convert pilot experience into a best practice others can adopt.

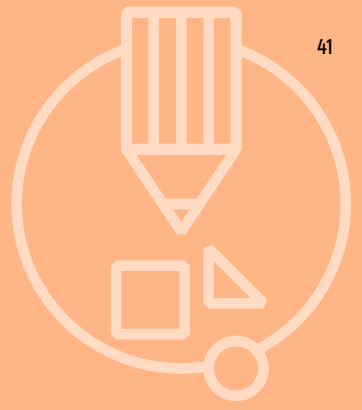
When to use: At pilot completion and after major milestones.

Minimum outputs: What worked, what did not, costs/effort, prerequisites, and replication steps.

Tools at a Glance

Tool	Purpose	When to use	Minimum outputs
1. Stakeholder mapping	Identify who must be involved for legitimacy, knowledge, implementation, and ownership	Before forming a CCRM, launching a campaign, or designing a pilot	Stakeholder list + contact points + engagement plan (who to meet first and why)
2. Bilateral interviews / one-to-one meetings	Build trust early, surface concerns, identify resources and constraints	Before workshops; for sensitive topics or fragmented responsibilities	Short notes: needs, offers, risks, decision constraints
3. Launch event + networking session	Make the mission visible, invite participation, connect actors	Start of a CCRM or pilot cycle	Attendance list + top priorities + sign-ups for next meeting/workshop
4. Citizen dialogue / open forum	Collect lived experience and validate priorities	Early problem definition; when trust and inclusion are key	Issues + locations + community ideas + agreement on one focus area
5. Co-design workshop (solution shaping)	Turn problems into a feasible, shared solution design	After choosing a priority; before procurement/permissions	Selected solution concept + roles + timeline + next steps
6. Participatory mapping (risk and opportunity)	Identify hotspots and feasible pilot sites	When location matters (most adaptation pilots)	Priority locations + site notes + backup options
7. Surveys and rapid feedback (on-site or online)	Capture user experience and perceived benefits; improve implementation	During or after a pilot (e.g., bus stops, schools, public events)	3–8 questions + response summary + at least 2 actionable improvements
8. Living lab routine (regular mission meetings)	Maintain momentum beyond one-off events and projects	Throughout the CCRM lifecycle	Action list + decision log + one outward-facing update message
9. Risk and vulnerability workshop (expert + community)	Understand hazard interdependencies and prioritise responses	For complex hazards (e.g., heat + flooding + landslides)	Priority risk list + interdependencies + recommended adaptation actions
10. Data and dashboard co-design (open data for climate action)	Make climate data usable for citizens, schools, and decision-makers	When using sensors, monitoring, or open data platforms	Agreed indicators + user-friendly dashboard layout + maintenance protocol
11. Education co-creation (schools as climate hubs)	Turn monitoring into learning and community awareness	When schools host sensors or climate learning modules	Lesson plan(s) + worksheets + simple student task tied to local data
12. Public festivals / open days (amplification tool)	Scale visibility and engagement beyond “already involved” groups	After pilots/milestones; tourism-heavy locations for seasonal outreach	Engagement numbers + key messages delivered + sign-ups + feedback
13. Implementation coordination (multi-competence management)	Reduce delays from fragmented responsibilities (permits, utilities, etc.)	Urban and infrastructure-linked pilots	Named coordination lead + responsibility matrix + permissions/procurement timeline
14. Learning capture and replication note	Convert pilot experience into a best practice others can adopt	At pilot completion and after major milestones	What worked/what didn't + costs/effort + prerequisites + replication steps

Trainings for Participants of Citizen-Led Initiatives



Community-led climate resilience depends not only on people's motivation to act, but also on their capacity to do so. Across Europe and globally, communities are increasingly stepping forward to address the impacts of climate change—flooding, heatwaves, drought, and ecological degradation. However, to ensure their efforts are informed, inclusive, and effective, **communities must be equipped with the right tools, knowledge, and skills.**

This chapter outlines the critical role of training and capacity-building in enabling and sustaining citizen-led climate initiatives. It presents key training themes for climate-resilience for citizens, highlights successful examples from across Europe, and demonstrates how structured learning can turn grassroots enthusiasm into resilient and equitable action.

