D4.3. Governance recommendations

Regions 4Climate

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or CINEA. Neither the European Union nor CINEA can be held responsible for them.

Deliverable Information Sheet

Version	01
Grant Agreement Number	101093873
Project Acronym	R4C
Project Title	Regions4Climate
Project Call	HORIZON-MISS-2021-CLIMA-02
Project Duration	60 months
Deliverable Number	4.3
Deliverable Title	Governance recommendations
Deliverable Type	Document, report
Deliverable Dissemination Level	PU – Public
Work Package	4
Lead Partner	University of Helsinki (UH)
Authors	Alexandra Malmström, Sirkku Juhola, Heidi Tuhkanen, Erica Manuelli, Erika Palmieri
Contributing Partners	SEI Tallinn, ICLEI
Reviewers	Gemma García- Blanco, Tecnalia Erica Manuelli – ICLEI Europe Erika Palmieri – ICLEI Europe Carmen Antuña Rozado - VTT
Official Due Date	31.12.2024
Delivery Date	14.12.2024

History of changes

Version	Date	Description	Author(s)
0	18.11.2024	Version for internal peer-review	Alexandra Malmström, Sirkku Juhola, Heidi Tuhkanen, Erica Manuelli, Erika Palmieri
1	2.12.2024	Version for final peer-review	Alexandra Malmström, Sirkku Juhola, Heidi Tuhkanen, Erica Manuelli, Erika Palmieri
2	13.12.2024	Final version	Alexandra Malmström, Sirkku Juhola, Heidi Tuhkanen, Erica Manuelli, Erika Palmieri

List of Acronyms

CR – climate resilience
CAPB – Communauté d'Agglomération Pays Basque
HURC – Helsinki-Uusimaa Regional Council
IP – Innovation Package
IPCC AR6 – 6th Assessment Report of the Intergovernmental Panel on Climate Change
MAP- municipal adaptation plan
NAP – national adaptation plan
NAS - national adaptation strategy
PNACC – the National Plan for Adaptation to Climate Change
RTO – research and technology organisation
SECAP – Sustainable Energy and Climate Action Plan
PPP – public-private partnership

List of Tables

List of Figures

Keywords list

- Effectiveness
- Successfulness
- Adaptation steering
- Division of powers
- Adaptation mainstreaming
- Equity
- Adaptation justice
- Adaptation governance
- Regional governance

Disclaimer

Table of Contents

Executive summary

The Deliverable D4.3 “Governance Recommendations” is developed under the Task T4.2 “Governance Framework” within the *Regions4Climate (R4C) project*, under the Grant Agreement number 101093873. The aim of the Deliverable is to build a general framework for just, evidence-based regional Climate Resilience (CR) transitions and to provide governance recommendations to the R4C partner regions. These Recommendations are developed based on a) baseline governance assessment of regional governance structures, processes, and mechanisms in R4C regions, b) assessment of the regional CR governance in R4C regions, and c) governance barriers to and enablers of regional Innovation Packages (IPs), identified in the Deliverable D6.1 “Common Innovation Roadmaps”.

The Deliverable develops and presents an evidence-based universally applicable governance framework to steer just adaptation and climate resilience. The framework is normative and builds on the scientific literature examining the most effective institutional arrangements to support adaptation and CR progress. The understanding of ‘effectiveness’ in this Deliverable pertains to the institutional structures and processes that create optimal conditions, structures, and mechanisms for adaptation and CR planning and mainstreaming. The framework is further transformed into an index to assess CR governance effectiveness in each R4C region, taking regional level as the central point of the assessment.

In the Deliverable, the unique governance context of each partner region is analysed, and the index is constructed in a way that accounts for their individual administrative characteristics. The collected data used in the assessment include a survey targeted at the R4C regions as well as the main climate resilience documents in each region (for example, climate laws, adaptation strategies, or plans). The data is further analysed using a structured expert judgment complemented by the confidence level assessment, to reduce bias and increase transparency in the assessments. The final assessments were validated by the regional partners.

