D2.4 - Just Transition Roadmaps

12 Regional Just Transition Roadmaps Towards Climate Resilience

Regions 4Climate

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List of Acronyms

AI	Artifical Inteligence
AR	Augmented reality
BG	Bulgaria
CAP	Common Agricultural Policy (Spain)
CAPF	Climate Action Planning Framework generation 2
CEA	Cyprus Energy Agency
CY	Cyprus
DK	Denmark
EE	Estonia
ERDF	European Regional Development Fund
ES	Spain
EWS	Early Warning Systems
F	Finland
FR	France
FRCT	Fundo Regional da Ciência e Tecnologia
GIS	Geographic Information System

GR-M	Grece
ICT	Information and Communication Technology
IPSS	local social solidarity institutions
IT	Italy
JT	Just Transitions
JTR	Just Transitions Roadmap
LK	National association of local governments, Denmark
NGO	Non-Governmental Organization
R4C	Regions4Climate
SECAP	Sustainable Energy and Climate Action Plan
SME	Small and Medium-sized Enterprise
VR	Virtual reality
WP	Work Package
XR	Extended Reality

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Keywords

- Climate Justice
- Climate Resilience
- Roadmapping
- Systemic change
- Transformation

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1. Introduction

Globally, 2024 was the warmest year on record, following on from the already exceptional warmth of 2023 and of the preceding decade (Copernicus Climate Change Service (C3S), 2025). Since the 1980s, Europe has been warming twice as fast as the global average, making it the fastest-warming continent on Earth and resulting in record-breaking extreme weather events due to climate change such as heatwaves, wildfires, floods, landslides, and rockfalls. Southern Europe has borne the brunt of the heat, with escalating droughts in France and devastating wildfires in Greece, Spain, and Portugal during 2023 and 2024. These extreme temperatures were accompanied by intense rainfall episodes and catastrophic flash floods in Central and Eastern Europe and in eastern Spain in 2024, which collectively claimed over 250 lives and caused an estimated €14 billion in damage. Permafrost thaw has caused a surge in rockfall and landslide risks in Alpine regions, including the dramatic collapse of part of the Birch Glacier above the Swiss village of Blatten in May 2025 that devastated nearly 90% of the settlement and prompted evacuations.

In response to these escalating climate impacts, the EU Mission on Adaptation to Climate Change plays a central role in strengthening Europe's resilience. Launched under Horizon Europe, the Mission aims to support at least 150 European regions and communities to become climate-resilient by 2030. It offers a framework for experimentation and innovation in adaptation strategies, co-developing solutions with local governments, researchers, and citizens. The Mission prioritizes nature-based solutions, climate risk assessments, disaster preparedness, and knowledge-sharing among regions. Through instruments like Mission Charter signatories, funding mechanisms, and tailored technical assistance, it enables municipalities and regions to translate adaptation planning into concrete, scalable actions. Notably, it leverages EU Climate Risk Assessment data and collaborates with platforms like Climate-ADAPT to guide decisions at local and regional levels. As climate extremes intensify, the Mission stands as a flagship initiative aligning science, policy, and community efforts to minimize vulnerability and protect livelihoods across Europe.

In alignment with the key objectives of the EU Green Deal, the Mission emphasizes leaving no one behind, recognizing that the benefits, costs, rights, and responsibilities in this process should be distributed in a just and fair way, and nobody should be more vulnerable or marginalised because of the transition to climate resilience. Therefore, adaptation plans must go beyond incremental technical fixes like infrastructure upgrades or early warning systems to incorporate transformative aspects that address the underlying social, economic, and governance inequalities that shape vulnerability and adaptive capacity. This means actively involving marginalised communities in decision-making, prioritising equity and inclusion in resource allocation, and fostering institutional change that challenges the status quo. Transformative adaptation requires not only managing risks but rethinking systems—from housing and healthcare to land use and labour—to build resilience that is both climate-smart and socially just.

Regions4Climate is a Horizon Europe initiative (2023–2027) involving 46 partners across 12 European regions, that aims to demonstrate a socially just transition to climate resilience in line with the EU Mission on Adaptation to Climate Change. At its core, the project facilitates co-created, cross-sectoral roadmaps developed with regional stakeholders—especially vulnerable and marginalised groups—combining technological, digital, business, governance, environmental, and socio-cultural innovations. Through systems dynamic modelling, regional "twinning", and demonstration projects—from urban heat mapping in Estonia to lagoon restoration in Spain—the

project aims to validate scalable, replicable solutions that ensure resilience pathways are not only effective, but also fair, inclusive, and transformative.

To operationalise justice and equity throughout adaptation planning, a Just Transition Framework (Klein et al., 2023) and roadmap development process were developed. These include a structured five-step process that integrates social vulnerability analyses, equitable decision-making, and prioritisation of actions that both share burdens and distribute benefits fairly. They guide each of the R4C regions in how to develop region-specific just transition roadmaps - actionable plans for just transition to climate resilience - according to their unique set of opportunities and challenges.

In this report we present the outcomes of this roadmap process. In Section 2, we briefly outline the principles of the just transition framework along with the preliminary and revised roadmap development methodology. In Section 3, we present the roadmaps themselves, along with specific adaptations for the core methodology and the key issues, target areas and vulnerable groups in each region. These include the Basque Country (ES), South Aquitaine (FR), Azores (PT), Tuscany (IT), Køge Bay (DK), Burgas (BG), Uusimaa (FI), Pärnumaa (EE), Sitia (GR-M), Castilla y León (ES), Nordic Archipelago (FI) and Troodos (CY). Finally, we discuss lessons learned across the 12 regions during the Just Transition Roadmap process.

2. Methodology

2.1. Just transition framework objectives and dimensions

The Just Transition Framework responds to the urgent need to ensure that climate adaptation policies and measures do not exacerbate existing social, economic, and spatial inequalities in Europe. It builds on the recognition that vulnerabilities to climate impacts are unequally distributed, often leaving marginalised communities—such as low-income groups, ethnic minorities, and rural residents—at higher risk. Moreover, adaptation strategies historically have prioritized technical efficiency over fairness, leaving justice dimensions poorly integrated in regional planning. The framework thus aims to embed justice at the heart of adaptation governance, addressing both historical injustices and new ones emerging from climate responses.

The core objective of the framework is to mainstream social and environmental justice into regional climate adaptation processes under the Regions4Climate project. More specifically, it seeks to:

- Promote a fair distribution of adaptation benefits and burdens.
- Facilitate inclusive decision-making through participatory governance.
- Guide the co-development of locally relevant solutions that are context-sensitive and equitable.
- Build capacities among regional stakeholders to recognize, assess, and address justice concerns.

The approach aims to contribute to a transformative shift in climate adaptation thinking—one that moves from isolated, technocratic fixes to systemic, socially grounded change.

The framework outlines ten enablers and barriers for transformation (including path dependency, participatory decision-making, practical experiments, and mindset change) and is grounded in the following four dimensions of justice:

- Recognitional justice - who is recognised as a stakeholder?
- Procedural justice - how are stakeholders included in adaptation processes?
- Distributive justice - what is the distribution of impacts, rights and responsibilities?
- Restorative justice - are pre-existing harms and injustices subject to restoration, reconciliation and compensation?

2.2. Core roadmap process

Roadmaps are strategic tools designed to coordinate actions toward a shared vision or goal among diverse stakeholders within a specific timeframe. They help drive transformation by fostering a common understanding of how political, sociocultural, economic, and environmental factors interconnect, and by addressing entrenched system barriers that market mechanisms alone cannot resolve. Their scope can vary from targeted innovations or sectoral challenges to broad societal transformations.

In the Regions4Climate project, roadmaps serve as frameworks for region-specific just transitions toward climate resilience. Each roadmap should articulate a transformative vision, set clear goals, and outlines actionable steps in the short- to mid-term while aligning with long-term objectives. Emphasizing justice, the roadmaps are designed to address unequal climate impacts and ensure inclusivity, avoiding the deepening of disparities. They integrate adaptation and regional development, incorporating principles of distributive, restorative, recognitional, and procedural justice to support fair and effective regional transformation.

To guide each of the regions in their roadmap development process, a structured process with five essential steps was developed to build an actionable, region-specific roadmap for just transition to regional climate resilience (Figure 1).

- Scope and context building – considering baseline data and the expected level of systemic change
- Actor identification and involvement - involving stakeholders, including marginalised and vulnerable groups
- Defining a vision and goal together - envisioning the ideal state of climate resilience and formulating goals
- Defining actions together - facilitating the transition process with an emphasis on climate justice
- Official approval of the roadmap - ensuring commitment by key actors

Figure 1. The five steps of a roadmap process for just transition to climate resilience.

In each step, the rationale of a just transition to climate resilience is associated with specific expectations for social justice and transformation.

Each of the five steps involve certain key activities and are supported by a catalogue of specific tools and methods that can be adopted in the processes of building just transition roadmaps that are outlined below.

Scope and Context Building

This first step provides the basis for the roadmap process. The initiators of the roadmap establish a core group of actors who collect relevant information about the region's climate challenges, policies, governance structures, and territorial characteristics, considering the overall rationale of transformative action towards regional climate resilience. The initiators also provide a preliminary scope for the roadmap, indicating the degree and level of systemic change the roadmap aims for.

Actor Identification and Involvement

In this part of the process, participants map all actors and stakeholders that should be involved in the roadmap process within the given scope. This step will give special attention to marginalised and vulnerable groups. Beyond the mere identification of actors, the active involvement of these actors is equally important. Therefore, this step also considers incentives for participation and the accessibility and inclusiveness of the roadmap process.

Defining the Vision and Goal Together

Includes two major activities. In the first activity, participants create a vision together – an ideal state of climate resilience – within the scope of the roadmap. The second activity provides a narrower, shorter-term goal in line with the vision that considers the available time, resources, and capacities of the involved actors.

Defining Actions Together

The actors jointly define actions that facilitate the transition from the current situation to the goal defined in the previous step. Each action is assessed with respect to the uneven distribution of the burden of climate change, the principle of "leaving no one behind", and the dimensions of adaptation justice. Attention is given to the credibility of the suggested actions, so the descriptions of the actions should include, where possible, information about the timing, accountable and responsible actors, resources, and criteria to monitor the progress and success of the action's implementation. This step can also include an iterative element, where local stakeholders and experts assess such aspects as the action's effectiveness, costs, or acceptability. The actions can be adjusted and improved based on different types of knowledge.

Official Approval

The fifth and last step is the "Official Approval" of the roadmap. The commitment of actors accountable and responsible for the implementation of the roadmap and the transition process is essential for legitimacy and credibility (De Geus et al., 2022; Miedzinski, McDowall, et al., 2019; Olazabal et al., 2019). Depending on the scope of the roadmap and the involved actors, the commitment can be expressed by the approval of the roadmap by a (regional) public authority or by a publicly stated commitment by relevant actors with the necessary mandate and resources to implement the roadmap.

2.3. The Roadmap Process in Practice

2.3.1. Scope and Context Building

To start the roadmap process Demos Helsinki hosted kickoff meetings with representatives from each region. These meetings happened between January 2024 and June 2024. In these meetings, Demos Helsinki presented the five steps of the roadmap process and suggested these as a procedure to be adapted to the needs and peculiarities of each region. In addition, the aim was to agree on a suitable scope of the roadmap and to get a first understanding of the relevant societal groups to be involved. Alongside this meeting, Demos Helsinki prepared a document that collected and summarized relevant context information from e.g. policy documents, strategies (e.g. adaptation strategies, sustainable energy and climate action plans, regional development plans), and as far as

available data and trends and scenarios for climate change, economic and demographic developments, as well as groups in potentially vulnerable positions and justice considerations. Also, project results from other deliverables (e.g. Deliverable 2.1) were utilized as far as possible.

The identification of a suitable scope was in some of the regions a long deliberation process that extended over several meetings and lasted in some cases until Spring 2025.

2.3.2. Actor Identification and Involvement

All regional partners were encouraged to map relevant actors with a specific focus on groups vulnerable to climate change impacts and to climate change adaptation. The actor identification was also part of the first Just Transition Roadmap Clinic, a workshop hosted at the Consortium Meeting in Sitia, Crete, Greece in April 2024.

The depth of this exercise varied a lot between the regions. Whereas some regional partners conducted an extensive actor mapping using the tools and methods suggested in Deliverable 2.2 Just Transition Framework, other partners relied on existing networks and contacts and did not see added value in an additional mapping of vulnerable groups. Because the scope of the roadmap changed over time in some regions, it was necessary to repeat the stakeholder identification and align it with the newly identified scope.

2.3.3. Defining Vision and Goal Together and Defining Actions Together

In most of the regions, these two steps were conducted consecutively in one participatory workshop. In these cases, Demos Helsinki provided methods and tools for participatory backcasting that were tailored to the regional needs. The methodology encompassed several key steps: (1) generating four distinct future snapshots, primarily created by Demos Helsinki, based on initial context building and refined through discussions with regional partners; (2) conducting a participatory backcasting workshop to analyse the provided scenarios in terms of justice and vulnerabilities; (3) collaboratively creating a vision of a just, climate-resilient region with workshop participants; and (4) identifying actions to support the transformation towards this vision. The methodology and agenda were typically developed jointly by the regional partners and Demos Helsinki, with the workshops facilitated by the regional partners.

There were several deviations from this general methodology across the regions. Some regions included only one or no future snapshot in the workshops, while others relied on scenarios derived from other policy processes such as regional development agendas or just transition plans. In one region, participatory workshops used arts-based methods to generate a joint vision.

The number and type of participants varied broadly based on the results of the actor identification in the previous step. Generally, in most regions vulnerable and marginalized groups were represented by respective advocacy groups.

With very few exceptions information about the timing, accountable and responsible actors, resources, and criteria to monitor the progress and success of the action's implementation was collected based on expert judgement collected after the workshops.

2.3.4. Official Approval

The integration of the roadmaps into relevant policy processes and the regional adoption of the roadmaps turned out to be the biggest challenge. In virtually none of the regions an official approval by the respective person or decision-making body in charge of climate change adaptation was a feasible option. In most of the regions, the roadmaps could be connected to ongoing policy and strategy processes such as the update of regional sustainable energy and climate action plans, adaptation plans, regional strategic development, or risk management strategies. In these cases, the content of the roadmaps is going to feed into upcoming policy and strategy documents and hence is adopted in the regions. These integration processes are described in the respective roadmaps. In some regions, the roadmaps remain stand-alone documents that can inform further actions related to transition towards climate resilience and climate change adaptation.

3. Just Transition Roadmaps

Each of the 12 regions has a unique set of opportunities and challenges in the just transition to climate resilience. These regions are located across Europe in different climatic areas. They differ considerably in terms of size, population, environment, and socio-economic conditions, and include coastal regions, cross-border regions, and archipelagos. Each region is exposed to specific climate change impacts and people are vulnerable to these impacts to different degrees. At the same time, regional decision-making processes are more or less participatory and more or less aware of climate resilience needs of different societal groups. Also, current governance and administrative setting can be conducive to transformative process or slow down transformation.

3.1. Azores

This roadmap was developed jointly by Fundo Regional da Ciência e Tecnologia (FRCT) and Universidad dos Acores (UAc), with the support of Demos Helsinki.

3.1.1. Introduction

The Roadmap is largely based on the Vision workshop which was held at the University of the Azores, on October 8th, 2024, and had 14 participants. There was a brief presentation to the attendees in the room, explaining the main goals of the project and its relevance in the current context. The presentation also introduced the concept of just transition, emphasizing the importance of ensuring that social, economic, and environmental changes benefit all parties involved equitably. Then the actual workshop focused on future variables for the year 2044, exploring possible scenarios and their implications for society, aiming to come up with an innovative vision based on long-term perspectives.

The future storylines that were used in the discussion were as follows:

- Silent Shores, Fading Voices: São Miguel a model of green innovation and economic success of corporations
- The Edge of the Horizon: Prosperity is within reach, but only for those equipped to grasp it.
- Challenging times, Enduring Communities: sense of resilience through grassroots efforts
- Shifting Paths, Re-interpreted traditions: Azores as a symbol of resilience in the face of climate change.

3.1.2. Vision

Based on the Vision workshop, the Roadmap is guided by the following Vision:

In 2045 the Azores is a resilient and just archipelago, deeply committed to safeguarding both its communities and its natural environment from the escalating impacts of climate change. There is a collective awareness of climate change, which has empowered to respond to both immediate climate threats and long-term environmental shifts. With environmental stewardship, social equity and sustainable innovation as the foundational pillars, the Azoreans

have been able to renew and climate-proof their key economic sectors. All people can afford clean energy and comfortable housing.

3.1.3. Key goals

For bridging the present situation with the desirable future, the following goals were defined:

- Fostering transparent, inclusive governance that promotes shared responsibility in resilience-building efforts
- Cultivating widespread climate awareness and risk preparedness through education
- Phasing out non-resilient land and water management practices
- Supporting economic sectors in transitioning to resilient, sustainable practices; Balancing tourism with environmental and social priorities
- Investing in infrastructure that adapts to extreme weather and changing environmental conditions
- Reducing dependence on fossil fuels and lowering energy and mobility costs for low-income households.

3.1.4. Action Plan and key stakeholders in its implementation

Theme 1: Phasing out non-resilient practices

- Spearhead project: Review of non-resilient agricultural practices and coastal planning measures
- Policy reform: Update land-use management instruments to integrate climate resilience criteria
- Stakeholders: Regional Government of the Azores (Regional Directorate for Environment and Climate Action, Regional Directorate for Spatial Planning and Water Resources), Municipalities, farmers, agricultural cooperatives, environmental NGOs

Theme 2: Identifying and caring for people and places with intersecting challenges

- Review of existing strategies (e.g., Municipal Emergency Plans) to incorporate social vulnerabilities
- Introduction of targeted support mechanisms for families living in coastal risk zones and low-income households
- Stakeholders: Civil Protection Services, local social solidarity institutions (IPSS), community associations, Parish Councils

Theme 3: Capacity building and collaborative problem-solving

- Regular roundtables with advocacy groups (environmental, social, and economic)
- Negotiations with private sector actors (tourism, transport, energy) to reduce dependency on fossil fuels
- Implementation of awareness campaigns on energy efficiency and sustainable mobility
- Stakeholders: Universities (University of the Azores, OKEANOS), business associations, tourism operators, energy companies, FRCT

Theme 4: Adaptation and innovation for resilience

- Pilot projects on sustainable and affordable housing (energy efficiency, use of local materials, cost reduction)
- Investment in nature-based solutions for coastal protection and water management
- Development of participatory digital platforms for coastal vulnerability monitoring and decision-making
- Stakeholders: Municipalities, construction companies, researchers

3.1.4.1. Timeline

2026:

- Public awareness campaigns on climate risks (schools and communities)
- Applications for European funding for adaptation pilot projects

2027–2035:

- Implementation and scaling of pilot projects in sustainable housing, renewable energy, tourism, and nature-based coastal defenses
- Legal reforms in coastal and spatial planning instruments
- Development and integration of interactive GIS-based decision-support tools
- Gradual reduction of fossil fuel dependency in the energy and transport sectors

Long term:

- Azores as a model archipelago for just transition and climate resilience
- Affordable housing and clean energy accessible to all
- Economic sectors fully adapted to climate change

3.1.5. Reflections on process / justice elements

The region recognises that particular care must be taken of the people whose lives are burdened by the effects of climate change – or the effects of mismanagement that the changing climate accentuates. These include people that are living in high-risk areas, people working in the primary sector and people whose cannot afford measures that would increase their own resilience. Where two or three of these factors intersect, the people are most likely be disproportionately affected:

3.1.6. Workshop participants

Participants from the fishing sector, including representatives from a fisheries federation and a fisheries cooperative, along with a member from a Regional Directorate for Forest Resources and Spatial Planning.

- *Direção Regional do Ambiente e Ação Climática (Regional Directorate for the Environment and Climate Action);*
- *Direção Regional de Políticas Marítimas (Regional Directorate for Maritime Policies);*
- *Direção Regional da Agricultura, Veterinária e Alimentação (Regional Directorate for Agriculture, Veterinary and Food);*
- *Direção Regional dos Recursos Florestais e Ordenamento Territorial Regional (Regional Directorate for Forest Resources and Spatial Planning);*
- *Direção Regional do Turismo (Regional Directorate for Tourism);*
- *Direção Regional da Energia (Regional Directorate for Energy);*
- *Amigos dos Açores – Associação Ecológica (Friends of the Azores - Ecological Association);*
- *Aceesa – Associação Centro de Estudos de Economia Solidária do Atlântico (Aceesa - Atlantic Solidarity Economy Study Center Association);*
- *Federação de Pescas dos Açores (Azores Fisheries Federation);*
- *Associação Agrícola de São Miguel (São Miguel Agricultural Association);*
- *Simbiente Açores - Engenharia E Gestão Ambiental, Lda. (Simbiente Azores - Environmental Engineering and Management, Lda.);*
- *Cooperativa de Pesca Açoriana (Azorean Fishing Cooperative);*
- *Direção Regional da Mobilidade (Regional Directorate for Mobility);*
- *ExpoLab – Centro de Ciência Viva (ExpoLab – Live Science Center).*

Also invited:

- *Direção Regional das Pescas (Regional Directorate for Fisheries);*
- *SPEA – Sociedade Portuguesa para o Estudo das Aves (SPEA – Portuguese Society for Bird Studies);*
- *Direção Regional para a Promoção da Igualdade e Inclusão Social (Regional Directorate for the Promotion of Equality and Social Inclusion);*
- *Conselho Económico e Social dos Açores (Economic and Social Council of the Azores);*
- *Câmara do Comércio e Indústria de Ponta Delgada (Ponta Delgada Chamber of Commerce and Industry);*
- *EDA Renováveis (Renewable Energy from the Azores);*
- *Direção Regional do Desenvolvimento Rural (Regional Directorate for Rural Development);*
- *MUSAMI – Operações Municipais do Ambiente (MUSAMI - Municipal Environmental Operations);*
- *Portos dos Açores (Azorean ports);*
- *SustainAzores.*

Some of whom confirmed their presence, but for reasons of time incompatibility and/or flight cancellations due to bad weather were unable to attend.

3.2. Basque Country

This Roadmap was developed by Zabala Innovation, with the support of IHOBE

3.2.1. Introduction

In the scope of WP2 task 2.4, the Basque Region has completed the steps to formulate a Just Transition Roadmap (JTR) towards climate resilience, based on the methodology outlined if the Just Transition Framework (D2.2). This introduction describes the objectives and process followed to implement the JTR, including an action plan and next steps.

To better understand the JTR approach implemented by the Basque region pilot in the context of the R4C project, legislative, context and project aspects need to be considered. The Just Transition Framework proposed by T2.2 (D2.2) describes a five-step process to develop a JTR. The Basque Region has carried out the five steps, and the focus has gone from a local approach to a regional approach as it is shown in Figure 2

Figure 2. Steps followed to develop a JTR from a local to a regional approach (Basque Country).

3.2.1.1. Scope and context building

The Basque Country is contributing to the R4C project with a Faster Adaptation intervention (WP5, Challenge Suite 1, in a small locality of the region (Txingudi area, Irun Municipality). The intervention consists of recovering the natural flooding of a wetland area, particularly the re-naturalisation of the San Lorenzo lagoon.

Introduction to the Basque region´s R4C innovation action

To better understand the impact of this intervention at the social level, an overview of the local geographic and urban characteristics should be understood. As shown in Figure 3, the Txingudi area, is the estuary and bay formed at its mouth by the Txingudi Bidasoa River. It is surrounded by a high demographic density area, including heavy industrialised areas at the confluence of three municipalities (Irun and Hondarribia which belong to the Basque Country in Spain, and Hendaye in France). The estuary also holds a small airport with one track, and half of it is surrounded by the Bidasoa River estuary.

At one end of the estuary is the Txingudi Plaiaundi Park. It is a unique leisure area in such density area and an internationally recognised place for bird breeding and bird watching, being included in the Ramsar List that brings together valuable international wetlands. The San Lorenzo lagoon is located in this Park and its re-naturalisation means that a big part of the walkable area of the park, including some of the birdwatching areas, will be removed and closed to citizens (the area will be flooded).

Although improvements in the estuary dynamics, adaptation capacity and biodiversity are expected, a significant impact on citizens that enjoy and utilise the area to connect with nature and enjoy daily leisure activities is envisaged.

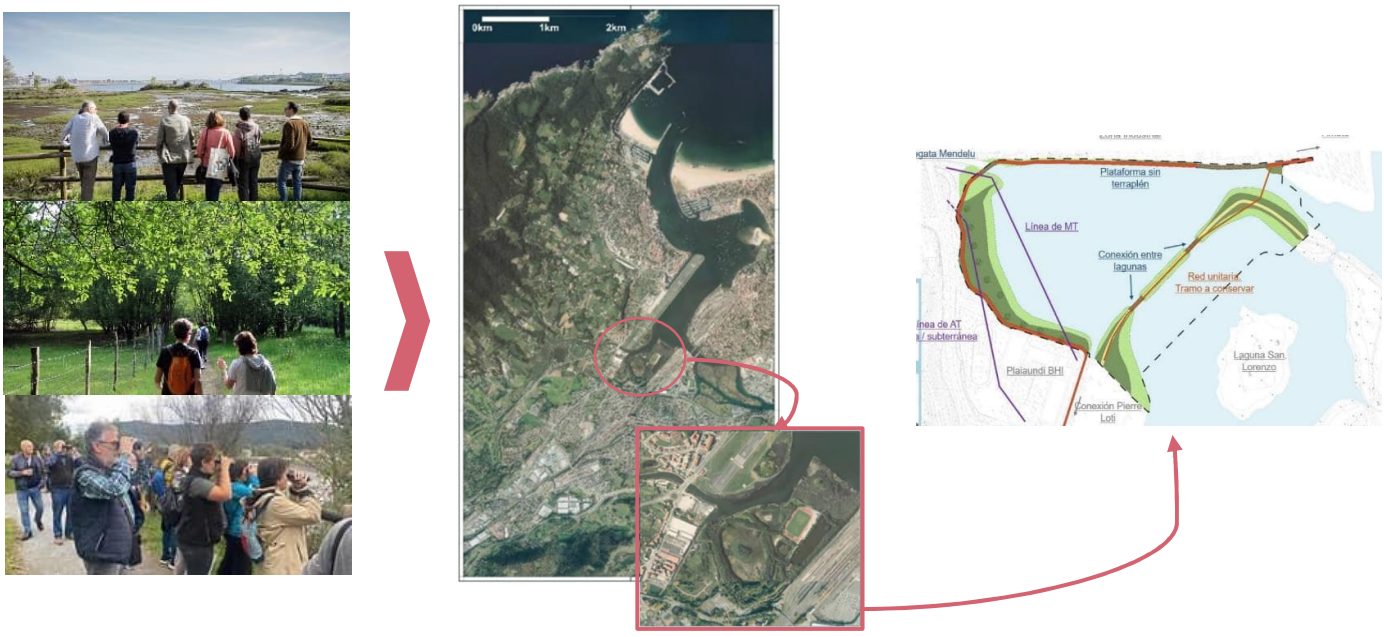


Figure 3. Basque local adaptation intervention for the re-naturalisation of the San Lorenzo lagoon in the framework of the R4C project (Basque Country).

Within this context, the contextualisation of the JTR methodology in the Basque Country has focused on understanding how Just Transition aspects could be embedded in future adaptation planning activities, learning from local interventions.

Legal context in which the innovation action is developed

To identify potential alignment and synergies with existing regional or local policies and legislation, a mapping of policy instruments and regulations on climate change adaptation, sustainability and/or environmental protection was conducted. From this mapping, the relevance of aligning the JTR with the Txingudi Masterplan and the newly approved Basque Law on Climate Change and Energy Efficiency (2024) was identified.

The Txingudi Masterplan presents the plans and actions defined to restore and improve the connectivity of the Txingudi estuary ecosystems. Part of these works consist of the beforementioned flooding and re-naturalisation of

the San Lorenzo lagoon which has been considered as a climate change adaptation action that aligns with the R4C project and represents the innovation action defined for the Basque Country in WP5.

The Basque Climate Change and Energy Transition Law (Law 1/2024) aims to facilitate the alignment with all the regulations, policies and plans to which the Basque Country has expressed its commitment and adherence, and which aim to achieve neutrality, resilience and a just transition by 2050. It highlights the importance of Just Transition for creating resilient communities and establishes a legal framework to achieve climate neutrality in the Basque Country by no later than 2050, with the aim of decarbonizing the economic activity and promoting a circular economy and adaptation to climate change.

JTR approach for the Basque region in the context of R4C

Given that the Txingudi Masterplan where the R4C Basque innovation action is located acts at the local level, and that the Basque Climate Change and Energy Transition Law is still at early stages of developing of its own roadmap, it was considered, that the JTR process could fit the purpose of producing learnings at local level on how to integrate Just Transition aspects in future climate change adaptation interventions in the Basque Country (regional level). Contextualising the practical steps of the JTR to a specific area and existing intervention allows for identifying specific vulnerable communities and collaboratively defining a vision and actions that could serve as an inspiration for future adaptation measures in the region.

3.2.1.2. Actor identification and involvement

Following this approach, the following stakeholders were identified to participate in the JTR process:

- R4C project partners responsible for the Innovation Action
- Environmental Educational Centre
- Civil Society Organisations representing citizens
- Citizens (in particular, vulnerable groups)

Vulnerable communities considered for the JTR

The specific vulnerable communities to climate change in the intervention area were first identified as senior people and kids, as identified by the municipality of Irun in the “Action Plan for Sustainable Energy and Climate in Irun”.

In addition, the Ekoetxea Txingudi, the Environmental Centre managed by Ihobe, the Environmental Agency of the Basque Country, and based in the R4C intervention area of the San Lorenzo lagoon, was identified as a key stakeholder, playing an essential role in the communication and collaboration with local communities. In collaboration with Ekoetxea Txingudi, the actor identification was further defined, and local organisations with access to the vulnerable communities were mapped.

After the analysis, seniors from 55 to 70 years old were selected as the main vulnerable groups, considering that they are the most impacted by this specific adaptation intervention, as they are the main users of the leisure area that will be considerably reduced in size.

To proceed with inviting people to the JTR activities to be organised, a list of local organisations conducting activities with senior people were contacted and the senior association “Asociación de Jubilados y pensionistas

alhondiga Belasko- Enea Soroxartxa" showed interest in participating. This target group consisted of people from 70 to 88 years old. In addition, the volunteer-based citizen organisation Ekopatrullak, which conducts environmental educational activities around the municipality of Irun, including around the area of the San Lorenzo lagoon, were invited to participate in the JTR workshop as well. This targe group consisted of people from 55 to 70 years old.

Moreover, all these participants have been or are active users of the area where the climate adaptation intervention will take place, and therefore, affected and vulnerable to this action.

3.2.1.3. Defining the vision, goals and actions together

The approach to defining the vision, goals and actions for the JTR has been twofold. First, a workshop with local stakeholders was carried out to define these aspects in relation to the San Lorenzo lagoon adaptation intervention. Second, learnings and more general conclusions that could be embedded in future planning were identified to define the JTR next steps.

JTR workshop definition

In preparation for the JTR workshop with stakeholders, a preliminary work session with R4C Basque project partners and with the Ekoetxea Txingudi, as a local stakeholder, was conducted in December 2025. During this session, the design of the structure and needs of the local JTR workshop, the content and the expected outcomes were discussed. The "futures table" defined in the JT Framework methodology was elaborated collaboratively based on climate change information collected in regulatory documents and policy reports (Figure 4). From this "futures table", future scenarios for the Basque area of Irun were developed. With the support of IA, the scenarios were further described and visualized in four figures.

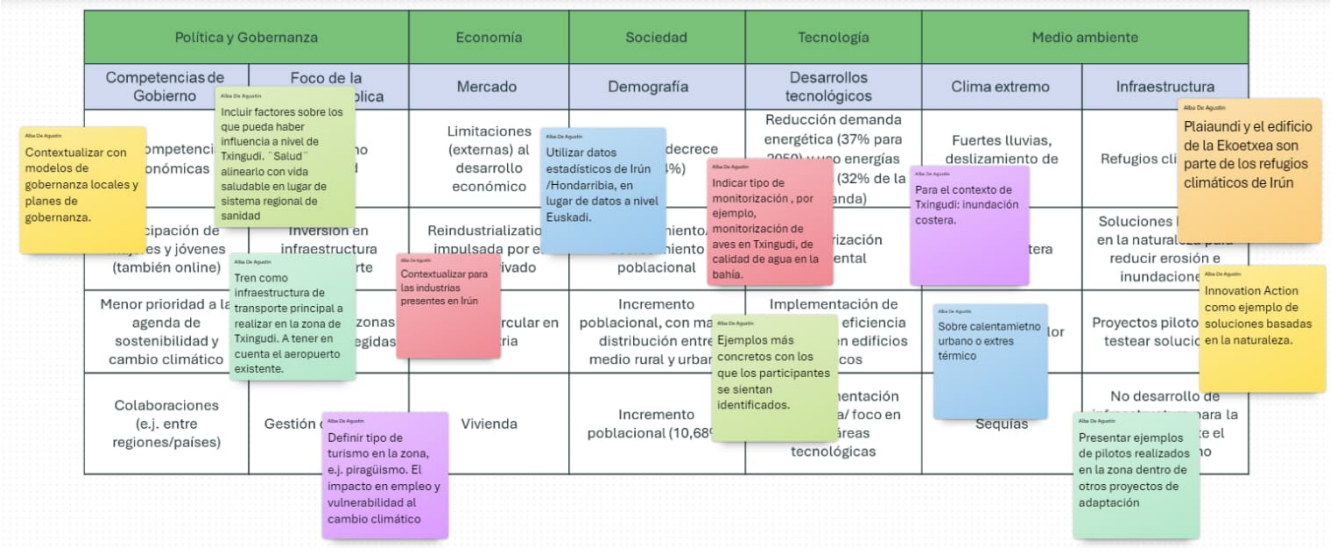


Figure 4. Exercise for Defining and Validating the Visualisation table with local stakeholders and project partners (Basque Country).

In terms of the structure of the JTR workshop with local stakeholders, it was decided with the Ekoetxea to divide it in two phases. The first phase focused on setting the scene and debating with the target group on how the region has changed over the years. Considering their life experiences in the area and by using old photos, the impact of climate change and human interventions was discussed, as well as the value of nature, economics and socio-cultural attachment to the San Lorenzo lagoon and surroundings. This workshop was conducted twice, one per participating organisation, and the discussions and technical vocabulary was adapted to each of the groups´ knowledge and context. The second phase, focused on discussing future scenarios, a common vision for the future, goals, and actions. Due to logistic limitations, and considering the expected outcomes of the second phase, this workshop was only conducted with participants from ¨Ekopatrullak¨ organisation and stakeholders from the Ekoetxea Txingudi.

Vision for the future

The vision for the Irun area defined by local stakeholders, based on climate change aspects was as follows:

By 2045, in the Basque Country, specifically in the Irún area, there will be improved cooperation between municipalities, even with those bordering France. This entails better communication and more sustainable transport, and infrastructure. Collaborative spaces are created, and there is a larger sense of community- thinking of others and personal responsibility.

The region gets prepared for climate change impacts, having protocols in place, complementarily to technological alerts, involving society. In addition, more green and natural areas are promoted and adaptation measures such as re-naturalisation through Nature Based Solutions are prioritized.

While tourism is booming, the region chooses a sustainable tourism approach, providing sustainable services and promoting different consumption models.

Goals and actions

The local stakeholders identified potential actions to be implemented to achieve the shared vision defined above, grouped in 6 categories, corresponding to:

1. *changes in the physical territory,*
2. *behavioral changes,*
3. *changes in laws and regulations,*
4. *changes in financing of adaptation,*
5. *changes in knowledge and information,*
6. *changes in the organization of adaptation.*

The actions were classified according to the stakeholders responsible for their implementation, defining whether the actions are to be taken at individual level (by citizens), at group level (by organizations), or by others (public institutions or companies) (See Figure 5).

At an individual level, actions related to behavioral change were identified, such as “make active choices, promoting local trade, and using the available services”. Some other actions at individual level relate to the pro-activeness to seek information (changes in knowledge and information), and to making use of available financing

alternatives such as the subsidized public transport card Mugi (changes in financing of adaptation). At individual level, a way to contribute to changing laws and regulations was identified as through participatory budgets.

At group level, it was suggested that local citizens´ organizations could take active action in relation to changes in the physical territory (e.g. waste collection and management accountability, fighting for the neighborhoods). Making use of joint forces, citizens organizations could lead awareness raising campaigns for example on harmful products, or in promoting sustainable living alternatives such as the possibility to use own containers in local groceries. Other actions were related to generating spaces to make community decisions (changes in laws and regulations), promoting better information sharing (changes in knowledge and information), and bringing people together.

Group “Others”, refers to actions that escape from the citizens capacity to act at individual level, or from citizen´s organizations. This group refers to public institutions or companies. For example, companies should take responsibility for potential environmental impact due to their activity and make changes in their production systems (behavioral change), at the same time, public institutions should regulate business impacts (changes in laws and regulations). Public institutions should equal rural-urban services (changes in the physical territory), invest and subsidize public transportation, create more policy instruments such as fines or incentives (changes in financing of adaptation) and make better use of the available data.

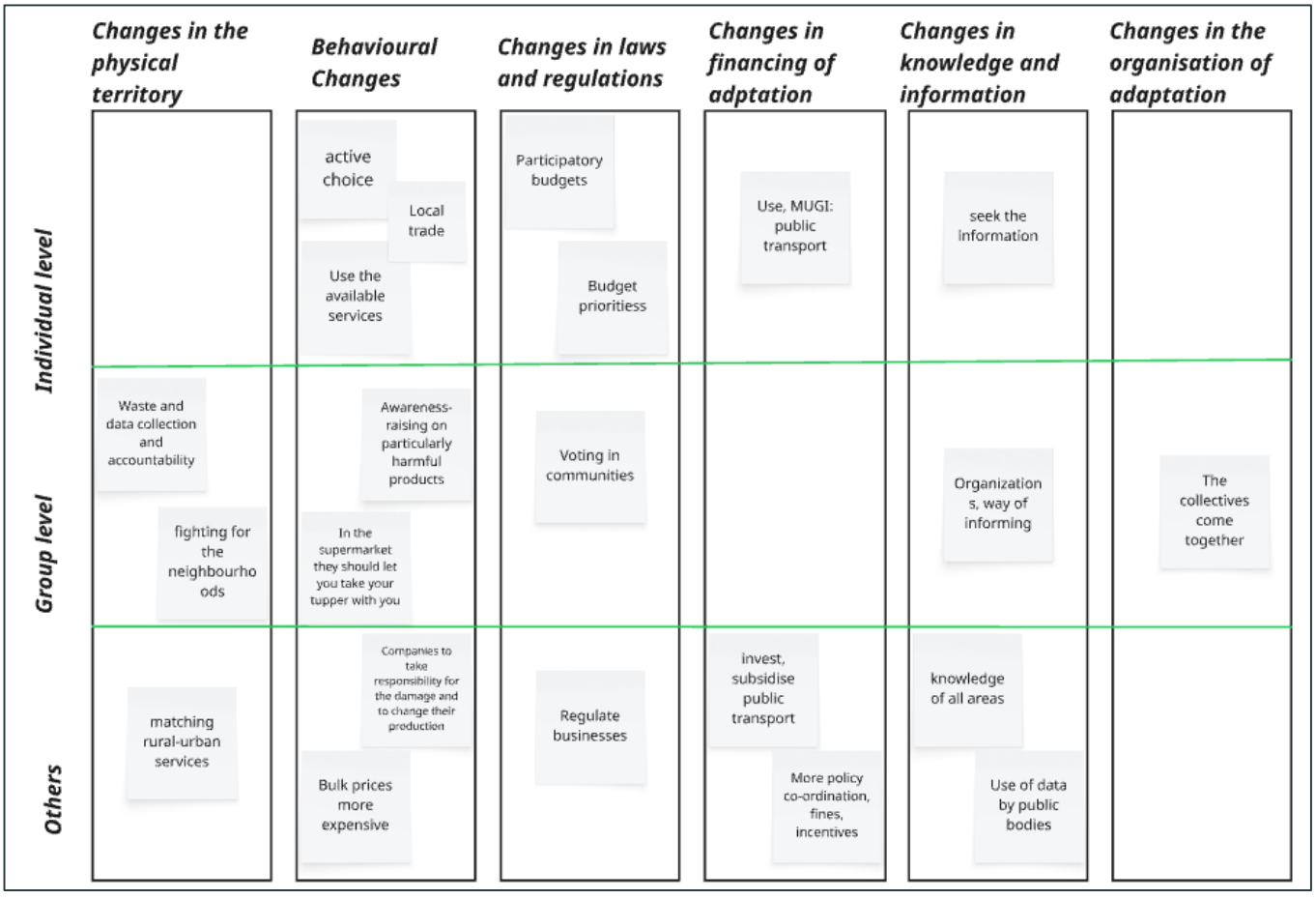


Figure 5. Potential actions proposed by local stakeholders (Basque Country).

3.2.2. Roadmap for just transformation towards climate resilience

The context analysis and workshops conducted with local stakeholders supported the definition of the potential key goals that could drive the Basque JTR and identify and define feasible regional actions to integrate Just Transition aspects in future climate adaptation planning.

The conducted sessions (e.g. JTR workshop) serve as a learning process on how to possibly include these aspects in future planning processes. In addition, conclusions from the JTR workshops conducted, will be embedded into an awareness raising experience and a digital app to be further used and disseminated by the Ekoetxea Txingudi.