Training is not a peripheral activity in climate governance—it is central. When communities are well-informed, they are better positioned to:

- 📍 **Understand and assess their specific climate risks;**
- 📍 **Design and implement locally relevant solutions;**
- 🗣️ **Participate in decision-making processes with confidence;**
- 🏠 **Access funding and resources;**
- 📊 **Monitor progress and adapt over time.**

Our Approach

A series of structured training sessions were developed within the MISSION CE CLIMATE project to build foundational knowledge and strengthen the capacity of local actors involved in Community Climate Resilient Missions (CCRMs). **Climate resilience requires not only strategic planning and technical solutions but also shared understanding among all stakeholders.** The training programme was designed to equip CCRM members with the scientific background, policy frameworks, and practical tools needed to respond effectively to climate challenges in their communities.

Covering essential themes such as climate adaptation, temperature and precipitation-related risks, and urban resilience within planetary boundaries, the sessions aimed at support a common learning baseline while addressing the specific needs of different local contexts. This approach

ensures that all participating communities, regardless of scale or focus area, can develop informed, collaborative, and adaptive responses to the climate crisis.

To build the knowledge and capacity of citizens, NGOs, and local actors in addressing climate challenges, initiatives should offer structured training sessions that combine scientific grounding, policy awareness, and practical application. The aim is to establish a **shared understanding among stakeholders** while tailoring content to the unique needs of each community.

Below are some training topics organized within the MISSION CE CLIMATE project that any CLI can adopt or adapt to strengthen community climate resilience.

1. Introductory training on climate change and its effects

Provided a clear introduction to climate change and its local and global impacts.

What the training covered:

- The science of climate systems and the greenhouse effect;
- How cities contribute to CO2 emissions;
- The importance of vulnerability assessments as a basis for adaptation planning;
- Practical examples of vulnerability assessments from other cities to inspire local action.

2. Understanding Temperature-Based Climate Risks

Educated participants on the health, environmental, and social risks of rising temperatures.

What the training covered:

- The urban heat island effect and its implications
- Climate projections under different emission scenarios
- Strategies for urban cooling and nature-based solutions
- Examples of both incremental and transformational adaptation actions from other cities

3. Addressing Precipitation-Based Climate Risks

Help communities prepare for floods, droughts, and shifting rainfall patterns.

What the training covered:

- Current trends and projected changes in precipitation;
- Types of flooding (riverine, pluvial, coastal) and related vulnerabilities;
- Adaptation measures such as flood defenses, water conservation, and ecosystem restoration;
- The economic and environmental costs of inaction.

4. Building Resilient Cities Within Planetary Boundaries

Guide participants in aligning urban development with the planet's ecological limits.

What the training covered:

- Introduction to the concept of planetary boundaries;
- Key resilience qualities: flexibility, inclusiveness, integration;
- Approaches for upgrading infrastructure and applying nature-based solutions;
- Ensuring equity in adaptation and engaging communities in decision-making;
- Setting up monitoring and evaluation processes for continuous improvement.

5. Using the Copernicus System for Climate Action

Introduced the EU Copernicus Earth Observation Programme and how communities can use its free data and tools.

What the training covered:

- Monitoring climate trends
- Assessing local risks
- Supporting evidence-based decision-making

6. Financing Strategies for Climate Adaptation

Provided guidance on how to secure and manage funding for climate resilience measures.

What the training covered:

- Public and private funding sources
- Innovative financing models (e.g., green bonds, climate funds)
- Building compelling proposals and partnerships
- Ensuring financial accountability and transparency

7. The Potential of Civic Participation

Highlighted how community engagement can accelerate climate action.

What the training covered:

- Methods for involving residents in planning and implementation
- Building trust and fostering collective ownership
- Case studies where civic participation led to stronger climate outcomes

8. Data for Climate Action: OpenData & CLIMAAX Tools

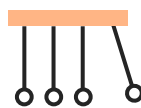
The journey towards an Open Data Platform (concept, key milestones, and enabling process).