Overall, the results of the assessment of all partner regions show that the state of CR governance varies, with some regions scoring high across most categories of CR governance (for example, Basque Country), while in other regions there are gaps and areas for development both in terms of climate resilience governance in general, as well as from the perspective of R4C Innovation Packages (IPs). Across most regions, there is a need to clarify governance processes and structures in terms of vertical and horizontal implementation. This is mainly achieved by passing regulatory frameworks that assign tasks, clarify the division of responsibilities, and ensure the coherence of adaptation and other sectoral goals, both vertically and horizontally. However, these frameworks and task delegation largely depend on the governance context in place, specifically in terms of vertical division of power across national, regional, and local levels. In terms of actor engagement, the results across most regions show that a variety of actors is involved in CR, but the engagement of private sector is still lagging. Most often, private sector is steered through financial instruments or participates in adaptation voluntary, and only in some cases is obliged legally (for example, utility companies in Køge Bay). The engagement of private sector, and of other sectors for that matter, depend on the predominant governance mode in each region, i.e. whether the rationale of CR steering relies on market, network & information, or regulatory steering. Finally, regions demonstrate a use of a variety of instruments from different categories to steer CR, often in a mix. While the assessment of policy and instrument mixes is out of scope of this Deliverable, it is notable that all regions use at least several types of instruments (financial, informational, and regulatory) to steer CR. However, there is an evident need to increase the supply of demand-driven climate services, as these have been largely missing in the assessments. Same time, climate services (such climate risk assessments,

climate scenarios and projections, vulnerability assessments) usually form the backbone for adaptation planning. This is also critical from the perspective of the IPs, as many regions have pointed out the lack of awareness or understanding of climate change & adaptation needs, low prioritization, and lack of urgency as the barriers for their IPs. Finally, the regions have raised the need for better networking and collaboration across private, public and third sectors, which can be steered with informational and networking instruments.

Chapter 2 of the Deliverable presents the general framework for CR governance. Chapter 3 presents the index to assess CR governance in each region. Chapter 4 describes the materials and methods used to collect and analyse the data used in the assessments. Chapter 5 presents the results and recommendations, including baseline governance assessments, identified governance barriers to and enablers of R4C IPs, and governance recommendations for each partner region.

1. Introduction

In this Deliverable, adaptation and climate resilience are defined as in the IPCC AR6. Adaptation to climate change is "the process of adjustment [of human and natural systems] to actual or expected climate and its effects, in order to moderate harm or exploit beneficial opportunities" (Möller et al. 2022, p. 2898). Climate resilience denotes "The capacity of interconnected social, economic, and ecological systems to cope with a hazardous event, trend or disturbance, responding or re-organising in ways that maintain their essential function, identity, and structure. Resilience is a positive attribute when it maintains capacity for adaptation, learning and/or transformation" (Möller et al. 2022, p. 2920). While R4C as a project focuses on the regions, this Deliverable examines the full climate resilience (CR) governance context – from national to local, while taking regional level as the entry point for the assessments and for the development of recommendations.

Governance Recommendations build on the following inputs (Figure 1):

1) *General Framework for Just and Effective Climate Resilience Governance (see Chapter 2).* The framework is grounded in the scientific empirical and conceptual literature dealing with governance effectiveness, climate adaptation, climate resilience, and justice in adaptation. The framework is broad in scope and can be applied to climate resilience governance at the national, regional, or local levels;
2) The framework has a normative character, i.e., it sets out the institutional arrangements that can be activated to steer just and effective CR governance planning and mainstreaming;
3) The framework is later tailored to the regional context to reflect the diversity of regional governance structures and it is converted into an *Index of Climate Resilience Governance Effectiveness* to assess CR governance structures and processes in each region (Chapter 3). The index and the following assessments do not include the assessment of justice, but only focus on the effective institutional arrangements to steer CR governance planning and mainstreaming;
4) *A Baseline Governance Assessment* is conducted to contextualize the assessments to the governance context within which climate resilience is embedded, with the special attention to the administrative structures, jurisdiction and division of powers and responsibilities across the levels of governance within each R4C region. More specifically, legislative, and self-governing capacities of each region are examined.
5) Tailored assessment of regions' CR governance is then conducted, based on both the index of CR governance effectiveness and the baseline governance assessment to provide ground for the Governance Recommendations and forecast the potential governance issues and knowledge capacity gaps.
6) Governance barriers and opportunities for innovation are identified building on the data collected in D6.1 "Common Innovation Framework".

This Deliverable is closely linked to other deliverables in the project. The approach to justice in CR governance framework is in line with the approach to justice in R4C D2.1 "Just Transition Framework". The analysis of the governance context (see Table 1 and Section 2.1.) has been co-developed with the D4.1 "Regional Resilience Maturity Model and Framework", Dimension 1: "regional governance and institutional capacity". A large part of the framework in this Deliverable examines the CR steering instruments, which are at the core of the T4.4. "Policy needs analysis" and forthcoming D4.4 "Policy recommendations" and D4.5 "Policy briefs". The approach is aligned and the data for both Deliverables have been gathered in the same survey. Thus, the intention of the D4.3 is to give a brief overview of the CR steering instruments, while analysing them as a part of the whole governance context, while D4.4

will focus on the instruments both for CR, as well as other relevant policy areas. Finally, this Deliverable utilizes the data collected in the course of D6.1 “Common Innovation Framework & Solutions Portfolio”, specifically the results of the survey collected to identify and rank relevant governance barriers and enablers for the project partners’ IPs. The questions in this survey have been adjusted by the authors of this Deliverable to ensure suitability of the data to analyse the barriers and enablers of regional partners IPs and identify potential governance gaps and opportunities.