3.2.2.1. Key goals

The key goals that should drive Just adaptation interventions are defined as follows:

- To define who are the stakeholders affected by a specific adaptation intervention or measure.
- Understand the needs and concerns of the population for adapting to climate change and increase awareness about why and how these interventions are being held.
- Understand the responsibilities for each stakeholder at different levels to create a sense of ownership and belonging (citizens as individuals, citizens organisations, companies, public institutions).
- Understand what it means for citizens and specifically for vulnerable communities to have a decent quality of life and wellbeing.
- Improve cooperation and communication between public organisations (i.e. municipalities to enable services and ways in which stakeholders can relate to their context (better transport etc.).
- Identifying different stakeholders´ priorities related to climate adaptation measures and protocols.
- Identifying aspects that can be streamlined in climate adaptation strategies.

3.2.2.2. Vulnerability and justice summary

In general, the following groups need particular attention, as well as their intersections in certain areas, but each adaptation action will need to identify specific, most affected, social groups:

- In the Basque Country, kids and seniors are identified as vulnerable groups to climate change, especially considering health implications.
- People with fewer economic resources are expected to suffer more from the consequences of heat waves due to limited accessibility to air-conditioning and other resources.
- People working in less skilled jobs might be more impacted by heat waves, especially those working in open areas such as road construction workers.

3.2.3. Next steps for the Roadmap

The generated knowledge, synergies and networks created through the task 2.4 are of added value for the Basque climate change adaptation process of leaving no one behind.

Considering the complexity of the Basque innovation action involving climate change adaptation works, and the recently released Basque law for Climate Change and Energy Transition, the JTR has been divided into short- and long-term actions:

In the short term, conclusions from the JTR workshops conducted, will be embedded into an awareness raising experience. The experience designed follows the contributions of the participants, considering inclusion factors such as physical accessibility, simplification of technical information to be shared, and inclusion of social perspectives, concerns and needs. A pilot of the experience was tested on 21/06/2025, which serve to receive feedback from participants on whether they feel their input has been valued, and their opinion on to what extend the knowledge awareness experience is enriching and contextualised to the local needs. The experience will be further defined and the integration of the digital tool, currently under development within R4C project, will be incorporated.

The ongoing collaboration with organisations and the integration of local perspectives from the design phase are considered enabling conditions to make of this action a success. The input collected from the participants and their opinions on the awareness experience, as well as their opinion of the participative process for JTR, would be considered success criteria.

In the long term, the Basque Country considers having Just Transition elements from the JTR process embedded in future demonstrators or adaptation actions design and planning. The conducted sessions (e.g. JTR workshop) serve as a learning process on how to possibly include these aspects in future planning actions.

3.3. South Aquitaine

This Roadmap was developed jointly by Communauté d'Agglomération Pays Basque and SUEZ Eau France – Center Rivages Pro Tech, with the support of Demos Helsinki.

3.3.1. Introduction

3.3.1.1. Region4Climate project context and JTR task

The growing frequency of extreme weather events, driven by climate change, is creating a critical situation that endangers our environment, health, and way of life. Building resilience in the face of these challenges demands multi-sectoral innovation in diverse fields including science, technology, governance, policy, while at the same time tackling the risk of social disparities that could appear along the adaptation process. In response to this need for a Just Transition to adapt to climate change, the Regions4Climate (R4C) initiative brings together partners committed to confronting both current and anticipated climate-related threats, accelerating the shift of European regions toward climate resilience through a forward-thinking, citizen-centered, and socially inclusive approach.

In this context, the Work Package WP2 of R4C has provided a Just Transition Framework (D2.2) for climate resilience, which outlines the enablers and barriers for transformation following different dimensions of justice. In addition, it laid the foundation for the Just Transition Roadmap (JTR) process and the corresponding steps. This process was then deployed in each of the 12 demo regions of the R4C project as a contribution to building climate resilience.

The present document reports the JTR developed in the South Aquitaine region as part of R4C, including the declination of the different steps of the process and the results obtained (action plan).

3.3.1.2. South Aquitaine regional context

The coastline of *Région Nouvelle-Aquitaine* region is 970 kilometers long, spanning from the Pyrenees in the South to La Rochelle in the North, and hosting a variety of environments from rocky cliffs to sandy shores and from dunes to marshes. With a population of approximately 700,000 that spreads over 7,645 km², it has a population density of 89 inhabitants per km², with millions of tourists visiting every year. At the southern end of *Nouvelle-Aquitaine* next to the Spanish border, the region South Aquitaine faces particularly significant climate adaptation challenges, primarily due to its exposure to the Atlantic Ocean and the highly urbanized and populated waterfronts. The 35 km long coastal stretch counts 120,000 inhabitants (out of the 300,000 in the region) distributed in 8 coastal municipalities (out of the 158 municipalities of the region). The South Aquitaine economy is deeply intertwined with the Atlantic Ocean, supporting activities such as port industry, fishing, boating, nautical sports, and tourism. The coastline is composed of a succession of beaches, estuaries and cliffs (**Error! Reference source not found.**). The region is particularly concerned about coastal risks, especially coastal flooding occurrences, and to a lesser extent coastal erosion of beaches and of cliffs. Both phenomena are expected to be amplified by climate change. These challenges not only threaten the safety of the population and the integrity of infrastructure but also pose risks to the preservation of economic activities tied to the coast. For example, it is evaluated that more than 530 homes, and 40 businesses are threatened by erosion in the short term.

The main regional strategy plan for coastal resilience is the "*Stratégie Locale de Gestion des Risques Littoraux*" (SLGRL), which gathers the 8 coastal municipalities of the South Aquitaine region under the coordination of the urban community CAPB (*Communauté d'Agglomération Pays Basque*). The SLGRL translates and adapts the French National Integrated Coastline Management Strategy [1] and the *Région Nouvelle-Aquitaine* Coastal Management Plan[2] into the local context and specificities of South Aquitaine. Based on local projections of coastline retreat and mean sea level rise at +10 and +30 years (2023-2043) established by the French Geological Survey (BRGM) in 2013, the SLGRL defines an integrated management approach and sets up risk prevention tools. Adopted in 2017, the SLGRL implemented a first action plan from 2017 to 2022, which was followed by the current second action plan from 2023 to 2028. The work conducted in R4C is expected to feed the SLGRL with new tools and actions, with the perspective of an integration into the third action plan of the SLGRL, which should be launched in 2028.

Figure 6. Illustrations of the different coastline configuration along the South Aquitaine coast.

In this context, the actions of the R4C project in the South Aquitaine demo region focus on the resilience face to coastal risk in the perspective of climate change. The main pilot site for the demonstration (WP5) is the coastline of Saint-Jean-de-Luz municipality. In this area, an ambitious adaptation program was launched in 2021 by the CAPB and Saint-Jean-de-Luz municipality, with the support of the French Government, as part of the SLGRL. The program consists in a global combined adaptation and spatial reconfiguration of the waterfront based on predictions of the local climate change impacts in terms of coastal flooding and erosion.

[1] https://www.legifrance.gouv.fr/jorf/id/JORFTEXT000043956924
[2] https://www.giplittoral.fr/ressources/strategie-regionale-de-gestion-de-la-bande-cotiere

3.3.1.3. Contribution of the JTR

The JTR for the South Aquitaine region was developed by the regional R4C partners Communauté d'Agglomération Pays Basque (CAPB) and Center Rivages Pro Tech of SUEZ EAU FRANCE, with a continuous support from the expert team of Demos Helsinki. The building of the JTR also involved an ensemble of regional stakeholders, who especially contributed to the process through a dedicated workshop, which will be further described in this document. Finally, significant contributions were brought by R4C partners from other demo regions, who shared their own process, reflection and focus as part of the JTR development task during the different project meetings and WP2 workshops, which inspired our own work.

At the South Aquitaine regional level, the JTR built in R4C project will aim at guiding the future evolutions of local policies and strategy plans, especially the SLGRL plan introduced in the previous paragraph. Those plans are regularly updated with new actions, following the progress of the adaptation path and the results of the related efforts. The objective of the work reported here on the region JTR for South Aquitaine is especially to contribute to guide and inspire future actions that could be included in the third action plan of the SLGRL, which should be launched in 2028. The regional JTR process and the resulting action plan are expected to provide possible orientations and insights for the future action definition and implementation in the seek to preserve social justice while building climate resilience in the region.

3.3.1.4. Organization of the document

The present document is organized as follows:

- Section 3.3.2 presents the JTR development process, through the declination of the different steps of the Just Transition Framework in the region.
- Section 3.3.3 synthetizes the JTR resulting from the followed process.
- Finally, Section 3.3.4 wraps up the main conclusions and next steps foreseen for the JTR implementation.

3.3.2. Roadmap development process

3.3.2.1. The JTR development steps

The Just Transition Framework developed as part of the R4C project (D2.2) sets the main steps in the JTR development process:

a) Scope and context building
b) Actor identification and involvement
c) Defining vision and goals together
d) Defining actions together

These different steps were addressed through different tasks and work sessions during the last years in South Aquitaine region.

More specifically, points a) and b) were developed through an iterative process between the expert team from Demos Helsinki and the South Aquitaine regional partners CAPB and RPT. The different exchanges allowed, on

the one hand, the Demos team to educate the regional partners to the Just Transition concept and the related challenges, while on the other hand local partners, especially the referent local authority CAPB, could expose the regional context, the related issues, risks and needs. This collaborative work ended up with a formulation of the targeted scope for the JTR (see paragraph 3.3.2.2) and subsequently, to the identification of the relevant stakeholders to be involved into the process in order to complement the vision carried by CAPB (see paragraph 3.3.2.3).

Then, the development of points c) and d) were largely supported by a “Vision Workshop”, which was organized by CAPB with the support of Demos team, in which the identified actors participated to share their vision and orientations that the Just Transition path could follow in the future to raise awareness equitably among the different vulnerable groups. The definition and validation of those groups were also part of the workshop, before exchanging views and perception about (i) the current situation (i.e. the current level of knowledge and understanding of the different groups), (ii) the desired situation (i.e. the targeted future of awareness raising and stakeholders’ engagement) and (iii) the way forward to ensure a Just Transition on this aspect (i.e. possible action plan). The process and main findings of the workshop are summarized hereinafter in paragraph 3.3.2.4, while the resulting JTR description for South Aquitaine is further detailed in the next Section 3.3.3.

3.3.2.2. Scope and context building

Due to its large exposure to the Atlantic Ocean, its highly urbanized and populated waterfront, the South Aquitaine region is primarily concerned by coastal risks and by the early consequences of climate change. As a result, local authorities are actively committed to the development of innovative strategies to adapt to this context, protect its population and preserve the local maritime economy. This commitment is especially catalyzed into the local risk management strategy “Stratégie locale de gestion des risques littoraux de la côte Basque” (SLGRL) introduced earlier in paragraph 3.3.1.2.

The development of the SLGRL over a period between 2015 and 2017 followed a rigorous methodology, divided into five distinct phases. The first step involved an in-depth diagnosis of the coastline, based on a 2013 report by the French Geological Survey (BRGM). This report cataloged existing protective structures, characterized coastal erosion hazards, and produced projections for ten and thirty years ahead. This diagnosis served as the foundation for defining territorial objectives, focused on public safety, preserving tourist appeal, and protecting the environment.

The third phase of the SLGRL development involved constructing management scenarios tailored to each coastal segment. These scenarios were compared based on technical, financial, and environmental criteria and validated through consultation with elected officials and municipal technical services. The fourth step analyzed and compared these scenarios to select the most relevant options. Finally, the fifth phase formalized the strategy, resulting in an operational document specifying objectives by sector, an action plan, and a multi-year schedule.

This methodical approach allowed the strategy to be divided into eight strategic axes represented in Figure 7 and covering all aspects of coastal risk management and adaptation, from risk awareness to stakeholder coordination.

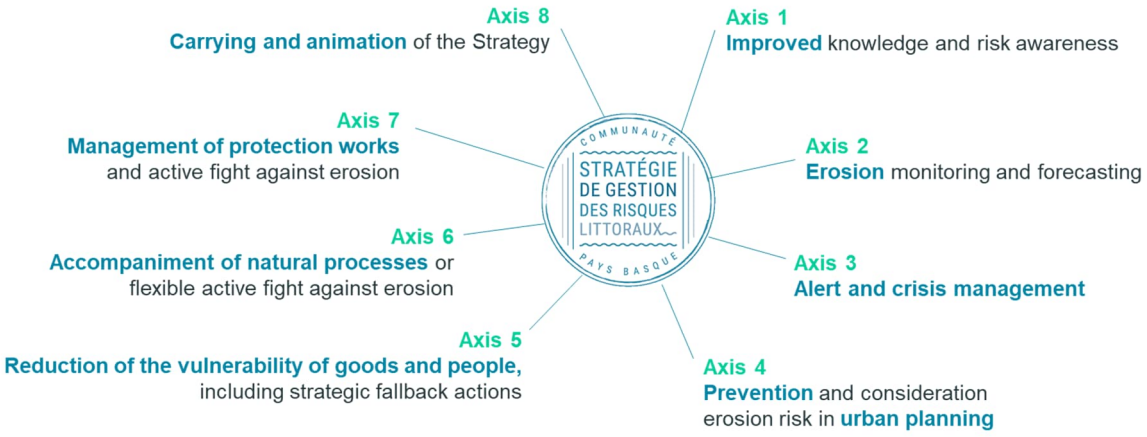


Figure 7. The strategic axis of the SLGRL in South Aquitaine region.

The first generation of the SLGRL, deployed between 2017 and 2021, achieved significant progress, with a total investment of €9.79 million, co-funded by the European Union, the Region, the Urban Community, and the municipalities. However, certain limitations were identified, such as the difficulty in predicting long-term actions due to uncertainties regarding costs and project ownership, or the need to adjust strategic choices in two specific sectors: the Basque Corniche and the northern part of Saint-Jean-de-Luz. Building on this assessment, CAPB initiated an update of the SLGRL in 2022, involving all stakeholders, including State services, the Region, the Department, and technical partners. This collaborative effort resulted in the validation, in July 2023, of a new action program for the period 2023-2028, with a budget of 23.3 million euros. The priorities of this second generation include integrating +30- and +100-years coastline retreat projections into Local Urban Plans, in accordance with the Climate and Resilience Law, as well as clarifying the management of protective structures, with a patrimonial inventory conducted by CEREMA. The continuation of spatial reconfiguration initiatives, such as the Corniche Road relocation project, the adaptation of the northern coastline of Saint-Jean-de-Luz or studies on the Bidart and Guéthary campsites, is also a major objective.

Indeed, in South Aquitaine like in most shorelines, coastal flooding impacts especially the low-lying urban areas, whereas coastal erosion is also an important issue for both the sandy coastline and rocky cliffs areas. Coastal flooding is an event-scale hazard, which happens at the scale of the few days of an energetic ocean storm. Coastal erosion is happening both chronically and as one-off events, e.g. due to major storms and dune or cliff collapses. The “one-off events” can be at best only predicted in the short term for coastal flooding and sandy coastline erosion, which is not the case for cliff collapses. Safe and efficient management of coastal risks requires awareness-raising, knowledge-sharing and involvement of an ensemble of actors, including local authorities, economic actors, inhabitants and visitors. For this reason, it is of key importance that all the stakeholders are both fully informed about the coastal risks assessment and management in the region, and especially about the management of sudden events. This is especially important for vulnerable groups exposed to hazards. Acquiring and sharing knowledge about coastal risk management and its underlying reasons is important also from the point of view of acceptability and legitimacy of prevention activities in the eyes of citizens. Therefore, the fair acquisition

and sharing of knowledge, and the equitable distribution of awareness raising efforts, are major enablers to ensure a just transition toward climate resilience in the region. This dimension, which is the purpose of the Axis 1 of the SLGRL (Figure 7), also fed by actions from Axis 2 and Axis 3, is the primary focus of the JTR presented for the South Aquitaine region in this document.

In the area of Saint-Jean-de-Luz especially, which is the main pilot site proposed for the demo of R4C project, an ambitious adaptation program was launched in 2021 by the CAPB and Saint-Jean-de-Luz municipality[3] in close connection with the SLGRL, with the support of the French Government. The program consists in a global adaptation and spatial reconfiguration of the waterfront based on predictions of the local climate change impacts. The reconfiguration plan includes both (i) priority areas to be maintained and protected and (ii) re-naturalization of other sectors where a retreat will be done faced to the sea level rise and ocean storm impact (see Figure 8). The area of Saint-Jean-de-Luz offers various waterfront types and environment, including urbanized waterfronts, semi-natural areas and rock cliffs, which are well representative of many other areas of the region. These characteristics, combined with the major challenges of the area, motivated the choice of Saint-Jean-de-Luz as the pilot site for R4C project. In particular, this context in Saint-Jean-de-Luz is a relevant illustration of the strong need for a just and efficient information as a support to the ambitious action plan, in order to prevent harm and reduce the vulnerability of people, assets, and economic activities to coastal erosion through developing citizen's knowledge and understanding of risks is a key priority of the strategy.

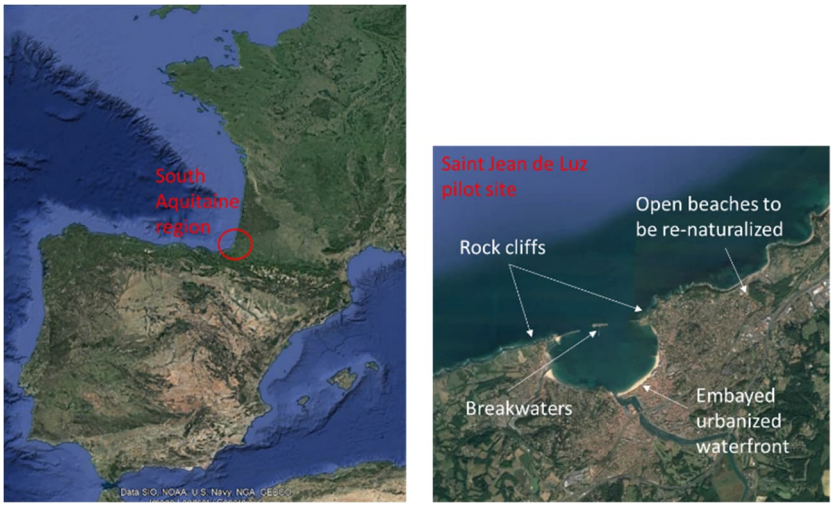


Figure 8. The configuration of the South Aquitaine demo region and of the Saint-Jean-de-Luz pilot site.

In this context, the goal of the JTR process is to support the implementation of the current SLGRL action plan and the development of its next round to be launched in 2028. It will support especially the engagement of vulnerable groups in the assessment of knowledge dissemination and communications activities of the strategy as part of the Axis 1 of the SLGRL. It could also guide the monitoring, forecasting and alert effort targeted by Axis 2 and 3 (data acquisition to feed an improved knowledge). Hence, the JTR process aims to

[3] https://www.communaute-paysbasque.fr/eau-environnement-energies/les-projets-partenariaux-damenagement-ppa/le-projet-partenarial-damenagement- Saint-Jean-de-Luz-nord

- Identify discrepancies in data availability, knowledge, awareness, and acceptability of risks and risk management activities.
- Educate citizens about the coastal risks and how they can be managed as outlined in the strategy.
- Assess and co-create different measures to build a better knowledge at local scale, to disseminate this knowledge and raise awareness about coastal risks and their management.

Identify the vulnerable groups and how their specific needs could be addressed in risk communication.

3.3.2.3. Actor identification and involvement

The actor identification for participation to the Vision Workshop was carried out with aim of representing main stakeholders, vulnerable groups, experts and local authorities involved in the topic of coastal risks and climate adaptation. This resulted in a total of 17 persons who took part to the workshop, 4 from inside the R4C consortium and 13 from outside the consortium. The workshop participants are presented below grouped by main typology of organization.

Public authorities

- The *Région Nouvelle-Aquitaine Region*, the administrative regional authority responsible for environmental policy, spatial planning, and regional development:
    - Camille ANDRE, Chargé de mission Littoral (invited but absent)

- The *Communauté d'Agglomération Pays Basque* (CAPB, the inter-municipal authority of South Aquitaine in charge of SGRL:
    - Caroline SARRADE, Head of of Coastal Areas and Natural Environments department.
    - Nicolas PEPIN, Head of Coastal Risks Department.
    - Lorie JEZEQUEL, Coastal Risk Technician.
    - Vincent CASTILLON, Coordinator of the Flood Prevention Action Program on Nive river (invited but absent)
    - Julie FRANCISCO, Coordinator of the Flood Prevention Action Program on the Basque coastal rivers (invited but absent)
    - Guillaume CAVAILLES, Adaptation and Forestry Project Manager
    - Quentin LAILLE, Tourism Project Manager
    - Lilou PHILIPPE, Intern Scientific outreach and creation of awareness-raising content on marine protected areas
    - Quentin THOMAS, Intern Implementation of preliminary consultation and public consultation within the framework of the Nive Flood Prevention Action Plan (PAPI)Alexia LAFAY, Flood forecasting and management coordinator

Public knowledge & education actors

- *GIS Littoral Basque* (*Groupement d'Intérêt Scientifique du Littoral Basque*), a regional group gathering municipalities, agglomeration, academic researchers and private expert actors, to develop innovative project supporting coastal management in South Aquitaine
    - Aurélie BOCQUET-ESCOURROU, Coordinator of the GIS Littoral Basque.

- *CPIE Littoral* (*Centre Permanent d'Initiatives pour l'Environnement Littoral*), a French network of environmental education centers that develops and implements sustainability projects in coastal areas:
    - Alistair BROCKBANK, Project Manager, Arriskua

- *GIP Littoral Aquitain* (*Groupement d'Intérêt Public Littoral Aquitain*), a public interest group coordinating coastal management strategies and supporting local authorities in adaptation measures:
    - Gael PERROCHON, Chargé de mission risques littoraux (invited bu absent)
    - Chloé RAGOT, Strategic Adaptation Project Manager

Non-Governmental Organization & associations

- Surfrider Foundation, an international non-governmental organization committed to the protection of oceans, waves, and coastlines:
    - Rémy MOREAU, Environmental Project Manager (invited but absent)

- The Anglet *Vert Océan* association, a local organization dedicated to protecting the coastal environment and promoting sustainable practices:
    - Bernard DULAUD, Président
    - Amélie CARDY, Member

Private scientific and expertise center

- Center Rivages Pro Tech, a research, monitoring and forecasting center of SUEZ dedicated to the management of coastal water quality and coastal risk
    - Matthias DELPEY, Head of Waves & Coastal Risks department.

3.3.2.4. Findings from the workshop

Workshop organization

This roadmap was developed by RINA with the contribution of Regione Toscana.

The Vision Workshop for South Aquitaine JTR was organized on the 18th of June 2025 at the CAPB headquarters in Urrugne, from 10h to 12h (CEST).

In preparation for the workshop, all the participants were officially invited with information about the project context, the workshop objective and the related agenda.

The workshop outline was the following:

- Reminding the context of R4C and the workshop.
- Filling in a survey on current level of participants' awareness of risks and risk management.
- Going through the survey and debating the results.
- Review of different current awareness-raising and communication actions in the Basque Country.
- Evaluating the SLGRL tools in relation to vulnerable populations.
- Debrief on the results and summarizing findings.

- Discussing potential new tools supporting better risk-awareness in the territory, targeting especially the identified vulnerable groups.

Justice and Vulnerability Considerations

The workshop participants discussed the main vulnerable social groups faced to coastal risks and climate change in South Aquitaine region. Some of those groups were pre-identified by the workshop organizers, others were added or complemented thanks to the discussions carried out during the event. The resulting evaluation is summarized below.

- **Primary residents** who live near the coast: these citizens live in the region most of the year, with their primary residence in the area. They can be exposed either because their residence lies directly on/near the coastline, or if it is not the case, because they frequently head to the coast and beaches.

- **Secondary residents** who visit the regional coast occasionally: people who do not live there in the region year-round but only visit the area from time to time, which can be for vacations or as part of an alternation of residence between two or several places. Their primary residence is in another region, but they own a secondary residence in South Aquitaine. Here again, they can be exposed because their secondary residence is built on/near the coastline, or if it is not the case, because they go to the coast during their stays in the region.

- **Tourists**: this third group corresponds to occasional visitors who do not own a residence in the region. Usually, their visits are less frequent than for the secondary residents. Their stays in the area relate exclusively to vacations (ranging from a few days to several weeks). Although the touristic activity reaches its peak during the summer months, many tourists still visit the coastline all year long including during winter, due to the mild local climate.

- **Students**: the region counts a large population of students of various ages, from the youngest one up to an important number of graduate students in the region universities and engineering schools. This group could be seen as a subgroup of the primary or secondary resident groups, being composed on the one hand of native people who live in the region year-round, and on the other hand of students originating from other regions or countries, who usually stay in the region only for a few years a typically only from September to June. However, it seems relevant to distinguish them from the first two groups because the vast majority is not homeowner but rather rents accommodation. Moreover, this group also represents a younger segment of the population.

- **Elderlies**: the region also welcomes many retirees who are attracted by the mild climate, the proximity of the ocean, the regional culture and way of life. Hence, the area is home to a significant senior population. Just like with students, this group can be seen as a sub-category inside the primary/secondary residents and the tourists groups. Due to their specificities and the possible behavioral contrast with the younger categories, workshop participants insisted on the necessity to also consider elderlies as a distinct vulnerable group. They also considered that fragile individuals (such as people with disabilities) could fall into this category.

- **Tourism professionals**: coastal tourism being the largest economic activity in South Aquitaine, these economic actors also represent the largest economic category in South Aquitaine. Gathering all the activities

supported by tourism, it brings together various professions, especially the hospitality sector (hotels, guest rooms, etc.), restaurant and food services, and leisure activities (beach stores, surf schools, etc.).

- **Other economic actors**, whose activity does not relate directly to tourism but still relates to the ocean and to the coast. This gathers various economic sectors, the most important ones being the Bayonne port industry, the fisheries sector, the building sector, the water and waste services.

- **Coastal users:** Individuals who regularly visit the coastal area, primarily for recreational activities (surfers, divers, boaters, hikers, anglers, etc.). While these individuals may also belong to subgroups such as "Tourists," "Residents," "Students," or "Elderlies," workshop participants emphasized the need to distinguish them as a separate category. This distinction is due to their direct exposure to risks (such as storms and cliff collapses) that affect their personal safety.

Next to the identification of the above vulnerable social groups, the workshop participants agreed to highlight that each group can include very various people with contrasted specificities in regard to coastal resilience, and that this diversity will have to be accounted for in any future action plan.

Finally, although not properly a social group, it was also mentioned that the impact of coastal risks, climate change and adaptation on animals should be considered in a Just Transition framework.

Vision, goals and actions

When asked about the evolution of coastal risks in South Aquitaine over the last years, 79% of the workshop participants estimated that those risks have already increased, while 21% considered them stable (0% voted for a decrease). In addition, 100% of the participants envision that those risks will increase significantly in the future, with the increase severity summarized in the figure below for the different types of risk.

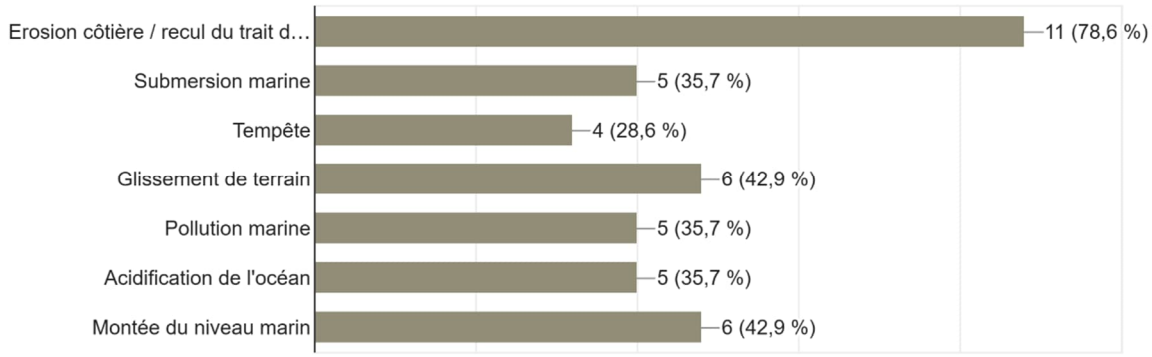


Figure 9. Assessment of the expected severity in the increase of coastal risks by the workshop participants (South Aquitaine).

The workshop participants were asked about the possible discrepancies in the vulnerability of the different identified social groups faced to the above expected increase in risk exposure: 93% of the participants estimated that those discrepancies are significant. Then, the participants rated the level of exposure of some of the above groups to coastal risk and climate change. The result obtained is displayed in the Figure 10 below. The

assessment suggests that primary residents will be the most impacted group, closely followed by elderlies (both groups possibly interconnected) and tourism professionals. Also significantly impacted but possibly less by one level of severity comes the other pre-identified groups which were the secondary residents, tourists and students.

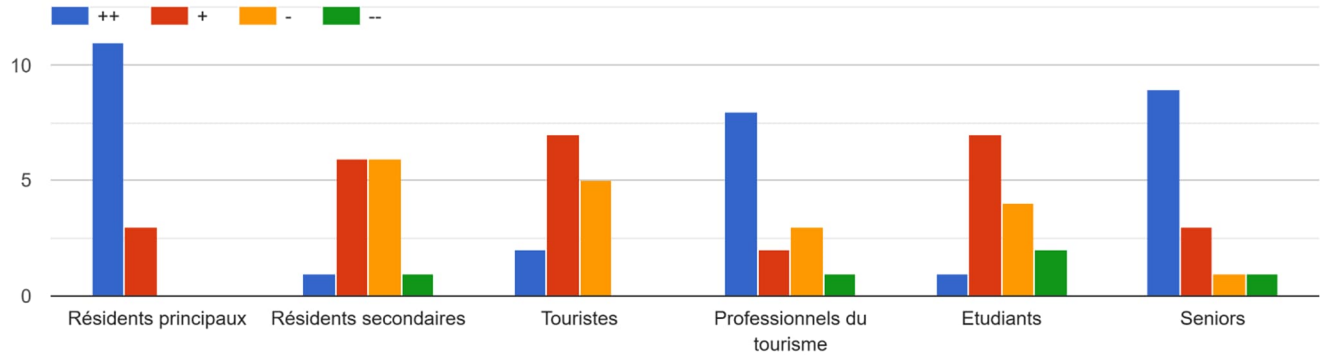


Figure 10. Assessment of the level of vulnerability of the different social groups established by the workshop participants, South Aquitaine.

Based on the above assessment of the current situation and its expected evolution, then the workshop considered the actions to be undertaken. First, the participants were asked about which entity or group should be the most responsible for the management of coastal risks and of their evolution in the future in South Aquitaine, among the French State, territorial authorities (regional or municipal), private companies, or citizens. Here, 100% of the participants envisioned that territorial authorities will have most of the responsibility in taking actions to manage coastal risks and resilience in the future, with a distribution of 64% for the regional authority (administrative region, Province Council or CAPB) and 36% for the municipalities (Figure 11).

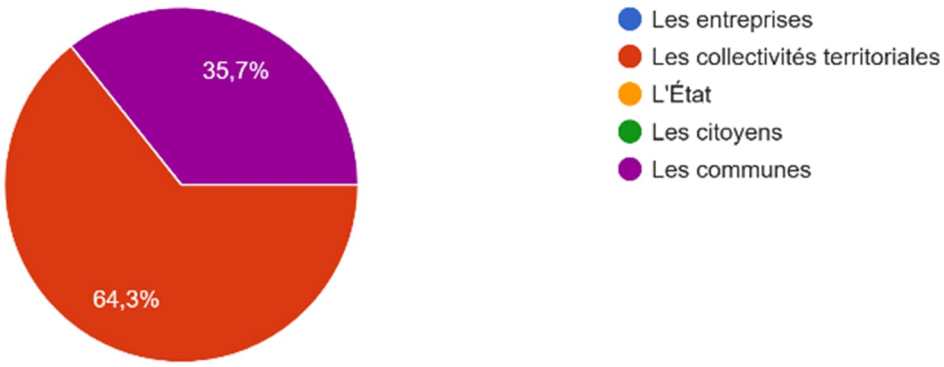


Figure 11. Vision by the workshop participants of “who should take action” for climate adaptation in South Aquitaine.

Second, the workshop dealt with the actions to be undertaken. The range of actions can be grouped in the two main ensembles below, both implying important a fairness and social justice dimension:

- *a) Actions about local-scale data availability, information dissemination, awareness raising, knowledge sharing and the resulting stakeholders' engagement.*
- *b) Actions about the defense or adaptation of the coastline, with various strategies and measures.*

The discussions first highlighted the major role of various forms of information and knowledge sharing, including awareness raising, prevention, pedagogic efforts, and support to the transition. The motivation to prioritize this aspect is multiple. Most of all, it is considered as a major lever for social justice that all the vulnerable groups are well aware about the coastal risks and their evolution with climate change. Indeed, in order for everyone to have the same opportunity to decide their destiny and the future of their living conditions, it is essential that knowledge be shared equitably. Moreover, the acceptance and the engagement of the different groups in the transition is also a crucial aspect for the fairness and the success of the adaptation. Here again, the just acceptance can only be brought by a just dissemination of the knowledge about the processes in play and the expects risks towards all the vulnerable groups. Furthermore, an enabling condition to achieve this purpose is beforehand to acquire relevant data to generate the knowledge to be shared. Here as well, the data acquisition, through e.g. monitoring program or forecasting models, must be fair in the sense that it should tend to cover all the vulnerable areas equitably along the South Aquitaine coastline. Here, it is considered that "equitably" means that the corresponding data acquisition effort should be proportional to the level of vulnerability of each coastline portions.

To support a fair and efficient sharing of the knowledge built from those data and of the acquired information, it is highly recommended that the dissemination effort should be tailored for the different groups and audiences. In particular, the need for a communication that is "in the field" was highlighted, i.e. not only conceptual and global but really connected to real cases and sites, to visualize the risks in a concrete manner as much as possible. This aspect is important for the shared information to reach each audience in adapted and fair way, especially non-technical actors. It was also recommended to relate this information effort about climate adaptation to the regional culture, values, and way of life. Indeed, the regional culture is very strong in South Aquitaine and any long-term adaptation strategy must consider this culture to preserve it and align to its core values. This is a necessary condition to favor acceptance of the change by the population, and eventually their engagement as actors of a just transition.

In terms of coastal adaptation actions, a consensus was met by the workshop participants to state that those actions will have to combine traditional hard defense, more progressive soft defenses or mitigation techniques, modifications in the use of the coastline by the population, and finally spatial reconfiguration and strategic retreat. The role of urban planning in the structuration of the different measures was deemed central. None of the participants considered that one of this approach is preferable for the entire coastline, but rather that they will have to be combined depending on the areas and on the related opportunities and constrains. Interestingly, it was highlighted that each of these possible actions requires the understanding, acceptance and possibly participation of the different vulnerable groups, whether in the case of hard defense (e.g. accepting the related cost for the maintenance of breakwaters and seawalls) or in the case of reconfiguration (e.g. accepting that some areas are not accessible during period at risks, or that some infrastructures like coastal roads must be delocalized). Hence, here again the need for information and knowledge sharing about the risks, the mitigation options and the related public policies, was back in the center of the discussion. To go even further in this aspect, the just dissemination of information must favor the engagement of the different vulnerable groups into the orientations of the policies and

plans for the region adaptation. For this dimension, the crucial role of municipalities was reaffirmed as the main interface between the authorities and the population.

3.3.3. Just Transition Roadmap for South Aquitaine

3.3.3.1. Vision

The work conducted as part of the WP2 of R4C, and especially the contribution from Vision Workshop, allowed to define a shared vision of the desirable future in terms of coastal risk management and coastal adaptation to climate change in South Aquitaine area. The emphasis was especially set on the equitable dissemination of knowledge to the different vulnerable social groups, which is considered as a crucial enabler for social justice and for the engagement of the society into the transition. This vision is summarized below through the description of two contrasted future, extracted from the “Future Tables” established as part of the JTR development process.

What we **WANT** for the future

By 2040, South Aquitaine has transformed into a model of regional cooperation and adaptation in the face of climate change. The once-challenging impacts of rising sea levels and extreme weather events have sparked innovative solutions and a unified approach to building resilience. This approach and the related strategy plans, in the center of which is the SLGRL strategy plan, are supported by a well-aware population who has access to understandable, transparent and precise knowledge resources about coastal risks, climate projections and the related public policies.

South Aquitaine, along with neighboring regions, has established a robust political framework designed to tackle climate change in close collaboration with coastal municipalities, which ensures a fluid interface with citizens and economic actors. This framework supports coordinated efforts in policy-making, emergency response, and resource allocation between all the municipalities of the region. This framework encompasses a central, concerted effort to ensure that knowledge and information are accessible to all socio-economic groups, leading to a global acceptance and engagement of the stakeholders into adaptation, and eventually to a more equitable society.

What we do **NOT WANT** for the future

By 2040, South Aquitaine must not be marked by strong contrasts in its adaptation to climate change, reflecting a fragmented and uneven approach to resilience. The region must not be characterized by a deep divide between affluent and less affluent social groups or geographical areas, which would lead to significant economic and social consequences.

This situation would result from the lack of a unified strategy for climate change adaptation, which would itself originate from an insufficient and unequitable dissemination of information, and from the related deficit of adhesion from the different social groups and territorial actors. This would result in a disjointed landscape, where informed and empowered areas or communities of South Aquitaine could have invested heavily in defensive and adaptation measures to protect their economies and lifestyles, while other communities or areas could not adapt and would be threatened regularly to significant risks. Although some groups would have successfully adapted thanks to their early awareness raison, other communities or actors would still struggle with a prohibitive delay and deal-breaker oppositions to change, without a fair consensus about the preferable adaptation path. The inability to adapt would

largely impact these exposed communities, through safety and economic risks, eventually affecting the entire region well-being directly or indirectly.

3.3.3.2. Goals

To meet the vision for the future, the following goals are set out:

1/ Develop and implement a just and efficient knowledge acquisition and sharing process with coastal municipalities

This first goal targets municipalities, supported by territorial supra-municipal authorities like CAPB, as the primary actors of the transition. In agreement with the workshop findings, municipalities and territorial authorities should be key actors in the transition toward a resilient coastal society, including ensuring a crucial interface with citizens. Hence, the first goal of the roadmap will be to empower municipalities and the CAPB as coordinator of the joint SLGR, through processes and tools that will offer an exhaustive and shareable knowledge about coastal risks and climate resilience. The connection with the vulnerable social groups is ensured by the role of municipalities and agglomerations in the French territorial organization, which gathers a wide range and responsibilities including the management of citizens' and coastal infrastructures safety, the regular exchanges with the population (e.g. during Municipal Councils), and the support to local economic actors and activities.

2/ Develop and implement a just and efficient awareness raising strategy oriented towards citizens and economic actors

This second goal is complementary to the first one. Also focused on knowledge sharing, it has a complementary objective of raising awareness in coastal communities, by sharing the information about coastal risks and adaptation in a fair and efficient way. The extensive and transparent dissemination of knowledge has the objective of empowering the different vulnerable groups in understanding the different strategies and policies for coastal resilience, to take a stand on the topic and then to accept the orientations selected by the elected representatives, and eventually to take an active part into the adaptation. This goal necessitates the development and implementation of various tools and strategies to adapt to the different vulnerable groups and ensure a fair distribution of an understandable, useful and actionable information. Hence, this goal must be achieved in parallel and in coordination with the first goal.

3.3.3.3. Action plan

For both goals, different timescales are considered regarding the need for information and knowledge, considering the fact that the South Aquitaine coastline is already at risk in the present climate, and that these risks are expected to increase with climate change if a relevant adaptation is not implemented at the scale of the entire society. More precisely, 3 timescales are considered:

- *Short term / Immediate: this scale relates to safety and emergency actions to implemented in the short-term considering the current risk exposure of certain coastline sections.*

- *Middle term: this scale relates typically to the cycles of the SLGRL action plans, usually 5 to 10 years. This is the scale of the implementation of defense or mitigation measures which aims at facilitating the transition between the short term and the long-term scales.*

- *Long term: this is the typical scale of the JTR, typically 20+ years, which relates to more a more global adaptation at the scales of the entire society, with more profound modifications in the spatial configuration of the coastal strip, in the use of coastline and of the local economic activities.*

The actions envisioned for reach each of the JTR goals are summarized in the tables below, where an estimation of the related time scale is also provided.

Table 1. Action plan for Goal 1 - Develop and implement a just and efficient knowledge acquisition and sharing process with coastal municipalities (South Aquitaine).