What the training covered:

- Barriers and challenges encountered (technical, organisational, and data-related) and how to address them;
- Presentation of core datasets (environmental, climate, and geospatial) and their practical value;
- CLIMAAX tools: functions, ecosystem overview, and data requirements;
- Case study: Košice – how OpenData and CLIMAAX tools support local climate-risk analysis;
- IoT & LoRaWAN networks and practical applications to monitor climate-relevant data;
- Practical examples and peer learning from experts involved in the MISSION CE CLIMATE project.

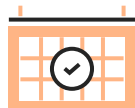
Recommendation for Development of Training Curriculums for Community-Led Climate Initiatives

A robust training program for community-led initiatives should address both technical knowledge and organizational capacity. Below are some recommended topics that form the foundation of such programs:



Climate Science and Local Risk Awareness

Communities need to understand how climate change manifests locally. Training in basic climate science, risk mapping, and local projections helps individuals and groups recognize how flooding, heatwaves, sea-level rise, or biodiversity loss may affect them directly. This knowledge is often the catalyst for action.



Community-Based Vulnerability and Capacity Assessment (CVCA)

Participatory tools like vulnerability mapping, seasonal calendars, and asset inventories allow communities to assess their risks and strengths. These tools enable self-reflection and set the foundation for locally driven planning.



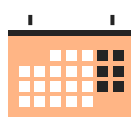
Nature-Based Solutions (NBS) and Green Infrastructure

Green roofs, rain gardens, urban forests, and restored wetlands are low-cost and multifunctional responses to climate impacts. Training on how to design, implement, and maintain such solutions enables communities to enhance local resilience while co-benefiting from improved health and biodiversity.



Community Organizing and Governance

Sustained climate action depends on organized structures and strong leadership. Training in local governance, meeting facilitation, consensus-building, and transparency ensures that groups can coordinate effectively and inclusively.



Project Planning and Management

Even grassroots projects require structure. From writing a project plan to managing budgets and evaluating outcomes, communities benefit from learning professional planning tools that help translate ideas into tangible results.



Climate Finance and Fundraising

Understanding where and how to access funding is critical for scaling community initiatives. Training might include how to apply for EU grants, pitch to donors, manage funds transparently, and report effectively.



Communication and Climate Storytelling

Communities need to tell their stories—to engage others, influence policy, and attract resources. Training in media engagement, public speaking, and visual storytelling can amplify local voices and inspire broader change.



Just Transition and Climate Justice

Climate change affects communities unequally. Training in equity, social justice, and intersectional inclusion ensures that resilience initiatives reflect the needs and priorities of all residents, especially those most at risk.



Community Engagement

This action involves organizing communication and awareness-raising activities to inform and engage the community about climate resilience initiatives. Activities may include public campaigns, community events, and educational programs.

Training Programme Design Checklist

(for citizens, NGOs, local actors)

Design

- Define training purpose: awareness, skills, implementation, funding readiness.
- Segment target groups (citizens, NGOs, municipal staff, teachers, youth, SMEs).
- Choose format: short workshop / modular series / mentoring / blended.

Make training practical

- Link each module to one real local task (mapping, pilot design, communication, data reading).
- Include one hands-on exercise per session (e.g., vulnerability mapping, co-design canvas, dashboard demo).
- Provide take-home materials (worksheets, checklists, links).

Integrate learning with pilots

- Use local pilot examples as teaching cases.
- Invite pilot partners (municipality, utility, school, NGO) for credibility.
- End training with an action commitment: who will do what by when.

Accessibility and inclusion

- Offer non-digital access where needed (print, local venues, short sessions).
- Schedule around school calendars, seasonal workloads, and tourism peaks.
- Collect feedback and refine content each cycle.



European Case Studies: Impact of Community Training

Across Europe, communities are increasingly stepping into leadership roles in responding to the climate crisis. While policy frameworks and infrastructure investments are essential, it is the knowledge, skills, and agency of local people that often determine the success—or failure—of climate adaptation efforts on the ground. Community training plays a pivotal role in this transformation. It bridges the gap between awareness and action, enabling residents to understand climate risks, co-design solutions, and sustain long-term resilience measures.

This chapter presents a selection of European case studies that demonstrate how strategic, inclusive training programs have catalyzed citizen-led climate initiatives.