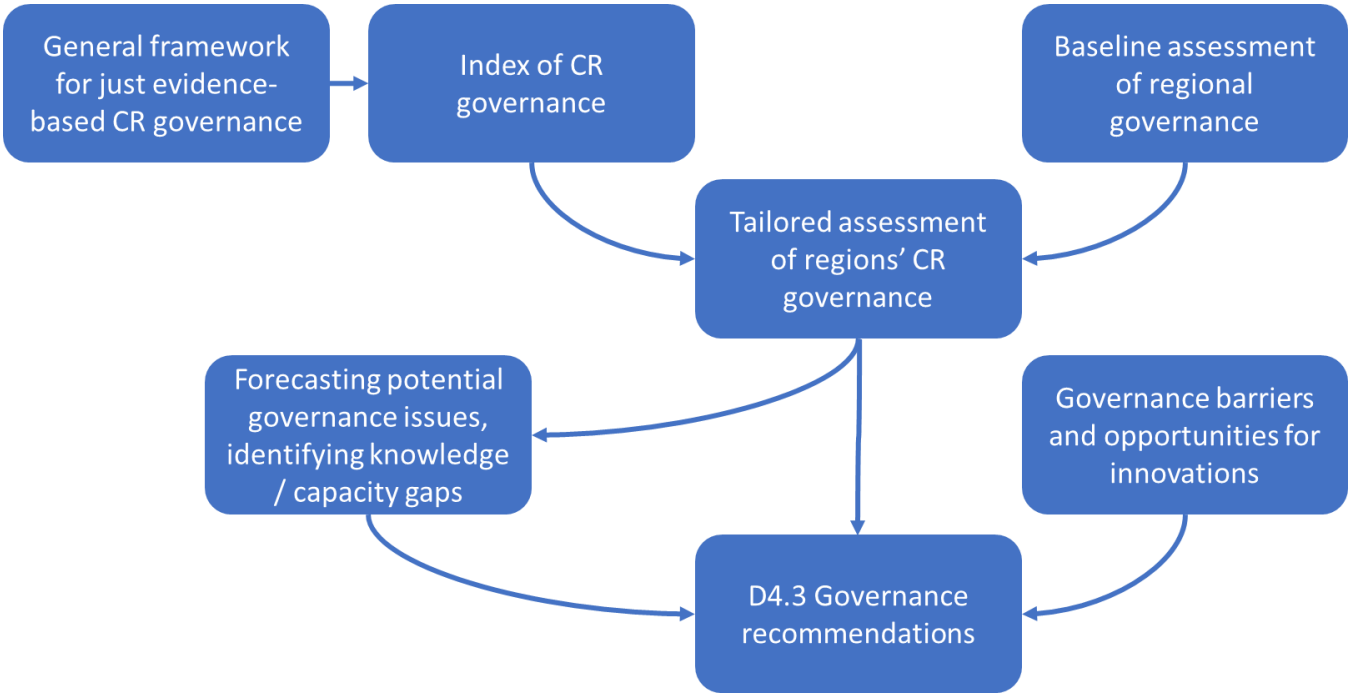

Figure 1. General approach to developing D4.3 “Governance Recommendations”.

2. General Framework for Just and Effective Climate Resilience (CR) Governance

In this Deliverable, governance is considered as "*the architecture of formal and informal institutions; as the process it signifies the dynamics and steering functions involved in lengthy never ending processes of policy-making; as a mechanism it signifies institutional procedures of decision-making, of compliance and of control (or instruments); finally, as a strategy it signifies the actors' efforts to govern and manipulate the design of institutions and mechanisms in order to shape choice and preferences*" (Levi-Faur 2012, p. 8). In the context of climate change, adaptation governance refers to "*the patterns that emerge from the governing activities of social, political, and administrative actors in the realm of climate change*" (Huitema et al. 2016, p. 2).