#	Action	Time scale	Enabling Conditions	Success Criteria
1	Animate of the SLGRL as a focal point for all the territorial authorities	Short, Middle and Long	Close interactions between CAPB and municipalities, regular technical and steering committees, inclusion of the diversity of municipalities along the coast	All the coastal municipalities actively involved and represented in the SLGRL, participating to its orientations and monitoring, access the related information and data
2	Monitor the evolution of coastal risks on the long term along the regional coast	Short, Middle and Long	Deploy adapted monitoring tools and procedures (inspection, sensors and measurements campaigns, videometry, etc.) homogeneously along the coastline to cover all the shoreline sections equitably	An objective standardized and sustainable monitoring program is implemented and produces coastal resilience data supporting the SLGRL monitoring axis.
3	Implement and operate Early Warning Systems (EWS) preventing risks and supporting the management of emergency situations	Short	Equip all the municipalities with adapted EWS, with different approaches and complexity levels depending on the configuration (beaches and waterfronts, cliffs, estuaries)	EWS covering all the vulnerable sites of the South Aquitaine coastline, and distributing alerts and decision-aid information to all the all the municipalities
4	Develop a sustainable science-based modelling and data analysis suite of tools as a support to the definition of future adaptation scenarios	Short, Middle	Ensuring the capitalization of the tools and of the analysis developed during the different projects to allow their perfectioning and optimal use (avoid the “new project new tool” situation).	Territorial actors are equipped with a sustainable, cutting-edge suite of modelling and data analysis tools, properly validated by the scientific community
5	Implement a Coastal Resilience data portal	Middle, Long	Centralization of the effort by the CAPB through the SLGRL for the development of a central database and data portal, gathering all the information about coastal risks and resilience	A Coastal Resilience data portal is available for all the territorial authorities, which gathers all the information generated by actions 2, 3 and 4, and which makes it easily accessible for all.
6	Train territorial actors to the use of the tools and of the generated information	Short, Middle, Long	Organize specific training tailored for the different territorial actors and authorities, in order for them to be able to interpret and use the information, especially that centralized in the Coastal Resilience data portal	All the territorial actors are trained and use regularly the data portal for decision making and awareness raising
7	Maintain and encourage a seamless link between the science & research community, the expert service providers and the local authorities	Short, Middle, Long	Continue and amplify structures like the Scientific Group of Interest (GIS) *Littoral Basque* or the joint research laboratory KOSTARISK.	Continuous, two-ways dialogue and exchanges is installed between the academic researchers, technology providers and local authorities to ensure the quality of the information provided about coastal risks and the related decision-making

Table 2. Action plan for Goal 2 - Develop and implement a just and efficient awareness raising strategy oriented towards citizens and economic actors (South Aquitaine).

#	Action	Time scale	Enabling Conditions	Success Criteria
1	Develop and share digital communication support adapted for the general public to disseminate information about coastal resilience	Middle, Long	Use pedagogic support, possibly innovative technologies like XR/VR, adapt different supports for different target groups. Use of a target digital access points. Promote their existence and usage to the population. Coordinate with associations working on coastal resilience or preservation	Communication supports are available online for the non-expert groups to access and understand the information about coastal resilience, coastal hazards and the related processes, as well as about public policies and strategy plans in this field
2	Develop communication supports in the field, on the vulnerable sites	Short, Middle, Long	Develop and install communication support on sites like nudges, information panels, markers, coastal flooding markers, audio messages/guides. Coordinate with associations working on coastal resilience or preservation	Most vulnerable sites are equipped with dedicated communication support on site
3	Organize regional information events and workshops about coastal resilience	Short, Middle, Long	Coordinated action by all the local and regional authorities to organize common events, sharing a homogenized and consistent information at the scale ot South Aquitaine. Coordinate with associations working on coastal resilience or preservation	Regular information events taking place with significant attendances from all the vulnerable groups, favoring awareness raising and participation to resilience-building initiatives
4	Disseminate emergency alerts generated by EWS and encourage adapted behavior during risk events	Short	Coordination between CAPB, municipalities and EWS operators to ensure an adapted diffusion of emergency information and of behavioral recommendations	All the risk events are anticipated, and the population is aware of it and adopts suitable behaviors limiting risk exposure to a minimum during impacting storm events
5	Intervention in school to raise awareness amongst the youngest	Short, Middle, Long	Coordination between local authorities and the academic institutions to allow for specific interventions in schools about coastal resilience	Most of the young population of the region is aware of coastal risks and coastal adaptation
6	Develop specialized courses about coastal resilience in regional universities and schools	Short, Middle, Long	Coordination between local authorities and the academic institutions to allow for specific courses or modules about coastal resilience	A majority of students are aware of coastal resilience issues and have the technical knowledge basis to understand the related processes and management strategies
7	Develop and offer an “information kit” for new residents and/for occasional visitors	Middle, Long	Coordination between local authorities, tourism offices, research labs / expertise centers and associations to build a useful information kit.	Most of the new residents and occasional visitors like tourists consults the information kit and thus get a minimal information about coastal risks and resilience

3.3.4. Conclusions & next steps

The development of the JTR for South Aquitaine was conducted by regional partners in the framework of the R4C project, with an active support from the expert partner Demos Helsinki. After a thorough preparation phase, which allowed especially to set up and disseminate a framework for the JTR development process, this process was deployed in South Aquitaine to build the present roadmap.

As recommended in the framework, the main steps were the a) the scope and context building, b) the actor identification and involvement and c) the Vision Workshop. This later workshop especially allowed to gather different stakeholders and representatives of the regional communities. Discussions held during the event with the identified actors permitted to precise the identification of the vulnerable social groups faced to coastal risks and climate adaptation, to examine the nature of their vulnerability, to discuss the possibly related social justice issues, and eventually to assess actions and formulate recommendations for the JTR.

This process resulted in the roadmap synthetized in the present document. Based on the workshop discussions and of the analysis by the regional stakeholders, the focus of the roadmap was set to the equitable knowledge acquisition along the different coastline portions, and then the fair and efficient sharing of the information with the different vulnerable groups, with the aim of building proactivity, engagement and acceptance among the communities. Consistently, a vision for the future, a set of goals and ensemble of actions have been proposed in the last part of this document, as a support to a Just Transition toward more resilience coastal communities in South Aquitaine.

The JTR process is built around the central regional strategy plan for coastal risk management in South Aquitaine, namely the SLGRL. The present JTR is intended to guide and inspire the actions to be integrated into future actions plans of the SLGRL. The next opportunity is foreseen in 2028, when the assessment of the ongoing 2023-2028 plan will be conducted, and new actions will be decided for the 2028-2033 plan. In the meanwhile, some actions will be considered by the CAPB as part of its already planned activities in the field of coastal risks. For further actions after 2028, a major challenge will still reside in the obtention of the required funding for the different actions and for their sustainable continuation over time. This will require the broad engagement of all the stakeholders, a supportive regulation at the national and European level, and the continuation of a proactive governance of coastal resilience. Opportunities and synergies may be also expected from a possible scale-up of the JTR process and more broadly of R4C actions to other part of the Nouvelle-Aquitaine administrative region, as well as synergies with the neighboring Spanish Basque Country region, also actively engaged in climate adaptation and Just Transition.

3.4. Tuscany

3.4.1. Introduction

Climate change severely affects regions, communities and livelihoods across the EU and globally. Adapting to changing climate is inevitable. However, if the process of climate change adaptation is not carefully planned, it risks exacerbating existing social inequalities and increasing the burden on those most affected by its impacts. This calls for a Just Transition to climate resilience.

In Piombino municipality, coastal flooding and erosion have been identified as key climate change impacts that increasingly pose risks and cause harm for the population. These risk and harm are not equally distributed across the municipality. Beach operators, hoteliers and farmers are expected to be among the most affected under critical scenarios of sea level rise and coastal erosion.

Currently, the population of Piombino has not yet developed a sufficiently solid awareness regarding climate change and climate justice issues. Although the Tuscany Region is among the most virtuous at national level with regards to the local adoption of the Action Plans for Sustainable Energy and Climate (SECAP)[4], the Municipality of Piombino, where the restoration of the coastal dune system is taking place, is still behind on this front, both in terms of planning and action.

Indeed, local authorities have not yet implemented strategies, policies or regulations aimed at ensuring resilience to climate change and promoting a Just Transition. In the surrounding areas there are virtuous examples, such as the municipalities of Cecina, Livorno, Florence, Rio Marina, Porto Azzurro and other municipalities on the Island of Elba.[5]

The Roadmap for a Just Transition was developed jointly with local stakeholders, identified through a structured mapping and engagement procedure. Each stakeholder actively contributed, bringing concrete ideas and personal experiences that allowed the development of a solid and realistic roadmap, with objectives achievable in both the short and medium-long term. In conclusion, it was elaborated following the guidelines validated within WP2, with the aim of becoming a stimulus for local authorities to undertake sustainable, forward-looking and innovative planning.

This Roadmap aims to propose to the municipality a guideline composed of concrete and targeted actions, which can be considered in the future development of sustainable and resilient plans. These actions are not limited to physical actions to mitigate climate-related risks and strengthen community resilience, but also to address in depth the needs of the most vulnerable social groups. The proposed measures aim to tackle the root causes of vulnerability through recommendations for improvements in behavioural practices, regulatory frameworks, and financial mechanisms.

[4] COMUNICANDO – SECAPs in Italian municipalities. Accessed on 1st August 2025
[5] EU Covenant of Mayors. Accessed on 1st August 2025

The Roadmap was prepared as part of Regions4Climate (R4C) - Building Resilient Communities EU Project, Grant agreement ID: 101093873, funded under HORIZON 2.5 - Climate, Energy and Mobility programme Call: HORIZON-MISS-2021-CLIMA-02-04 - Large scale demonstrators of climate resilience creating cross-border value.

3.4.2. Roadmap development process – Tuscany Vision Workshop for Just Transition Roadmap

In the scope of Task 2.4, the Tuscany Region has completed the steps to formulate a Just Transition Roadmap (JTR) towards climate resilience. This comprehensive document outlines the various activities undertaken throughout the process, including the identification of regional vulnerabilities and justice-related considerations. It also presents a shared vision for 2044, a detailed action plan, and the key conclusions drawn from the initiative.

Actors' identification and involvement

The Just Transition Vision Workshop for Tuscany region was held on 11 April 2025 at Villaggio Orizzonte, Piombino, from 9.00 to 13.30 (CEST).

The invitations were strategically addressed with the aim of involving actors and enterprises active in the area, potentially exposed to the negative impacts of climate change analysed for this geographical area. The workshop was attended by 16 people, including 11 from outside the consortium, while 25 guests were unable to take part in the meeting.

Representatives of strategic sectors for the territory contributed to the definition of the Just Transition Roadmap, including steel, energy, environmental services, urban and territorial regeneration, coastal tourism, agriculture and economic-agronomic research. Furthermore, independent professionals active in the fields of geology, environmental consultancy and scientific dissemination participated.

Among those absent are representatives of areas equally relevant for the Just Transition, such as the management of water resources, civil protection, environmental conservation, management of protected areas, civic rights, scientific and academic research, fishing, marine biology, port governance and local administrations. Their non-participation represented a missed opportunity to further enrich the comparison with complementary technical and institutional perspectives.

Workshop introduction and methodological approach

The team of facilitators and collaborators opened the session with an introductory presentation to outline the project's main objectives and relevance in the current context. Then, the concept of Just Transition was clarified, highlighting the importance of ensuring that social, economic, and environmental changes benefit all stakeholders fairly.

Finally, the team presented the workshop activities, their objectives, and the innovative methodology, which is based on the analysis of long-term perspectives and designed to stimulate imagination and the vision of a sustainable future achievable through a carefully planned transition.

Vision Workshop – Future Scenarios (Activity 1)

Activity 1 was dedicated to the analysis of four future scenarios, developed starting from a "Table of Futures", a tool that explores different possible evolutions of the main factors that influence the just transition: political, economic, social, technological and environmental.

POLITICA	ECONOMIA			SOCIETÀ E TECNOLOGIA		AMBIENTE	
Modalità di Governance	Settore primario	Turismo	Coste	Uso del Suolo / Abitazioni	Dinamiche del Mercato del Lavoro	**Cambiamenti Climatici**	Stato dell'Ambiente
Autorità municipali centralizzate e forti.	Crisi nell'agricoltura a causa delle condizioni climatiche mutevoli. Il settore della pesca scompare a causa dell'aumento della temperatura del mare.	Diminuzione del numero di turisti a causa di ondate di calore estreme e condizioni meteorologiche imprevedibili.	Rivalutazione economica delle aree costiere, con un aumento dei costi di gestione delle concessioni e le piccole imprese locali che faticano a competere.	Il turismo prevale sugli altri usi del suolo (tra cui l'uso del suolo a scopo residenziale ed industriale). Sviluppo speculativo per locali e piccole imprese lungo la costa.	La centrale geotermica in Val di Cornia investe per ampliarsi ma riscontra un forte disallineamento tra le skill richieste e le competenze disponibili nella forza lavoro locale.	Aumento considerevole della temperatura media e del numero di notti tropicali, insieme a una maggiore imprevedibilità dei cambiamenti stagionali.	Conservazione riuscita degli habitat costieri e della pianura del fiume Cornia.
Stakeholder locali coinvolti nelle decisioni politiche.	Settore primario diversificato: rendimenti inferiori ma economia del settore primario locale più forte e resiliente.	Transizione verso un turismo ecologico rivolto a una clientela di classe medio-alta.	Vengono approvati progetti di salvaguardia costiera che spingono la popolazione residente nell'area interessata a migrare.	La pressione sull'uso del suolo diminuisce gradualmente grazie alla riduzione della domanda di alloggi per turisti.	Grave carenza di forza lavoro in tutti i settori.	Leggero aumento della temperatura media e considerevole crescita del numero di notti tropicali; tempeste sempre più imprevedibili.	Improvviso degrado dell'ecosistema della pianura del fiume Cornia e della costa dovuto a sfruttamento eccessivo in un clima sempre più severo.
Governance collaborativa tra comuni.	Settore primario altamente industrializzato: focus sulla produttività a scapito della sostenibilità.	Il turismo di massa prevale, spingendo fuori dal mercato i piccoli operatori.	I nuovi criteri di concessione promuovono una gestione più sostenibile della costa, andando così ad escludere gli operatori non idonei.	Le limitazioni imposte sull'uso del suolo hanno un impatto significativo e alleviano in parte le pressioni sulla costa.	Mercato del lavoro in rapida crescita grazie a una maggiore presenza di lavoratori immigrati, principalmente impiegati nel settore primario.	Leggero aumento della temperatura media e delle notti tropicali; il graduale innalzamento del livello del mare causa la scomparsa della duna costiera e l'intrusione di acqua salata nelle falde costiere.	Degrado ambientale localizzato, causato in parte da passate speculazioni sull'uso del suolo e da una gestione politica inadeguata.
Politica locale frammentata.	L'impatto combinato dei cambiamenti climatici e la riduzione dei sussidi compromettono la produttività agricola.	Il turismo si orienta verso la conservazione del patrimonio naturale e culturale, limitando il turismo di massa.	Le grandi catene turistiche ottengono concessioni balneari e le "industrializzano", compromettendo una gestione costiera sostenibile.		Il mercato del lavoro è in rapida crescita, trainato dal turismo di massa e dalle attività ad esso collegate, come la ristorazione, i servizi e il commercio. I lavoratori immigrati contribuiscono a soddisfare la crescente domanda.		Perdita lenta ma costante della biodiversità.

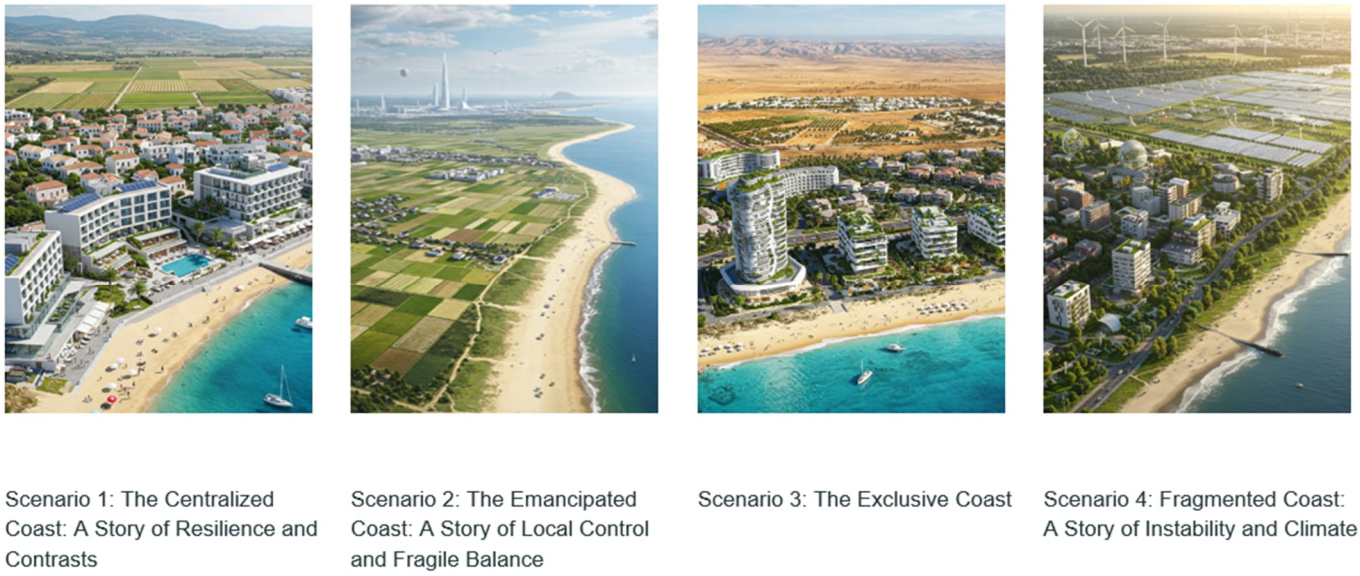
Figure 12. Table of futures (Tuscany).

Combining these factors and using AI support, four future scenarios were developed, each one featuring specific characteristics.

The scenarios presented realistic, and sometimes provocative, scenarios with the aim of stimulating discussion and imagination about how the area under analysis should be in the future.

The graphical representation below highlights the main differences between the four scenarios, especially in terms of their environmental and economic impact.[6]

[6] To ensure the success of the activity, RINA-C first developed the scenarios and then proposed them to the consortium partners supporting the Tuscany Region within the project to gather feedback on the clarity of the



Scenario 1: The Centralized Coast: A Story of Resilience and Contrasts

Scenario 2: The Emancipated Coast: A Story of Local Control and Fragile Balance

Scenario 3: The Exclusive Coast

Scenario 4: Fragmented Coast: A Story of Instability and Climate

Figure 13. Visual representation of the four future scenarios (AI Support) (Tuscany).

The activity took a considerable amount of time, but the evaluation of the storylines proved to be very valuable, and a significant amount of relevant information was gathered. At the end of the activity, each of the four groups, led by their facilitator, presented to the others the key aspects of their assigned scenario.

Vision Workshop – Shared Vision (Activity 2)

Activity 2 focused on identifying both desirable and undesirable aspects of each scenario, as well as defining the key elements of the shared vision for 2044. To facilitate a more effective and engaging discussion, participants were divided into two mixed groups.

Among the positive priorities common to the two groups are environmental sustainability, inclusive governance, social cohesion, the development of resilient businesses and the valorisation of cultural tourism. On the contrary, centralized governance, socio-economic inequalities, environmental degradation, loss of local skills and mass tourism pressure were highlighted as critical issues.

The shared vision promotes an integrated approach that includes sustainability education, forward-looking territorial policies, sustainable mobility, protection of biodiversity, strengthening local communities and combating rural gentrification, with the aim of ensuring a just and inclusive transition for all member of the territory.

activity. Based on this feedback, the scenarios were revised with the help of partners such as SSSA, ICLEI and UNIFI.

Vision Workshop – Actions identification (Activity 3)

For the final activity of the workshop, all participants were asked to sit in a circle around the final canvas and engage in a collective discussion on the key actions to be taken to achieve the shared future common vision.

Given the diverse backgrounds of the participants, it was possible to cover all sectors and areas of analysis, resulting in the creation of a comprehensive and well-structured vision along with a set of concrete actions.

On a physical level, the need for proactive coastal retreat and dune restoration strategies was highlighted, to protect vulnerable areas from rising sea levels. In the energy field, the importance of renewable energy communities to strengthen energy independence was underlined. Desired behavioural changes include the promotion of sustainability-oriented civic networks and the de-seasonalisation of tourism, enhancing local traditions.

At the regulatory level, the evolution of regulatory frameworks is proposed to foster intermunicipal governance and integrate equity into public policies. For the financing of adaptation, it is suggested to monetize ecosystem services (e.g. soil conservation, groundwater protection) and to activate shared financing mechanisms.

Finally, it is recommended to strengthen knowledge building (e.g. climate literacy, inclusion of less represented voices) and organizational adaptation, through unified governance structures that avoid fragmentation and ensure the inclusion of the most vulnerable groups in the transition process right.

Workshop considerations

During the workshop, efforts were made to actively engage all participants, foster open dialogue, and encourage a collaborative exchange of ideas. The aim was to ensure that each voice had the same space and value, creating a context in which everyone could freely express their point of view.

The participants showed great interest and awareness of the challenges faced by the Italian demo site and were able to nurture an interesting debate on future scenarios.

All the information collected during the workshop proved to be fundamental for the development of this document and represents a crucial milestone in the process of defining the Just Transition Roadmap for the Italian site.

3.4.3. Vulnerabilities and Justice Considerations

Vulnerable social groups

Based on the discussion that emerged during the workshop, certain social groups may be subject to increasing vulnerability in the future, exacerbated by the ongoing climate crisis.

Particular attention must be paid to:

- **Farmers** who practice traditional farming methods and grow local varieties. These operators, often linked to techniques and crops historically rooted in the territory, can encounter serious difficulties in adopting more resilient practices or in diversifying production. New crops, better suited to addressing the impacts of

climate change, often require significant investment in economic resources, technical training and soil adaptation. Without adequate support, these farmers risk being excluded from transition processes, with negative consequences on both a productive and socio-economic level.

- **Untrained and older people** risk social exclusion due to a lack of digital skills and limited access to the resources and tools needed to adapt to ongoing changes. For instance, individuals with limited education or technical expertise may be excluded from training programmes or job opportunities related to transitions.
- **Seasonal workers** in the tourism sector and small beach operators also represent categories that are particularly vulnerable to the effects of climate change. From a socio-economic point of view, the tightening of climatic conditions can generate the following critical issues:

    - *Increased demand for seasonal work in extreme conditions:* As mass tourism grows, more seasonal workers will need to be employed. However, these workers will find themselves operating in increasingly difficult climatic contexts (heat waves, extreme events, etc.), without employment guarantees at the end of the tourist season.

    - *Fragility of small beach operators*: small tourist facilities, often family-run, may not have the economic and technical resources necessary to implement climate adaptation measures (e.g. coastal protection, redevelopment of facilities, diversification of supply). This exposes them to the risk of being progressively marginalized or absorbed by large hotel chains, better equipped to face new environmental challenges and promote forms of alternative tourism.

- **Inhabitants of coastal communities**, who risk suffering the negative effects linked to the growing commercialization of the coast, with impacts on social well-being, increased housing costs and essential goods, and greater environmental pressure on the territory.

On the contrary, certain categories such as owners of eco-tourism businesses, the wealthiest segments of the population, technologically advanced farmers and entrepreneurs in the renewable energy, healthcare and environmental services sectors could benefit from the climate transition, thanks to greater economic resources, technical expertise and adaptability.

Fairness and unfairness of the future

The analysis of the four future storylines highlighted several key issues of fairness and unfairness emerging in the context of climate change adaptation.

Below, the list of fair and unfair aspects is reported. This information clearly provides indications of the key actions to be considered during the development of the roadmap and action plans.

Regarding fair aspects, stakeholders identified the following points:

- The need for **environmental conservation**, **territorial resilience** and **protection**, and the enhancement of the area's cultural heritage, while **reducing pressure on coastal zones**.

- Promotion of more **inclusive governance** and **community empowerment**, to face potential vulnerabilities.

- Recognition of the need for **climate literacy**, **youth engagement**, and **equity in decision-making**.
- Promotion of **financial support for the transition**, particularly for the development of more robust and resilient agricultural models and skilled workforce.
- Implementation **of nature-based solutions** to mitigate the effects of climate change on the environment and enhance the quality of life of communities.

On the contrary, all actions and behaviours that go against fair principles have been considered negative. More specifically, stakeholders have identified the following aspects as potentially unfair for the future:

- ***Centralization of power*** *and* ***exclusion of local communities*** *from decision-making processes.*
- ***Gender inequality****.*
- *Disproportionate burden of* ***adaptation costs on marginalized groups****.*
- ***Job precarity*** *among seasonal workers,* ***lack of support for SMEs****, and* ***absence of training programs*** *for unskilled local workers.*
- ***Environmental degradation****,* ***costal commercialization*** *and* ***biodiversity loss****, and short-term profit orientation at the expense of community well-being.*

The reflections expressed by stakeholders on the identification of vulnerable social groups and what is fair or unfair in the four future scenarios analysed were fundamental to laying the foundations of a shared vision of the region by 2044. This process allowed them to understand the current socioeconomic situation, imagine plausible future scenario and identify the right conditions towards which to direct actions.

3.4.4. A Joint Vision for 2044

One of the main objectives of the workshop was the definition of a shared joint vision for the pilot area of the Tuscany Region (Golfo di Follonica, Sterpaia Coastal Park), through the structured collection of ideas and opinions from the stakeholders involved. Particular attention was paid to ensuring active and equal involvement of all participants, demonstrating the effectiveness of an open and barrier-free discussion.

During the discussion, four key words emerged that summarize the shared vision: **capacity building**, **sustainability**, **inclusion** and **resilience**. These concepts represent the fundamental pillars on which to build development strategies consistent with the needs of the territory.

A recurring theme in the debate was the recognition of the need to learn from the mistakes of the past and to promote a new culture of sustainability, accessible and understandable to all - both individually and collectively. The objective is to increase awareness of the active role that each actor can and must take on in this transition phase.

Particular emphasis was placed on the importance of actively involving new generations in public consultation processes, enhancing their contribution in terms of innovative ideas and prospective visions. Promoting youth participation not only strengthens the sense of belonging to the territory but also represents a strategic element to combat depopulation phenomena and to stimulate local growth and innovation.

At the same time, it was underlined that, in the present, it is essential to prevent phenomena of impoverishment and the formation of new vulnerable categories, in order to guarantee social cohesion and long-term sustainability.

A further important aspect that emerged during the workshop, closely related to the geographical characteristics of the pilot area, concerns the tourism sector, recognized as strategic for the Gulf of Follonica. However, the need has emerged to carefully monitor its evolution, in order to avoid the establishment of unregulated mass tourism models, concentrated exclusively in the summer months and based on the logic of profit and exploitation.

The public discussion gave rise to a vision aimed at promoting sustainable and seasonally adjusted tourism, capable of generating economic benefits throughout the year. This approach aims to enhance not only seaside activities, but also SMEs, through tourist offers focused on contact with nature, culture and environmental sustainability.

In parallel, the need to strengthen infrastructure and support services was highlighted, with particular reference to sustainable mobility. The discussion underlined the importance of developing an integrated system composed of efficient public transport, cycle paths and pedestrian paths immersed in the natural context, capable of promoting accessibility and responsible use of the territory.

A second strategic sector for the pilot area is represented by agriculture. Val di Cornia, in fact, contributes approximately 20% to the overall production of fruit and vegetables consumed in Tuscany. In this context, it is essential that the agricultural sector evolves towards a model resilient to climate change, counteracting the progressive abandonment of cultivated land, a phenomenon already underway.

To achieve this goal, the sector will need to equip itself with advanced technologies and adopt innovative and sustainable agricultural models. During the workshop, the importance of establishing agricultural cooperatives capable of actively participating in public debate and decision-making processes was highlighted, contributing with a clear representation of the risks and opportunities linked to the resilience of the sector. This highlights the need for structured political support.

In support of these virtuous models, the key role of local authorities was underlined. They are called upon to promote change through innovative territorial policies aimed at:

- Ensure resilience of the agricultural sector.
- Promote industrial diversification.
- Encourage the use of renewable sources for energy production.
- Foster the creation of local energy communities.

From a social point of view, the need has emerged to combat phenomena such as gentrification, promoting the integration of vulnerable social groups. Furthermore, the importance of responsible land use was reiterated, with the aim of reducing anthropic pressure through the restoration of natural ecosystems, preferably interconnected via waterways and integrated with nature-based solutions. A concrete example is represented by the coastal dunes, the subject of intervention in the Tuscan site of the R4C project.

3.4.5. Actions of the Roadmap

In the final workshop activity, participants identified key actions to achieve the collectively defined future vision.

The actions to be implemented in the JTR have been identified and grouped in 6 categories, corresponding to:

- Changes in the physical word.
- Changes in everyday behaviour and practices.
- Changes in laws and regulations.
- Changes in the financing of adaptation.
- Changes in knowledge and information.
- Changes in the organization of adaptation.

In more detail, proactive coastal retreat strategies and dune restoration are needed within the physical transformation, protecting vulnerable zones from sea-level rise. At the same time, renewable energy communities are necessary for strengthening energy independence and shifting reliance toward clean energy sources.

Behavioural shifts focus on fostering citizen networks focused on sustainability and transitioning to a de-seasonalized tourism leveraging on the local traditions, supported by sustainable mobility systems such as expanded cycling paths and public transit.

Regulatory frameworks must evolve to enable cross-municipal governance bodies, embedding equity into policies (e.g., biodiversity offsetting agreements, tax mechanisms to distribute the costs of adaptation, etc.).

Financing adaptation should be based on quantifying ecosystem services, such as soil preservation and groundwater protection, to incentivize climate-resilient farming and distribute costs regionally through grants and shared funding mechanisms.

Knowledge-building initiatives underscore the importance of education as a key driver for a just transition, emphasizing the role of schools, post-school training, and public communication in fostering awareness and inclusion.

Finally, organizational adaptation requires unified governance structures to coordinate municipal efforts, promoting collaboration between authorities, businesses, and agricultural cooperatives to avoid fragmentation and that marginalized groups are left behind in the Just Transition process.

Together, these actions aim to achieve the Just Transition within the area that has been analysed.

To further contextualize and monitor each action, a consultation was held with Work Package leaders and regional partners to define appropriate time horizons, based on implementation complexity, along with enabling conditions and success criteria. The figure and table below illustrate the outcomes of the process.

The results obtained refer to the local area surrounding the demo site and will require further discussion and validation through consultations with local stakeholders. Potential elements for scaling up the actions to the regional level will need to be reviewed and assessed by the regional administration. These initiatives will be further explored in the coming months to assess their effective implementation.

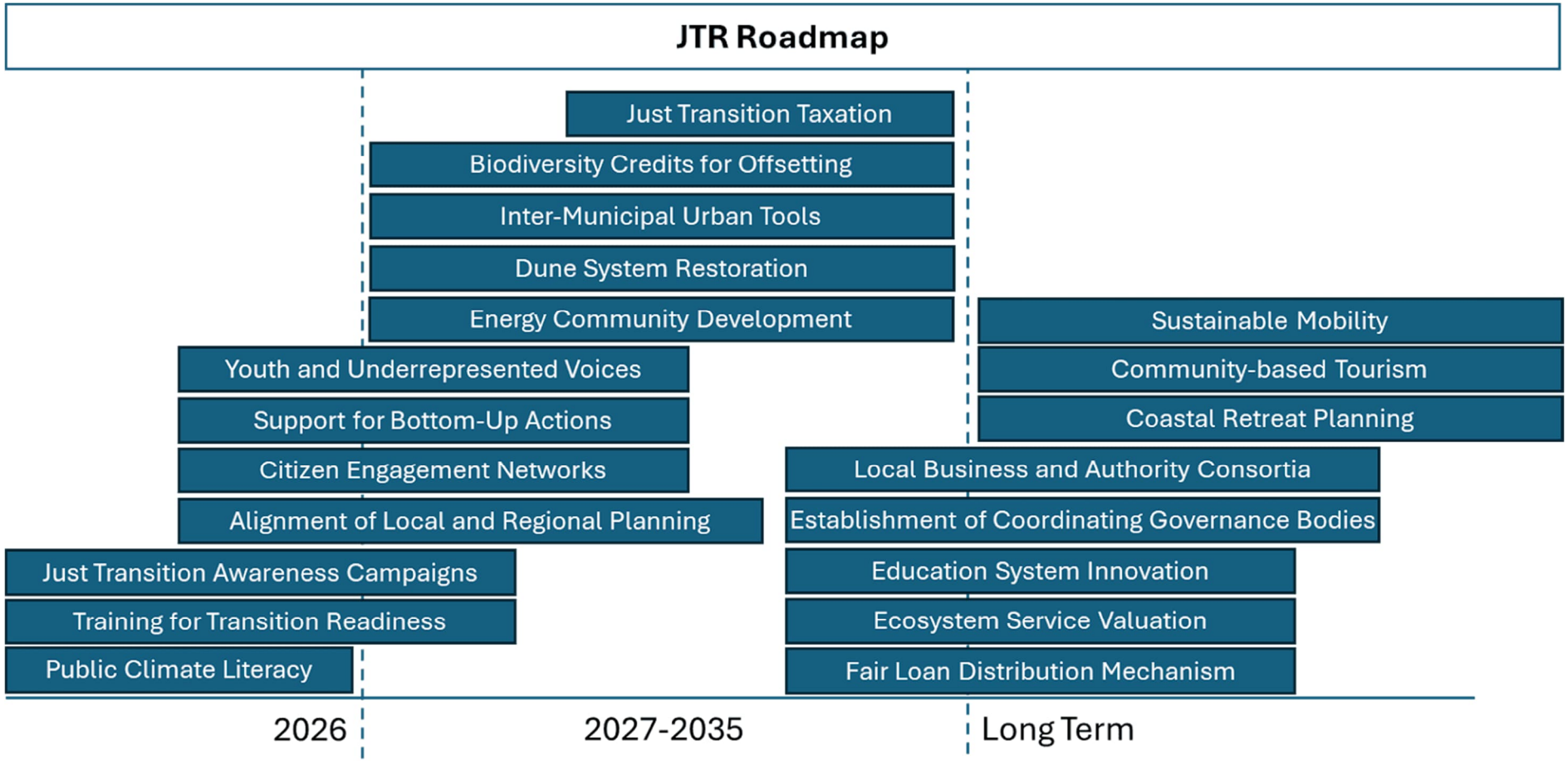


Figure 14. Actions of the Just Transition Roadmap (Tuscany).

Table 3. Enabling and Success Criteria for the actions of the JTR (Tuscany).

Action	Description	Type of intervention	Enabling Conditions	Success Criteria
Coastal Retreat Planning	Implement proactive coastal retreat strategies where space allows for planned relocation of assets, activities and people to safe areas.	Physical	Legal framework for strategy implementation; community consent; dedicated funding; technical feasibility studies.	Measurable reduction in coastal damage; high resident satisfaction.
Dune System Restoration	Preserve and restore dune systems as natural barriers protecting inland areas from sea-level rise and storm surges.	Physical	Ecological expertise; community stewardship programs; enforcement against disturbances.	Dune coverage restored by 100% in the Piombino municipality; significant reduction in storm surge inland penetration; biodiversity recovery (e.g., native species return).
Energy Community Development	Support the creation and growth of energy communities to promote decentralized renewable energy and local empowerment.	Physical	Regulatory approval for energy sharing; seed funding/grants; technical training; grid integration agreements.	1 energy community operational.
Citizen Engagement Networks	Build citizen engagement networks to raise awareness and participation in sustainability initiatives.	Behavioural	Periodical consultations between the municipality and local stakeholders; Digital/platform infrastructure; trusted local facilitators; inclusive outreach strategy.	1 community-led project discussed during consultation launched every 5 years; verified increase in climate literacy.
Support for Bottom-Up Actions	Promote and give visibility to bottom-up actions led by local communities.	Organizational	Communication channels (e.g., municipal portal/social media); recognition mechanisms (e.g., awards); collaboration with local media.	Community-led projects amplified; increased volunteer sign-ups; external replication of Piombino models.
Community-Based Tourism	Encourage a new model of tourism where visitors are guests integrated into the local community.	Behavioural	Periodical consultations between municipality and local stakeholders; Cultural shift in tourism marketing; industry partnerships; incentives for	≥50% of those who expressed willingness to adopt the model during the consultations have actually

Action	Description	Type of intervention	Enabling Conditions	Success Criteria
			community-based tourism; generational education programs.	implemented it; diversification beyond seasonal peaks.
Sustainable Mobility	Implement efficient and sustainable mobility	Behavioural	Overhaul of transport infrastructure (e.g., EV networks); urban redesign; fiscal policies (e.g., congestion pricing); behavioral incentives.	Fossil-fuel-free transit by 2050; ≥60% adoption of public/active transport; air quality compliance with EU standards.
Alignment of Local and Regional Planning	Align local planning with regional and territorial strategies, promoting adjustments when inconsistencies arise.	Legislative	Inter-municipal coordination protocols; legal authority to amend plans; data-driven impact assessments.	Full alignment of local plans with recognized regional, national, or European resilience frameworks; established coordination mechanisms with neighboring regions.
Inter-Municipal Urban Tools	Introduce urban planning tools at the inter-municipal level, such as the “Contratto di Fiume”.	Legislative	Multi-stakeholder agreements; standardized guidelines; pilot project funding.	Tools adopted by all coastal municipalities; measurable ecosystem improvements (e.g., water quality); conflict reduction.
Just Transition Taxation	Introduce taxes to address just transition issues, such as the tax implemented to support marine plastic recovery efforts.	Legislative	Transparent revenue allocation; public acceptance via consultations; enforcement mechanisms.	Tax enacted; 100% revenue directed to target Just Transition issues (e.g., support to more vulnerable groups); quantifiable environmental benefits.
Biodiversity Credits for Offsetting	Introduce biodiversity credits for carbon offsetting, as was done in the Tuscan-Emilian Apennines. This approach could be replicated in the Val di Cornia park system.	Legislative	Periodical consultations between municipality and local stakeholders; Scientific valuation methodology; market infrastructure; landowner participation.	All areas identified as suitable during public consultations are contributing to the generation of carbon credits; new conservation partnerships.
Fair Loan Distribution Mechanisms	Analyze loans through a cost-benefit analysis across different social groups and	Financial	Disaggregated socioeconomic data; participatory workshops; statistical expertise.	Analysis completed; fair cost-sharing implemented; reduced financial exclusion of marginalized groups.

Action	Description	Type of intervention	Enabling Conditions	Success Criteria
	subsequently design mechanisms for cost distribution.			
Ecosystem Service Valuation	Map ecosystem services and economically quantify their value (e.g., soil preservation by farmers using traditional practices such as cultivating ancient grains...).	Financial	Periodical consultations between municipality and local stakeholders; GIS/data collection tools; partnerships with universities/farmers; standardized valuation metrics.	Comprehensive map published; all services identified as suitable during public consultations are monetized; integration into land-use policies.
Education System Innovation	Work within schools and the education system to create better models.	Educational	Teacher training; updated curricula; student participation channels.	Sustainability modules in all schools; youth-led environmental projects.
Youth and Underrepresented Voices	Create spaces for expression for voices that are currently underrepresented (e.g., youth).	Organizational	Accessible platforms (physical/digital); mentorship programs; outreach to marginalized groups.	Increased participation of target groups; periodical inclusivity audits at municipal level.
Training for Transition Readiness	Provide post-school training for decision-makers and policymakers, as well as worker education on transition-related topics.	Educational	Customized training programs; expert networks; incentives for completion.	Worker upskilling certifications; policy changes informed by training.
Public Climate Literacy	Educate the public on climate-related choices and actions. Politicians must be able to communicate decisions effectively and explain the systemic benefits.	Educational	Clear messaging frameworks; diverse media campaigns; politician communication training.	Increased public support for policies; measurable behavior change (e.g., energy conservation).
Just Transition Awareness Campaigns	Communicate the urgency of activating pathways for a Just Transition in order to avoid future social conflicts.	Educational	Crisis narratives co-developed with communities; trusted messengers; multi-channel dissemination.	Heightened public urgency measured through surveys.
Establishment of Coordinating Governance Bodies	A second-level governance body should be established. It would be responsible for	Organizational	Defined authority; inter-municipal agreement; technical secretariat.	Unified coastal management plan; efficiency gains (e.g., cost sharing); consistent adaptation standards.

Action	Description	Type of intervention	Enabling Conditions	Success Criteria
	coordinating municipalities for cohesive and long-term adaptation planning.			
Local Business and Authority Consortia	Establish consortia among local businesses in both agricultural and industrial sectors. Foster collaboration between local authorities and private enterprises to avoid fragmented management and inefficiencies.	Organizational	Business incentives; public-private Memorandums of Understanding (MoUs); shared resource platforms.	1 functional consortia; reduced operational redundancies; job creation in green sectors.

3.4.6. Conclusions

This Just Transition Roadmap marks a significant step forward in building climate resilience for the Piombino municipality. Developed through participatory foresight and broad stakeholder engagement, the roadmap outlines a clear and inclusive path to address the overlapping challenges of climate change, social vulnerability, and economic transformation. It recognizes that adaptation is not only a technical process, but a societal shift that must place equity, justice, and inclusion at its core.

One of the key strengths of the roadmap lies in its participatory foundation. Through the Vision Workshop, stakeholders from across sectors (industry, agriculture, tourism, academia, and civil society) came together to co-create a shared vision. While some sectors such as water management, civil protection, and fisheries were underrepresented, the dialogue was nonetheless rich and locally grounded. This inclusive approach ensured the strategies respond to real-world needs, especially for traditionally marginalized groups like seasonal workers, coastal residents, and small-scale farmers.

Participants collectively envisioned the future of the Gulf of Follonica and the Sterpaia Coastal Park by 2044, centered on four guiding principles: capacity building, sustainability, inclusion, and resilience. The vision promotes sustainable tourism that moves beyond seasonal peaks and mass exploitation, supporting community-based models rooted in environmental care. It calls for climate-resilient agriculture, where traditional farmers are empowered through innovation, cooperatives, and supportive policies. It emphasizes inclusive governance, youth participation, and inter-municipal coordination to prevent gentrification and exclusion. Finally, it advocates for nature-based solutions such as dune system restoration, aiming to strengthen ecosystems and protect coastal zones.