From rain gardens in Rotterdam to climate-sheltering schoolyards in Barcelona, each example shows how empowering people with the right tools and understanding can lead to meaningful environmental and social outcomes. These cases highlight not only the diversity of training formats and topics but also the shared principles of participation, ownership, and capacity-building that underpin successful community resilience.

By examining these stories, practitioners and policymakers can gain valuable insight into how to design and scale community training programs that are not only technically effective but also socially inclusive and locally grounded.



Rotterdam, Netherlands – Water Sensitive Neighborhoods and the Sponge Garden

In response to increasing rainfall and urban flooding, Rotterdam developed an ambitious strategy to become a “water-sensitive city.” Central to this effort was the active involvement of local communities in understanding and co-designing nature-based flood management solutions. One of the most prominent examples of this approach is the **Sponge Garden**, a living laboratory established in collaboration with community members, local designers, and water experts.

Residents participated in training sessions and workshops where they learned how green-blue infrastructure works—specifically how soil, vegetation, and landscape features

can be designed to store and slowly release rainwater. They were involved in testing various soil compositions, choosing plant species, and designing small-scale bioswales and rain gardens. Local participants also learned how to monitor water absorption and contribute to long-term maintenance.

The Sponge Garden not only reduced flood risks in the area, it also became a model for similar community-based projects across Rotterdam. The initiative demonstrated how well-informed and engaged citizens can play a meaningful role in urban climate adaptation, creating more livable, green, and flood-resilient neighborhoods.



Barcelona, Spain - Climate Shelters in Schools

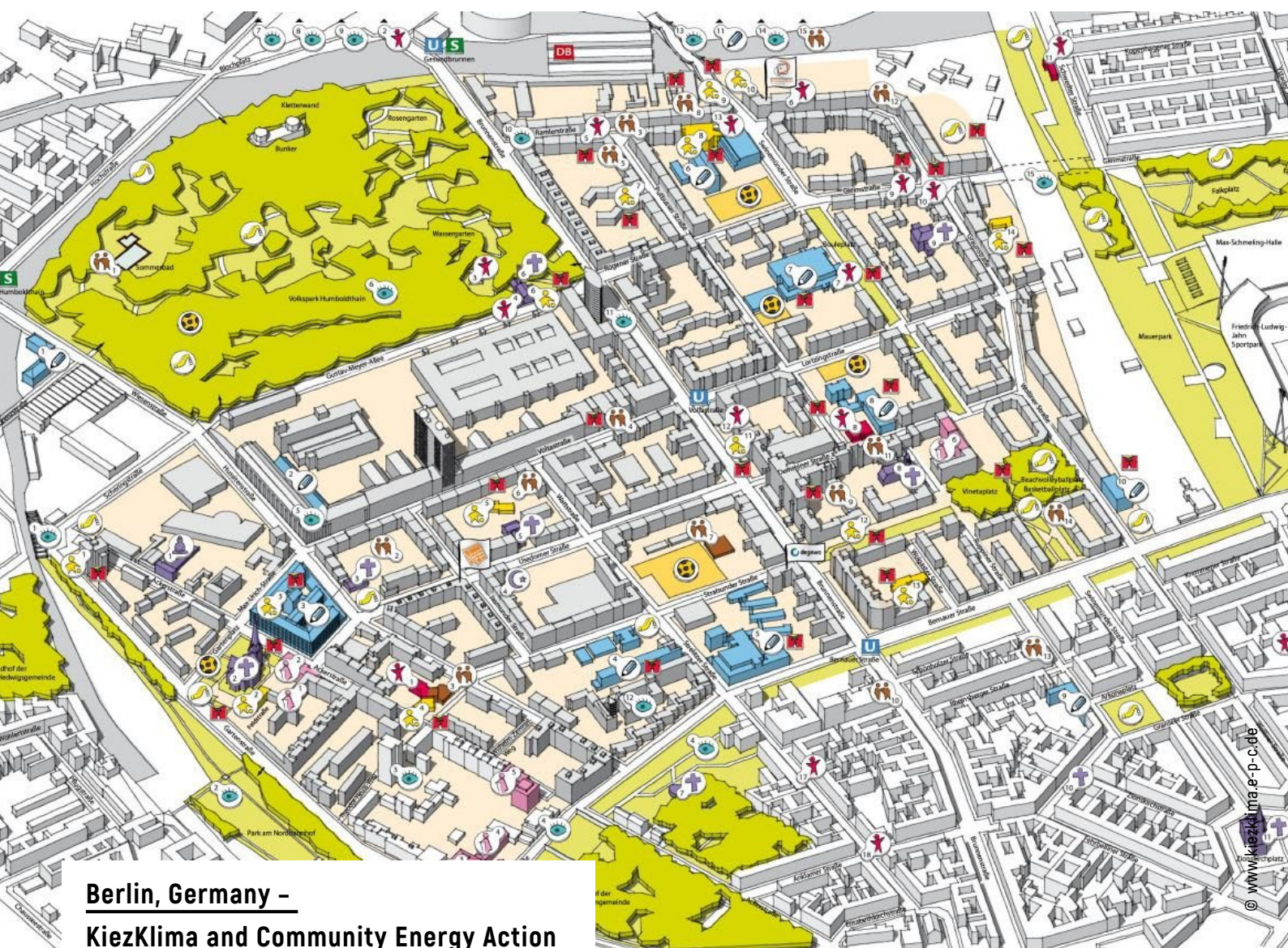
As part of its urban climate adaptation strategy, the city of Barcelona developed an innovative program to **transform schoolyards into climate shelters**. These redesigned spaces aimed at reduce the effects of urban heat, increase access to green infrastructure, and serve as safe community hubs during extreme weather events.