These definitions are used to construct a normative framework of effective CR governance that builds on three pillars: structure, process, and mechanisms. Strategy is deliberately excluded from the framework as the shaping of formal institutions is out of scope of this study. The three pillars are further examined using the following questions:

1. How is governance effectively organized across different levels of administration? (structure)
2. Who has the power and who are the main actors? (process)
3. What are the main mechanisms for steering CR governance? (mechanisms)

The general approach to framework construction is to identify and suggest the governance arrangements across the three pillars that most effectively support CR governance from planning, to implementation, to evaluation and, to re-planning. The framework is general and, when applied to each specific region, may differ in term of what is possible and what is the most effective arrangement.

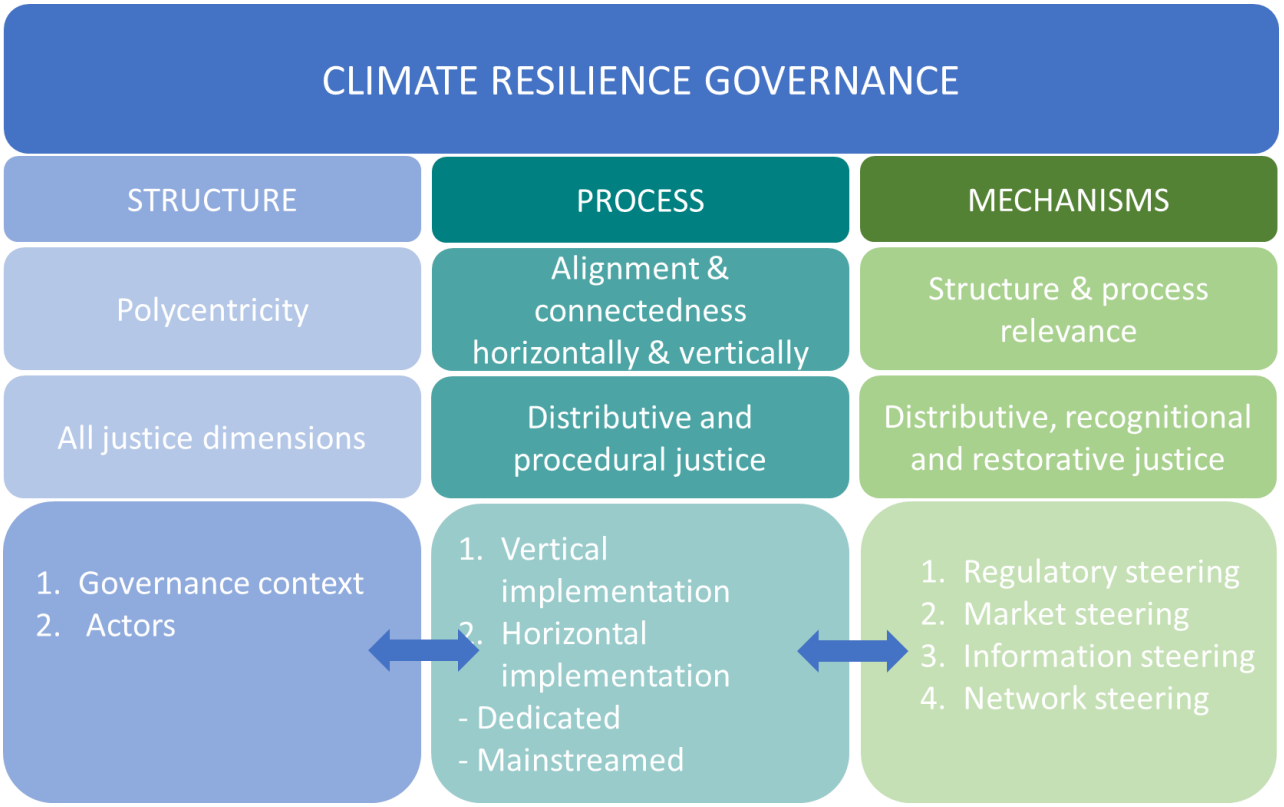

Figure 2. General Framework for Just and Effective Climate Resilience Governance.

2.1. Structure

In this pillar, two main elements are addressed: the governance context and the actors involved.

Governance context

Adaptation and climate resilience are not steered in the vacuum but denote a deliberate collective effort that takes place in a given governance context, referring more specifically to the existing governance structures as well as administrative division and the division of powers across different levels of governance. From the perspective of CR governance, special attention is paid to the legislative and regulatory power.