To translate this vision into practice, the roadmap proposes a holistic set of 20 actions, grouped into six dimensions of change. Physical interventions include planning for coastal retreat and restoring dunes to buffer against sea-level rise. Behavioral shifts focus on building citizen engagement and promoting sustainable mobility. Regulatory innovations recommend tools for inter-municipal governance and mechanisms like biodiversity credits that embed justice into policy. Financial mechanisms emphasize fair cost distribution and the economic valuation of ecosystem services to support vulnerable communities. Knowledge-building actions aim to boost climate literacy and reform education systems. Finally, organizational adaptation is encouraged through the creation of cross-sector consortia and governance structures that ensure coordinated, long-term implementation.

While the roadmap offers a solid foundation, it also acknowledges significant challenges. Key stakeholders, such as those from port governance and fisheries, were not sufficiently involved, pointing to the need for more inclusive engagement in future iterations. Implementation will depend on the presence of enabling conditions, including funding, supportive regulations, and community acceptance. Moreover, although tailored to Piombino, the approach has the potential to scale across Tuscany. This will require strategic alignment with broader regional and European frameworks, such as SECAPs and Horizon Europe missions.

Ultimately, this roadmap is not a final product but a springboard for action. Its success depends on adoption at the local level, where the municipality must embed its actions into climate plans, urban strategies, and budgets. Collaboration across governance levels, sectors, and communities will be essential to develop and test pilot initiatives that can serve as scalable models. Equally important is a commitment to continuous learning, with

regular monitoring and evaluation of key indicators such as climate literacy, energy transition implementation, and ecosystem resilience.

In conclusion, the Just Transition Roadmap offers a transformative pathway toward a resilient, inclusive, and climate-just Piombino municipality. By placing equity at the heart of adaptation, it ensures that no one is left behind in the face of accelerating climate impacts. It stands as a testament to the power of collective vision, grounded in urgency, collaboration, and local wisdom.

3.4.7. Additional information

Workshop Organizers:

- *Alberto Marasi (RINA-C), Lorenzo Canepa (RINA-C) (Facilitators)*
- *Erika Palmieri (ICLEI Europe), Erica Manuelli (ICLEI Europe), Giorgia Condomitti (SSSA), Maria Rosa De Giacomo (SSSA), Luigi Cipriani (Regione Toscana) (Collaborators)*

Participants (not R4C Partners): Adriano Bruschi (Legambiente), Gilberto Lunardi (JSW Steel Italy Piombino S.p.A.), Luca Sbrilli (freelance, geologist and environmental consultant), Tiziano Scappelli (G. Boscaglia S.r.l.), Alessio Baldini (Enel Produzione S.p.A.), Nicolò Belliti (Tor del Sale), Fabrizio Lotti (Consortia of beach managers), Lucia Tudini (Consiglio per la ricerca in agricoltura e l'analisi dell'economia agraria), Marco Di Luca (freelance, environmental excursion guide), Giovanni Maria Guarnieri (Regione Toscana), Enzo Pranzini (retiree, former professor at Università degli Studi di Firenze).

Participants (R4C Partners): Lorenzo Cappietti (Università degli Studi di Firenze), Leonardo Lombardi (Nemo S.r.l.), Maurizio Bacci (Iris S.a.s), Michele Giunti (Nemo S.r.l.), Stefano Corsi (Iris S.a.s.).

Also invited: Alessandro Fabbrizzi (Consorzio di Bonifica 5 Toscana Costa), Francesca Finocchiaro (Regione Toscana Genio Civile), Michele Del Corso (ASA S.p.A), Antonio Martelli (WWF Livorno), Emiliano Maratea (ENEL), Paolo Pipeschi (Ambiente Mare Italia), Simona Santinelli (Parchi della Val di Cornia), Clara Gonnelli (Associazione per i Diritti dei cittadini), Rudy Rossetto (SSSA), Sabine Gennai Schott (NEXUS project), Fedagripesca Toscana, Matteo Caramante (Comune di Piombino), Stefano Vivarelli (Comune di Piombino), Marco Vita (Comune di Piombino), Roberto Bedini (Istituto di Biologia ed Ecologia Marina), Claudio Capuano (Autorità del Sistema Portuale), Gabriele Lami (Autorità del Sistema Portuale), Gianpaolo Pioli (Villaggio Orizzonte), Orti Bottagone (WWF Oasi Val di Cornia), Ilaria Rossi (ARPAT Piombino), Ludovica Marinaro (Università degli Studi di Firenze), Gabriele Paolinelli (Università degli Studi di Firenze), Marco del Francia (freelance, architect), Alessandro Spinicci (Comune di Follonica), Marco Masi (Regione Toscana).

Equipment: Canvases prepared by Demos Helsinki, laptops, post its, pens, pencils, and highlighters.

3.5. Burgas

This roadmap was compiled by Demos Helsinki as a suggestion. The roadmap has not been reviewed or adopted by the Regions4Climate project partner Burgas Municipality.

3.5.1. Introduction

Climate change severely affects regions, communities and livelihoods across the EU and globally. Adapting to the changing climate is inevitable. Yet, if the process of climate change adaptation is not carefully thought through, it risks aggravating already existing inequalities in society and exacerbating the burdens for those who are the most affected by the impacts of climate change. This calls for a just transition to climate resilience.

Burgas faces intertwined societal and climate challenges as it strives for just climate resilience. Socioeconomic issues include a rising mortality rate, youth emigration, high unemployment—especially among the educated—and significant poverty and housing insecurity. Rural areas exhibit ethnic segregation, with certain villages dominated by Roma or Turkish populations, often with limited access to services. These factors contribute to social vulnerability, particularly in the face of climate-related stressors.

Burgas is highly susceptible to flooding due to intense rainfall and coastal exposure. Sea-level rise, soil erosion, and landslides further threaten the region’s infrastructure and ecosystems. Droughts increasingly strain supply systems, endangering water security. Forest and field fires, worsened by human activity and prolonged heat, present recurring dangers during summer months.

Climate change scenarios point to heightened risks of water scarcity and ecosystems being negatively affected. Burgas is responding with flood monitoring systems, urban greening for erosion control, and renewable energy projects. However, the city's success depends on equitable participation, support for vulnerable groups, and sustained investment in climate change adaptation and social inclusion.

The following roadmap is based on the input received during a workshop hosted in Burgas on March 20th, 2025.

This roadmap was prepared as part of has been produced as part of Regions4Climate (R4C) - Building Resilient Communities EU Project, Grant agreement ID: 101093873, funded under HORIZON 2.5 - Climate, Energy and Mobility programme Call: HORIZON-MISS-2021-CLIMA-02-04 - Large scale demonstrators of climate resilience creating cross-border value).

3.5.2. The Process for the Just Transition Roadmap

The municipality of Burgas hosted a participatory workshop on March 20th, 2025, with specific focus on elderly, youth, people with disabilities and minorities, and fishermen living in the area. In this workshop, these groups analysed four explorative future storylines, created a desired visions for 2044, and identified a set of actions that could contribute to achieve the visions.

3.5.3. Vulnerabilities and Justice Considerations

In the future, some social groups might experience a further increase in vulnerability. Therefore, special attention should be given to elderly people, people with low digital literacy or without access to technology, the internet, and devices, and resident of old neighborhoods. Also, poor households, ethnic minorities, single parents, farmers, and low-skilled workers are going to be especially vulnerable to the impacts of climate change.

On the other hand, active citizens, active communities and volunteers, people with high digital literacy and access to technology, people with middle income, business, as well as Institutions and departments with access to finance and technology, are expected to be able to cope with changing circumstances and benefit from a changing climate and climate change adaptation.

The analysis of the four future storylines revealed several key fairness issues that arise in the context of climate change adaptation:

- **Unequal Access to Digital Services and Sustainable Infrastructure:** A significant concern is the **lack of equal access to digital services and sustainable infrastructures.** This means that while some areas and groups benefit from modern, highly digitalized services and technologically advanced infrastructure, others, particularly **residents of old neighborhoods**, are left with less access to these improvements.
- **Disproportionate Burden on Vulnerable Households:** Climate change adaptation measures, or the lack thereof, can accentuate social inequalities. **Poor neighborhoods experience more heat and flooding, and high energy costs burden vulnerable households.** This indicates that the financial burden and physical impacts of climate change are not evenly distributed, often falling more heavily on those least able to cope.
- **Digital Divide and New Barriers:** The digital transition, while offering benefits, **can create new barriers for a part of the population.** Vulnerable groups, especially those **without access to the internet and devices**, do not have equal access to information and adaptation resources. This can lead to improved areas not being evenly distributed and some communities being excluded from participatory processes.
- **Persistent Social and Ethnic Inequalities:** Access to housing and services **still depends on ethnic and social background,** suggesting that existing inequalities are exacerbated. Vulnerable neighborhoods suffer more from heat and flooding, and insufficient public engagement makes it difficult for some groups to access adaptation solutions.
- **Uneven Focus of Adaptation Efforts:** Efforts might **be focused on certain risks (like floods) but not on others (such as heat or social protection).** This leaves many people without adequate protection or participation in decisions. Additionally, food and energy prices are rising, especially for people on low incomes.
- **Exclusion from Decision-Making and Innovation:** Throughout the storylines, there's a recurring theme that vulnerable groups, such as elderly people, people with disabilities, and minorities, feel excluded from technological progress, important societal processes, and decision-making regarding adaptation. They often perceive technical solutions as distant and inaccessible, and their needs may go unnoticed by institutions.

3.5.4. A Joint Vision for 2044

Elderly people:
Elderly people have equal and quality access to digital services; the condition of the housing infrastructure has also improved - energy efficiency measures have been introduced.

People with disabilities:

Building and improving the existing "accessible environment", implementing a targeted socio-economic policy of the municipality for the integration of people in disadvantaged situations. Improving the quality of life and social infrastructure.

Youth:
A leading policy of the Municipality of Burgas is the active involvement of young people in decision-making. Their opinion is important. Many seminars are held to involve citizens in the fight against climate change. Institutional support is high and favors the achievement of the set goals.

Minorities:
Active social policy to include minority groups in the process of access to resources. Living conditions have improved and social infrastructure is evenly distributed across neighborhoods. The municipality is conducting a mediation campaign in low-educated neighborhoods.

Fishermen:
The community is united and engaged in decision-making for climate adaptation. Appropriate infrastructure has been built to protect against disasters. Access to digital services has been facilitated.

A joint vision for a just climate resilient Burgas:

Burgas is committed to being an inclusive, resilient, and forward-looking city where all citizens—regardless of age, ability, ethnicity, or occupation—have equal access to opportunities, services, and participation in public life.

The municipality prioritizes accessible infrastructure, digital inclusion, improved living conditions, and targeted social policies to support the elderly, people with disabilities, minorities, youth, and professional communities such as fishermen.

Through active civic engagement, climate adaptation, and equitable distribution of resources, Burgas fosters social cohesion, sustainable development, and a high quality of life for all.

3.5.5. Identified actions

The participants identified the following actions:

- *Improving infrastructure in an equally distributed manner*
- *Building an "accessible environment"*
- *Building green and blue zones to help reduce flooding and heatwaves*
- *Activating participation of citizens in urban planning and improving community engagement*

- *People actively participate in infrastructure maintenance*
- *Implementing afforestation campaigns*
- *Conducting an active social policy among residents*
- *Enforcing strict sanctions for violators*
- *Facilitating access to building energy efficiency programs*
- *Tackling unemployment and Increasing incomes*
- *Organizing training seminars on addressing climate change*
- *Conducting adaptation campaigns in remote neighborhoods*
- *Activating the private sector and civil society organizations in resilience building*
- *The municipality is following an adaptation plan with the active involvement of citizens and businesses*
- *Efforts focus on all types of risk (incl. heat, social protection, and floods)*
- *Establishing an integrated approach to include all vulnerable groups in decision-making*
- *Facilitating access to technology*
- *Enabling equal access to services and resources*

3.6. Køge Bay

This roadmap was jointly developed by University of Copenhagen, Danish Coastal Authority and The Capital Region of Denmark

3.6.1. Introduction

The Køge Bay area is one of 12 regions in the European Regions4Climate (R4C) project. A key part of the project (WP5) is to use the Køge Bay region to explore, test and demonstrate methods and pathways to build resilience to climate change, specifically the impacts of sea level rise and coastal flooding. Three innovation actions are included in the Køge Bay demo including the role of augmented reality in decision-making processes (IP A), the options of building social resilience to coastal flooding (IP B), and the potential of landscape-based coastal adaptation (IB C).

In parallel, R4C focuses on promoting just transition (WP2) and the development of just transition roadmaps for each of the 12 regions in the project. This Just Transition Roadmap for Køge Bay aims to support social justice in the process of building regional climate resilience. The roadmap is informed by the Just Transition Framework (D2.2) which suggests a five-step approach comprising a scoping process, identification of actors, visioning, action planning and approval. See Figure 9. The roadmap targets a higher strategic level than the innovation actions in R4C. This paper outlines the process, actions, and way forward for the Just Transition Framework for Køge Bay.

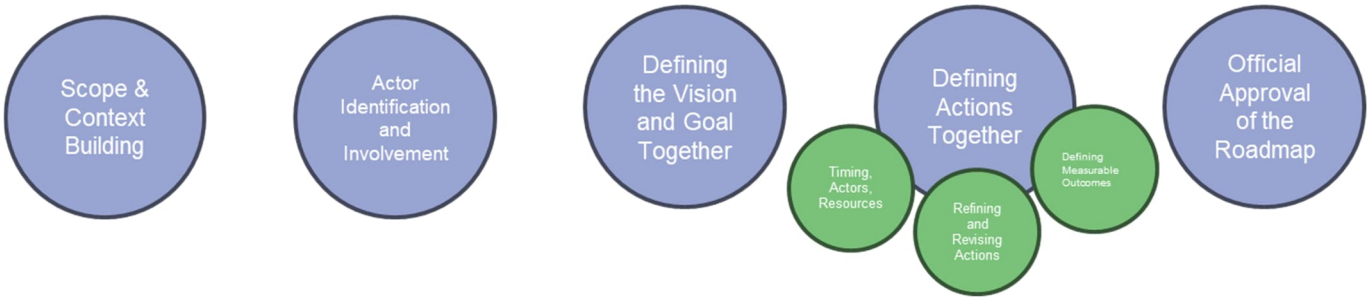


Figure 15. Five steps of a roadmap process for just transition to climate resilience. Source: Klein et al., 2023.

3.6.1.1. Task description in the grant agreement

According to the task description in the grant agreement, task T2.4 Regional just transition roadmaps aims to "define actionable, region-specific roadmaps for just transition to climate resilience for each of the partner regions, focusing on customised, co-developed plans for sustainable and just socioeconomic renewal targeting relevant sectors of regional economies. Each roadmap will include guidelines on good practices on integration of regional adaptation projects with local investment projects aiming to ensure an inclusive transition and avoid/remediate any negative socio-economic impact in local communities. The guidelines will include metrics to assess job creation and dynamisation of local economies, and the preservation of cultural heritage and identity." (Regions4Climate, 2022).

3.6.1.2. Initial screening in the Just Transition Framework

In the initial screening included in the Social Vulnerability Assessment (Fertner et al., 2023) and the Just Transition Framework (Klein et al., 2023) the following issues were highlighted for the Køge Bay Region:

“The Køge Bay region covers 11 municipalities and has a population of approximately one million people. It has by far the highest population density among the 12 case regions (included in the Regions4Climate project, ed.). The region has a high share of single households, but the share of elderly citizens is relatively low. The population is generally well-educated; the employment rate is high and there is a very high level of digital access to public authorities. The poverty rate is equal to the national average and primary industries only have a marginal role in the local economy. From a regional perspective, Køge Bay is anticipated to be among the least socially vulnerable regions in Regions4Climate.

In the Køge Bay region, the main impacts of climate change relate to water and the risk of pluvial, fluvial and coastal flooding. Geographically, the region is a low-lying plain with a 40 km coastline. Referring to the EU Floods Directive, the Køge Bay region is the area with the highest flood risk in Denmark. This is due to very high flood impact costs resulting from the high concentration of people, buildings, and infrastructures (and social risk, ed.) in the Køge Bay area.

The region demonstrates a high level of ambition concerning stakeholder engagement, involving the public and private sector as well as civil society. The proposed Innovation Actions include co-creation processes, workshops, raising awareness through group education and the application of tools (including Augmented Reality, ed.) that enable more citizens, decision-makers and other stakeholders to be prepared and take action in relation to climate change. Hence, the aim of the region is to build social resilience to climate change, specifically to build social resilience to dynamic coastal changes.

In addition, the Køge Bay region aims to improve policy integration and collaboration across administrative boundaries, and to explore the wider potential of ‘non-structural’ innovations as a climate adaptation measure (i.e., solutions in the social realm rather than in terms of physical infrastructure).

In combination, the Køge Bay region demonstrates recognitional justice by emphasizing socio-economically disadvantaged groups in particular municipalities within the region. In terms of distributive justice between regions, Køge Bay is the area with the highest flood risk in Denmark and hence, flood risk reduction and climate adaptation actions in this region is particularly important from a national perspective (though the justice concerns related to equity and distribution among social groups on a local level can be challenged, ed.). The multi-stakeholder engagement and the adoption of Augmented Reality tools to enhance citizens’ participation and preparedness in the process of building climate resilience contributes to the promotion of procedural justice.

Transformation enablers that are already in place include practical experiments, the allocation of funding, community empowerment, participatory decision-making and distributed knowledge and power structures. Barriers to transformation might include path dependency, the lack of shared goals and limited knowledge of worldviews among individual and institutional stakeholders. (Klein et al., 2023, p. 29-30)

3.6.1.3. Framing the task

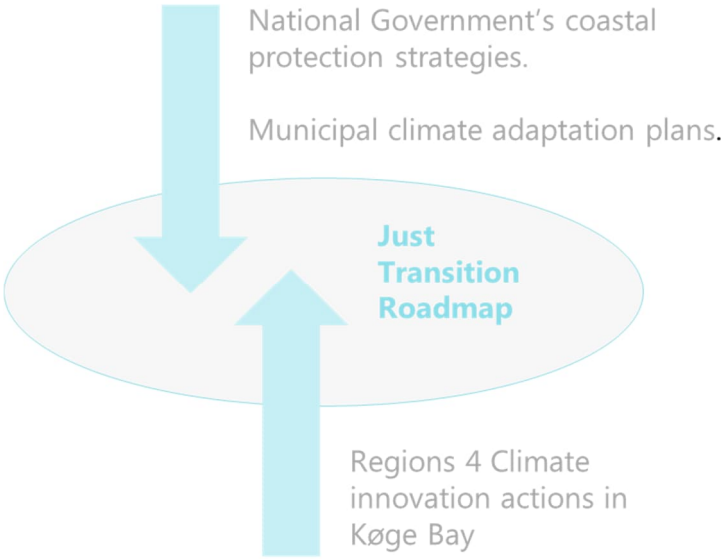


Figure 16. Positioning the Just Transition Roadmap in the interface between top-down policies and bottom-up initiatives concerning climate resilience in the Køge Bay region.

To frame the task at hand the following problem, hypothesis and concerns have been outlined.

Problem

There is no shared vision for the development of the Køge Bay region. Further, much of the planned climate adaptation activities are dominated by 'top-down' approaches led by the central Government and the municipalities. The local, community level perspective, and the 'bottom-up' approach is less emphasized.

Hypothesis

The Just Transition Roadmap can help to bridge top-down and bottom-up perspectives in regional climate adaptation. It can help to exploit and scale up R4C innovation actions and provide synergies that have regional and national impact. In addition, the Just Transition Roadmap process can assist in providing a shared vision for the future of the Køge Bay region. See Figure 10.

Issues of concern

In this process, there has been a need to seek a balance between the climate adaptation planning occurring in the municipalities, the innovation actions in the Regions4Climate project and the higher level and longer term Just Transition Roadmap.

There have been some concerns about how much this process will 'rock the boat' and how much the Just Transition Roadmap needs to be inside or outside of the regime. How much will the Just Transition Roadmap process reflect a hypothetical exercise or a real-life political commitment among key stakeholders in the region?

Hence, the mandate and level of commitment needed to be clarified in the initial scoping process. The outcome is a Just Transition Roadmap that literally maps out the road, the pathway, for just transition towards climate resilience in the Køge Bay region.

3.6.2. The roadmap process

According to the Just Transition Framework (Klein et al., 2023), the Just Transition Roadmap process contains five key steps:

1) Scope and context building
2) Actor identification and involvement
3) Defining vision and goals together
4) Defining actions together, therein
    a. Timing, actors and resources
    b. Refining and revising actions
    c. Setting up monitoring
5) Official approval of the roadmap

In the Køge Bay region the scoping and context building started in February 2024, was specified in April 2024 along with the identification of relevant actors and was implemented in April-May 2025 when visions and goals were identified by actively involving underrepresented actors in two specific future visioning workshops in the Brøndby Strand coastal urban community. Findings from the workshops were utilized to propose an action plan for the roadmap with special emphasis on methods to engage underrepresented (and potentially vulnerable and marginalized) groups and enhance social justice in the process of building climate resilience in the Køge Bay region. This was done in June-July 2025 by the Danish partners in the Region 4 Climate consortium and led jointly by the Danish Coastal Authority and the University of Copenhagen.

The content of Step 1 and Step 2 is specified below in section 2.1. Chapter 3 summarizes Step 3 and Step 4, and the pathway towards Step 5 is presented and discussed in Chapter 4.

3.6.2.1. Future visioning workshops in Brøndby Strand

Two workshops have been implemented by the Danish Coastal Authority in collaboration with the Social Housing Secretariat in the district of Brøndby Strand, which is located along Køge Bay in Brøndby Municipality and next to Køge Bay Beach Park.

The future visioning workshops were inspired by the ‘visioning and backcasting’ approach provided by Demos Helsinki in the Just Transition Framework (Klein et al., 2023). See Figure 11. In the visioning and backcasting process, desired long-term goals set the stage for shorter term actions and milestones and provide pathways towards a desirable future condition.

Further, the aim of the workshops was to explore novel and inclusive engagement methods and to give a voice to social groups that are often underrepresented in traditional decision-making processes.

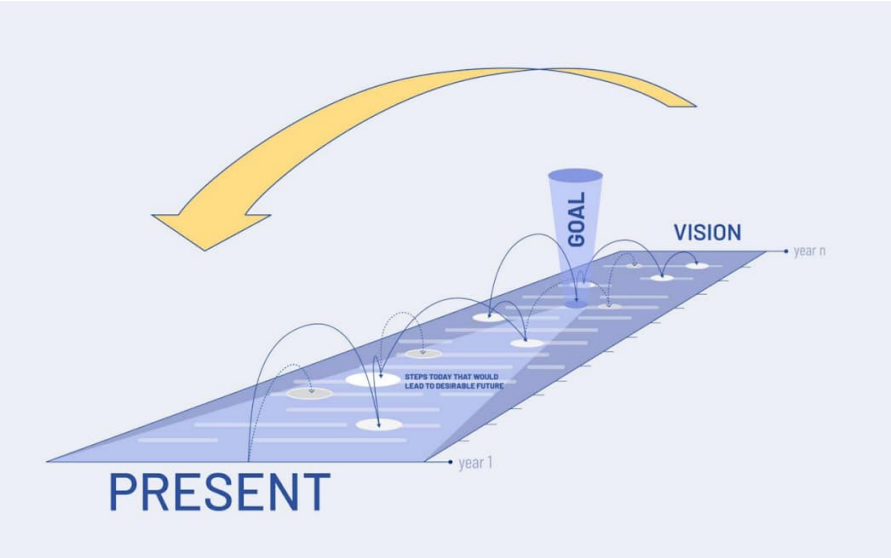


Figure 17. The visioning and backcasting process. Source: Klein et al., 2023.

3.6.2.1.1. Background – scope and context building

Mia Cassidy Prall is an industrial PhD candidate with the Danish Coastal Authority. The focus of her research is to understand how climate adaptation can have different societal impacts on equality and social justice. Specifically, this is investigated in connection with the ongoing modernization process of Køge Bay Beach Park. The beach park was constructed about 50 years ago, but because of sea level rise the crest height of the storm surge protection needs to be elevated by approximately 1 meter. In addition, some of the service facilities are outdated and need to be modernized.

Many of the planned climate adaptation activities in the modernization of the Køge Bay Beach Park are dominated by 'top-down' approaches, led by the national government and the municipalities along the Køge Bay Beach Park. The local perspectives at the community level and the 'bottom-up' approach to planning are less emphasized in the process, and thus the primary users and local residents of the area are largely excluded from the discussion about climate adaptation and coastal development. Therefore, as an essential part of the roadmap process, Mia Cassidy Prall and the Danish Coastal Authority aimed to explore how different local target groups envision the future of the coastal landscape and recreational opportunities in Køge Bay Beach Park. Specifically, underrepresented groups were identified based on interviews with municipalities and invited to attend workshops where they could share their perspectives on how Køge Bay Beach Park could look like in the future.

3.6.2.1.2. Methodology – actor identification and involvement

Figure 18. Collage developed by one of the groups during the visioning workshops in Brøndby Strand on the future of Køge Bay Beach Park. Photo: © Mia Cassidy Prall.

The Danish Coastal Authority held two workshops in collaboration with the Social Housing Secretariat in Brøndby Strand. One workshop was held with a group of immigrant women learning Danish and one with a group of mostly second-generation immigrant mothers. The workshops used arts-based methods (collage) to collectively envision the future of the Køge Bay Beach Park in 2035.

The Social Housing Secretariat teaches women in 9th grade Danish (through an initiative referred to as ‘Basis’) and offers a place to gather for stay-at-home mothers and their children (in the playgroup ‘Legestuen’). Students in Basis have been categorized as an underrepresented group due to their limited knowledge of the Danish language, which can prevent them from readily understanding important information regarding e.g. storm surge warnings. In addition, the women from Basis and the Legestuen playgroup do not, according to their own statements, experience that their voices are heard in the public debate, neither do they vote in municipal or parliamentary elections.

The purpose of the workshops was to learn more about the participants' thoughts and visions for the future coastal landscape, both in relation to the recreational elements and the coastal protection itself in Køge Bay Beach Park. In

addition, the purpose was to engage the participants in reflecting on how the coastal area and the community at large can adapt and become more resilient to storm surges. The workshop with Basis had around 20 participants and the workshop with Legestuen had approximately 10 participants.

The workshop approach also aimed to test whether art-based research methods such as drawing and collaging (with cutting and pasting images from magazines) can be effective as a means of communication. Traditional participatory planning and citizen engagement methods are generally only effective in reaching specific groups, i.e. the “vocal” citizens who actively participate in public hearings which are often held at large venues and/or require the ability to read and write Danish at a high level. This traditional form of citizen engagement can be intimidating for some, making it difficult for certain groups to participate. During these events, it can also be a challenge to deal with power dynamics and ensure that all voices are heard. Furthermore, there can be practical barriers to entry that can limit certain stakeholders from participating, for example the time of the day and access to childcare.

Art-based research methods, and structured daytime workshops, offer potential as they represent a different way of engaging with citizens: they are accessible, they can help people think outside the box, they allow participants to relate to problems and solutions in a new way, and they can be a way to gather new perspectives that are not often heard. Art-based methods include e.g. painting, drawing, poetry, and participatory theatre. However, art-based methods are not necessarily suitable for all target groups or contexts. For example, not all people thrive in visual or creative methods. Some prefer to express themselves in writing, verbally or otherwise. Some creative exercises require physical space, materials and time, which are not always available in all workshops or for all participants.

The workshops were divided into two days. The first day was a field trip to Køge Bay Beach Park, which is the local beach near the Brøndby Strand district in Brøndby Municipality. The aim of the field trip was to introduce the participants to the area and to initiate thoughts and reflections for the vision exercise the following day. The visioning exercise on day two consisted of two parts over a period of 2-3 hours. The first part was a presentation provided by the Danish Coastal Authority as an introduction to the Køge Bay area and what challenges exist and may arise in connection with climate change and flooding in the area. The second part was a visioning exercise, where interactive participation with drawings and the cutting and pasting of images was done in groups in order to visualize the participants wishes for the future of Køge Bay Beach Park in 10 years’ time. Collage was chosen as an accessible method where the participants could use existing images found in magazines to help imagine possible futures. This resulted in posters that the participants presented in Danish to the rest of the group. See Figure 13. The teachers at Basis experienced a very positive dynamic in the group work and were surprised that all the participants were able to express their thoughts and considerations during the presentations. It turned out that visual presentations were easier to convey and discuss in the groups than perhaps presentations with mere text descriptions. The visioning exercise therefore contributed to creating a dialogue among the participants.

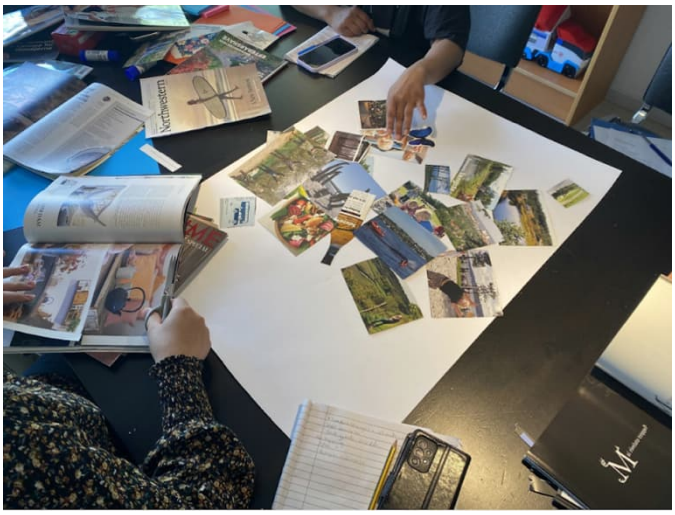


Figure 19. Image from the field trip to the Køge Bay Beach Park on day one of the two-day workshop (right), and a photo from the visioning workshop with cutting, pasting and collaging images, ideas and visions for the development of Køge Bay Beach Park over the next 10 years. Photos: © Mia Cassidy Prall.

3.6.2.1.3. Findings from the workshops – defining vision and goals together

Some repeated points from the groups at Basis and from Legestuen were that there should generally be more benches and cafes, baby changing tables in the public toilets and easier access to the beach for people with a physical disability. There was generally a very supportive perspective on what the future coastal landscape in the Køge Bay Beach Park should look like as participants thought not only about their own needs and wishes but also about the needs of other user groups.

The workshops were considered a success for this target group, and there was a lot of positive feedback from both participants and the teachers and staff. The participants felt that they had been heard and engaged in the workshop. The visioning exercise gave the participants an active role in reflecting on future challenges and solutions. They were not only presented with existing knowledge but were given the opportunity to think in multiple dimensions, for example by understanding the importance of the interaction between technical solutions, recreational elements, the forces of nature and societal preparedness. The visioning exercises are thus an effective method for creating shared visions of the future and getting participants to actively engage and foster creative thinking when a framework and direction have been created. The creative element (drawing, cutting and pasting) provides new avenues for different ways of thinking and expressing oneself as a participant. It can help break familiar thought patterns and can contribute new ideas that would not have emerged otherwise. It also became clear that because the participants helped creating the visions themselves, they felt more responsible and committed to the modernization process of the Køge Bay Beach Park going forward.

The Social Housing Secretariat felt that the workshops were a success in a wider perspective of social engagement and inclusion. The relevance of sharing the experiences from the workshops with a wider audience is documented

in the article published in June 2025 by a local magazine (see Figure 14). The article summarizes the workshop process and the results and shares the insights and perspectives from some of the participants.

ER KYSTEN KLAR?

Lokale inddrages i modernisering og kystsikring af Strandparken

Stormflod, stigende havvand og øget nedbør. Sådan lyder nogle af de triste konsekvenser ved klimaforandringerne. Heldigvis er der fokus på at lave klimatilpasninger og finde løsninger, der kan mindske påvirkningen på natur og mennesker. Det er fortrøstningsfuldt at høre, når man tænker på, hvor stor en del af Brøndby Strands "DNA", der netop er bundet op på bydelens fantastiske strandpark.

På den baggrund besøgte Kystdirektoratet Brøndby Strand, hvor de igennem EU-projektet, Regions4Climate, ser på hvordan klimaindsatserne kan have forskellig påvirkning på lighed og social retfærdighed på tværs af samfundet. Specifikt undersøger de det i relation til moderniseringen af Køge Bugt Strandpark.

For at få nogle tanker og visioner fra lokale beboere, inviterede Kystdirektoratet de voksne kursister fra 9. klassen i Klydebo og forældrene i den boligsociale Legestue. Tre dage gik med tur til stranden og efterfølgende workshops. Det overordnede tema, der skulle diskuteres, var "Fremtidens kystlandskaber".

Klip og klister til Ph.d.

De mange forskellige indspark fra deltagerne blev nedskrevet, tegnet, klippet og klistret, så der til sidst var en masse plancher, der illustrerede udfordringer ved Strandparken, som den ser ud nu, og idéer til løsninger og forbedringer i fremtiden.

Til at facilitere projektet var tre af Kystdirektoratets medarbejdere: Laura Storm Henriksen, Anna Elkjær og Mia Prall. Sidstnævnte skriver en Ph.d. om koblingen mellem klima, social retfærdighed og inklusion. Resultaterne fra workshoppen vil både blive brugt i Regions4Climate-projektet og Ph.d.-afhandlingen.

Kyst og klima

Mia Prall indleder med at beklage hendes danske sprogevner, da hun er nyligt tilflyttet fra USA. Hun er dog let at forstå, når hun forklarer, hvordan hendes Ph.d. især fokuserer på den sociale del af klimatilpasning og kystbeskyttelse.

"Hvordan opleves konsekvenserne af oversvømmelse for de forskellige sociale grupper? Og hvordan tænker vi det ind i klimatilpasningsplanlægning? Den type spørgsmål", fortæller Mia, inden Laura Storm tilføjer:

"Vi arbejder på flere plan. Der er både noget, der handler om de konkrete fysiske ombygninger af strandparken, andet handler om planlægning, og så noget der handler mere om civilsamfundet. Hvordan gør man, hvis der så endelig kommer en oversvømmelse, og hvad er det, vi skal tænke over?"

Alle skal høres

Kystdirektoratets medarbejdere lavede i dagene efter turen til strandparken to workshops. Først med kursisterne i 9. klasse i Klydebo dernæst forældrene i Legestuen. Mia fortæller, at deltagerne delte deres fremtidsvisioner og ønsker til strandparkens modernisering.

"Det er ikke os, der skal stå for selve moderniseringen, men vi forsker i processen, og vi vil gerne høre alle stemmer i forhold til det. Så vi vil især gerne fokusere på sårbare grupper, og grupper, der er lidt svære at involvere i for eksempel borgermøder. Så det er også derfor, vi kommer ud i dag og blandt andet snakker med folk, som er i gang med at lære dansk, og måske ikke har været inkluderet i planlægningsprocessen endnu. Vi vil gerne høre, hvad de synes om fremtiden i området, om der mangler noget, og hvad der kunne gøres anderledes i fremtiden."

Udover at få idéer og tanker fra deltagerne vil Kystdirektoratet, ifølge Laura, også bruge mødet med Brøndby Strand-beboerne til at formidle, hvilke konsekvenser klimaforandringerne kan have.

"Vi vil selvfølgelig også bruge anledningen til at fortælle en lille smule om beskyttelse, og at vandet stiger. I det hele taget skabe opmærksomhed omkring det, uden at gøre folk bange, fordi det jo er noget, der sker lige så stille."

Politikere præsenteres for inputs

Allerede efter det første møde på stranden med deltagerne fra Brøndby Strand fik Mia et indtryk af, hvilke ønsker der var til moderniseringen af området. Det er interessant viden for hende og kollegaerne, som skal bruges i deres videre arbejde. Slutteligt skal resultaterne fra undersøgelsen gives videre til de lokale politikere.

"Jeg har hørt mange gode ting om strandparken i sin nuværende form, men jeg har også hørt, at det kan være svært med barnevogn, og det kan være svært for f.eks. ældre mennesker på stierne herude. Det er noget, vi også har hørt fra tidligere interviews med andre borgere herude. Al den information, vi får, samler vi og præsenterer for kommunerne senere i år, så de forhåbentlig tager det med videre i arbejdet med moderniseringen. Derudover kommer det selvfølgelig til at bidrage til forskningen på området."

Laura tilføjer, at Kystdirektoratet selvfølgelig også tager erfaringerne fra Brøndby Strand med ind i det videre arbejde for, hvordan de arbejder med inddragelse i kystbeskyttelse.

Et positivt møde med kursister og forældre

Efter workshopsne med kursister og forældre fra Legestuen har både Mia, Laura og Anna Elkjær fået en masse relevante tanker om fremtidens strandpark. For Laura var det meget gavnligt for deres undersøgelse, og hun sætter stor pris på, hvordan hun og kollegaerne blev modtaget.

"Det har været rigtig spændende. De var rigtig gode til at fortælle. De har også tænkt over nogle ting, som vi aldrig selv ville have tænkt over. Det har været en stor og positiv oplevelse, og de har taget godt imod det. Det var vi lidt spændte på, om de ville, men det har de virkelig gjort."

Oplevelsen har også kun været positiv for Anna, der er imponeret over det bidrag, deltagerne gav til projektet.
"De har været interesserede, de har lyttet, de har været gode til at stille spørgsmål. Det har været et lidt alternativt emne for dem i forhold til, hvad de ellers normalt bliver undervist i. Men der har bare været stor opbakning, så det har gjort det nemt for os, vil jeg sige."

Læs videre på bagsiden om, hvordan oplevelsen var for deltagerne fra 9. klasse og Legestuen.

Sommer Sjov

SOMMER-AKTIVITETER FOR BØRN OG BØRNEFAMILIER

Skal sommerferien afholdes hjemme i år, så er der gode tilbud for skolebørn gennem Sommersjov.

NOGLE TILBUD ER GRATIS, MENS FX DAGSTUR TIL BONBONLAND ELLER EXPERIMENTARIUM KOSTER 75 KR.

Der åbnes for tilmelding via **sommersjovbrondby.dk** tirsdag den 10. juni kl. 16 (til de første 3 uger af sommerferien).

Der er desuden mulighed for tilmelding og køb af billetter (max 3 billetter pr. barn) i T13-Huset, Kisumparken 2. Mød op den 2. og 3. juni kl. 14-16.

I uge 32 vil der være forskellige aktiviteter i boligafdeling T13.

Bl.a. kommer Rullende Sommersjov forbi den 8. august – en bus med aktiviteter for hele familien.

Nærmere oplysninger følger via opslag i opgangene og på de sociale medier.

www.brøndbystrand.dk

www.brøndbystrand.dk

Figure 20. Article in a local magazine for the Brøndby Strand community informing about the visioning workshops on coastal climate adaptation. Source: Hald, 2025 (Køge Bay).

In more general terms, the visioning exercise was good at creating shared visions and thoughts, which can form the basis for planning, innovation and collaboration. The workshop approach with designated target groups and the adoption of art-based methods can also reach groups that usually are not included in traditional forms of climate adaptation planning.

The main challenge was finding participants for the workshops. It was a long process to identify and engage underrepresented groups and individuals who were willing to participate in the workshop. This is the reason why only two workshops have been completed until now. Most likely, there needs to be some clear incentive and motivation for underrepresented groups to participate in these types of engagement activities. This might be related to the structure of the event and the trust-building across different actors. In addition, the Danish R4C partners operate within regional and national tiers of government, rather than the local government level. Consequently, there was an increased need for dialogue and coordination with municipalities prior to the implementation of workshops which required more time and effort compared with a situation where the municipalities were partner organizations from the start.

Though the workshop approach worked well with this group, it is important to be critical about which target groups are invited to this type of event, as there can be a big difference among target groups. So, as a recommendation, the workshops need to be planned, tailored and communicated to fit the specific target group.

3.6.2.1.4. Next steps – defining actions together

The results from the workshops will be presented to the municipalities responsible for modernization of Køge Bay Beach Park, i.e. Hvidovre, Brøndby, Ishøj, Vallensbæk, and Greve, to inform them about the wishes and expectations put forward during the workshops. This is scheduled for the autumn of 2025 and will be organized by the Danish Coastal Authority in collaboration with other Regions4Climate partners in Denmark.

The results from the workshop will also be used in Mia Cassidy Prall's PhD study, as they have contributed knowledge about the link between climate, social justice and inclusion. Specifically, results from the workshops provide insight into the potential for arts-based methods to advance just co-creation of climate change adaptation solutions. Hence, there will be scientific contributions deriving from the Just Transition Roadmap process in the Køge Bay region.

An important task is to disseminate knowledge from the workshop and explore the scalability of the workshop approach to empower and give a voice to underrepresented groups in the process of building climate resilience. In the case of Køge Bay, the actions and timeline need to be specified. This is outlined in the following chapter.

3.6.3. Just Transition Roadmap for Køge Bay

The Just Transition Roadmap towards climate resilience in the Køge Bay region comprises a vision, a set of goals and an action plan. The roadmap is proposed to work at two levels. Part A is a direct continuation of the future visioning workshop presented in Chapter 2 along with the augmented reality app developed for the Køge Bay Beach Park and Greve Municipality as part of the Regions4Climate innovation action. Part B is 'deeper' at the regional urban systemic level and sets out the initial steps for just transition and transformative climate adaptation in the Køge Bay region.