The success of the program relied heavily on the active involvement of school communities—teachers, students, parents, and local organizations. Through participatory workshops and hands-on training sessions, community members learned about climate risks, thermal comfort, and landscape design. Children were taught how green spaces could cool the environment, reduce flooding, and support

biodiversity. Adults collaborated with city planners to identify the best features to include, such as trees, shaded seating areas, water play zones, and permeable pavements.

The program resulted in the transformation of eleven schoolyards into multifunctional climate shelters. Families reported improved comfort during heatwaves, increased usage of outdoor space, and stronger community engagement. Based on this success, the initiative has been expanded to additional schools and integrated into Barcelona's long-term urban resilience strategy. It has become a leading example of how participatory design and climate education can turn everyday public spaces into hubs of resilience and well-being.





**Berlin, Germany -
KiezKlima and Community Energy Action**

In Berlin, the **KiezKlima initiative** targeted inner-city neighborhoods where residents faced both socioeconomic challenges and exposure to environmental risks such as heat and poor air quality. The program focused on empowering local people through environmental education, hands-on greening activities, and energy-saving initiatives.

Community workshops were held to teach residents how to reduce household energy consumption, improve building insulation, and implement small-scale renewable energy solutions. At the same time, participants received training on urban greening techniques, including rooftop gardening, planting shade trees, and managing shared green spaces.

Residents applied their new skills by creating small neighborhood parks, greening inner courtyards, and forming local groups to monitor energy use and promote behavior change. The program fostered a strong sense of ownership and mutual support, particularly in areas where trust in public institutions had historically been low.

Although its outcomes were less formally measured than other programs, KiezKlima demonstrated the power of knowledge-sharing and grassroots collaboration in fostering climate resilience. It showed that when people are given the opportunity and tools to act, even small interventions can have a cumulative and transformative impact on urban environments.



Cluj-Napoca, Romania – Urban Labs and Youth-Led Climate Action

In Cluj-Napoca, Romania's growing interest in climate governance intersected with a vibrant civic culture and youth activism. Through a series of **urban living labs** supported by EU-funded initiatives, local residents—particularly young people—were trained in participatory planning, climate risk analysis, and sustainable neighborhood development.

Workshops introduced participants to tools like participatory mapping, scenario planning, and systems thinking. These sessions encouraged citizens to explore how different climate risks—such as extreme heat, air pollution, and flooding—could be addressed through nature-based solutions and low-carbon infrastructure. One flagship outcome was the “Net Zero Champions” initiative, which trained young people to advocate for and co-develop retrofitting strategies for apartment blocks, helping entire communities reduce energy use and emissions.

The project not only resulted in concrete proposals for climate-resilient neighborhoods, but also strengthened youth leadership in local governance. Many participants continued to collaborate with municipal planners, influencing public policy and budget decisions related to sustainability. Cluj's experience shows that empowering communities—especially young people—with knowledge and planning skills can result in long-term civic engagement and system-level change.


The case studies in this chapter illustrate that when communities are equipped with the knowledge, confidence, and tools to act, they become powerful drivers of climate resilience. In cities across Europe—from Rotterdam to Cluj-Napoca—training has proven to be more than a learning exercise; it is a strategic investment in social infrastructure. It transforms residents from passive recipients of climate policy into co-creators of adaptation and sustainability.


What unites these diverse examples is the central role of inclusive, context-sensitive training that reflects local realities and builds on community strengths. Whether it involves technical skills like designing green infrastructure or soft skills like facilitation and advocacy, training fosters both individual empowerment and collective capacity. It builds trust, unlocks creativity, and supports long-term stewardship of climate solutions.


As climate impacts continue to intensify, the need for localized, community-driven responses will only grow. These European experiences offer clear guidance: for resilience to take root and endure, community training must be seen not as a support activity, but as a core pillar of any climate initiative. Integrating such training early and consistently into climate planning can ensure that local people are not only prepared for what's ahead—they are leading the way.

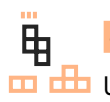
Next Steps for Practitioners

Effective training does more than transfer information—it builds confidence, trust, and the practical ability to act. When communities understand their climate risks and have the skills to respond, participation becomes meaningful and sustained rather than symbolic or reactive. In the context of escalating heatwaves, floods, droughts, and coastal risks, strengthening local capacity is one of the most cost-effective and socially beneficial investments in resilience. Building on the experiences of the CCRMs and pilot projects presented in this manual, the following steps can help practitioners (local governments, NGOs, schools, utilities, universities, and community groups) embed training as a core pillar of community-led climate resilience:


 **1 | Start with a training needs assessment**
Map the target groups (citizens, municipal staff, teachers, youth, SMEs, community organisations) and assess what they need in order to participate effectively. Identify barriers such as time constraints, digital literacy gaps, language accessibility, or lack of prior experience with participatory processes.

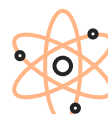
 **2 | Co-design training with the community**
Co-create learning objectives, formats, and materials with those who will use them. The Košice experience shows that training works best when teachers and practitioners shape content together, test it in real settings, and improve it through feedback.


 **3 | Combine scientific grounding with practical application**
Balance core climate knowledge (local hazards, vulnerability, adaptation options) with hands-on tools: participatory mapping, nature-based solutions design principles, data interpretation, monitoring routines, and project planning. Link training directly to ongoing initiatives (pilots, local action plans, SECAP/Adaptation Plans) so learning immediately translates into action.


 **4 | Offer modular and accessible formats**
Use a mix of short workshops, online sessions, peer-learning exchanges, mentoring, and practical demonstrations. Schedule activities around local rhythms (tourism peaks, school calendars, seasonal workloads) and

ensure accessibility for those less digitally connected by using local media, printed materials, and in-person outreach.

 **5 | Build long-term capability, not one-off events**
Treat training as an ongoing process that strengthens the CCRM as a living lab. Develop local trainers and facilitators, document materials for reuse, and create simple onboarding packs so new partners can join missions over time without losing momentum.

 **6 | Connect training to governance and implementation**
Training should reinforce clear roles, shared decision-making, and transparent processes within the CCRM. This includes facilitation skills, conflict management, and collaboration across sectors—especially important when pilots involve many competencies and approvals, as seen in dense urban settings.

 **7 | Integrate monitoring, evaluation, and learning**
Define how progress will be tracked (e.g., participation, knowledge gain, behaviour change, pilot performance indicators). Pair technical monitoring (sensor data, microclimate measures, water-loss metrics) with social feedback (surveys, interviews, community reflection sessions) to capture full benefits and inform replication.