In contrast to Part A, Part B is not developed through a structured and systematic just transition roadmap process with 'real-world' stakeholders such as municipal staff, decision-makers or underrepresented stakeholder groups. Part B is solely the result of professional discussions, reflections and actions carried out by Danish consortium partners in the Regions4Climate project in parallel to the just transition roadmap process.

3.6.3.1. Vision

Part A – the scalability of the Brøndby Strand workshops and augmented reality tools

By 2035 it is common practice to use inclusive and targeted engagement methods that empower underrepresented groups to have knowledge about, inform and make active contributions to climate adaptation planning in their local communities in the Køge Bay region of Denmark.

Part B – stimulating deep systemic impact on transformative climate adaptation in Køge Bay

By 2030, that is, within the next five years, the level of ecological concern and impact on social equity is thoroughly addressed in decision-making processes in the Køge Bay region (transgressing geographical regions, generations and species) and contributes to increasing awareness about the limitations of a business-as-usual approach, assists in understanding the need for sustainable development short term and long term, helps building resilience, and sets out pathways for transformative change that fundamentally challenges traditional values and mindsets.

Specifically, the role of landscape-based climate adaptation measures (including no-build zones, wetland restoration, barrier islands, and planned retreat), social justice (incl. uneven burdens, impacts on vulnerable and marginalized groups), the assessment of benefits and costs (environmental, social, economic), and the risk of maladaptation (carbon footprint, species extinction, social inequality, environmental impact, compounding effects) informs the need for path-dependent or path-deviant actions.

3.6.3.2. Goals

To meet the vision the following specific goals are set out

1. **Part A – the scalability of the Brøndby Strand workshops and augmented reality tools**
    a. Developing and testing methods and tools that are complementary to traditional public engagement methods currently used by municipalities in Denmark (i.e. future visioning workshops targeted underrepresented groups, arts-based engagement methods and augmented reality tools, in contrast to written communication and public meetings at large venues),
    b. Disseminating experiences with these methods and tools among the 11 municipalities located in the Køge Bay area (i.e. the municipalities of Copenhagen, Tårnby, Dragør, Hvidovre, Brøndby, Vallensbæk, Ishøj, Greve, Solrød, Køge, Stevns), stating with the five municipalities along the Køge Bay Beach Park
    c. Supporting municipalities to make similar engagement activities as part of their climate adaptation efforts.
    d. Documenting the initial impact by counting the number of augmented reality applications adopted and inclusive workshops held by the municipalities in the Køge Bay region by 2027.

2. **Part B – stimulating deep systemic impact on transformative climate adaptation in Køge Bay**
    a. Increasing awareness about just transition and transformative change among decision-makers and professionals employed in the 11 municipalities in the Køge Bay region by presenting key elements of the Just Transition Framework (Klein et al., 2023)
    b. Increasing awareness about transformative change among professional stakeholders involved in climate adaptation in Denmark by presenting the Just Transition Framework along with key elements of landscape-based coastal adaptation (Lund et al., 2025), and the notion of planetary boundaries (Richardson, et al., 2023)
    c. Increasing awareness in the wider public in Denmark by disseminating knowledge to about the social, economic and environmental implications and uncertainties of using ‘grey technologies’ and ‘green technologies’ in climate adaptation in Denmark
    d. Informing holistic decision-making in the Køge Bay area by assessing how coastal landscapes and the sea territory are represented in municipal risk management plans along Køge Bay
    e. Informing holistic decision-making in the Køge Bay area by assessing the benefits and costs of artificial barrier islands versus planned relocation along Køge Bay with an emphasis on estimating the carbon footprint
    f. Documenting the initial impact by assessing the methods used in coastal climate adaptation in the 11 municipalities in the Køge Bay region in year 2025 and year 2027.

3.6.3.3. Action plan

The actions, enabling conditions, success criteria, timeline and status of actions to achieve the goals are presented below for Part A and Part B.

Part A – the scalability of the Brøndby Strand workshops and augmented reality tools

Actions	Enabling conditions	Success criteria
a) Implementing future visioning workshops, arts-based methods and augmented reality tools in the Køge Bay region	Collaboration between R4C partners and selected municipalities (Brøndby, Greve) and the Social Housing Secretariat in Brøndby Strand	At least 10 people are willing to participate in the workshop At least 1 municipality willing to participate in AR site application Extracting lessons leaned
b) Disseminating experiences with methods and tools among municipalities in the Køge Bay area	R4C partners invite representatives from the Køge Bay municipalities to attend a 1-day seminar in the autumn of 2025	Representatives from at least 5 of 11 municipalities attending the seminar At least 2 participants show keen interest in methods and tools
c) Supporting municipalities to make inclusive engagement activities in their climate adaptation efforts	R4C partners available to assist municipalities on request R4C partners share information about pilot workshops and AR tool	By Q2 2026, at least 1 municipality has approached R4C partners about adopting workshop methods or AR tools
d) Documenting impact by counting the number of AR applications and workshops held by municipalities in the Køge Bay area	R4C partners share information about workshops and AR tool Review/survey of actions in the 11 municipalities in the Køge Bay area in May-June 2026	At least 1 municipality in the Køge Bay area has implemented a similar workshop by July 2027 At least 1 additional municipality has adopted the AR tool by July 2027

Part B – stimulating deep systemic impact on transformative climate adaptation in Køge Bay

The actions to be taken to achieve the set goals can be grouped into the following six categories:

- *Physical changes*
- *Behavioral changes*
- *Changes in financing*
- *Changes in the organization*
- *Changes in laws and regulations*
- *Changes in knowledge and information*

All goals and actions in Part B are related to the latter bullet point, i.e. changes in knowledge and information. The goals, actions and deadlines (as of July 2025) are specified in the table below. It is anticipated that the changes in knowledge and information will serve as a precondition for the longer-term impact on the other five categories of transformative change.

Category	Goals	Actions	Timeline and status
Changes in knowledge and information	a) Increasing professional awareness about just transition and transformative change in the Køge Bay region	Presenting the Just Transition Framework to decision-makers and professionals in the 11 municipalities in Køge Bay	**Due December 2025** Lead: DCA
	b) Increasing professional awareness about transformative climate adaptation at national level in Denmark	Presenting JTR and transformative climate adaptation at a minimum of five national professional events	**COMPLETED!** Lead: UCPH
	c) Informing holistic decision-making in the Køge Bay area by highlighting role of non-human actants	PhD research assessing the representation of 'water' in municipal risk management plans in Køge Bay	**Due June 2026** Lead: UCPH
	d) Increasing public awareness about grey and green technologies for climate adaptation in Denmark	Presenting implications of grey/green options at a minimum of five venues targeting the general public	**COMPLETED!** Lead: UCPH
	e) Informing holistic decision-making on coastal adaptation by emphasizing carbon footprint in the Køge Bay area	Analyzing and comparing the carbon footprint of artificial barrier islands and planned relocation in Køge Bay	**Due January 2026** Lead: UCPH
	f) Documenting the 2-year impact in municipalities in the Køge Bay region	Assessing coastal adaptation measures (grey/ green, structural/ non-structural) used in Køge Bay in year 2025 and 2027	**Due October 2027** Lead: UCPH

3.6.3.4. Vulnerability and social justice

The target groups in **Part A** are the individuals, groups and other stakeholders currently underrepresented in decision-making processes related to climate change and coastal development. This includes:

- Marginalized groups that are underrepresented in traditional engagement activities due to e.g. language barriers, culture and sub-culture, non-inclusive means of communication
- Disadvantaged groups, including e.g. socio-economically disadvantaged groups with limited social and economic resources, physically disadvantaged groups with limitations in terms of accessibility
- Stakeholders who have limited access to traditional decision-making processes, e.g. adolescents and other individuals who are excluded from the right to vote in elections, or children who are rarely included in higher level decision making processes

For **Part A** and **Part B**, particularly exposed property owners, communities and municipalities should be considered from a justice perspective in terms of fairness, risk profiling, the distribution of rights and responsibilities, uneven burdens, and collective actions and means of support, including short-term and long-term financial and regulatory incentives in the context of a Scandinavian welfare state.

Furthermore, in the context of **Part B**, it is relevant to consider stakeholders who do not currently have a direct voice in decision-making processes, for example, future and unborn generations of residents, more-than-human species on land and in the sea, abiotic factors such as “water”, “salt”, “sediments”, “CO2” and “climate”. It is relevant to consider how these actants are recognized, represented and included in decision-making processes and to which extent they have, or should be granted, formal rights and agency.

3.6.4. Next steps for the Køge Bay Roadmap

The Just Transition Roadmap has not been formally approved by key stakeholders in the Køge Bay region, such as the municipal planning directors, the eleven mayors along Køge Bay, or the chairs of the Greater Copenhagen and Zealand regional governments. Hence, the fifth step in the Just Transition Roadmap process dealing with the official approval of the roadmap has not been met in the context of Køge Bay.

3.6.4.1. Reflections on the process and actions

Following the multi-level perspective in transition theory (Geels, 2022), the workshops in Brøndby Strand, the augmented reality app for the Køge Bay Beach Park, and the dissemination of knowledge regarding just transition and transformative climate adaptation are all to be considered as niche level experiments and actions that can inform decisions and possibly accelerate systemic changes at the regime level. Yet, the methods, tools and concepts cannot be forced into the regime.

The diffusion of knowledge and the maturation of ideas needs time, patience and multiple iterations for systemic changes to occur. The process will be ridden by repercussions, path-dependent actions, traditional thought patterns, and multiple professional, financial and legal practices that impede change. However, if path-deviant actions are not explored, if current mindsets and values are not challenged, if a plethora of experiments and local empowerment initiatives are not envisioned, then there is very little chance that a change of the status quo will happen in a timely manner, and hence, the risk of maladaptation will increase.

Mapping the three just transition actions in Køge Bay in alignment with the conceptual framework by Klein et al. (2023) they operate at different, yet complementary levels. See Figure 21.

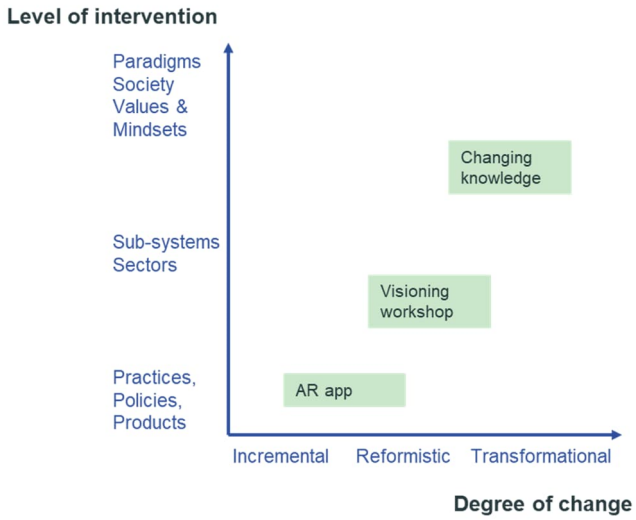


Figure 21. Mapping the three just transition roadmap actions in Køge Bay. Adapted from Klein et al., 2023, p. 42.

In combination, the three initiatives are considered relevant, viable and realistic as stepstones in a just transition process. They have practical and operational relevance short term, they challenge the status quo regime, and they avoid being overly prescriptive and conclusive about means and ends. They purposefully remain explorative and open-ended.

3.6.4.2. Translating the roadmap into policy impact

On 01 July 2025, the Capital Region of Denmark and Region Zealand, withdrew from the Regions4Climate consortium. This was a result of national political decisions regarding the organization and governance of climate adaption in Denmark where the regions' responsibilities were made redundant.

However, in parallel to the Just Transition Roadmap process, the two regional governments in the Danish part of the Regions4Climate consortium have collaborated with the national organization Danish Regions to support the 98 municipalities in Denmark in their work on the implementation of their Climate Action Planning Framework generation 2 (CAPF 2). This work continues, but without the regional governments as contributing partners in a coordinating role.

The CAPF 2 is a critical lever for change in Denmark and a relevant way to disseminate and scale up the methods and knowledge developed in Regions4Climate on just transition. Decisions on the specific content of the CAPF 2 reports are with the local governments, but the development process is facilitated by and rooted in a framework developed by the global network C40 Cities. It should be noted that the new C40 framework has a far bigger justice aspect than the first version of the CAPF. The Danish version of CAPF 2 is developed in collaboration with the Danish think tank CONCITO, who also have the responsibility to assess and certify the quality of the municipal climate action plans. In addition, the national association of local governments (KL) and the philanthropic trust Realdania serve as facilitators of the CAPF 2 process through the Climate Alliance initiative and the associated knowledge portal.

Communicating findings and insights from the just transition roadmap process to CONCITO and the Climate Alliance is a relevant step to qualify and support the next generation of municipal climate action plans in Denmark and ensure that just transition, including climate justice, transformative climate adaptation and inclusive public engagement methods, is made operational and adopted into planning practice. The Danish consortium partners (DCA, UCPH, VIA) have an agreed joint commitment to support this process.

3.7. Pärnumaa

This roadmap was by developed by SEI, with contributions from Pärnu County Development Centre, City of Pärnu, Estonian Environmental Research Centre and Demos Helsinki.

3.7.1. Introduction

Climate change severely affects regions, communities and livelihoods across the EU and globally. Adapting to the changing climate is inevitable. Yet, if the process of climate change adaptation is not carefully thought through, it risks aggravating already existing inequalities in society and exacerbating the burdens for those who are the most affected by the impacts of climate change. This calls for a just transition to climate resilience.

In Pärnu county, heat stress has been identified as one of the climate change effects that increasingly causes risk and harm for the population. The risk and harm are not equally distributed across Pärnu county's population. Elderly and children, and other vulnerable groups are expected to suffer under heat stress. The effects are aggravated also for those who live and work in buildings that are poorly protected against heat and overheat easily.

At the same time, there has been a lack of support measures for cooling and climate proofing buildings and limited awareness of these challenges at county level and in the municipalities. Also, the current Climate and Energy plan for Pärnu County 2030 acknowledges a lack of attention to those most vulnerable to climate change: "The effects of climate change on the most vulnerable groups of people in the local community have not been assessed. There is no plan to reduce the vulnerability of the most vulnerable groups of people to the effects of climate change."

This Roadmap was jointly created with Stockholm Environment Institute Tallinn Centre (SEI Tallinn) and Pärnu County Development Centre. It is largely based on the discussions, inputs, and jointly developed ideas that emerged from two dedicated stakeholder workshops held in early 2025. The roadmap specifically addressed the lack of attention to the needs of those most vulnerable to climate change and the identified actions of this roadmap help to make climate change adaptation more just. The suggested actions of the roadmap are not limited to incremental physical improvements, but they also suggest interventions that address root causes for vulnerabilities by asking for improvements in funding, laws and regulations. The identified actions can help to fill this gap, and they will feed into the preparation process for the upcoming revision of the Climate and Energy plan for Pärnu County 2030, which will be conducted by Pärnu County Development Centre.

3.7.2. Brief Overview of the Workshops

First Workshop

The first workshop was held on the **7th of February 2025** at the Pärnu County Development Centre. The session began with an introduction to the Regions4Climate project and the related activities already underway in Pärnu County and Pärnu City. The workshop brought together 16 participants, including project partners, and representatives from local institutions such as the Pärnu City Government, Häädemeeste Municipality, Tori Municipality, Kihnu Municipality, and the Estonian Rescue Board. A key focus of the initial presentations was the urban heat island effect, particularly in Pärnu City and its surrounding areas, and how this relates to broader

climate risks facing the region—most notably the expected increase in the frequency and intensity of heatwaves in the near future.

The workshop highlighted a significant gap in both the **city's** and **county's** existing climate strategies: the absence of a clear assessment of how climate change affects **vulnerable groups** within the community. It was noted that there are currently no targeted measures to reduce these groups' exposure or sensitivity to climate impacts. To set the stage for deeper discussion, participants were provided with a clear explanation of who is considered vulnerable in the context of heatwaves, and why these populations are at greater risk.

Following this theoretical foundation, the workshop moved into a practical session centered on **four future scenarios** for Pärnu county. These scenarios were developed in advance through a review of strategic planning documents and input from stakeholder meetings held in autumn. Each scenario addressed key dimensions including **political, economic, social, technological**, and **environmental** factors.

Participants were divided into small groups, with each group assigned one scenario. They were asked to explore and critically assess their scenario by considering questions such as: *What could make this future likely or unlikely?* and *How would the region look from a social justice perspective, especially in relation to climate impacts?* The discussions also aimed to identify which elements in the scenario were **desirable** and which **social concerns** were most pressing.

Building on these reflections, each group drafted a **vision** for a desirable future in Pärnu County. A vote was then held to determine the most widely supported vision among participants. In the final stage of the workshop, all participants came together to collaboratively identify **concrete actions** required to achieve this shared vision. These actions were structured across six thematic categories:

- Changes in the physical environment
- Changes in everyday behaviour and practices
- Changes in laws and regulations
- Changes in the financing of adaptation
- Changes in knowledge and information
- Changes in the organisation of adaptation

Second Workshop

The second workshop was held on the **28th of March 2025** at the **Pärnu County Development Centre**, continuing the collaborative work toward a just climate transition in the region. **In total, there were 13 participants in addition to the project partners. The group included both returning participants from the first workshop and new faces, representing a range of key local institutions such as the Pärnu County Development Centre, the Estonian Rescue Board, the City of Pärnu Government, Saarde Municipality Government, and Pärnu College.** The session began with a brief reintroduction to the **Regions4Climate** project and an overview of activities carried out in Pärnu County. A quick recap of the key outcomes from the first workshop was also provided, to bring both returning and new participants onto the same page.

The workshop focused mostly on **practical group work**, during which participants were divided into three groups and guided through a structured process using a three-part worksheet.

In the **first part**, the goal was to reconnect with the **joint vision** for a just transition in Pärnu county that had been developed during the previous workshop. Participants were invited to reflect on how **individual and collective actions** could help achieve this vision and what kinds of outputs these actions might generate. Then they identified key **challenges currently present in the city and county**, making sure these were in line with the roadmap's overall scope. Drawing on the outcomes of Workshop 1, participants revisited and added to the list of **proposed actions** that could help address the challenges they had identified. Lastly, they described the **expected outcomes** of these actions, helping to clarify the intended impact and direction of the roadmap.

The **second part** of the session involved working **together on a shared timeline**. Participants considered the timeframes required for implementing the proposed actions and discussed when each should take place—**immediately, in the near future, or over the longer term**. This step helped prioritise and sequence actions in a realistic and goal-oriented manner.

In the **third and final part**, participants explored the **requirements and success factors** needed to ensure effective implementation of the roadmap actions. They responded to guiding questions such as: *Who should lead each action? Who could provide support? What resources would be needed? How will we know if an action has been successful?* The resulting worksheet was structured into three columns: the first listing the **specific actions**, the second identifying **assumptions and requirements for success**, and the third outlining **clear criteria for measuring success**.

This workshop marked an important shift from planning to implementation, helping to refine the roadmap into a concrete and actionable guide. Through collaborative reflection, prioritisation, and planning, participants continued to shape a pathway that supports **climate resilience and social justice** in Pärnu County.

3.7.3. Vulnerabilities and Justice Considerations

The following paragraph presents the results from the four-scenario analysis of the first workshop. These scenarios were developed based on local strategic planning documents and stakeholder input and aimed to provoke reflection on the intersection of climate adaptation, social justice, and regional development. Each scenario explored different political,

Scenario 1

The first scenario titled **"At the crossroads of tourism, technology, and heatwaves"** describes a future where Pärnu county thrives economically as a logistics and tourism hub, supported by major infrastructure projects and investments in green energy. However, social and ecological sustainability lag behind. Technological advances and climate-smart infrastructure primarily benefit wealthier residents and tourists, while vulnerable groups—such as low-income households and the elderly—struggle with increasingly frequent heatwaves, high energy costs, and inadequate housing conditions. Blue-green spaces are enhanced for tourism appeal but fail to deliver significant ecological or cooling benefits.

Which population groups are doing well, which less so? What is fair / unfair in this future from your perspective?

In this future, residents with higher incomes and better access to technology and infrastructure fare significantly better. In contrast, lower-income groups, elderly individuals—particularly those with limited mobility—and residents

of older buildings face greater challenges due to inadequate cooling and limited mobility infrastructure. The lack of inclusive urban design and uneven investment in neighbourhoods deepens inequality. Access to recreational and cooling amenities like swimming areas is focused in tourist zones, neglecting other parts of the region.

In this future, how might climate change accentuate social inequalities? Whose needs are catered for? Who benefits from adaptation and who carries the (financial) burden?

Climate change exacerbates existing social divides. Adaptation measures largely benefit tourists, businesses, and wealthier residents, while more vulnerable populations—especially in suburban or less-developed areas—are left behind. Financial burdens, such as rising energy costs and limited access to affordable cooling, fall disproportionately on those with fewer resources, further entrenching inequality.

Scenario 2

The second scenario titled **"Barriers to climate adaptation in a fragmented county"** describes a future where Pärnu county faces both persistent challenges and selective progress in adapting to climate change. While regional security has improved and niche tourism thrives in its quiet countryside and coastal areas, the county's overall economic development is hindered by weak transport connectivity—due in part to the halted Rail Baltica project—and limited regional cooperation. Lost investments and fragmented municipal collaboration have led to stagnation in renewable energy development, high energy prices, and minimal building renovations, leaving many households vulnerable to heat.

Despite these constraints, notable progress has been made in green infrastructure. With support from EU and national policies, municipalities have successfully integrated nature-based solutions—such as green roofs, tree planting, and unsealed pavements—into land-use planning, improving biodiversity and local resilience. Civil society plays a modest but meaningful role in raising awareness and promoting local support systems, while schools increasingly serve as hubs for climate education, notably through institutions like the Pernova Nature House.

However, the built environment remains poorly equipped for hotter summers. Aging residential buildings, especially apartment blocks from the early 2000s, lack adequate cooling and insulation. Vulnerable groups such as the elderly, people with health issues, and low-income residents face the greatest risks, as renovation efforts are limited and often unaffordable. Social services focus primarily on emergency response and become overwhelmed during extreme events.

Which population groups are doing well, which less so? What is fair/unfair in this future from your perspective?
Older people and economically insecure residents are especially disadvantaged, often living in outdated apartment buildings that are not renovated due to lack of funds or opposition to upgrades. As property values fall, lower-income buyers move into buildings that require improvements they cannot afford. This leads to a cycle where vulnerable populations remain exposed to heat risks without adequate infrastructure. Meanwhile, better-off residents and private sector actors tend to be more resilient, creating an uneven landscape of wellbeing.

In this future, how might climate change accentuate social inequalities? Whose needs are catered for? Who benefits from adaptation and who carries the (financial) burden?
Social inequality grows as adaptation progress remains uneven. Income becomes a key determinant of wellbeing, with wealthier individuals and businesses better equipped to respond to climate risks. Adaptation efforts—such as

green infrastructure—benefit the general environment and urban livability but do not sufficiently target vulnerable groups. The financial burden of climate adaptation is shared between local governments and individuals, yet many residents lack the resources to carry their part of the load, deepening existing disparities.

Scenario 3

The third scenario titled **"Smart solutions and strong communities"** describes that Pärnu county has emerged as a regional leader in logistics and green innovation, thanks to the operational Rail Baltic line and expanded freight infrastructure. Economic growth is supported by a diversified tourism strategy that includes green, food, and sports tourism, helping to extend the tourist season beyond the summer months. These developments are underpinned by improved cooperation among municipalities, businesses, and civil society, coordinated largely through The Association of Local Authorities.

Technological advancement has played a central role in the region's green transition. Local innovation in smart energy grids, electric transport, biofuels, wind, and solar energy has reduced fossil fuel dependency and created a more decentralized, affordable energy supply. Community involvement—especially through NGOs and resident cooperatives—has ensured these benefits reach a broad segment of society.

However, economic growth and expanding tourism are placing pressure on natural spaces. The demand for commercial and event infrastructure has resulted in increased urbanization and paved surfaces, intensifying local heat stress and diminishing the appeal of Pärnu's green tourism. While some hybrid green-grey infrastructure exists, more technologically driven climate solutions have been prioritized over nature-based ones, increasing risks such as flooding and erosion.

On the social side, community-driven initiatives have helped support vulnerable groups during extreme heat events through cooling centers, emergency aid, and educational workshops. Yet not all groups are equally able to benefit: some organizations serving the elderly, disabled, or children face funding shortages, limiting their capacity. Civil society plays a key role in fostering resilience, but disparities remain based on digital access, income, and local leadership capacity.

Which population groups are doing well, which less so? What is fair/unfair in this future from your perspective?

Those who are technologically literate, financially secure, and live in areas with strong community leadership adapt well in this future. Households and communities producing their own energy benefit from lower electricity costs and greater independence. Conversely, older adults—especially those unfamiliar with new technologies—risk exclusion and become more reliant on younger generations. Residents in high-density or overly built-up areas may experience more heat-related stress, particularly if green space is limited. The gap between communities with proactive leaders and those without becomes increasingly evident.

In this future, how might climate change accentuate social inequalities? Whose needs are catered for? Who benefits from adaptation and who carries the (financial) burden?

Climate adaptation in this scenario benefits primarily those involved in or supported by technology and infrastructure development—such as wind farm developers, real estate investors, and energy firms. Local governments and private developers carry much of the financial burden for adaptation investments, but national-level support is also needed, especially in rural areas. The rapid expansion of the built environment places additional strain on public services and infrastructure, impacting vulnerable residents like the elderly and

immigrants. The prolonged tourist season adds pressure to healthcare and service sectors, which may already be stretched.

Scenario 4

The fourth scenario titled **“Balancing security and climate resilience"** describes that Pärnu county operates within a tense global context marked by ongoing geopolitical instability, particularly in relation to Russia. In response, the region has adopted a dual approach focused on security and climate resilience. Local defense measures—such as community-based evacuation plans and volunteer security networks—reflect a bottom-up approach that also extends to climate preparedness, where tightly knit neighborhood systems offer mutual aid during disruptions, including heatwaves and floods.

Infrastructure upgrades and strategic investments have improved self-sufficiency across the county. New building regulations ensure better insulation and climate comfort, while public funds have been used to retrofit older housing. Shaded public spaces and municipally maintained cooling centers help the population cope with increasing temperatures. However, green infrastructure and nature-based solutions have received limited attention, as defense-related spending and hard infrastructure projects take precedence.

The region's accessibility—due to completed Rail Baltic and Via Baltica upgrades—has made it more attractive to refugees and tourists. While this stimulates economic activity, the resulting population pressure strains water, energy, and health systems. Resource use surges seasonally, creating tensions between permanent residents and temporary visitors, especially in terms of utility costs and public service access.

Energy transition efforts have progressed, largely through private investment. Households and cooperatives with autonomous water or energy systems fare well, but small farmers and low-income residents struggle to afford such solutions. Although community cooperation helps offset some vulnerabilities, gaps persist, especially where people are less socially connected or reliant on outdated infrastructure.

Which population groups are doing well, which less so? What is fair/unfair in this future from your perspective?
People with independent systems—like private energy and water supplies—or those engaged in community cooperation are better off in this scenario. Newcomers who arrive from more vulnerable regions may also find Pärnumaa relatively safer and more stable. In contrast, those who are socially isolated or lack the means to adopt adaptive solutions—such as the elderly, low-income households, and outdoor laborers—are more exposed to climate risks and financial strain. The artificial scarcity of land and housing worsens inequality, while expanded social support systems raise concerns about economic balance. On the other hand, support for community-led initiatives and shared resources is seen as a fair and effective response.

In this future, how might climate change accentuate social inequalities? Whose needs are catered for? Who benefits from adaptation and who carries the (financial) burden?
Climate change exacerbates existing divides between the resource-secure and the resource-vulnerable. Those with wealth or cooperative support can invest in resilient systems and avoid the brunt of rising costs. Adaptation efforts mainly benefit these groups, while others remain exposed. The financial burden of adaptation is distributed among citizens, local governments, and the state, but outcomes are uneven. Ownership of key assets increasingly defines resilience, reinforcing the advantages of the already well-resourced.

3.7.4. A joint vision for 2044 and actions

After reflecting on the four future scenarios, each group in the workshop developed a vision for a desirable future in Pärnu County. Participants then voted on the most compelling vision, leading to the adoption of the following shared goal:

In Pärnumaa, communities are self-sufficient and caring, where technology supports daily life and progress, mobility corridors connect us to Europe, and green technology and nature are in harmony.

And too achieve this vision, participants identified key actions across six thematic areas. These are summarized below under guiding questions.

1) What needs to change in the physical world?

- Complete strategic mobility corridors (e.g., Rail Baltic, Via Baltica) and ensure good accessibility
- Expand and implement green technologies, while designating areas that do not conflict with nature
- Build well-functioning light traffic and mobility infrastructure
- Create cooling solutions: shaded areas, water access, public cooling spots, drinks availability
- Preserve and integrate green spaces in urban and artificial environments
- Develop community spaces (parks, centers) for connection, co-creation, and shelter
- Integrate green infrastructure into urban planning (e.g., green roofs, corridors)
- Support community-based physical solutions

2) What needs to change in everyday behavior and practices?

- Foster a strong sense of community: people know their neighbors and help each other
- Encourage individual responsibility: “Be prepared! Be green!”
- Promote climate awareness and understanding of cause-and-effect in climate impacts
- Shift culture toward pragmatic thinking and reduce baseless ideological opposition
- Normalize crisis preparedness and proactive mutual support

3) What needs to change in laws and regulations?

- Ensure green technology is genuinely prioritized in legislation
- Adapt laws to evolving needs and align them with strategic documents (e.g., climate plans)
- Allow flexibility in how natural values are assessed, relocated, or balanced with innovation

4) What needs to change in the financing of adaptation?

- Introduce flexible funding mechanisms to support a variety of local adaptation needs
- Provide mandatory support measures for climate resilience (e.g., building renovations)
- Offer climate-specific funding (e.g., cooling systems) through agencies like KredEx
- Ensure transparency, clarity, and alignment at the national level for all funding instruments

- Develop new grants and financial tools to match the realities of climate change

5) What needs to change in knowledge and information?

- Make information channels accessible to all; ensure clear, proactive communication
- Offer preventive counseling and early support in the social sector
- Emphasize that investments in adaptation improve quality of life
- Provide citizenship education and equip communities with skills for self-reliance
- Improve forecasting, crisis communication, and awareness of biodiversity and environmental health
- Break down institutional silos and build a shared understanding across governance levels

6) What needs to change in the organisation of adaptation?

- Build climate competence in education and governance
- Treat adaptation as an internal, cross-sectoral process
- Create enabling conditions for local implementation and long-term action

3.7.5. Actions of the Roadmap

The second workshop focused on refining and prioritizing the actions proposed during the first workshop to help realize the jointly agreed vision for Pärnu County. Participants reflected on how both individual and collective efforts can contribute to achieving this vision and considered what kinds of concrete outputs and impacts these actions could generate.

They then identified key challenges currently facing the city and county—ensuring alignment with the overall scope of the roadmap—and revisited the initial list of proposed actions. Building on the outcomes of Workshop 1, participants expanded and refined these actions to address the identified challenges more effectively. Finally, they described the expected outcomes of each action, helping to clarify the direction and intended impact of the roadmap. The results are organized in a table that categorizes proposed actions across three time horizons (Table 2). This time-based structure helps ensure a realistic and sequenced approach to building climate resilience and social sustainability in Pärnu County.

Most of the proposed activities are expected to begin in 2026. It is important that these activities should be prioritized which focus on those measures that most directly improve the well-being of vulnerable groups. These include actions that enhance social support systems, reduce exposure to climate risks, and ensure equal access to adaptation resources and infrastructure.

Table 4. Actions categorized across three-time horizons.

Now (2026)	2027 - 2035	Long term
Strongly take climate change into account in planning and construction activities	Developing support measures for cooling and climate adaptation.	Hiring a community specialist (ongoing activity which starts within the period of 2027-2035)
Bringing the indoor climate into compliance with the requirements in public buildings	Raising awareness among adults on climate adaptation.	Diversification of green spaces (ongoing activity which starts within the period of 2027-2035)
Systematised awareness-raising outreach	Reducing the fear of residents by explaining cooling systems + introducing technology and resources.	
Increased awareness of social workers in local municipalities, and concrete guidelines		
Local planning and activities		
Integrating climate change related topics into education		
Searching for project funding for the field (environment)		
Budgetary funding for awareness-raising outreach		
Design and install cooling solutions in urban spaces for everyone (accessible to all, including vulnerable groups). Korteriühistute esimeeste koolitamine		
Preventive social counseling and awareness raising on coping with climate change (e.g., shelters during heatwaves).		
Integrating climate competence into curricula of schools		

Mapping communities and resources, providing the people with skills and tools for independent yet considerate towards others type of action.		
Community gathering places (community centers, parks, etc.) where people can interact and exchange ideas aimed to help vulnerable groups at community level		
Awareness campaign (how to cope with the heat/use of cooling devices etc/consideration of animals too)		
Improving information exchanges (person to person)		
Consciously guiding community initiatives		
Education programme (e.g. in cooperation with Pernova educational centre), aimed for teachers, pupils, kindergartens		
Increase the number of free drinking water taps in the public		

To ensure the effectiveness of the proposed actions, participants identified key enabling conditions—assumptions and requirements that must be in place for successful implementation. These include legal, financial, social, and institutional prerequisites. In addition, success criteria were defined to help assess whether the actions are delivering the intended impact. The following table summarizes these essential conditions and indicators of success.

Activity	**Assumptions and requirements for successful implementation (financial resources, knowledge etc)**	**Success criteria (will the outcomes be accomplished?)**
Mapping communities and resources, providing the people with skills and tools for independent yet considerate towards others type of action	Collecting and compiling real-life cases and practices (illustrative examples, e.g., from urban space)	People are more climate conscious and know how to act and cope with the changing climate
Community gathering places (community centres, parks, etc.) where people can interact and	Finding solutions to problems as a basis for planning preventive actions	It is known to officials who the potential people in need of help

exchange ideas aimed to help vulnerable groups at community level	(sharing experiences and knowledge with the public)	are, who are their assigned helpers and equipment
Developing support measures for cooling and climate adaptation.	A clause in the inter-municipal agreement at the county level Appointing a climate coordinator for the county (expert, leader, and spokesperson)	
Integrating climate competence into curricula of schools	Integrating climate change adaptation and related topics into curricula	Individuals take responsibility – be ready! Go green!
Reducing the fear of residents by explaining cooling systems + introducing technology and resources.		People are prepared for crises and adaptation to climate change, and are not afraid to help others
Raising awareness among adults on climate adaptation		If warning signs become common in urban space, a so-called social norm, then the whole climate topic will feel more familiar and relevant to people
Training of chairmen of housing associations		
Preventive social counselling and awareness raising on coping with climate change (e.g., shelters during heatwaves).	Bringing funding to the county (skills, capacity)	
Design and install cooling solutions in urban spaces for everyone (accessible to all, including vulnerable groups). -> warning signs in heat island areas; for example public revolving chairs with a shade above the head		Accessibility and support for cooling options, and the possibility to cool down in urban spaces
Systematised awareness-raising outreach	Communication on a country level (team, specialists of the topic, information)	Changes in behaviour

Budgetary funding for awareness-raising outreach		
Strongly take climate change into account in planning and construction activities	Implementation of requirements, finances	Measures, comfortable public spaces
Bringing the indoor climate into compliance with the requirements in public buildings	Regulations, supervision, awareness growth	
Increased awareness of social workers in local municipalities, and concrete guidelines	Trainings, team, budget	Guidelines, people being trained
Integrating climate change related topics into education		
Searching for project funding for the field (environment)		
Drinking water taps	(Already in progress) Necessary budget, finding the right locations, considering the sustainability of drinking water taps in advance (vandalism, winter, etc.)	Ongoing project -> drinking water taps will be installed where it is needed (the call for need has to come from the people)
Making more green the existing spaces and increase accessibility	Increasing interest of developers (WHY should they want to do it?), sharing experiences, cooperation between the private sector, municipalities, and the development centre of Pärnumaa	Developers have the desire/wish to create innovative green spaces to their areas, for example a green corridor around Port Artur shopping centre
Consciously guiding community initiatives	Hiring a community specialist in municipalities; good examples from Estonia; introducing the idea to municipalities (development centre of Pärnumaa, Association of Local Authorities of Pärnu county)	Community movements, directed towards dealing with climate change
Education programme (e.g. in cooperation with Pernova educational centre), aimed for teachers, pupils, kindergartens	Erasmus+ large-scale project for developing the program	

Awareness campaign (how to cope with the heat/use of cooling devices etc/consideration of animals too)		Awareness has raised and so has increased the actions
Improving information exchanges (person to person)	Identifying bottlenecks, developing solutions, information channels and their effectiveness (routine check of contact details on eesti.ee) → e.g., Postimees Group allows municipalities to share information for free	

3.8. Uusimaa

This roadmap was developed by Helsinki-Uusimaa Regional Council and Demos Helsinki

3.8.1. Introduction

Climate change affects regions, communities and livelihoods across the EU and globally. Adapting to the changing climate is inevitable. Yet, if the process of climate change adaptation is not carefully thought through, it risks aggravating already existing inequalities in society and exacerbating the burdens for those who are the most affected by the impacts of climate change. This calls for a just transition to climate resilience.

In the Helsinki-Uusimaa Region, the climate is projected to become significantly warmer and wetter over the 21st century. Compared to the baseline period of 1981–2010, average temperatures are expected to rise by approximately 1.7–5.0 °C, depending on global greenhouse gas emission scenarios. The region has already warmed by about 0.6 °C since1981-2010. Monthly temperatures are projected to increase throughout the year, with the most notable warming occurring from November to March. Annual precipitation is expected to rise by 5–15%, reaching around 630–750 mm per year. Precipitation is projected to increase in nearly all months by mid-century, particularly from November to January, though summer precipitation levels are expected to remain relatively unchanged (Ilmasto-opas.fi, 2022).

These changes go hand in hand with increasing climate risks. Extreme weather events and freeze-thaw cycles are expected to increase significantly. Heatwaves pose a particular risk to those who work outdoors or in non-air-conditioned spaces, people with health issues, and residents whose homes overheat easily. Extreme events, such as floods, heavy rainfall, and heatwaves can damage transport infrastructure, making it harder for people to move around. At the same time, more frequent freeze-thaw cycles increase the risk of slipping accidents, especially affecting those who travel frequently on foot or by bicycle.

A decline in the reliability of emergency, healthcare, and rescue services under extreme weather conditions poses a threat to people with health problems. Also, mental health issues are likely to increase as winters become more frequently snowless and darker. Additionally, growing health risks include the spread of waterborne and vector-borne diseases, smoke from forest and wildfires, and rising pollen levels (source: VILKKU − Visiona ilmastokestävä Uusimaa, Uudenmaan sektorikohtaiset ilmastoriskitaulukot).

The aim of this roadmap is to address specifically the needs of those most vulnerable to the effects of climate change. The proposed actions in the roadmap go beyond incremental physical improvements; they also include measures that tackle the root causes of vulnerabilities including enhancements in funding, legislation, urban planning, education, preventing climate change or generally strengthening societal resilience.

This roadmap was jointly created by Helsinki-Uusimaa Regional Council and Demos Helsinki. The roadmap is part of wider strategic processes in the Helsinki Uusimaa Region. It feeds to the Regional Adaptation Plan currently being prepared by the Regional Council with ERDF funding. The work also supported the framing of adaptation in Helsinki-Uusimaa Regional Strategy and Regional Plan and supported the inclusion of social justice viewpoints in both of these mandatory regional processes.

This roadmap was prepared as part of has been produced as part of Regions4Climate (R4C) - Building Resilient Communities EU Project, Grant agreement ID: 101093873, funded under HORIZON 2.5 - Climate, Energy and Mobility programme Call: HORIZON-MISS-2021-CLIMA-02-04 - Large scale demonstrators of climate resilience creating cross-border value).

3.8.2. A Participatory Approach to the Roadmap

The joint vision and proposed actions of this roadmap were created in a participatory foresight workshop addressing the question: How do we ensure that adaptation to climate change is socially just? In this workshop, held on 3.6.2025 with 12 participants representing a wide variety of stakeholder groups, three scenarios were jointly analyzed for the future of Helsinki-Uusimaa (see table x for the scenarios). These scenarios built on the scenarios created for the strategy work of the Helsinki-Uusimaa Regional Council (Capful, 2025) with a more pronounced emphasis on climate change impacts and risks written in by Demos Helsinki.

Crucial support for the workshop was given by HyTe (HyTe ry), a networking NGO for volunteer organizations and other third sector contributors to citizens' health and wellbeing and the NGO Network of Central Uusimaa (Keski-Uudenmaan Yhdistysverkosto). Through their channels we were able to attract relevant NGO's to the process, after initial dissemination rounds resulted in inadequate number of attendees.

In a first step, the participants worked in three groups, familiarised themselves with the three scenarios and analyzed which societal groups would be well off and which would be vulnerable and experience harm under each scenario. Special attention was given to the differential impacts of climate change. These analyses were shared among all participants. The following chapter (Vulnerabilities and Justice Considerations) presents a summary of this analysis. In a second step, the participants created potential visions for the Helsinki-Uusimaa Region in 2050. The participants agreed finally on one joint vision by voting on the three potential vision and jointly editing their favorite version. In a final step, the participants identified several fields of action that could open a pathway towards the jointly created vision.

The results of the workshop were presented by Demos Helsinki in the Regional Adaptation Plan stakeholder workshop on 11.6.025, where the participants sought regional adaptation actions. This enabled a deep inclusion of social justice viewpoints in the Adaptation Plan process. Prior to this, the theme was already introduced to the stakeholders by Demos Helsinki in a joint regional risk evaluation workshop organized by Helsinki-Uusimaa Regional Council on 6.11.2024.