 **8 | Link capacity-building with funding and sustainability**
Support communities in identifying funding sources, preparing proposals, and managing resources transparently. Where possible, combine external project funding with local budgets, in-kind contributions, and institutional commitments to ensure continuity beyond individual project cycles.

Ultimately, community-led climate resilience succeeds when people are equipped to lead: when citizens can interpret local risks, co-design solutions, and sustain long-term stewardship of climate actions. By embedding training early and consistently—alongside real projects and inclusive governance—practitioners can strengthen local ownership, accelerate implementation, and make resilience a lasting feature of everyday decision-making.

References

- Arnstein, S. R. (1969). A ladder of citizen participation. **Journal of the American Institute of Planners**, 35(4), 216–224.
- Barcelona City Council. (2021). [Climate shelters in schools.](#)
- Carayannis, E. G., & Campbell, D. F. J. (2010). [Triple Helix, Quadruple Helix and Quintuple Helix and how do knowledge, innovation and the environment relate to each other?](#) *International Journal of Social Ecology and Sustainable Development*, 1(1), 41–69.
- De Urbanisten. (2020). [Sponge Garden Project.](#)
- European Environment Agency. (2013). [Urban storm water management in Augustenborg, Malmö.](#)
- European Environment Agency. (2023). [Urban adaptation case studies.](#)
- Frontiers in Public Health. (2025). [Evaluation of climate shelters in Barcelona.](#)
- MISSION CE CLIMATE (2025). [Deliverable 1.2.1., deliverable 1.2.2., deliverable 1.2.3., deliverable 2.1.1., deliverable 2.2.1., deliverable 2.3.1., deliverable 2.5.1.](#)
- NetZeroCities. (2024). [Pilot blueprint: Cluj-Napoca – Net Zero apartment blocks.](#)
- NetZeroCities. (2024). [Cluj-Napoca NZC capacity-building reports.](#)
- OurCluj. (2022). [OurCluj community-led urban development platform.](#)
- Portico Urban Initiative. (2022). [Climate shelters: Barcelona.](#)
- Pretty, J. N. (1995). **Participatory learning for sustainable agriculture.** *World Development*, 23(8), 1247–1263.
- Urban Agenda for the EU. (2022). [Water sensitive cities: Implementation pathways.](#)
- World Bank. (1996). **Participation sourcebook.** Washington, DC: World Bank.
- World Habitat Awards. (2005). [Ekostaden Augustenborg.](#)
- World Landscape Architecture. (2022). [Sponge Garden Rotterdam – WLA Honour Award.](#)



MISSION CE CLIMATE Project



Climate Resilient Communities of Central Europe

Central Europe faces many climate change challenges like the rest of the world. The main aim of the MISSION CE CLIMATE project is to overcome the disjointed sectoral responses to climate change by introducing a coordinated, cross-sectoral approach that puts local/regional authorities at the centre of the governance and management of the climate resilience process. The overall objective is to support communities in Central Europe to become resilient to climate change and to enable them to respond in a coordinated way to the impacts caused by climate change. The project will build sustainable systems (community climate missions) and community capacities (integrated strategy, local action plans, and solutions).

THE PROJECT'S INTENDED OUTCOMES ARE:

1. Establishment of climate resilience systems in partner communities (Community Climate Missions) supported by a joint 2030 Climate Resilience Strategy (definition of actions, business models, financing mechanisms) and locally tailored action plans (project portfolio approach);
2. Enhancing community capacity to adapt to climate change with new skills and tools;
3. Activated citizens contributing to community climate resilience through increased awareness and capacity (tools, etc.);
4. Solutions developed through pilot projects that respond to community adaptation challenges.

For more information on climate adaptation and good practices, consult our websites:

www.interreg-central.eu/projects/mission-ce-climate/
www.climatehub.si

This document has been produced within the project **MISSION CE CLIMATE – Climate Resilient Communities of Central Europe**. This project is supported by the Interreg CENTRAL EUROPE Programme with co-financing from the European Regional Development Fund. Views and opinions expressed are, however, those of the authors only and do not necessarily reflect those of the European Union or the Interreg CENTRAL EUROPE Programme authorities. Neither the European Union nor the Interreg CENTRAL EUROPE Programme authorities can be held responsible for them.

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