The overlapping schedules of these processes made it possible to directly utilize the JT process results, but in practice complicated the JT process, too, as careful consideration had to be made on the timing and nature of stakeholder participation to avoid confusion and thematic overlap. This also meant that the time frame for the JT process was quite narrow and initial hardships in attracting participants forced us to keep the process very compact, in order to be completed before the end of the activities in Regions4Climate Task 2.4.

During the JT process, Helsinki-Uusimaa Regional Council updated the regional strategy, as is done in the beginning of each 4-year period of regional assemblies. The process included redefining the scope of climate change adaptation and mitigation, whereby the input gained in the JT process helped us to reframe adaptation, taking social justice considerations better into account. In addition to this, social justice is an overarching theme in the new Regional Plan, which is currently being drafted by Helsinki-Uusimaa Regional Council in a multi-year

participatory process. The JT process directly contributed by defining social justice perspectives within the theme of adaptation.

Table 5. Three scenarios used in the participatory foresight workshop (translated from Finnish with the help of Google Translate).

Scenario Title	Narrative of the Scenario
European Renaissance	By 2050, Uusimaa will have developed into a multicultural and technologically advanced region, where economic well-being and social stability are emphasized. As the European Union has strengthened as a global actor and moved towards a federal structure, Finland has found its place in the EU value chains. This has brought significant international investments to Uusimaa, especially in green industry and energy-efficient forms of production, which has strengthened the region's economy and reduced social tensions. This has supported the region's competitiveness both domestically and internationally, although as the rest of Finland has succeeded, Uusimaa has had to fight for its position. The region has a comprehensive, emission-free public transport system that smoothly connects cities and rural areas. Thanks to improved connections with Estonia and Rail Baltica, Uusimaa is closely connected to the Baltic and Central European transport networks. Although the quality of life in Uusimaa has generally improved, an aging population and lifestyle diseases are putting a strain on healthcare. However, proactive welfare services and community spirit have supported residents' coping. The Uusimaa of the future has balanced urbanization, technological development, and environmental challenges, but the community spirit of the region and international cooperation create the foundation for a more sustainable future. However, the effects of climate change are visible in everyday life. Rising sea levels, extreme events, and weather extremes are causing continuous adaptation measures. Heat waves and freeze-thaw cycles are putting a strain on both people and infrastructure. Those working outdoors, the elderly, and those who exercise are particularly facing challenges, and mental health problems are increasing due to dark, snowless winters. The availability and quality of drinking water have deteriorated, which increases competition between different user groups. New diseases and pests are also becoming more common. At the same time, the operational reliability of healthcare and rescue services is weakening.

From Withering to a Wellbeing Economy	By 2050, the world is divided into competing power blocs, with the United States and China still leading, while the EU has drifted into stagnation without significant development. In Finland, alongside economic growth, the well-being economy has emerged, which emphasizes the well-being of people and society in non-material ways as well. This has reduced polarization and made society more harmonious than before, although the aging population and low economic growth continue to pose challenges. Uusimaa is doing relatively well, and the region maintains its position as the driver of the Finnish economy and research, development and innovation. However, the aging population and the lack of a skilled workforce are burdening the region. The level of healthcare has been maintained at a good level, and everyday life in Uusimaa is functional with the increase in small communities in large cities. The well-being economy has successfully alleviated the segregation of residential areas, which has contributed to reducing polarization and strengthening community spirit. Climate change creates significant challenges. Climate action is largely opportunistic and based on commercial profitability, which is not sufficient for effective adaptation. Adaptation measures are constantly needed, which burdens both municipalities and companies. Uncertainty about the smooth flow of everyday life and the continuity of business life is growing due to global spillover effects and nature loss. Strong warming is increasing extreme weather phenomena, such as floods, heavy rains and long heat waves, which threaten particularly vulnerable population groups. Heat waves and freeze-thaw cycles are straining the transport infrastructure and causing slip and fall accidents and traffic disruptions. The availability and quality of drinking water have deteriorated, which increases competition between different user groups. New diseases and pests are also becoming more common, and the operational reliability of healthcare and rescue services is weakening, especially for people suffering from health problems.

Refugees and polarization	By 2050, the world has drifted into instability and conflict, causing massive displacement as climate change makes large areas uninhabitable. The EU's capacity to operate has weakened, and populist movements have strengthened due to economic crises and refugee flows. In Finland, the economic structure has become more local, and traditional industry has strengthened. Population growth has accelerated because of immigration, but polarization has increased between population groups, education levels, and genders. In Uusimaa, population growth and diversity are strong in both large cities and surrounding municipalities. The proportion of foreign-speaking and non-native Finns is higher than the native population, making Uusimaa the most diverse region in Finland. However, segregation is a significant challenge, especially in large cities and suburbs, and the differentiation of residential areas increases social tensions. Weak economic development makes it difficult to organize services throughout the province, and bubbles and unrest are visible in everyday life. On the other hand, civil society acts as a counterforce and strengthens the community. Security is being invested in, and critical infrastructure is being maintained in good condition. Legislation and state control have tightened due to major changes, and the emphasis on "discipline and order" weakens pluralism and democracy. As a result of climate change, extreme events such as floods, heavy rains and heat waves are becoming more common, which complicates the functioning of the transport infrastructure and increases health risks, especially for the most vulnerable. Reduced water availability causes competition in the use of resources. In addition, water- and vector-borne diseases are becoming more common, as well as smoke from forest fires and an increase in pollen, which exacerbate health challenges. Mental health problems are becoming more common, especially with dark and snowless winters. Despite the challenges, Uusimaa maintains its role as the centre of Finland's economy and innovation. Local communities support each other in everyday challenges, but the region constantly balances the cross-pressure of security, diversity and a changing climate.

3.8.3. Vulnerabilities and Justice Considerations

Based on the scenario analysis, the participants of the workshop identified four interconnected areas of concern that could exaccerbate vulnerabilities and inequality.

1. Health inequalities

Increasing cost of healthcare may disproportionately affect lower-income individuals who cannot afford private healthcare services, especially the long-term sick or elderly who require frequent medical attention. Long-term sick individuals and the elderly were identified as particularly vulnerable. The elderly face risks related to housing (e.g., inability to afford repairs), heatwaves, and limited mobility, which could further widen health and social inequalities. Finally, in addition to darker winters, reduced mobility and access to activities among children, young people, and the elderly could negatively impact mental health, leading to further inequalities in health outcomes.

2. Direct and indirect impacts of climate change

More frequent extreme weather events could exacerbate vulnerabilities in marginalized groups, particularly those unable to modify their living environments (e.g., elderly people, low-income families). Increased exposure to allergens and air pollution could lead to higher incidences of asthma and other respiratory conditions, especially affecting the most vulnerable. Additionally, the participants raised concerns about how the needs of poor elderly people will be met, as they may not be able to adapt their living environments to cope with climate change impacts like extreme heat.

3. Social and Economic Inequality:

Rising unemployment, especially among low-skilled workers, could further deepen social inequality in the region. Those without stable employment may be less able to cope with the challenges posed by climate change and economic instability. Limited access to mental health services and other critical support systems may widen existing inequalities, leaving disadvantaged groups without the necessary resources to adapt to changing circumstances.

4. Environmental and Structural Vulnerabilities:

The participants were concerned that the design of public spaces and homes may not adequately support the needs of the elderly or those with cognitive impairments, making it harder for them to maintain a good quality of life. They also pointed out that adequate community-driven solutions are needed, to reduce the risk of eroding social cohesion and exacerbating inequalities.

3.8.4. A Joint Vision and Fields of Action

The participants of the workshop agreed on the following joint vision:

The wellbeing economy guides social and economic decision-making in Uusimaa, and the green transition is well underway. Corporate social responsibility and innovation are key drivers of this transition, propelling Uusimaa toward a future that is climate-resilient on all human levels.

Uusimaa embraces multiculturalism as a strength, and newcomers receive support for integration through social and health services, education, and local communities. The region recognizes vulnerable population groups and deliberately allocates resources to promote equality.

The vision was complemented by notions on which sectors and fields of action social justice viewpoints should especially be prominent, considering regional adaptation activities. These fields coincide with the fields of action identified in the Regional Adaptation Plan process of Helsinki-Uusimaa, and will be scrutinized when concrete adaptation actions are defined within this process.

1. Urban and regional planning:

- The challenges of climate change are taken into account in the planning and implementation of new residential areas.
- Planning and implementation of greenways.

- More green and shade.
- Turn stormwater retention basins into oases that promote diversity.
- Make green areas accesible for everyone.

2. Community development:

- Building societal support for community involvement and participation by providing expertise, education, and resources.
- Increasing awareness of the impact of individuals' or community's actions on climate change adaptation and mitigation.

3. Dissemination and education:

- Increasing awareness and knowledge about climate change, related risks, and preparedness and resilience via education and tailored information for different societal groups.
- Preventing radicalization movements amongst young people through education.
- Improving the capacity of individuals and organization to utilize expertise from elsewhere.

4. Decision making:

- Improving the long-term perspective in decision making.
- Making decision making more transparent and inclusive.
- Integration of climate change concerns in all strategies, plans, and action programmes.
- Increasing awareness of relevant climate legislation at the municipal level.
- Making climate impact assessment mandatory at all decision-making levels.

5. Improved societal cohesion:

- Targeting climate change adaptation measures to vulnerable population groups (positive discrimination).
- Advice and support for the societal integration of immigrants.
- Taking into account the most vulnerable groups when preparing for extreme and disruptive events.

The fields of action identified in the just transition roadmap process underline the fact, that as climate change adaptation is mainstreamed on different sectors, many of the foreseen actions actually fall within the realm of social policy, and deal with the basic need of social cohesion and justice, as a solid ground for more targeted actions. The same applies to urban and regional planning, where the social concerns amplified by climate change are readily taken into account. This means that instead of identifying separate adaptation actions, we may need to shift our focus to enhancing social justice concerns already built in these crucial sectors supporting societal well-being.

3.8.5. Timeline of the Roadmap

The timing and necessary preconditions for the successful implementation of social justice considerations were identified after the stakeholder workshop based on expert judgements. These notions are directly fed to the Regional Adaptation Plan process, which will be completed by the end of 2025. The process continues in 2026 with a deeper stakeholder dialogue on defining concrete adaptation actions on regional and municipal levels, supporting

the regional adaptation aims. In this stage, the timing and responsibilities related to the actions initiated by the JT process will also be defined, completing the preliminary timeline presented in this Roadmap.

Update of the Regional Strategy started with scenario work in 2024 and will be completed in early autumn of 2025. The new Regional Plan is currently being drafted and will be completed by the end of 2027.

3.9. Castilla y León

This roadmap was by jointly developed by La Junta Castilla y León and Demos Helsinki

3.9.1. Introduction

The region of Castilla y León, located in northwestern Spain, is the country's largest autonomous community, covering over 94,000 km². Despite its vast area, it has a low population density of 27 inhabitants per km², with approximately 2.5 million residents. The region's economy is predominantly based on agriculture and livestock farming. However, rural areas are experiencing significant demographic decline due to migration to urban centers.

Castilla y León faces a unique convergence of demographic decline and climate vulnerability as it advances toward just climate resilience. Pronounced depopulation, particularly in smaller towns and villages, leads to a lack of basic infrastructure, an unsupported aging population, a shrinking workforce, and significant challenges to maintaining economic vitality. Youth outmigration, limited job opportunities, and uneven access to services exacerbate social fragmentation and deepen territorial inequalities.

Environmentally, Castilla y León is increasingly exposed to extreme climate events. Rising temperatures and prolonged summer droughts strain water resources and directly affect agriculture, which plays a central role in the region’s economy. These conditions also heighten the risk of wildfires. Additionally, episodes of heavy rainfall can lead to flooding and damage fragile rural infrastructure. Notably, the areas most affected by climate change often overlap with those suffering the greatest levels of depopulation.

Climate change projections suggest intensifying challenges for water availability, agricultural productivity, and forest health. In response, Castilla y León is developing adaptation strategies including investment in water-efficient agriculture, wildfire prevention programs and rural revitalization initiatives. Socially, the region is co-creating sustainable job opportunities, emphasizing support for women and young entrepreneurs. Economically, the region is promoting Green Social Business Models through cooperatives and business agreements to boost competitiveness and job creation. However, ensuring a just transition in the region will require deliberate efforts and political commitment to address current and future vulnerabilities within the new realities.

This Just Transition Roadmap focused on the territorial challenges specific to Castilla y León, particularly those related to agriculture, land use, and demographic change. It was jointly developed by the local government (La Junta Castilla y León) and Demos Helsinki in the context of the Regions4Climate project. The roadmap also includes the participation of sectoral experts, civil society organizations, academic institutions, and community groups. Their collective knowledge, lived experience, and diverse perspectives were essential in identifying both the key challenges and the actionable pathways toward a just climate transition in Castilla y León. The co-creation process included a collaborative workshop, and iterative feedback rounds to ensure the roadmap reflects shared priorities and is grounded in regional realities.

The results of the Castilla y León Just Transition Roadmap will serve multiple strategic purposes both within the region and as a model for broader application across Spain and Europe. At the regional level, La Junta de Castilla y León can directly implement the identified actions to reformulate territorial and agricultural policies, integrate findings into existing and future rural development plans, and use the roadmap as a foundation for securing European funding from Next Generation EU, cohesion funds, and the reformed Common Agricultural Policy. The

framework will enable better interinstitutional coordination between different regional departments and agencies while facilitating the development of training programs in regenerative agricultural practices, the creation of public bodies for coordinated territorial development, and the design of financial incentives for small producers pursuing sustainable agriculture.

Beyond Castilla y León, the roadmap offers significant replicability potential for other Spanish regions facing similar rural challenges. Regions such as Aragón (particularly Huesca and Teruel provinces), Castilla-La Mancha's rural areas, Extremadura, interior Galicia, and rural Asturias could adapt the participatory methodology, vulnerability identification framework, and integrated approach connecting climate, demographics, and agriculture to their specific contexts. The transferable elements include strategies for participatory governance that can be adapted to different autonomous community frameworks while maintaining core principles of social justice and environmental sustainability.

Multiple stakeholders across Spain could benefit from the roadmap's insights and methodologies. At the institutional level, other autonomous communities with rural depopulation challenges, provincial councils in depopulated areas, the Ministry of Ecological Transition, and the Ministry of Agriculture could use this work to inform territorial just transition models and rural development policies. Research institutions including rural universities studying depopulation and sustainable agriculture, CSIC institutes focused on agriculture and territory, and autonomous agricultural research centers could leverage the findings for further investigation and policy development.

The agricultural sector presents numerous opportunities for application through organizations like ASAJA, UPA, and COAG, which could replicate participatory approaches among their members, while agricultural cooperatives interested in sustainable transition and young farmers' associations could use the model for rural development initiatives. Private sector engagement could involve agricultural technology companies developing solutions for small producers, rural renewable energy cooperatives, and circular economy enterprises focused on biomass and agricultural waste. Civil society organizations, particularly anti-depopulation platforms like “España Vaciada” and “Teruel Existe”, environmental NGOs working in rural territories, rural women's associations, and local development groups (GAL) could adapt the participatory methodologies and justice-focused approaches.

This roadmap was prepared as part of has been produced as part of Regions4Climate (R4C) - Building Resilient Communities EU Project, Grant agreement ID: 101093873, funded under HORIZON 2.5 - Climate, Energy and Mobility programme Call: HORIZON-MISS-2021-CLIMA-02-04 - Large scale demonstrators of climate resilience creating cross-border value).

3.9.2. Overview of the Roadmap process

Castilla y León has developed a Just Transition Roadmap (JTR) for climate resilience in the scope of Task 2.4. This document details the activities undertaken during its formulation, including the process of identifying regional vulnerabilities and justice considerations. It also includes a shared vision for 2044, and an action plan featuring actions to ensure a fair and resilient transition that addresses climate risks while supporting social cohesion, sustainable agriculture, and territorial equity.

The process leading to the completion of this roadmap followed closely the methodology suggested by Regions4Climate Just Transition Framework (Klein et al., 2023) and adapted it to the regional local context.

Focus definition

For its Just Transition Roadmap, Castilla y León chose to maintain a focus on agricultural development, recognising this economic sector as one of the most critical at the intersection of climate change and the region's deepening demographic challenges. Agriculture is not only central to the region's economy and cultural identity, but also particularly vulnerable to climate impacts and depopulation, making it a key area for developing fair and effective adaptation strategies.

The Just Transition roadmap process in Castilla y León focused aimed to focus on the following questions:

- Exploring the tension between technological progress and preserving socio-cultural fabric in rural areas → *How can Castilla y León lead innovation in the agricultural sector without losing rural identity, cultural heritage, and small-scale farming traditions? What are the unintended consequences of technological and economic modernization, and how can policy mitigate deepening inequalities?*

- Exploring current governance and institutional fragmentation → *What governance and policy frameworks are needed to ensure a just and inclusive transition that benefits small producers, vulnerable groups, and depopulated territories?*

- Exploring demographic challenges: depopulation, youth migration, gender gaps, and aging populations → *How can the region address rural inequality and demographic decline while ensuring equal access to infrastructure and services?*

- Exploring the links between local knowledge, climate resilience and fair market conditions → *What strategies can promote sustainable agriculture and climate adaptation in a way that is both locally grounded and economically viable?*

- Exploring capacity-building to incentivise bottom-up innovation and inclusion → *How can education, participation, and collaboration between stakeholders (farmers, institutions, women and migrants) be strengthened to drive inclusive regional resilience?*

Screening

The screening of information included the review of the document "Iniciativas de Recuperación y Resiliencia en Castilla y León" (Recovery and Resilience Initiatives in Castile and León) prepared by La Junta in the context of the operationalization of mechanisms for resilience and recovery after the 2020 pandemic crisis. The screening also included material and analysis for the preparation of D2.1 Socio-Economic Analysis and Pre-Existing Vulnerabilities (background material, interviews).

The screening process and feedback from regional partners contributed to the development of a "Table of Futures," a tool outlining possible evolutions of the key factors shaping the just transition across politics and governance, economic, social, technological, and environmental dimensions. The table focused on potential developments by 2044 and served as the foundation for constructing four distinct scenario narratives, each combining diverse perspectives into a coherent storyline. These four scenarios were crafted with the help of AI tools and manually reviewed and edited by the organisers. The stories served as a starting point for discussions on what a desirable future for the region could look like.

POLITICS & GOVERNANCE		ECONOMIC		SOCIAL		TECHNICAL	ENVIRONMENT	
Regional Climate Governance	Trust and Participation	Agriculture	Sectoral economic dynamics	Demographic challenges	Employment	Technology	Climate change	State of the environment
Adaptive innovation landscape: Priorities in line with innovation but conflicting political agendas at local, regional and national level limit coordination of implementation of climate strategies.	High trust in regional government and high participation in decision-making	Successful implementation of regional greenhouse-based business model for climate-smart production for small and medium agriculture.	Ecotourism and agroforestry rise the value of forest and natural landscapes as a label for regional identity.	While younger population continues moving to urban areas, the ageing population is left behind.	Greater demand for seasonal work. Work patterns shifts related to harvest times.	Region-led technological innovation, focused on digitalisation and smart agro systems.	Mild increases in hot summer days and dry spells.	Successful balance of conservation, reforestation, conservation and agro-techniques.
Collaborative and institutionalised resilience: Shared priorities for resilience and participation ensures cohesive climate policies	High trust in experts groups and active community participation,while marginalized voices risk exclusion.	Traditional farming methods struggle to keep up while adaptation capacity is insufficient to implement measures to deal with climate change.	Tourism and forestry both suffer the consequences of wildfires and the loss of biodiversity.	**Traditional rural work becomes less appealing to women, who are now finding more opportunities in agro-tech and digitalization, reshaping their role in the agricultural sector.**	New education programs train more farmers in the use of digital technologies.	Technological innovation and sustainability focused on circularity, decarbonisation and organic production.	Moderate warming. Noticeable increase in hot days, tropical nights, and days with fire danger; heavy rainfall days become more frequent, increasing flood risks.	Slow trend towards biodiversity loss.
Community-driven commitment: Ideological clash results in fragmented policies and uncoordinated, isolated climate adaptation initiatives	Low trust in government and strong leadership of civil society groups	Big investment in digital technology and engineering infrastructure to secure the productivity of agro sector. Mixed model aims to benefit small-scale innovation and large-scale efficiency	Technology and digital innovation sector becomes the main regional investment.	Regional strategies successfully encourage young people to stay in rural areas rather than moving to cities. **Villages form networks to collaborate and share resources.** Region welcome newcomers but often with less benefits.	Increased shortage of agriculture workers, favouring jobs in industry and tourism.	Technology development implementation faces challenges due to digital literacy and resistance to change.	Intense warming leads to extreme conditions with nearly significantly more warm days and tropical nights, prolonged drought periods and high fire risk.	Mix of local hotspots of successful conservation, and hotspots of environmental degradation
Expertise-rich and advocacy-based resilience: Experts leading resilience measures gain influence over fluctuating climate and political agendas.	Low trust and little participation	**Prevalence of technology-driven large-scale industrial farming model. Exploitation based highly dependant in use of fertilizers, irrigation and automation. Smaller and more geographically isolated enterprises struggle to invest in innovation.**	**Large scale industrial farming focused on economic growth dominates the regional economy**	**While some areas struggle with depopulation and lack of infrastructure, other areas start attracting newcomers. Automation replaces stable occupations affecting young rural population the most.**	Entrepreneurship in eco-tourism and sustainable agriculture production grows, with women-led initiatives playing an increasingly significant role.			Rapid decline of environmental integrity.

Figure 22. Table of Futures for Castilla y León for the year 2044.

Actors' identification and involvement

Recognising both current and future vulnerable actors in the region is a key step to ensuring that their specific needs are addressed in the transition process. In practical terms, this recognition also helps identify the relevant stakeholders who can represent these groups during the next stages of the JTR. The following table reflects the effort to contextualize these vulnerable groups and their specific exposures in relation to climate hazards.

Table 6. Framework for the context specific identification for groups potentially vulnerable to the transition to climate resilience (Castilla y León).

Framework for the context specific identification for groups potentially vulnerable to the transition to climate resilience			
Specific group vulnerable to climate change / Representation	**Climatic hazard**	**Vulnerability Factor**	**Exposure**
People working outside, in agriculture and construction	Heatwave Droughts Water scarcity	Occupation Age	- Working outdoors (direct exposure to heat) - Outdated water management* - Work availability in uncertain scenario - Loss of income
Youth	Climate change adaptation	Socio-economic status Social inclusion	- Lack of work/study opportunities in the region

Women	Climate change adaptation	Socio-economic status Gender	- Job opportunities** - Loss of income
Immigrants (seasonal workers)	Climate change adaptation	Socio-economic status Education Race Ethnicity	- Current business models make it difficult for them to integrate in society and stay - Lack of social networks and support relationships
Small Agriculture sector	Heatwaves Water scarcity Droughts Wild fires	Occupation Socio-economic factors Gender Geographic location	- Low production, economic losses - Devaluation of labour - Pressing need of innovation - Geographic variability hinders implementation of solutions - Dependence of regional policies of support - Affected by demographic challenges
Senior citizens	Heatwaves Climate change adaptation	Age Residence location Mobility Occupation	- Less services close to residence - Challenging access to health and care - Less economic adaptation capabilities
People working in Tourism sector	Biodiversity loss Wildfires Heatwaves	Geographic location	- Effect on the land and infrastructure decrease number of visitors
Small town inhabitants	Heatwaves Water scarcity Climate adaptation	Age Socio-economic factors Residence location & distance	- Loss of social network, support relationships and belonging - Less services close to residence

Workshop

La Junta Castilla y León hosted a participatory workshop to engage relevant stakeholders into the development of its JTR. The workshop took place at the General Directorate of Rural Development, on February 19, 2025 and was organised as a collaborative effort by Demos Helsinki, Cartif, and La Junta Castilla y León. Guided by the Just Transition Framework, the methodology emphasized building a shared regional vision and identifying concrete adaptation actions aligned with the territorial realities of the region.

Invitations were extended to committed actors already involved in the region's innovation initiatives, with a deliberate focus on securing representation from all recognized stakeholders, including vulnerable groups. While this broad representation was a priority, it was not always achievable; for example, there was no identified actor or institution able to directly represent the migrant population's perspectives. Nevertheless, these efforts successfully engaged several actors who demonstrated a strong interest in participating in these discussions. Invitations were accepted by 20 actors among representatives from La Junta, the Regional Council, local universities, technical education institutions, agricultural and environmental education centers, and environmental organizations. Many of these participants were actively involved in civil society groups and were familiar with the challenges faced by isolated communities.Ultimately, the workshop convened nine participants. While a larger number of stakeholders had initially been considered, the geographical spread of the region posed logistical challenges for broader in-person participation.

The workshop was structured around several collaborative activities based on the narratives of four future scenarios for 2044, developed from the analysis of the Table of Futures and with climate considered as a central driver of change. These scenarios combined a range of elements—some viewed as more likely, others less so—and incorporated both positive and negative aspects to stimulate imagination, reflection and discussion.

The nine participants were divided into three groups, leaving one of the scenarios unused. In the first activity, participants engaged directly with the scenarios, reflecting on the likelihood that different groups would experience either the benefits or the burdens of the emerging regional context while recognising the implications of changes from a perspective of social and environmental justice. The second activity invited them to identify desirable and undesirable elements, helping to outline the key components of a shared vision. In the third activity, participants proposed concrete actions that could guide the region toward outcomes aligned with this vision.

Figure 23. Just Transition Workshop in Castilla y León. February 19, 2025.

3.9.3. Vulnerabilities and Justice Considerations

Castilla y León faces significant risks, vulnerabilities, and justice challenges that are central to building regional resilience. These include **technological disparities** that disadvantage small farms, **persistent territorial and demographic issues** such as depopulation and aging—further exacerbated by climate change in the a**bsence of equitable territorial policies**—alongside **environmental degradation** and increasing land occupation by large industries. Gaps in governance, including limited coordination, inadequate policy adaptation, and low consensus

and participation, further complicate the region's response. Additionally, the **cultural erosion** linked to the decline of small farming remains a pressing concern.

The following section presents a brief summary of the results from the workshop activities in relation to the three scenarios provided. Each scenario reflects the intersection of climate adaptation, social justice, and regional development from various perspectives, offering valuable insights into existing and future vulnerabilities, as well as an updated perspective on the interlinks of climate risk and justice.

First Activity: Discussion of the proposed futures

1) Discussion on Scenario 1: "Smart Growth, Fragmented Lives"

In this session, participants analysed **how technological progress impacts rural society** and the necessary balance between **modernisation and the preservation of rural identity**. It was discussed how intangible values, linked to rural traditions and the relationship with the territory, can come into conflict with technological progress when they are not considered. It was highlighted that technology can fix population, but also make it easier for farmers to live in the city while managing farms remotely. It was identified that, despite technological progress, active political intervention is required to ensure that rural areas benefit equitably. In this sense, **technological advances can be seen as double-edged swords.**

One of the main points was the inequality generated by technology, which **favours large farms** while hindering the competitiveness of small farmers. The case of **flax** was mentioned as an example of innovative crops that have failed in their implementation. **Political regulation** was considered key to prevent technological development from prioritising economic benefit over sustainability and social well-being.

The group also addressed the differences between rural and urban areas in **access to services**, highlighting **unwanted loneliness** and the **lack of food marketing** in the producing areas themselves. **Historical migration since the 1960s** was discussed, which has contributed to the current depopulation of Castilla y León, as well as the increasing migration caused by climate change.

Another key issue was the importance of **banking and universities in technological development**, and the threat posed by large companies and investment funds in the exploitation of the territory. **Governance** and the need to strengthen **food autonomy** to improve regional resilience were discussed. The Common Agricultural Policy (**CAP**) was pointed out as insufficient and poorly adapted to the needs of the territory.

Finally, the **cultural loss** associated with the disappearance of family farms and the reduction in the consumption of local products was mentioned, despite the fact that Castilla y León produces a large part of the organic food that is exported.

2) Discussion on Scenario 2: "Fields of progress, seeds of inequality"

The group analysed history and agreed that it is a fairly realistic scenario for Castile and Leon. They highlighted the trend towards an **increasingly industrialised, technologically advanced and automated agriculture,** which leads to a concentration of land in fewer hands, affecting biodiversity and accelerating environmental deterioration.

It was identified that this model **prioritises economic competitiveness** over environmental and social aspects, leaving small farms and the most isolated rural communities in a marginal position. Despite the technological

development, it was pointed out that Castilla y León would continue to lose population, both in cities and towns, and that the ageing of the population would worsen.

The **lack of trust in the regional government** and the progressive reduction of participation in governance were discussed. It was also mentioned that, contrary to what some projections suggest, there is no **competition between local and immigrant youth** in the agricultural sector, as local youth reject these jobs and the workforce in this sector comes mostly from immigrants.

Participants identified large business owners and owners of large farms as the main beneficiaries of the model described in the story. In contrast, the most disadvantaged groups would be:

- *The most isolated rural communities.*
- *Dependent and vulnerable elderly people.*
- *Female caregivers with reduced mobility.*
- *Young people with less education and fewer job options.*

It was highlighted that extreme weather events will disproportionately impact the most vulnerable populations, especially those living in poorer quality, less efficient housing located in higher risk areas. It was concluded that there is **currently no political consensus on the need for adaptation to climate change,** which translates into a lack of institutional coordination.

3) Discussion on Scenario 3: "Grassroots Resilience, Divided Governance"

The discussion focused on the **fragmentation of the territory** and **the lack of a clear adaptation strategy** promoted by the administrations. It was identified that agricultural and environmental policies **are mainly designed at European level, without an approach adapted to local needs**. However, there is a growing trend towards the adoption of agroecological practices, although it remains a small and dispersed fraction.

The discontent of farmers regarding agro-environmental regulations was analysed, since, while they must comply with strict requirements, the importation of products from countries that do not follow these regulations is permitted. The importance of education in sustainability and the need for more specific training strategies for the sector were also discussed.

A key aspect was the **ageing of the farming population**, with an average age of 67 years. It was suggested that the new generation of farmers will be better educated and have a greater capacity to adapt to precision agriculture and new climatic conditions. However, the importance **of preserving local knowledge** was highlighted, especially with regard to crops adapted to the changing climate, such as late almond, pistachio, olive and walnut.

It was mentioned that digitalisation is increasingly integrated into everyday life, making decision-making in agriculture easier. However, **cities will face serious problems** of overcrowding and waste management.

Regarding gender equality, it was highlighted **that women are increasingly involved in innovative and sustainable initiatives** and that they could well **become protagonists in scenarios of fair transitions of rural digital innovation.** However, there is still a lack of a gender focus in agricultural legislation. In addition, the issue of caring for dependent persons was raised, currently largely carried out by migrant women, who remain a vulnerable group.

The need to improve **the integration of the migrant population** in the region was addressed, by promoting their grouping and representation at the local level. Energy poverty was also identified as a growing problem, with increasingly evident inequalities in access to resources.

Finally, the need **to reform the Common Agricultural Policy (CAP)** to prioritise sustainable measures and provide real support to small producers was discussed. It was mentioned that **agricultural unions** play an important role in training, but sometimes come into conflict with universities and technology centres. The lack of coordination between these actors has made it difficult to implement good practices in the sector.

Second activity: Comparison between the three stories and analysis of desirable and undesirable aspects

Desirable and undesirable aspects of the scenario were then identified and the bases of a regional vision were outlined from the perspective of the rural context. The following section presents the summary of the discussions of the three groups on recognising desirable and undesirable aspects:

Desirable Aspects:

- **Balanced and sustainable development model** that includes nature conservation, regulation of the impact of renewable energy on agricultural land, and the promotion of regenerative agriculture.
- **Coordination of governance and greater social participation** in decision-making.
- **Technological modernization with equitable access.** Training and advice on digitalization to achieve resilience in the agricultural sector without generating inequalities.
- **Territorial cohesion and revitalization of the rural environment** Ensuring the right to services in remote areas and creating real opportunities for young people and migrants.
- **Gender equity,** recognizing the role of women in innovation and incorporating a gender perspective into rural development policies.
- **Preservation of cultural and ecological heritage,** strengthening regional identity and ensuring food security.

Undesirable Aspects:

- **Economic and territorial inequalities** Concentration of economic power and decision-making on the big agriculture, exclusion of small farmers.
- **Technology without a social focus** which only favors economic growth.
- **Uprooting and rural depopulation,** exodus of young people due to the lack of opportunities and essential services, aggravated by climate change. Fragmentation and absence of territorial strategies.
- **Crisis of values and loss of rural identity**, disconnection between modernization and preservation of traditions and local knowledge.
- **Biodiversity loss and environmental degradation** reduce ecosystem resilience.

Summary of Vulnerabilities and Justices Considerations for Castilla y León

During the Just Transition Workshop in Castilla y León, several key vulnerabilities and justice considerations were prominently recognized through discussions on future scenarios and regional adaptation processes. The following

sections present an analysis of the general risks, vulnerabilities, and justice considerations that emerged from the workshop's activities.

Risks and vulnerabilities:

- **Technological and economic disparity at disadvantage of small-scale agriculture**
  - **New technologies present a paradox for agriculture**: they offer modernization and potential population retention, yet they risk exacerbating inequality. This is because large agricultural sectors may benefit disproportionately from technological solutions aiming at overcoming the challenges of climate and demographics, while small producers, lacking resources or expertise, could be hindered in adopting digital solutions affecting their possibilities to enter the market. There is a concern that technological development might prioritize economic benefit over sustainability and social well-being.
  - Concentration of **economic power** and **decision-making in large agriculture**, potentially excluding small farmers and leading to land concentration in fewer hands. The threat of large companies and investment funds exploiting the territory.
- **Territorial and demographic challenges:**
  - Persistent **depopulation, aging, isolation and loneliness** are serious and multidimensional challenges, especially in more isolated rural communities that already experience hardship when accessing services and adequate infrastructure.
  - Without **adequate territorial policies**, climate change adaptation initiatives, such as energy transition to solar energy and technological innovations, could lead to greater disconnection of the population from its territory.
- **Environmental degradation and climate change impacts:**
  - The risk of further **biodiversity loss** and **environmental degradation** due to the action of intensive land use is exacerbated by climate change, reducing the resilience of the regional ecosystems.
  - **Extreme weather events** such as droughts and heatwaves will disproportionately impact the most vulnerable populations, particularly those living in poorer quality, less efficient housing located in higher risk areas.
- **Governance and Policy Deficiencies:**
  - A perceived **lack of institutional coordination** and insufficient adaptation of external policies to local reality.
  - The Common Agricultural Policy (CAP) is seen as **insufficient and poorly adapted** to the needs of the territory, not adequately supporting small producers or promoting sustainable models.
  - Fragmentation of the territory and the **absence of a clear adaptation strategy** promoted by administrations.
  - A **lack of general political consensus** translates into a perceived lack of support for local communities and small producers, in favour of external business interests and large-scale industrial actors.
  - A general **loss of tradition in social participation** in decision-making favors the concentration of power.
- **Cultural Loss and Crisis of Values:**
  - The **cultural loss** associated with the disappearance of family farms and the reduction in the consumption of local products results in the increased cultural loss and devaluates the intangible heritage of the region

- A growing **lack of interest in rural life**, coupled with a perceived **crisis of territorial values**, is leading to a loss of rural identity and traditional knowledge tied to the land.

Justice Considerations

The workshop consistently emphasized the importance of fair, inclusive, and equitable adaptation strategies, particularly for vulnerable and marginalized populations. The following factors influencing the implementation of just transitions were identified:

- **Vulnerable populations:**
  - Dependent and vulnerable **elderly people living** in remote areas, as well as **female caregivers**, were identified as highly disadvantaged groups
  - **Young people** with fewer job options and other opportunities are prone to leave the region in search of better employment.
  - **Migrant populations**, often temporary workers, were recognized as particularly vulnerable, with little representation in decision-making, highlighting the importance of better integrating them into local dynamics and ensuring fair working conditions.
  - **Small farmers** and **isolated rural communities** are often left in a marginal position, bearing the burden of adaptation without adequate resources or institutional support.
  - The role of **women** was discussed, noting their growing involvement in rural innovation but also the lack of a gender focus in agricultural policies and challenges in accessing resources and opportunities.
- **Equity and inclusion in adaptation actions:**
  - A primary concern was to ensure that **technological advancements in agriculture benefit all communities**, remaining accessible and promoting overall well-being rather than solely prioritizing economic growth and the enrichment of large-scale agricultural industries.
  - The **unfair distribution** of both **the impact of climate change** affecting already vulnerable populations such as the elderly and the young rural communities, and **the benefits of the new opportunities** brought by adaptation measures, such as technification.
  - The **need to promote social participation** in territorial policies and bottom-up decision-making for a more inclusive and effective adaptation process.
  - Emphasis was placed on **recognizing and supporting vulnerable groups** such as women, immigrants, older adults, and young people in the organization of adaptation.
  - The importance of promoting coexistence between the **young rural population and immigrants** was also highlighted as a crucial justice consideration.

3.9.4. A joint vision for 2044 and actions

Building on the recognised trajectories and vulnerabilities, enhancing climate resilience in Castilla y León greatly depends on investing in updated territorial policies, promoting education and capacity-building tailored to rural realities, including training in sustainable and regenerative practices, climate adaptation, and digital skills for both established and incoming generations of farmers. Strengthening local food systems through the promotion of local markets, shorter value chains, and food sovereignty can also play a central role in increasing both environmental and social resilience.

Castilla y León outlined the element of a desired vision for the future, focusing on achieving fair, inclusive, and equitable climate resilience across four key categories:

1. **Sustainable and Resilient Agriculture:** The vision emphasizes a commitment to **regenerative agriculture,** combining technological innovation with traditional knowledge to reduce the impact of climate change. This involves **promoting sustainable agricultural practices** and ensuring that the **Common Agricultural Policy (CAP)** and **other territorial policies** genuinely support small producers and regenerative methods of the environment. The region aims for a balanced and sustainable development model that includes **nature conservation** and the regulation of the **impact of extractive activities**, including renewable energy, on agricultural land. A key aspect is the development of **agricultural technologies** adapted to climate change and accessible to the entire region, along with **crop variability** as a climate resilience strategy. There's also a focus on preserving and protecting native crops and **ensuring training** and **advice on sustainable agricultural practices** and **new technologies**, particularly for farmers and the elderly.

2. **Participatory and Coordinated Governance:** A future vision for governance in Castilla y León includes **greater coordination** between **administrations** and **sectors**, with active participation of citizens and increased support for civil society initiatives. This means creating **participatory mechanisms** for decision-making in **agricultural and territorial policies** and ensuring that local policies are consistent and adapted to the needs of each community, including the small and isolated localities, promoting fair and equitable development. The workshop highlighted the need for political consensus with greater trust and citizen participation in regional government and the **strengthening of food autonomy/sovereignty** to improve regional resilience and guarantee local markets.

3. **Cultural Identity and Social Cohesion:** The vision for cultural identity and social cohesion prioritizes **valuing rural culture** and **local traditions**, integrating them into modern life. It aims to achieve **gender equality** and recognize the growing role of women in rural transformation and innovation, incorporating a gender perspective into rural development policies. Crucially, **the integration of young people** and **migrants** is seen as a way to strengthen social and cultural cohesion, ensuring they have real opportunities and fair working conditions within the region. There's also an emphasis on preserving the cultural and ecological heritage, which strengthens regional identity and ensures food security.

4. **Sustainable Territorial Reorganization:** Sustainable territorial reorganization in the future vision involves recognizing the interdependencies of **economic activities, environmental balance,** and the **quality of life** for all inhabitants. This includes reorganizing service **infrastructure for remote areas** and ensuring the right to essential services in isolated communities. The vision promotes balanced rural development by **limiting land speculation** and **improving the quality of life** in rural areas to prevent depopulation. There's a focus on **supporting the needs of remote locations** and regulating land use to prevent unsustainable exploitation and manage the expansion of renewable energy to avoid negative impacts on the landscape. The aim is to **make rural development an attractive option** through incentives and facilities for those who wish to live and work in villages.

A joint vision for a just climate resilient Castilla y León:

Castilla y León is committed to a future of just climate resilience deeply rooted in regenerative agriculture, which combines technological innovation with traditional knowledge to effectively reduce climate impact. This includes

reforming territorial policies to genuinely support small producers and promote sustainable practices. This vision emphasizes participatory and coordinated governance, fostering greater citizen involvement in decision-making and ensuring consistent local policies that strengthen food autonomy and sovereignty. Furthermore, it champions cultural identity and social cohesion by valuing rural traditions, achieving gender equality (recognizing women's key role in rural transformation), and ensuring the successful integration of young people and migrants through equitable opportunities to strengthen communities. This future is underpinned by sustainable territorial reorganization, acknowledging the interdependencies of economic activities and environmental balance, leading to reorganized service infrastructure for remote areas and balanced rural development that prevents depopulation, regulates land use, and preserves natural heritage, making rural life an attractive option.

3.9.5. Actions of the Roadmap

The following section presents the region's identified actions within a timeline (Figure 24) that outlines short-term (2025–2027), mid-term (2027–2035), and long-term (post-2035) commitments. It also situates each action within its enabling conditions and specifies the corresponding success criteria.

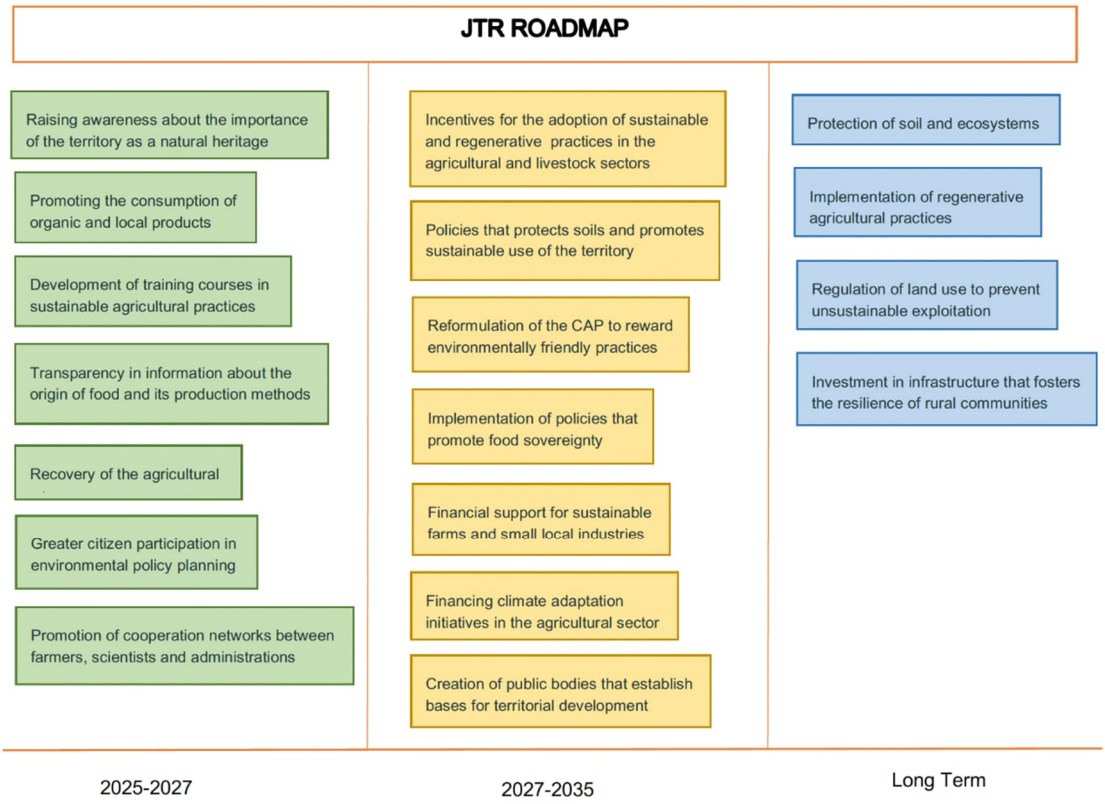


Figure 24. Timeline of actions of the Just Transition Roadmap (Castilla y León).

Table 7. Castilla y León: Actions, Enabling Conditions and Success Criteria.

Action	Enabling Conditions	Success Criteria
Changes in the physical world		
Protection of soil and ecosystems	Clear regulations for soil and ecosystem protection; educational and awareness programs; constant environmental monitoring; active community participation.	Reduction of soil degradation; increase in protected areas; ecosystem recovery; heightened public awareness.
Implementation of regenerative agricultural practices	Economic and technical incentives for regenerative practices; access to knowledge and technologies; institutional support and training.	Increase in adoption of regenerative practices; improvement in soil health and biodiversity; reduction in the use of chemical inputs.
Regulation of land use to prevent unsustainable exploitation	Effective legal framework; monitoring and evaluation systems.	Decrease in cases of unsustainable use; regulatory compliance; better balance between use and conservation.
Changes in behavior and daily practices		
Raising awareness about the importance of the territory as a natural heritage	Educational and communication campaigns; collaboration with schools, media, and organizations; community participation.	Increase in public knowledge; greater involvement in conservation actions; positive changes in environmental behaviors.
Promoting the consumption of organic and local products	Awareness campaigns; local distribution networks; incentives for producers and consumers.	Growth in demand and supply of organic/local products; increase in participation in local markets.
Incentives for the adoption of sustainable and regenerative practices in the agricultural and livestock sectors	Economic support policies; technical training; access to green markets.	Increase in the number of sustainable producers; improvement in environmental indicators.
Changes in laws and regulations		
Policies that protects soils and promotes sustainable use of the territory Reformulation of the CAP to reward environmentally friendly practices	Comprehensive environmental legislation; implementation and oversight mechanisms; inter-institutional coordination. Multisectoral dialogue; design of clear incentives; monitoring and evaluation mechanisms.	Effective policy implementation; reduction in destructive practices; improvement in soil quality. Increase in beneficiaries of green practices; improvement in agricultural sustainability indicators.
Implementation of policies that promote food sovereignty	Legal and financial support; integration of small producers; local marketing systems.	Increase in local production and sustainable consumption; strengthening of rural economies.

Changes in adaptation financing		
Financial support for sustainable farms and small local industries	Access to financing; technical and commercial support programs.	Improvements in economic and environmental viability; increase in the number of sustainable enterprises.
Financing climate adaptation initiatives in the agricultural sector	Specific funds; viable technical projects; monitoring and accountability.	Increase in resilient practices; reduction of losses due to climate events; greater production stability.
Investment in infrastructure that fosters the resilience of rural communities	Participatory planning; financial resources; inter-institutional coordination.	Functional and accessible infrastructure; more resilient and adapted communities.
Changes in knowledge and information		
Development of training courses in sustainable agricultural practices	Appropriate curriculum design; availability of experts; accessibility for farmers.	Active participation; improvement in knowledge and practical application.
Transparency in information about the origin of food and its production methods	Traceability systems; public access to information; labeling regulations.	Informed consumers; increase in trust and responsible demand.
Recovery of the agricultural advisory service	Trained human resources; allocated budget; effective communication channels.	Greater access to advisory services; improvement in productive and sustainable practices.
Changes in the organization of adaptation		
Creation of public bodies that establish bases for territorial development	Clear definition of roles; technical and financial resources; political support.	Effective coordination; implementation of sustainable territorial plans.
Greater citizen participation in environmental policy planning	Consultation platforms; transparency; training for community stakeholders.	High participation; inclusive and socially accepted plans.
Promotion of cooperation networks between farmers, scientists and administrations	Dialogue spaces; formal collaboration mechanisms; institutional support.	Joint projects implemented; effective knowledge transfer; institutional strengthening.

3.9.6. Conclusions

The Just Transition Roadmap for Castilla y León reveals a region grappling with the complex challenges posed by demographic decline, climate vulnerability, and economic transformation. Through a participatory process under the Regions4Climate project, key pathways have been identified to address both urgent needs and long-term resilience goals. This roadmap reflects a nuanced understanding of the region's multifaceted situation, emphasizing solutions that balance immediate responses with sustainable development.

Among the primary vulnerabilities identified are technological disparities that place small-scale agriculture at a disadvantage, persistent territorial inequalities worsened by depopulation and an aging population, and environmental degradation intensified by climate change. These issues are further compounded by fragmented

governance, limited policy coordination, and the gradual erosion of rural cultural identity, creating a complex web of interrelated challenges that require integrated and inclusive responses.

At the heart of the roadmap is a focus on justice and equity. Climate adaptation efforts must prioritize vulnerable groups such as elderly residents in remote areas, female caregivers, young people facing limited opportunities, migrant workers, and small farmers. The participatory process highlighted that without intentional and targeted interventions, technological advances and adaptation measures risk exacerbating existing inequalities rather than alleviating them, underscoring the need for inclusive policies and practices.

Looking ahead to 2044, Castilla y León envisions a future anchored in four interconnected pillars. These include sustainable and resilient agriculture that blends innovation with traditional knowledge; participatory and coordinated governance that strengthens citizen involvement; a commitment to preserving cultural identity and fostering social cohesion by valuing rural traditions and integrating diverse populations; and sustainable territorial reorganization that guarantees equitable access to services and opportunities across the region. This vision offers a comprehensive framework for systemic transformation rooted in justice and resilience.

The roadmap outlines a strategic framework of actions that span multiple domains. These include protecting soils, implementing regenerative agricultural practices, reforming territorial policies, and strengthening food sovereignty. Recognizing that effective climate adaptation demands more than isolated initiatives, the roadmap emphasizes simultaneous changes in infrastructure, behavioral practices, regulatory frameworks, financing, knowledge systems, and organizational structures to create a holistic and sustainable approach.

3.10. Nordic Archipelago

This roadmap was developed by Skärgårdssamarbetet and Demos Helsinki

3.10.1. Introduction

The Nordic Archipelago is a vast area covering the archipelago regions of the counties of Stockholm, Uppsala, Sörmland, and Östergötland in Sweden, and the Uusimaa and Kymenlaakso counties of Finland, and Åland. Spanning approximately 1,580 km² with a population of around 30,000, the area is characterized by its low population density and a strong reliance on maritime industries such as shipping, ferry services, tourism, and the processing of agricultural and fishery products. These activities are vital for the local economy and daily life, especially given the region's dispersed island geography.

To find a meaningful scope for the Regions4Climate just transition roadmap process, the roadmap facilitators and the regional partner Nordiska Skärgårdsamarbetet (NAC) decided to focus on the Turku archipelago in Southwest Finland and Åland Islands. For practical reasons, the final focus of the roadmap was on the Turku archipelago area (see next section on methodology).

Skärgårdsamarbetet had identified a specific knowledge gap in better understanding how climate change affects critical infrastructure in the region, and how the transition to a climate-resilient infrastructure can happen in a socially just way, that takes into consideration the most vulnerable groups affected. The just transition roadmap process aimed to respond to this need by leveraging local, context-specific knowledge and experiences on the topic.

3.10.2. Methodology

The Just Transition Roadmap process in the region aimed to focus on the following questions:

- What are the main risks climate change poses on infrastructure in the area and how well is the region prepared for these risks?
- How could the infrastructure be made more resilient in collaboration with neighboring regions, different municipalities, and local stakeholders and inhabitants?
- Who are the most vulnerable groups affected?

To map the current state of awareness on climate risks to infrastructure, a risk identification workshop was held in Turku in February 2025. The workshop brought together regional experts on infrastructure and climate change issues. The workshop aimed to identify central risks posed by climate change to infrastructure in the region and to prioritise these based on possible impact, probability, and urgency, as well as to get a better understanding of the state of preparedness to climate risks in the region.

The risk identification was followed by a participatory citizen workshop held in Nauvo in Parainen in June 2025. The workshop convened local stakeholders and residents to share their lived experiences about the risks posed by climate change on infrastructure, and how these affect different groups. A similar workshop was meant to be held in Mariehamn in Åland in May, but it needed to be canceled due to illness.

3.10.3. Vulnerability and justice summary

The Turku archipelago is a sparsely populated region in South-West Finland and a geographical mosaic of tens of thousands of islands. The remote and scattered nature of the archipelago makes its residents and entrepreneurs in general particularly vulnerable to climate change. If the connection to the archipelago is permanently or temporarily disrupted, it will affect the whole society, as most supplies are transported via ferry connection and many inhabitants are commuting to the mainland daily. In some circumstances, such as too strong winds or high sea levels, the ferries will stop operating as they cannot properly moor.

Tourism is a central livelihood in the region, but it also creates pressure on local infrastucture and leaves the costs for taking care of the crucial infrastructure on the locals.

One vulnerable group in the region are farmers and other primary producers. Strong fluctuation of rainfall affects the spring and autumn sowing and may destroy the cattle's feed. In this case, cattle feed needs to be imported from the mainland, which increases farmers' costs. Secondary risks are posed by new or alien species that may cause harm both in farming and forestry. Fisheries have already declined due to various environmental stresses in the Baltic Sea. A warmer climate and shorter periods of ice cover are accelerating the process.

3.10.4. Risks identified

Main risks concerning the infrastructure identified in the risk identification workshop were the following:

Resilience of water supply

- The catchment area for rainwater is small in the archipelago. Dryer summers decrease the amount of fresh water available, while the tourist season is at its peak.
- The level of seawater affects freshwater availability and seawater can seep into wells.This is particularly harmful for farmers, whose livelihood require vast amounts of fresh water.
- Desalination of seawater for domestic use requires electricity, and electricity cuts in times of storms pose a challenge.

Functioning of roads and ferries

- The region is highly dependent on ferry traffic and imports from the mainland and commuting on daily basis, which makes it vulnerable to changing weather conditions.
- Docks, ferry docks, and road embankments are affected by sea level rise. The situation worsens if it rains for several consecutive days.
- Strong winds or too high sea levels that affect the mooring of ferries.
- The region is planning to electrify its ferry traffic, which will decrease emissions, but can also create new dependencies.
- Increasing hourly downpours challenge permeable surfaces. Infrastructure often requires paved surfaces that do not absorb water, hence, flood-prone areas around infrastructure are increasing.
- Roads and buildings are affected by frost damage following soil movement, as the volume of water in the soil changes when it alternately freezes and thaws.

- Tourism is under strong growth pressure, yet extreme conditions and rapid weather fluctuations pose significant challenges to maintaining infrastructure capable of supporting growing visitor numbers.

Risk of electricity and ICT connection cuts

- Telecommunications: power outages, telecommunications outages.
- There are already now challenges with internet connections in peak tourist seasons.

Risks to buildings

- Moisture risks for buildings when there are no sufficiently long dry periods.
- Marine flooding, sea spray, wind, and possibly erosion pose risks to properties.
- More often “horisontal “ rain fall, more moisture impact on buildings.

Residents’ and decision-makers' skills, capabilities, and attitudes in preparedness

- Contingency plans, including evacuation plans exist, but are they sufficient and readily available everywhere?
- A systematic lack of drought and flood risk management, for example, from the perspective of agriculture.
- Are residents prepared and skilled enough to get by for several days, if e.g.,roads, ferries, and/or telecommunications connections are cut?
- General loss of communality, that would support collective preparedness.

3.10.5. Proposed actions

The participants of the citizen workshop identified the following as key actions needed to address the risks posed by climate change on the archipelago infrastructure and its residents.

Agriculture

- Explore new cultivation opportunities suited to a warming northern archipelago climate.
- Support diverse cultivation to reduce risks from alien species and plant diseases.
- Avoid monoculture to build resilience.

Self-Sufficiency

- Strengthen residents’ ability to live more self-sufficiently, allowing better preparedness for disruptions e.g. in ferry traffic.
- Recognize the growing importance of self-sufficiency as a positive future prospect, also for agriculture.
- Strengthen communality as a foundation for climate preparedness.
- Support the third sector in providing information, preparedness training, and community activities.

Water Management

- Raise awareness of sustainable water use, especially among tourists.
- Make water-saving technologies and rainwater harvesting mandatory.

- Support projects developing smart sewage systems for circular nutrient use at the local level.
- Promote storage and reuse of rainwater.

Built Environment and Culture

- Utilize and preserve traditional construction methods in adaptation strategies.

Tourism and Economy

- Support sustainable tourism that balances economic benefits with ecological resilience.
- Extending the tourist season beyond the peak period so that the number of visitors would be distributed more evenly.
- Distribute infrastructure-related costs of climate change more evenly (e.g., taxation of summer residents or tourism tax).

3.11. Sitia

This suggestion for a roadmap for Sitia is based on the results of a workshop held In Sitia with 15 participants[7] (May 8th, 2025). The participants assessed how the Territorial Just Transition Plan (TJTP) for the North & South Aegean Islands and Crete 2021 affects Sitia, which would be beneficial impacts, and what would cause challenges. Based on this assessment, the participants identified a set of positive aspects and social concerns that they would like to see addressed by local actions.

This suggestion is based on very limited material and was compiled by Demos Helsinki. The suggestion has not been reviewed or adopted by the Regions4Climate project partner Municipality of Sitia.

3.11.1. Introduction

The Territorial Just Transition Plan (TJTP) sets out how the North and South Aegean Islands and Crete will adapt to the EU target of climate neutrality by 2050. Greece has committed to phasing out lignite by 2028 and decarbonising islands by 2029. This requires decommissioning thermal power stations, expanding renewable energy capacity through interconnections and hybrid systems, and ensuring that islands eventually run entirely on clean energy.

The transition poses challenges. Around 1,220 jobs in local power plants are at risk, with further losses expected across supply chains and local economies. Many islands already struggle with geographic isolation, weak infrastructure, and high unemployment, particularly in the North Aegean. EU climate policies affecting shipping and aviation may increase costs and reduce connectivity, adding pressure to island economies that depend heavily on tourism and maritime activities.

To address the issues Greece is facing with the transition, the TJTP identifies five priorities. These are supporting entrepreneurship and innovation, promoting renewable energy and energy efficiency, ensuring fair labour transition through training and reskilling, fostering integrated local projects such as the Greco Islands initiative, and, to a lesser extent, circular economy and land-use measures. Tourism and the blue economy are highlighted as key sectors where the green transition can create new opportunities.

3.11.2. Vulnerability and justice considerations

According to the plan and participant's reflections, Crete is one of the territories most affected by the transition, since its electricity generation will shift away from thermal plants such as Linoperamata, Chania, and Atherinolakkos, with the first two scheduled for closure and the last kept only as an emergency reserve. As a result, it is estimated that 50% of all employees in the island's power plants—including both permanent and temporary staff, equivalent to 243 full-time positions—will lose their jobs. At the same time, the local economy will lose approximately €2 million in annual payments from the Public Power Corporation (PPC) to local suppliers. The combined loss of around €7.3 million in annual income and €2 million in regional expenditure will further reduce employment by an estimated 118 jobs and lower the added value of the local economy by €5.6 million each year.

[7] Information based on oral communication at the Regions4Climate Consortium Meeting, Copenhagen, May 22nd, 2025

This decline is driven by reduced consumer spending and the disruption of supply chain activities previously supported by the power plants. The sectors most affected are energy, tourism, and the blue economy. These losses are compounded by the limited ability of the islands to attract new and modern activities that appeal to environmentally conscious tourists especially in the blue economy - particularly maritime transport and coastal tourism. The region is also facing challenges with connectivity. The reduction in relevant spending will affect both the local tourism product directly and a wide range of related activities connected to supply chains and worker consumption.

On the other hand, the creation of new jobs in renewable energy, especially during both the construction and operational phases of projects, can provide a significant boost to local economies. Employment in green energy and renewable energy sources (RES) can act as a driver for economic diversification and sustainable development in island regions.

3.11.3. A vision for the future

Based on the analysis of the Territorial Just Transition Plan, the participants envision for the Sitia region a future where building stronger resilience against natural disasters such as earthquakes and Mediterranean hurricanes will safeguard the communities of Sitia and create a more secure foundation for sustainable development. Ensuring fair prices for products with Protected Designation of Origin (PDO) will protect local producers and consumers from the impact of rising energy costs. Mobility and access are no longer a burden. Reducing the cost of passenger transport will strengthen connectivity and ease the disproportionate pressures on the people of Sitia, who are often forced to make frequent air and sea journeys because of the lack of basic local services.

To make the vision of a just transition for the Sitia region achievable, several interconnected concerns require attention. First, strengthening and promoting entrepreneurship is essential for diversifying the local economy and creating opportunities beyond traditional sectors, while the energy transition toward climate neutrality must ensure that renewable energy development brings real benefits to the community in terms of lower costs and local employment. Second, land use readjustment and the adoption of circular economy practices will be critical for preserving natural resources and embedding sustainability into agriculture, tourism, and waste management. Thirdly, a just labor transition is needed so that workers affected by the closure of traditional facilities or other structural changes can access retraining and secure new jobs. Finally, integrated small-scale interventions, such as improvements in connectivity, infrastructure, and community-led projects, will play a vital role in addressing immediate needs and building local trust. Together, these concerns define the areas that demand the greatest attention and investment to turn the vision for Sitia into a fair, resilient, and sustainable reality.

3.11.4. Actions

The workshop participants identified the following actions needed to support the transition:

- Investing in affordable and resilient energy systems
- Strengthening preparedness (e.g. citizen engagement in disaster risk reduction practices, municipal GIS / apps for real time information on hazards, improving the condition of the road network)
- Investing in green jobs (e.g biological farming)

3.12. Troodos

This roadmap was jointly developed by Troodos Network and Cyprus Energy Agency (CEA)

3.12.1. Introduction

Climate change severely affects regions, communities, and livelihoods across the EU and globally. Adapting to the changing climate is inevitable. Yet, if the process of climate change adaptation is not carefully thought through, it risks aggravating already existing inequalities in society and exacerbating the burdens for those who are the most affected by the impacts of climate change. This calls for a just transition to climate resilience.

In the Troodos region of Cyprus, the effects of climate change are already evident, threatening both natural and cultural heritage and placing additional strain on local communities. To address these challenges and explore pathways toward an inclusive and fair adaptation strategy, a participatory workshop was held at the Conference Centre of Troodos Hotel on 11 February 2025. The workshop gathered 14 participants representing a diverse mix of backgrounds, including tourism, environment, local governance, the Troodos Fire Service, and the hospitality industry. The group also reflected a wide range of ages, from young adults in their twenties to individuals approaching retirement and encompassed various family structures and social classes.

The event commenced with a presentation by CEA, outlining the project's core objectives and underscoring the importance of inclusive and equitable social, economic, and environmental transitions. The concept of a just transition was introduced, along with future scenarios for 2045 as tools to explore developmental pathways and assess potential social impacts.

Following the presentation, participants were divided into two groups, each facilitated by representatives from CEA and the Troodos Network. The workshop methodology combined scenario narrative discussions with structured group exercises. Participants engaged in an interactive process to address guiding questions on future outcomes—identifying potential beneficiaries, those at risk of exclusion, and measures to enhance community resilience.

This participatory format fostered dynamic exchanges and captured diverse perspectives across the Troodos region. Key themes included the impact of reduced snowfall on tourism and forest ecosystems, crop damage from extreme weather events, limited public transport, village isolation, and unequal access to services.

This roadmap was prepared as part of the Regions4Climate (R4C) – Building Resilient Communities EU Project (Grant agreement ID: 101093873), funded under the HORIZON 2.5 – Climate, Energy and Mobility programme (Call: HORIZON-MISS-2021-CLIMA-02-04 – Large scale demonstrators of climate resilience creating cross-border value).

The resulting insights will inform future planning and help ensure that climate change adaptation in Troodos does not merely address immediate risks but also supports a just and inclusive transition for all residents.

3.12.2. Roadmap Approach and Design

Co-Development Process of the Roadmap

The roadmap was co-developed during a participatory workshop that brought together regional stakeholders, experts, and community representatives. A **single workshop** was organized as part of the broader initiative to develop a sustainable and resilient vision for the Troodos region. It took place at the **Conference Centre of Troodos Hotel** on **February 11, 2025**, from **10:00 to 16:45 (Cyprus time)**, and included **14 participants**. This was the **first such workshop held in the region**, aiming to facilitate scenario-based thinking, stakeholder dialogue, and collective visioning.

The workshop and resulting roadmap form an integral part of the R4C project's broader objective in Troodos: **to transform the region into a climate-neutral and regenerative tourism destination**.

Participants and Invitations

To ensure broad and meaningful stakeholder engagement aligned with the R4C project's overarching goal of promoting sustainable tourism in Troodos, the workshop invited participants whose roles are directly connected to key sectors such as tourism, environmental management, agriculture, and local governance. The group represented a diverse mix of expertise, including professionals from tourism organizations, environmental bodies, local authorities, the Troodos Fire Service, and the hospitality industry.

The workshop also benefited from a wide demographic representation, with participants ranging in age from 25 to over 60, encompassing various educational backgrounds and social contexts. This diversity enriched the discussions with a broad spectrum of perspectives rooted in personal experiences and everyday challenges faced in the region.

An added value was the inclusion of individuals from different family structures—ranging from young singles and newlyweds residing in Troodos, to families with young children, empty-nesters, and individuals approaching retirement. This variety contributed to a comprehensive understanding of the socio-economic impacts of climate change and the resilience needs of the Troodos community.

Geographically, participants came from multiple communities across different altitudes within the Troodos region, each facing distinct social and climate challenges. These included impacts on agricultural production due to climate variability, reduction in tourism earnings attributed to climatic factors, housing affordability for young families, limited public transportation between villages, insufficient bus routes connecting to major urban centres. Such insights were instrumental in shaping a roadmap that reflects the lived realities and priorities of the local population. Unfortunately, due to scheduling conflicts and severe weather conditions (snowfall) on the day of the workshop, some invitees were unable to attend. The participants invited to the workshop included:

- *Deputy Ministry of Tourism (attended)*
- *Troodos Fire Service (attended)*
- *Ministry of Agriculture (did not attend)*
- *Local Authorities - Regional Secretary of Troodos Cluster (attended)*
- *Local Authorities - President – Amiantos Community Council (attended)*
- *Commissioner of the Environment (did not attend)*

- *Troodos Regional Board of Tourism (attended)*
- *Farmers cooperatives (did not attend)*
- *Troodos Regional Development Agency (attended)*
- *Troodos Hoteliers (attended)*
- *Director of Troodos Development Agency (did not attend)*
- *Cyprus Energy Agency (attended)*
- *Troodos Network & European Rural Parliament (attended)*
- *Community Council of Kakopetria (did not attend)*
- *Commissioner of Mountainous areas (did not attend)*

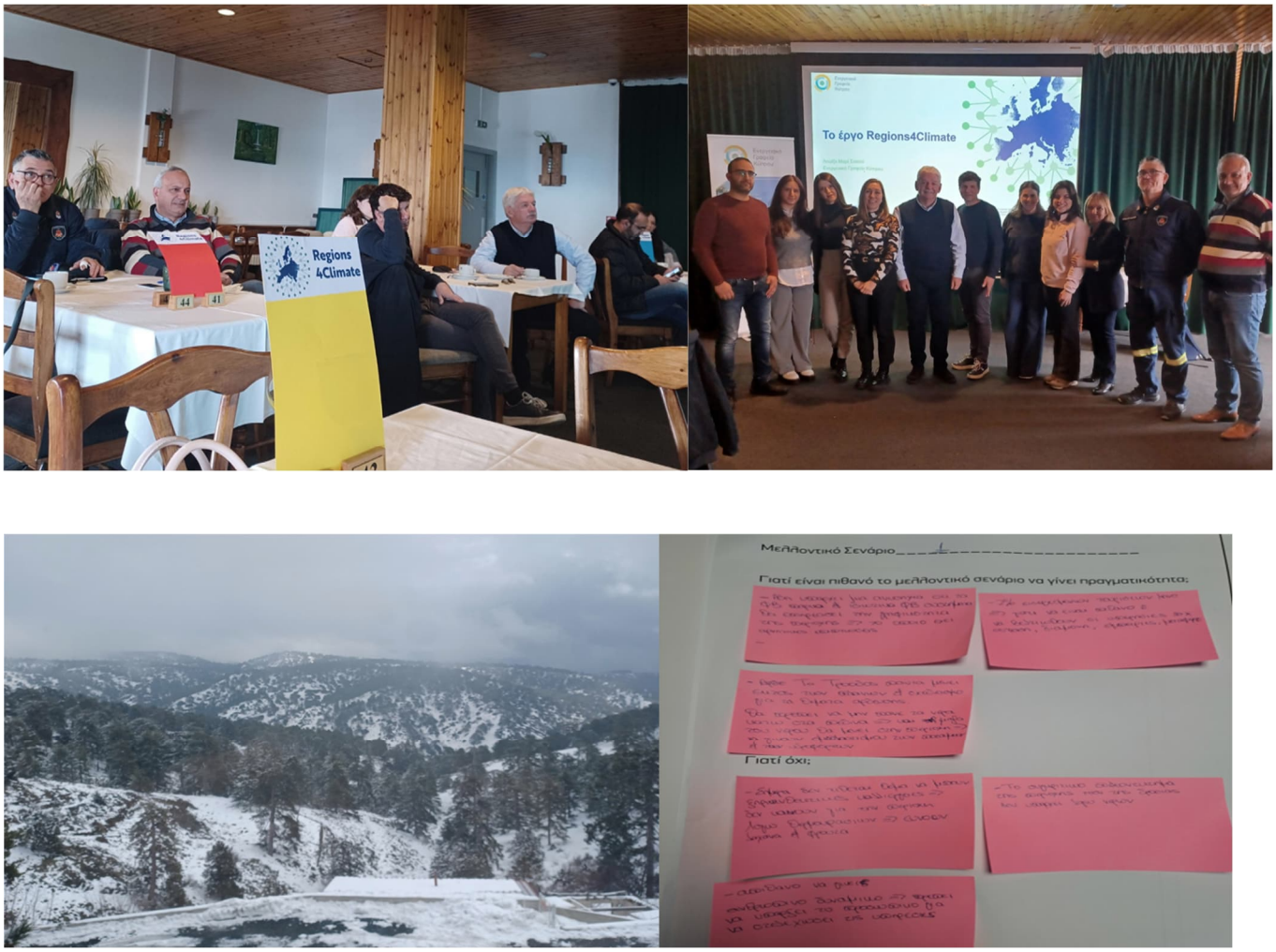


Figure 25. Workshop on February 11, 2025. The participants, snowy Troodos and completed canvas.

Workshop approach

The workshop employed **scenario-based group discussions** as a central methodology to explore future challenges and opportunities for the Troodos region. Four distinct scenarios were developed to illustrate alternative pathways for the area's development, each integrating social, economic, and environmental dimensions. These scenarios served as tools to identify potential risks and opportunities, enabling participants to critically assess how different factors may interact under varying conditions.

By engaging stakeholders in this forward-looking exercise, the workshop aimed to foster strategic thinking and informed decision-making. The process highlighted how current choices could influence long-term outcomes, supporting the co-creation of a sustainable and resilient future for Troodos. Special emphasis was placed on climate justice, ensuring that the perspectives of diverse community members were considered in shaping the roadmap.

The scenarios developed for Troodos were the following:

Scenario 1: Green Divide – Troodos in 2040 (Green)

By 2040, Troodos has achieved major environmental progress through rapid adoption of green technologies like solar power, drought-resistant crops, and efficient irrigation. However, these benefits are unevenly shared. Wealthier groups and businesses thrive, while small farmers, low-income households, and isolated villages struggle with unemployment, rising costs, and social exclusion. The region faces growing inequalities as green innovation advances, but many traditional communities are left behind.

Scenario 2: Stuck in Transition - Troodos in 2040 (Blue)

By 2040, Troodos remains in a state of partial transition. Agriculture and infrastructure have improved in some areas, but small farmers, tourism, and rural communities struggle with high costs, climate impacts, and limited investment. The region faces droughts, heatwaves, wildfires, and biodiversity loss, while progress towards renewable energy and resilience has been slow, leaving many communities vulnerable and unequal.

Scenario 3: Tenuous Ground – Troodos in 2040 (Yellow)

By 2040, Troodos faces rising nationalism and reduced global cooperation, relying mainly on community-driven initiatives. Traditional farming and solar energy provide some resilience, but high costs, water scarcity, and limited infrastructure investment leave small farmers and households struggling. Tourism has declined due to harsher climate conditions, while droughts, heatwaves, and cloudbursts threaten cultural landscapes. The region stands at a fragile crossroads, with resilience efforts undermined by economic vulnerability and lack of sustainable development.

Scenario 4: The Margins of Progress – Troodos in 2040 (Red)

By 2040, Troodos faces deepening inequality as wealth and opportunity concentrate in select sectors while rural and low-income communities fall behind. Agriculture remains central but increasingly unsustainable, with water scarcity, soil degradation, and high costs straining small farmers. Tourism benefits coastal areas more than the mountain region, leaving many communities excluded. Rapid renewable energy expansion has reduced reliance on fossil fuels but has damaged landscapes and heritage sites, sparking local tensions. Meanwhile, climate change

brings frequent droughts, wildfires, and floods, devastating ecosystems. Overall, Troodos is caught between progress and inequality, with vulnerable communities left behind in a future of uneven development.

The scenarios played a pivotal role in the workshop methodology, serving as effective tools to stimulate creative thinking, facilitate meaningful stakeholder dialogue, and promote long-term strategic planning for the future of the Troodos region. By framing diverse and plausible futures, the scenarios enabled participants to engage critically with complex topics such as climate resilience and justice, fostering a shared understanding of potential.

Overview of Workshop Activities

At the outset of the workshop, participants were divided into two groups to facilitate structured and focused discussions. The group composition was carefully considered to ensure sectoral diversity, with each group including representatives from various fields such as tourism, environmental management, agriculture, and local governance. This approach was designed to encourage a wide range of perspectives and insights, enriching the dialogue and enhancing the quality of the outcomes through cross-sectoral exchange.

Group 1 included:

- President of Amiantos Community Council
- Tourism expert from the Troodos Regional Board of Tourism
- Architect and Environmental Engineer from the Troodos Development Agency
- National Champion of the European Rural Parliament
- Climate change expert, Cyprus Energy Agency

Group 2 included:

- Deputy Ministry of Tourism
- EU grants expert, from the Troodos Development Agency
- Fire Service representative
- Regional policy maker
- Sustainable rural development expert, DIKTET
- Climate change expert, Cyprus Energy Agency

As part of a strategic workshop, a series of structured canvases were employed to guide participant discussions and support the development of a forward-looking action plan. These canvases served as a practical framework, enabling participants to systematically explore complex topics, share diverse perspectives, and collaboratively generate ideas.

One such canvas, titled "Region 2045", exemplifies this approach. It was designed to facilitate a comprehensive exploration of the region’s potential future, encouraging participants to envision and articulate a detailed narrative for the year 2045. The canvas was divided into key thematic sections, each prompting reflection and dialogue on critical dimensions of regional development under future climate change:

- **Future Storyline**: Participants crafted narratives describing their vision for the region’s future.
- **Drivers and Barriers**: They examined why this future might or might not materialize.
- **Regional Characteristics**: This section captured the defining features of the envisioned future.

- **Daily Life and Change**: Participants compared everyday life in 2045 with that of 2024, highlighting major shifts.
- **Social Equity**: Discussions focused on which population groups might thrive or struggle, and what fairness would look like in this future.
- **Climate and Inequality**: The canvas prompted analysis of how climate change could deepen social inequalities, identifying who benefits from adaptation and who bears the financial burden.
- **Additional Notes**: A space for further insights and reflections.

By engaging with these canvases, participants were able to explore the future in a structured and inclusive manner. This process ensured that the resulting action plan was grounded in a shared understanding of long-term challenges and opportunities, and reflected a broad spectrum of social, environmental, and economic considerations.

Summary of Workshop Results

This section presents the key outcomes and insights generated through the workshop discussions, reflecting stakeholder perspectives, which were used to define the Just Transition Roadmap.

Group 1

At the beginning of the session, participants engaged in a structured reading of Scenario 1 (Green), ensuring a shared understanding of the context and establishing a foundation for meaningful reflection. This initial step enabled participants to consider key issues before addressing the questions presented in the first discussion canvas. The group actively exchanged ideas, fostering a dynamic and inclusive dialogue enriched by the diverse expertise of its members.

This scenario envisions a future for the Troodos region shaped by environmental, economic, and social dynamics under the influence of climate change and external investment.

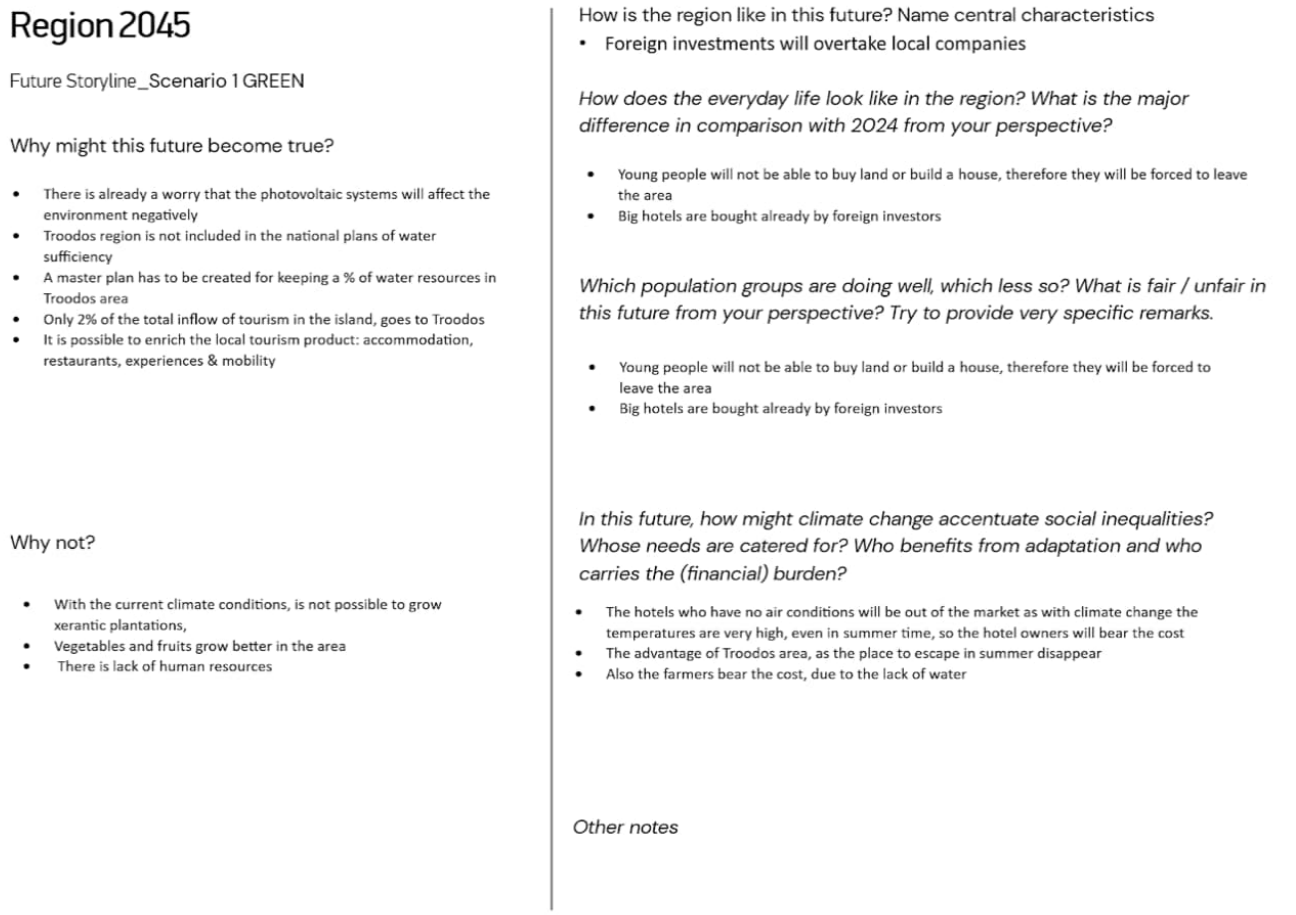
The canvas exercise prompted a series of discussions among participants, through which the following insights and reflections emerged:

- *Concerns over the environmental impact of photovoltaic systems, including landscape concerns.*
- *Troodos' exclusion from national water management plans, highlighting the need for a regional water resource strategy.*
- *Currently, only 2% of the island's tourism reaches Troodos, indicating untapped potential.*
- *Climate conditions limit agricultural viability.*
- *Opportunities exist to enrich the local tourism offering through improved accommodation, dining, experiences, and mobility.*
- *Possible barriers to development include a shortage of human resources.*

Should Scenario 1 be realised, participants envision that by 2045, the Troodos region would be characterised by the following:

- *Foreign investment dominates, potentially displacing local enterprises.*
- *Ownership of major hospitality assets shifts to external stakeholders.*

- *The shift in economic control and environmental stressors raises concerns about fairness and long-term community resilience.*
- *Young residents will face significant barriers to land ownership and housing, leading to rural exodus.*
- *Decline in the traditional role of Troodos as a summer refuge due to rising temperatures.*
- *Social inequalities are exacerbated by climate change, with domestic hotel owners and farmers bearing the financial burden of adaptation.*
- *The needs of vulnerable groups, particularly young families and local entrepreneurs, are insufficiently addressed.*



Region 2045

Future Storyline_Scenario 1 GREEN

Why might this future become true?

- There is already a worry that the photovoltaic systems will affect the environment negatively
- Troodos region is not included in the national plans of water sufficiency
- A master plan has to be created for keeping a % of water resources in Troodos area
- Only 2% of the total inflow of tourism in the island, goes to Troodos
- It is possible to enrich the local tourism product: accommodation, restaurants, experiences & mobility

Why not?

- With the current climate conditions, is not possible to grow xerantic plantations,
- Vegetables and fruits grow better in the area
- There is lack of human resources

How is the region like in this future? Name central characteristics

- Foreign investments will overtake local companies

How does the everyday life look like in the region? What is the major difference in comparison with 2024 from your perspective?

- Young people will not be able to buy land or build a house, therefore they will be forced to leave the area
- Big hotels are bought already by foreign investors

Which population groups are doing well, which less so? What is fair / unfair in this future from your perspective? Try to provide very specific remarks.

- Young people will not be able to buy land or build a house, therefore they will be forced to leave the area
- Big hotels are bought already by foreign investors

In this future, how might climate change accentuate social inequalities? Whose needs are catered for? Who benefits from adaptation and who carries the (financial) burden?

- The hotels who have no air conditions will be out of the market as with climate change the temperatures are very high, even in summer time, so the hotel owners will bear the cost
- The advantage of Troodos area, as the place to escape in summer disappear
- Also the farmers bear the cost, due to the lack of water

Other notes

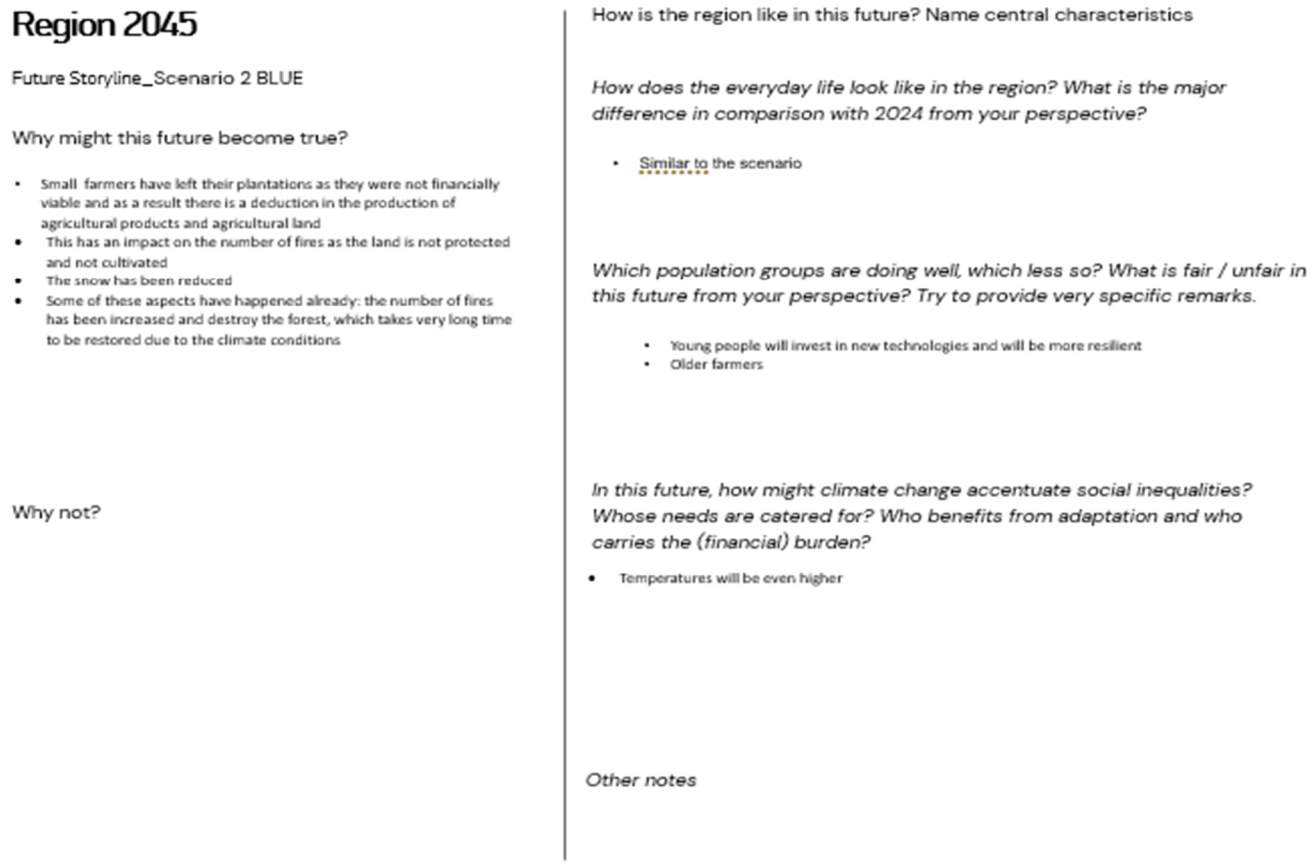
Figure 26. Future Storyline: Completed Canvas for Scenario 1 (Troodos).

The same structured approach was applied to Scenario 2 (Blue), allowing participants to build upon earlier discussions while exploring a new thematic context. Throughout the session, the group demonstrated strong collaboration, thoroughly examining each point before progressing. This ensured that all voices were heard and contributed to a comprehensive set of insights and perspectives relevant to the future resilience of the Troodos region.

- *The canvas exercise prompted a series of discussions among participants, through which the following insights and reflections emerged:*
- *Abandonment of small farms due to financial unsustainability has led to reduced agricultural activity and increased wildfire risk.*
- *Uncultivated land is more vulnerable to environmental degradation, including forest fires and loss of snow cover.*
- *Some of these environmental changes are already observable, indicating a trajectory toward worsening conditions.*
- *Climate change is expected to intensify, with higher temperatures affecting both ecosystems and communities.*
- *Technological innovation presents opportunities for adaptation, particularly among younger populations.*
- *Older farmers face challenges due to the decline of traditional agricultural practices and limited access to new technologies.*

Should Scenario 2 be realised, participants envision that by 2045, the region would be characterised by the following:

- *Agricultural landscapes will be increasingly abandoned, contributing to ecological vulnerability.*
- *Slow regeneration of the forest ecosystem, hindered by climate stressors and lack of active land management.*
- *Young people will lead adaptation efforts through technological investment, while older generations may struggle to keep pace.*
- *Climate change will deepen social inequalities, with adaptation benefits skewed toward those with financial and technological resources.*
- *Vulnerable groups, including older farmers and low-income households, will bear the brunt of environmental and economic pressures.*
- *The region's resilience will depend on inclusive strategies that address both environmental restoration and social equity.*



Region 2045

Future Storyline_Scenario 2 BLUE

Why might this future become true?

- Small farmers have left their plantations as they were not financially viable and as a result there is a deduction in the production of agricultural products and agricultural land
- This has an impact on the number of fires as the land is not protected and not cultivated
- The snow has been reduced
- Some of these aspects have happened already: the number of fires has been increased and destroy the forest, which takes very long time to be restored due to the climate conditions

Why not?

How is the region like in this future? Name central characteristics

How does the everyday life look like in the region? What is the major difference in comparison with 2024 from your perspective?

- Similar to the scenario

Which population groups are doing well, which less so? What is fair / unfair in this future from your perspective? Try to provide very specific remarks.

- Young people will invest in new technologies and will be more resilient
- Older farmers

In this future, how might climate change accentuate social inequalities? Whose needs are catered for? Who benefits from adaptation and who carries the (financial) burden?

- Temperatures will be even higher

Other notes

Figure 27. Future Storyline: Completed Canvases for Scenario 2 (Troodos).

Group 2 – Scenarios 3 and 4 (Yellow and Red Scenarios)

At Group 2, Scenarios 3 and 4 (Yellow and Red) were examined using the same methodology as in Group 1.

The discussion was highly interactive, with all participants actively sharing their ideas. Facilitators recorded the contributions, ensuring that each participant had an equal opportunity to speak. In addition, valuable perspectives were provided by two new residents of the Troodos area, who shared personal insights on the benefits and challenges of relocating from a city to a mountain village, especially in the context of climate change and resilience.

The canvas exercise prompted a series of discussions among participants, through which the following insights and reflections emerged:

- *Scenario 3 represents a near-continuation of the present situation in Troodos, underscoring the risk of inaction.*
- *Agricultural viability is significantly compromised due to water scarcity and rising operational costs.*

- *Citizens bear the financial burden of high energy and water expenses.*
- *Small communities face challenges stemming from limited knowledge, awareness, and access to expert support.*
- *Strategic cooperation with specialised organisations will be essential for building resilience.*

Should Scenario 3 be realised, participants anticipate that by 2045, the Troodos region will be characterised by the following:

- *Agriculture will be severely impacted, with water shortages and high input costs threatening sustainability.*
- *Vulnerable groups-including older adults, low-income households, and children-will be disproportionately affected due to inadequate mobility systems and limited access to resources.*
- *More resilient groups will include high-income individuals, proactive residents who have invested in green technologies, and farmers employing traditional, sustainable practices.*
- *Climate change will exacerbate social inequalities, with adaptation benefits accruing to wealthy investors and entrepreneurs, while low-income populations face increasing hardship.*
- *The region's future resilience will depend on inclusive planning, equitable access to resources, and targeted support for vulnerable communities.*

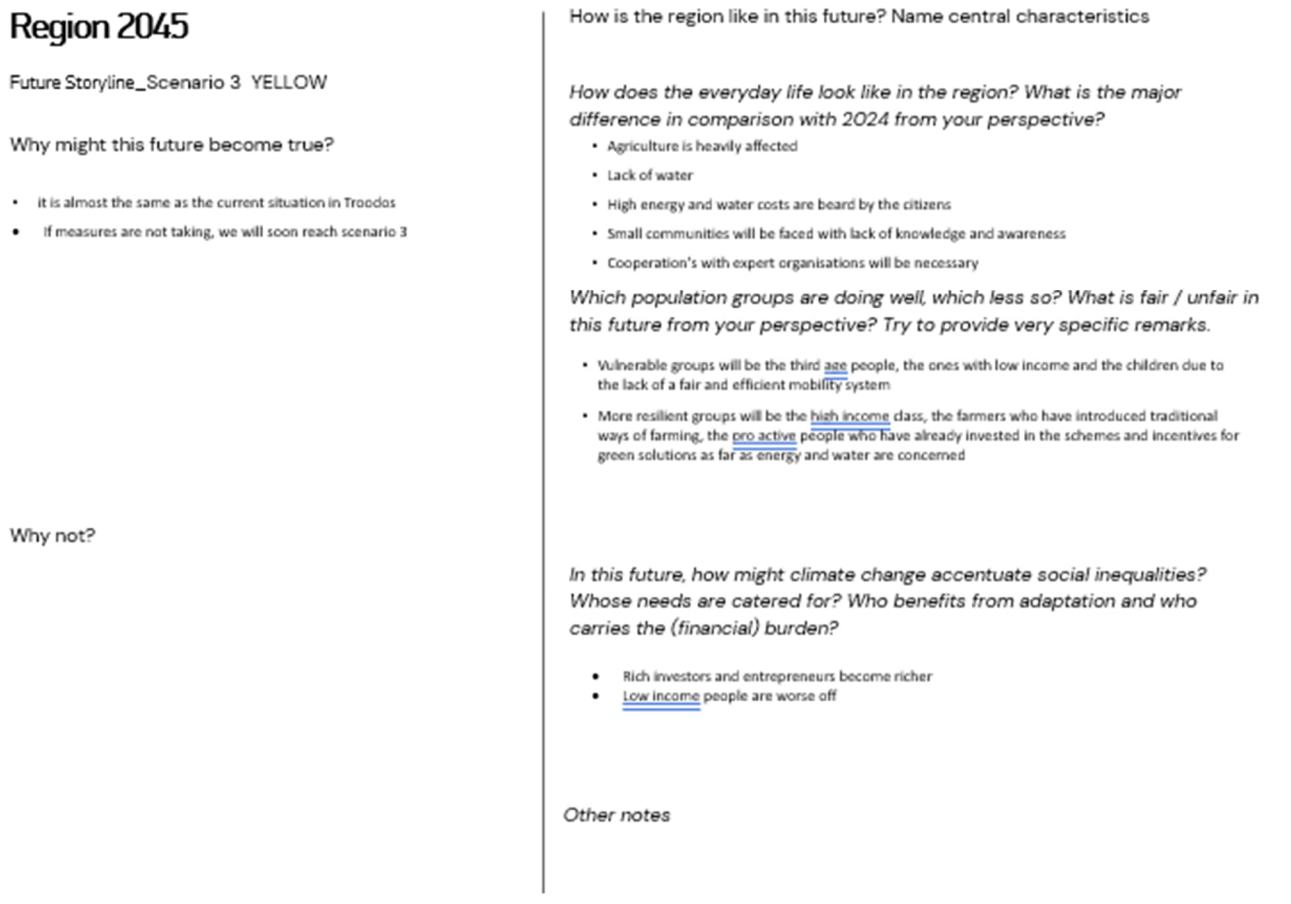


Figure 28. Future Storyline: Completed Canvas for Scenario 3 (Troodos).

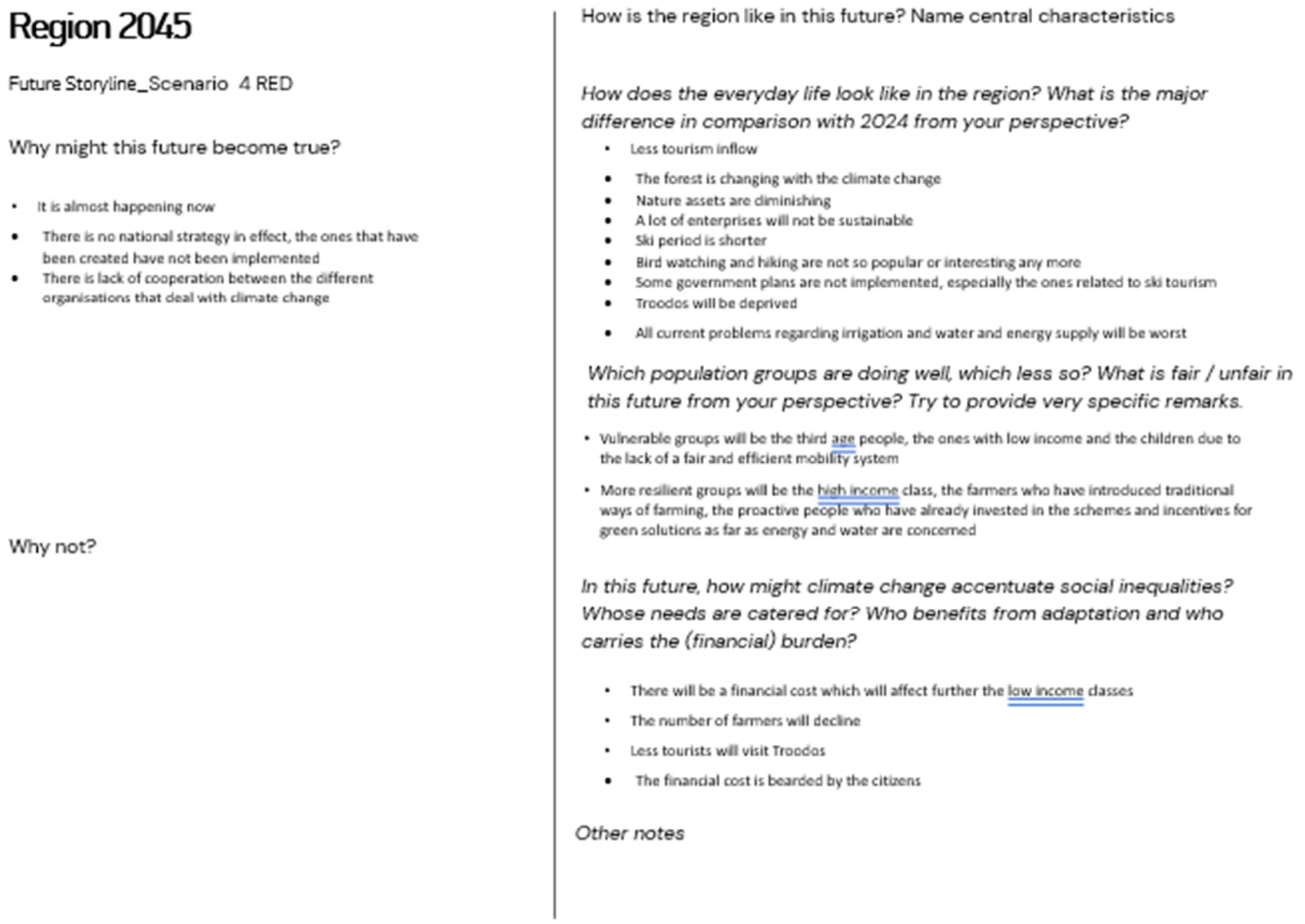
The structured canvas exercise for Scenario 4 (Red) enabled participants to critically assess a future shaped by systemic inaction and fragmented governance. Building on earlier discussions, the group explored the implications of failing to implement national strategies and the consequences of limited institutional cooperation. The session highlighted the urgency of coordinated climate action to prevent further deterioration of the Troodos region.

The canvas exercise prompted a series of discussions among participants, through which the following insights and reflections emerged:

- *The scenario reflects a continuation and intensification of current challenges, with no effective national strategy and poor implementation of existing plans.*
- *Progress has lagged due to a lack of coordination among organisations addressing climate change.*
- *Tourism inflow is expected to decline significantly, impacting local economies.*
- *Climate change is altering forest ecosystems and diminishing the region's natural assets.*
- *Many enterprises will become unsustainable, particularly those reliant on seasonal tourism such as skiing, birdwatching, and hiking.*
- *Government plans, especially those related to ski tourism, remain unimplemented.*
- *Existing issues related to irrigation, water supply, and energy provision are projected to worsen.*

Should Scenario 4 be realised, participants anticipate that by 2045, the Troodos region will be characterised by the following:

- *A marked decline in tourism and recreational activities due to environmental degradation.*
- *Economic instability, with many local businesses unable to sustain operations.*
- *Vulnerable groups—including older adults, low-income households, and children—will be disproportionately affected by inadequate mobility systems and rising living costs.*
- *More resilient groups will include high-income individuals, proactive residents who have invested in green technologies, and farmers employing traditional, sustainable practices.*
- *Climate change will exacerbate social inequalities, with adaptation benefits favouring wealthier stakeholders while low-income populations bear the financial burden.*
- *The number of active farmers will decline, further impacting food security and rural livelihoods.*
- *The region's long-term viability will depend on the implementation of cohesive, inclusive strategies that address both environmental and socio-economic challenges.*



Region 2045

Future Storyline_Scenario 4 RED

Why might this future become true?

- It is almost happening now
- There is no national strategy in effect, the ones that have been created have not been implemented
- There is lack of cooperation between the different organisations that deal with climate change

Why not?

How is the region like in this future? Name central characteristics

How does the everyday life look like in the region? What is the major difference in comparison with 2024 from your perspective?

- Less tourism inflow
- The forest is changing with the climate change
- Nature assets are diminishing
- A lot of enterprises will not be sustainable
- Ski period is shorter
- Bird watching and hiking are not so popular or interesting any more
- Some government plans are not implemented, especially the ones related to ski tourism
- Troodos will be deprived
- All current problems regarding irrigation and water and energy supply will be worst

Which population groups are doing well, which less so? What is fair / unfair in this future from your perspective? Try to provide very specific remarks.

- Vulnerable groups will be the third age people, the ones with low income and the children due to the lack of a fair and efficient mobility system
- More resilient groups will be the high income class, the farmers who have introduced traditional ways of farming, the proactive people who have already invested in the schemes and incentives for green solutions as far as energy and water are concerned

In this future, how might climate change accentuate social inequalities? Whose needs are catered for? Who benefits from adaptation and who carries the (financial) burden?

- There will be a financial cost which will affect further the low income classes
- The number of farmers will decline
- Less tourists will visit Troodos
- The financial cost is bearded by the citizens

Other notes

Figure 29. Future Storyline: Completed Canvas for Scenario 4 (Troodos).

Proposed Actions

Drawing on the outputs from the canvases, participants co-developed a set of actions under different themes, that have been incorporated into the Just Transition Roadmap.

Sector-Specific Proposed Actions

1. Agriculture

- Support the use of traditional seeds and local agricultural products.
- Establish fire protection zones to safeguard rural areas.
- Introduce incentives to attract new farmers and residents.
- Position agriculture as a cornerstone of the local economy.
- Promote innovative water and energy solutions to enhance sustainability.

2. Energy & Infrastructure

- Achieve energy self-sufficiency through photovoltaics and alternative energy sources.
- Create a one-stop shop for energy services and access to EU funding.
- Expand sustainable mobility options, including public buses, e-bikes, and car-sharing schemes.
- Upgrade infrastructure to meet the needs of both residents and visitors.

3. Tourism

- Develop and promote authentic tourism experiences.
- Offer experiential workshops (e.g., gastronomy, traditional crafts).
- Map and promote traditional wellness and health practices.
- Diversify into alternative tourism niches (e.g., astro-tourism).
- Ensure a more equitable distribution of tourism-generated income.

4. Nature & Biodiversity

- Preserve and enhance local biodiversity.
- Use native, fire-resistant species such as carob trees when reforesting burnt areas.
- Conserve traditional architecture to improve climate resilience.
- Raise public awareness of the value of the natural environment.

5. Economy & Governance

- Provide legal and promotional support for local and handmade products.
- Offer incentives to retain and attract young professionals to the region.
- Implement circular economy practices (e.g., recycling, composting).
- Strengthen inter-agency cooperation and establish a clear strategic direction.
- Deliver annual training for community leaders on climate resilience.

Across all four scenarios, several recurring themes emerged:

- Behavioural Change: Promotion of sustainable habits such as car sharing, recycling, food waste reduction, and climate-conscious living.
- Policy and Governance: Local legislative adjustments to protect biodiversity and water resources, alongside improved coordination and enforcement mechanisms.
- Financial Incentives: Development of accessible funding schemes for residents, farmers, and new entrepreneurs.
- Knowledge and Education: Integration of climate education from early childhood, leadership training, and public awareness campaigns.
- Administrative Reform: Empowerment of community councils, creation of centralized information platforms, and enhancement of public service delivery.

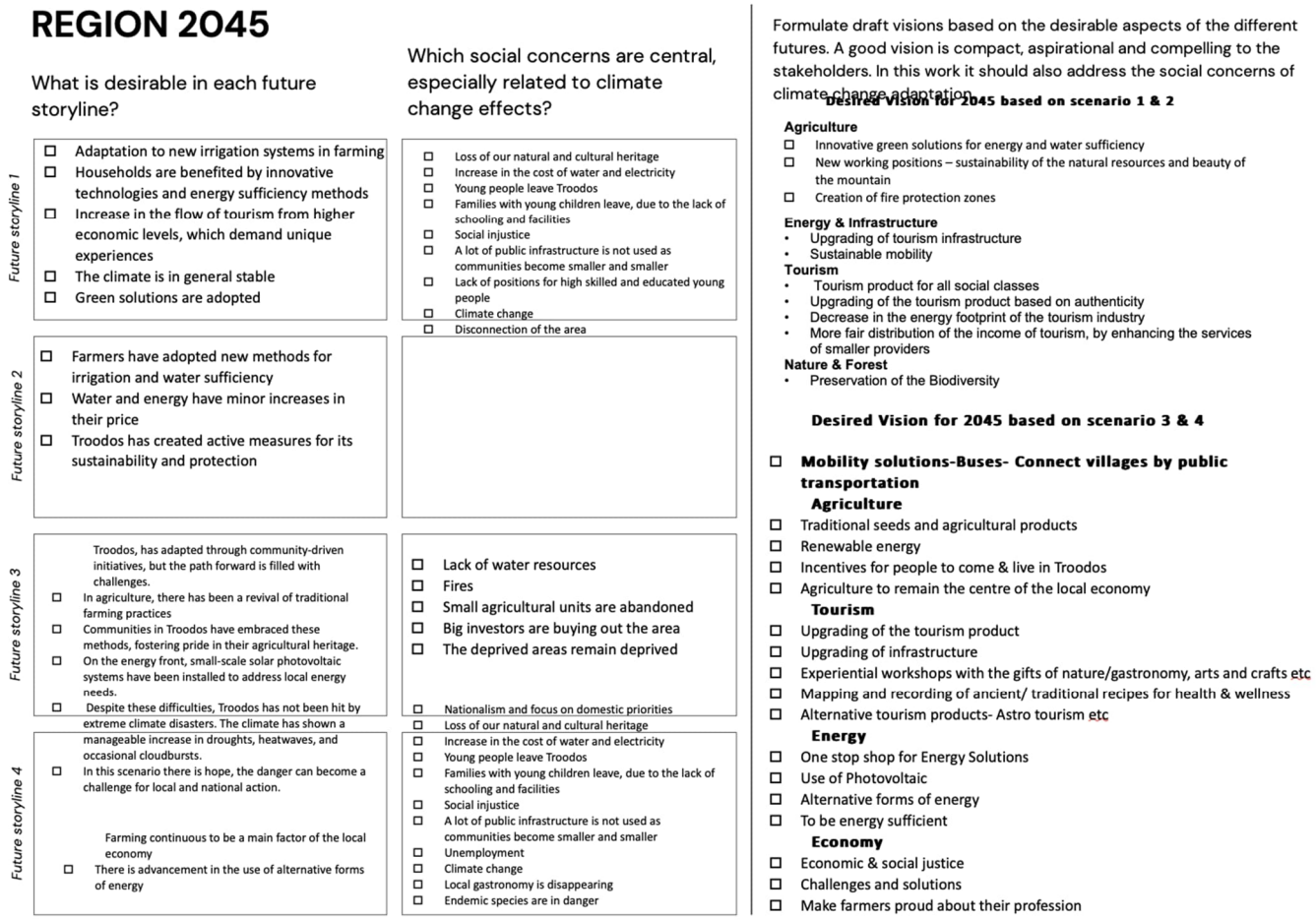


Figure 30. Completed “Desired Vision for 2045” Canvases Integrating All Scenarios (Troodos).

3.12.3. Vulnerabilities and Justice Considerations

Troodos is likely to face a range of complex social and economic challenges under the combined pressures of climate change and broader economic shifts, with significant implications for climate justice.

Existing trends such as rising property prices and the expansion of tourism-driven investments could increasingly limit opportunities for young people to purchase land or build homes, contributing to the depopulation of the area. At the same time, wealthier investors—often from outside the region—may disproportionately benefit from tourism revenues, widening economic disparities.

Climate change is expected to intensify these inequalities. As temperatures rise, Troodos’ traditional appeal as a cool summer destination diminishes, resulting in fewer visitors and declining income for small hotel owners. Those unable to afford adaptations, such as retrofitting properties with cooling systems, face financial hardship, while better-resourced actors can more easily adjust. Similarly, farmers confront increasing challenges due to water scarcity and changing climatic conditions. Smaller agricultural units may be abandoned, while those who have

invested in water-saving technologies or renewable energy are better positioned to adapt, creating a gap between more and less resilient farmers.

Vulnerable groups—including low-income households, older farmers, the elderly, and children—bear the heaviest burdens. Limited access to mobility and essential services, combined with rising costs of water and electricity, heightens their exposure to climate-related risks. This may deepen social fragmentation and perceptions of injustice, further intensified by the loss of natural and cultural heritage, local gastronomy, and endemic species under intensified climate change.

In addition to these challenges, Troodos faces systemic issues in water and land management, with current practices failing to retain local water resources—further stressing agricultural viability and ecological balance. Public mobility systems remain disconnected and inefficient, limiting access to services and opportunities, especially for vulnerable groups. Moreover, fragmented governance and the lack of implementation of national strategies for mountain regions hinder coordinated responses and long-term planning, leaving local communities without the support they need to adapt and thrive.

While certain resilient groups—such as innovative young people adopting new technologies, or farmers applying traditional cultivation methods—may better withstand these shifts, the overall distribution of risks and benefits is highly uneven. Without intervention, financial and social pressures will continue to fall disproportionately on those least able to cope, deepening existing inequalities and eroding community cohesion.

Addressing these challenges will require deliberate and inclusive policy measures, supported by collaboration with expert organisations and local stakeholders. Particular attention must be given to the following groups and their intersecting needs:

- Elderly residents in remote areas, who face mobility, energy, and service access challenges.
- Small-scale farmers struggling with water scarcity, low incomes, and abandonment risks.
- Low-income households with children, especially in poorly connected communities.
- Younger generations unable to afford land or housing and likely to migrate.
- Local entrepreneurs at risk from foreign investments and land sell-offs.

3.12.4. A Joint Vision for 2045

The structured canvases used during the workshop facilitated collaborative discussions that helped shape a shared vision for Troodos in 2045, capturing the aspirations and concerns of a diverse range of stakeholders. It embodies a collective vision for the future, based around resilience, sustainability, and social inclusion, and is articulated as follows:

In 2045, Troodos is a vibrant and resilient mountain region that has successfully safeguarded its unique natural beauty and cultural identity while adapting to the impacts of climate change. The local economy thrives through a balanced mix of sustainable tourism, traditional agriculture, and innovative energy solutions tailored to the region's mountainous character.

Climate-related risks—such as forest fires and groundwater depletion—have been effectively mitigated through robust ecosystem management practices. Communities are socially inclusive and well-connected, supported by

efficient mobility systems and accessible public services. Young people are empowered to remain in the region, contributing to its vitality and choosing to build their futures locally.

A strong sense of pride and collective ownership fuels community resilience, ensuring that Troodos continues to flourish while preserving its natural and cultural heritage for generations to come.

From Vision to Action

Key goals proposed for delivering the Just Transition Vision include:

- Revitalizing traditional agriculture with modern irrigation and local seed practices
- Promoting energy sufficiency with small-scale renewables and infrastructure upgrades
- Developing sustainable mobility solutions to connect remote villages and enable access to services
- Establishing fair tourism that benefits local providers and preserves cultural identity
- Reforming legal and financial regulatory frameworks to empower local communities and prevent land abandonment.
- Encouraging intergenerational continuity through housing and farming incentives
- Fostering environmental action, climate education, and cross-sector collaboration

These goals form the foundation of the Just Transition Roadmap that supports a just and climate-resilient future for the Troodos region.

3.12.5. Actions of the Roadmap

Goal	Action	Activity	Timescale	Stakeholders	Contribution to Justice & Vulnerability	Contribution to Vision
Revitalizing traditional agriculture with modern irrigation and local seed practices	Promote use of local seeds	Creation of Traditional Seeds Bank	2027-2035	Local farmers Agricultural Institute of Cyprus	Supports young farmers; reduces inequality; preserves local resources	Enhances biodiversity; strengthens local food systems
	Use drought resistant varieties	Identification of traditional drought resistant varieties Development of new varieties based on traditional species	Longterm	Local farmers Agricultural Institute of Cyprus	Supports young farmers; reduces inequality; preserves local resources	strengthens local food systems
	Promote water-saving irrigation practices	Piloting of state-of-the-art irrigation technologies Providing incentives to farmers to integrate modern water saving irrigation methods	2027-2035	Local farmers Department of Agriculture Water Development Department	Helps small farmers adapt to water scarcity	Contributes to sustainable land use and climate adaptation

Goal	Action	Activity	Timescale	Stakeholders	Contribution to Justice & Vulnerability	Contribution to Vision
Promoting energy sufficiency with small-scale renewables and infrastructure upgrades	Promote small-scale renewables	Funding for the installation of PV panels and storage on community buildings Support for vulnerable homeowners in applying for central government subsidies for the installation of photovoltaic (PV) systems Funding support for energy efficiency upgrades in hotel accommodations	2027-2035	Local Community Councils Department of Energy	Combats energy poverty in vulnerable populations	

Goal	Action	Activity	Timescale	Stakeholders	Contribution to Justice & Vulnerability	Contribution to Vision
Developing sustainable mobility solutions to connect remote villages and enable access to services	Shift to shared and low-emission transport	No-car zones within the region Subsidies for rural public transport Incentives for electric vehicles and buses	long term	Local Community Councils Planning Department Troodos Tourism Board	Reduces isolation, improves access to services	Connects remote villages, supports inclusive development
	Adoption of low-carbon mobility practices	Training and awareness campaigns on sustainable mobility Creation of mobility hubs (bus, e-bike, car-sharing options) in key areas that serve Troodos	2027-2035	Local Community Councils Citizens Tourists		

Goal	Action	Activity	Timescale	Stakeholders	**Contribution to Justice & Vulnerability**	**Contribution to Vision**
Establishing fair tourism that benefits local providers and preserves cultural identity	Promote regenerative tourism	Legalise/promote homemade local artisanal products Introduce incentive mechanisms during the licensing process for tourism-related businesses to promote eco-tourism and the adoption of sustainable practices. Training for local tour operators on regenerative tourism Supported enhanced cooperation among service providers to ensure coordinated and impactful implementation of sustainable practices.	2027-2035	Troodos Tourism Board Tourism service providers Deputy Ministry of Tourism	Supports local income, reduces inequality	Diversifies economy, aligns with sustainable tourism vision

Goal	Action	Activity	Timescale	Stakeholders
Encouraging intergenerational continuity through housing and farming incentives	Incentives for new farmers	Provide targeted support for young farmers and new residents. Implement housing and agricultural incentive schemes to promote rural continuity. Offer grants and tax relief tailored to youth farming and settlement. Deliver education and training on sustainable livelihoods.	Longterm	Community Councils Department of Planning Department of Agriculture
	Restore traditional architecture	Implement awareness campaigns to highlight the cultural and historical value of traditional architecture. Establish policies to support the restoration and adaptive reuse of abandoned houses. Provide targeted grants and financial incentives for the restoration of heritage homes. Organize technical workshops on traditional construction techniques, such as drystone masonry. Strengthen coordination among municipalities to streamline restoration efforts and ensure consistency in heritage preservation.	Longterm	Community Councils Department of Planning Department of Agriculture

Goal	Action	Activity	Timescale	Stakeholders	Contribution to Justice & Vulnerability	Contribution to Vision
Reforming legal and financial regulatory frameworks to empower local communities and prevent land abandonment	Land use and ownership reform	Protect unused land from fires	2027-2035	Community Councils Department of Planning	Empowers communities, prevents land abandonment	Enables long-term, inclusive territorial development
	Encourage community-led development	Develop Community investment schemes	Longterm	Community Councils Treasury Department		

Goal	Action	Activity	Timescale	Stakeholders	Contribution to Justice & Vulnerability	Contribution to Vision
Fostering environmental action, climate education, and cross-sector collaboration	Promote recycling and composting	Implement recycling programs, including food waste composting and fabric reuse initiatives. Introduce refund schemes for reusable containers, such as bottle refills. Provide targeted training on effective recycling and organic waste management.	2027-2035	Department of Environment Community councils	Reduces vulnerability of communities reliant on natural resources Protects vulnerable populations from climate risks Reduces environmental burden	Strengthens sustainability Enhances environmental resilience Builds sustainable community practices and awareness
	Resilience to fire risk and protection of the forest ecosystem	Enhance community awareness on fire prevention and climate-related risks. Implement and enforce fire safety and land use regulations. Provide funding for tree planting initiatives, including fire-resilient species. Establish water access points for visitors in forested areas. Promote public education campaigns and knowledge sharing on fire risks. Strengthen coordination among emergency services and local authorities. Clear mission and vision on climate resilience	2027-2035	Forestry Department Community councils		
	Advancing Climate Literacy and Awareness	Integrate climate education into early childhood curricula Provide annual training for community council leaders.	Longterm	Department of Education Community councils		

3.12.6. Conclusions

The Troodos Just Transition Roadmap is closely linked with regional activities under Work Package 5 (WP5), particularly Innovation Action 05, which focuses on **”Defining a Vision and Action Plan for a Climate Neutral, Regenerative Tourism Destination”** (Vision and Action Plan). The Roadmap sets out a series of actions to advance climate justice and reduce systemic inequalities, which will be integrated into the Vision and Action Plan. The ultimate goal is the formal adoption of the Vision and Action Plan by key stakeholders, including the Troodos Tourism Board, the Commissioner for Mountainous Regions, the Deputy Ministry of Tourism, and local community councils.

The participatory workshop held in the Troodos region highlighted the value of inclusive, future casting dialogue in addressing the multifaceted challenges posed by climate change. The process successfully convened a diverse group of stakeholders—spanning sectors, age groups, and social backgrounds—to collaboratively develop a scenario-based vision and co-create a roadmap toward a more resilient and equitable future for the region. The outputs and learning gained from the workshop activities will be built upon when designing and implementing the upcoming workshop on **”Defining a Vision and Action Plan for a Climate Neutral, Regenerative Tourism Destination”** (WP5).

The workshop highlighted a range of climate and social challenges facing the Troodos region, including unsustainable resource management, energy dependency, inefficient mobility systems, cultural erosion, youth exodus, agricultural decline, and fragmented governance. These issues are interconnected and require coordinated, long-term interventions.

Participants collaboratively proposed a wide range of actions to address the identified challenges. These included offering incentives to attract young farmers and new residents, investing in renewable energy and sustainable mobility infrastructure, preserving traditional agricultural practices and architectural heritage, and implementing targeted education and awareness campaigns. A strong emphasis was placed on strengthening governance, fostering better coordination among institutions, and ensuring that financial and technical support effectively reaches the communities most in need.

The discussions underscored that while climate change adaptation is critical for the long-term resilience of the Troodos region, poorly designed measures risk exacerbating existing social and economic inequalities. Specific vulnerabilities—such as depopulation, land abandonment, water scarcity, and unequal access to resources and services—pose significant threats to the region’s sustainability and must be addressed through inclusive and equitable adaptation strategies.

The resulting roadmap reflects a collective commitment to a just transition, balancing environmental protection, economic vitality, and social equity. This shared vision for 2045 aspires to make Troodos a model of sustainable development where communities thrive, heritage is protected, and adaptive capacity is strengthened against future climate risks.

Moving forward, sustained cooperation among local authorities, civil society, businesses, and EU institutions will be critical to turn this vision into reality.

4. Conclusions

The aim of this activity in Regions4Climate was to create “Actionable plans for achievement of a socially just transition to climate resilience for each of the R4C partner regions” (work plan of Regions4Climate). The Just Transition Framework that has been laid out in the Regions4Climate Deliverable 2.2 provided the methodological basis for this endeavor and was adapted to the needs of each specific region. In each region, a specific interplay of governance structures, political settings, project structures, settings in individual organisations, and individual attitudes shaped unique conditions that either enabled or restricted the transformative aspirations of the roadmaps and shaped the depth of suggested interventions.

The process for jointly creating the Just Transition Roadmaps towards climate resilience was initiated in January 2024 and it was completed in the second half of 2025. Several challenges that were not well anticipated stretched the process over a long period. Since the scope of the roadmaps, the involvement of relevant actors, and the possibilities for an adoption of the roadmaps are closely related, several iterations were necessary to find the right regional approach that could facilitate all three aspects. Generally, the perception of climate change adaptation and resilience building as a technical process and not as an activity that would require wider deliberation, rendered it sometimes challenging to convince regional representatives of the benefits of a participatory process. In several regions, Regions4Climate was able to create awareness for need to include a wider range of stakeholders and to pay attention to the needs of vulnerable and marginalized groups. However, raising this awareness was often associated with a slower roadmap creation process. Finally, ensuring the regional ownership of the roadmaps—also closely related to the adoption of the roadmaps—was a time intensive endeavor that often included negotiating the roadmaps with other regional and local administrative bodies that have not been part of the project.

When there was a limited amount of resources dedicated to the roadmap process, delicate political constellations, concerns to lose carefully established connections to stakeholders, or hopes to preserve the current regional status quo, the resulting regional Just Transition Roadmaps tend to have a very specific thematic focus or target group and pinpoint individual adjustments to improve specific justice aspects. On the other hand, the strong commitment of organisations, individuals’ belief in the possibilities of transformative adaptation, or the recognizing Regions4Climate as a space for testing and experimentation often contributed to roadmaps with a scope going beyond narrowly understood climate change adaptation and with actions implicating transformation at the systemic level.

While all regions have been committed to the adoption of the roadmaps, strong connections to ongoing policy and strategy processes, increased awareness of justice questions, and the buy-in of important decision makers are central to the actual adoption activities and fields of actions suggested by the roadmaps.

Bibliography

Copernicus. Eu. OBSERVER: Europe's warmest year on record—striking climate contrasts in 2024 (2025). Retrieved August 28, 2025, from https://www.copernicus.eu/en/news/news/observer-europes-warmest-year-record-striking-climate-contrasts-2024

De Geus, T., Wittmayer, J. M., & Vogelzang, F. (2022). Biting the bullet: Addressing the democratic legitimacy of transition management. Environmental Innovation and Societal Transitions, 42, 201–218. https://doi.org/10.1016/j.eist.2021.12.008

Fertner, C., Jessen, M., & Fryd, O. (2023). *Social vulnerability in R4C demo regions - regional indicators and narratives: Regions4Climate, deliverable number D2.1.* Retrieved 06 2025, from https://curis.ku.dk/ws/portalfiles/portal/381142174/D2.1_Social_v (cited on 30 June 2025)

Geels, F. W. (2022). Technological transitions as evolutionary reconfiguration processes: A multi-level perspective and a case-study. *Research Policy 31, 8-9*, 1257–1274.

Hald, P. (2025). Retrieved 06 2025, from "Er kysten klar?". Din 2660 kalender: https://www.brondbystrand.dk/wp-content/uploads/2025/06/netvaerkskontoret_kalender_juni25_web.pdf

Klein, J., Malmström, A., Fryd, O., Schmidt-Thomé, K., Jousilahti, J., Mersarcik, P., . . . Pascual Herranz, K. (2023). *Just Transition Framework. Regions4Climate, deliverable number D2.2.* Retrieved 06 2025, from https://regions4climate.eu/resources/

Lund, A., Fryd, O., & Jørgensen, G. (2025). *Urban Shores – towards landscape-based coastal adaptation.* Copenhagen: Danish Architectural Press.

Miedzinski, M., McDowall, W., Fahnestock, J., Muller, G., & Diaz Lopez, F. J. (2019). Science, Technology and Innovation Policy Roadmaps for the SDGs (p. 50). inno4sd. https://www.inno4sd.net/sti-roadmaps-sdgs-87

Olazabal, M., Galarraga, I., Ford, J., Sainz De Murieta, E., & Lesnikowski, A. (2019). Are local climate adaptation policies credible? A conceptual and operational assessment framework. International Journal of Urban Sustainable Development, 11(3), https://doi.org/10.1080/19463138.2019.1583234

Regions4Climate. (2022). *Description of the Action. Annex 1 (Part A). European Commission, HORIZON-MISS-2021-CLIMA-02, project number 101093873.*

Richardson, K., Steffen, W., Lucht, W., Bendtsen, J., Cornell, S. E., Donges, J. F., . . . Nogués-Bravo, D. (2023). Earth beyond six of nine planetary boundaries. *Science Advances 9, 9*.