Legislative power refers to the power to pass or amend laws (Legal Information Institute 2024). Depending on the country, regions may have no legislative power, may have legislative power limited to specific sectors or policy areas, and there may be differences in terms of national or regional precedence. With regards to self-governance, we examine the capacity to implement or enforce national-level laws by passing regional regulation for the regional matters, and/or to exercise budgetary functions (regulatory and fiscal power) (Legal Information Institute 2024). Regulation here refers to “a rule made and maintained by an authority, typically, a governmental agency, to control and govern conduct within its jurisdiction” (Legal Information Institute 2024). Thus, a regulation is comparable to a law in its binding strength with the difference of application to a specific jurisdiction as compared to the national.

Actors

Adaptation governance is by definition, polycentric and multi-level, denoting that the centres of decision-making (here mainly referring to actors), negotiation and coordination are diverse, independent and connected in their activities while their degree of engagement may vary from very loose to very tight organized through formal or strategic coordination mechanisms (Jordan et al. 2018).

2.2. Process

The Deliverable examines the delegation and implementation of climate adaptation from a process perspective, focusing on vertical and horizontal approaches.

Climate resilience governance is multi-level, referring to local, sub-national (e.g., regional), national and international levels of government, at which actors engage in governance activities (Bauer and Steurer 2014; Nalau, Preston, and Maloney 2015). **Vertical implementation** involves coordination across levels of government, from local to international, often in a top-down manner. It refers to integrating responsibilities and delegating tasks among these levels, with mechanisms varying based on governance contexts, such as regional or municipal self-governance. Effective vertical arrangements should adhere to principles of coherence, connectedness, and nestedness (Bennett and Satterfield 2018):

- *Coherence and connectedness ensure clear responsibility divisions and alignment of goals, resources, and capacities.*
- *Nestedness emphasizes delegating adaptation responsibilities to the lowest capable level of governance, respecting mandates and capacities.*

Horizontal implementation occurs within each governance level and involves integrating adaptation across sectors or policy areas. This can follow one of three approaches, with mixed approach being the most common in practice (see Table 1 for more details on the differences between dedicated and mainstreaming):

- *Dedicated approach: Establishing specialized institutions or policies focused on adaptation.*
- *Mainstreaming approach: Embedding adaptation objectives into existing sectoral policies.*
- *Mixed approach: Combining dedicated and integrated strategies.*

Table 1. Conditions for dedicated and mainstreaming approaches to the horizontal implementation of adaptation (Uittenbroek et al. 2014).

Condition	**Dedicated**	**Mainstreaming**
Agenda setting	political agenda / commitment	policy agenda
Framing	core value	added value
Institutional resource	specialized institution, formally added as a function to existing institutions	institutional entrepreneurs

Budget	dedicated / allocated budget (special pilot projects etc)	utilizing existing sectoral budgets

2.3. Mechanisms

This pillar addresses the ways governments steer adaptation using different rationales and sets of instruments and strategies (Henstra 2016; Bednar and Henstra 2018). These instruments and strategies generally reflect the prevailing mode of governance, with the three most common ones being regulatory (also “command-and-control” or hierarchy), market-based (financial incentives and market mechanisms), and networks (collaboration) (Bednar and Henstra 2018; Molenveld, van Buuren, and GJ. 2020). Modes of governance reflect the role of government and its rationale, whether it is from imposing obligations to adapt and enforcing them or by enabling actors through various financial, informational, and collaborative policy instruments. While some research has focused on the empirical applications of the three modes and on conceptualizing the ideal types of modes (Bednar and Henstra 2018), this Deliverable acknowledges that each mode of governance employs a mix of different policy instruments, with favorable combinations depending on the governance context (Structure pillar, Figure 2) and mode of governance in place.

2.4. Justice in adaptation and climate resilience governance

Justice in adaptation to climate change is an emerging topic that builds on the earlier works on environmental and climate justice, while focusing specifically on justice in governing the adaptation to the impacts and the expected or perceived risks of climate change. The latest literature presents the Adaptation Justice Index (AJI) (Juhola et al. 2022), that assesses the justice dimensions in terms of the context of Urban Climate Adaptation Plans. Since so far, justice has not been examined in the scientific literature on adaptation governance , the General Framework for Just and Effective CR Governance (Figure 2) draws on the AJI and on the literature regarding the consideration of justice in environmental governance (Bennett and Satterfield 2018).

In the context of this Deliverable, adaptation justice is conceived as built on the central notions of equity, fairness, and equality. Adaptation justice focuses on the equitable processes and outcomes of adaptation governance for those who have suffered or may suffer in the future from the impacts of climate change, prioritizing most vulnerable and marginalized population groups. This Deliverable adopts the IPCC AR6 approach of vulnerability to the impacts and risks of climate change defined as the propensity to be adversely affected (Möller et al. 2022). In the context of adaptation justice, vulnerability can be understood as arising from personal characteristics, i.e. sensitivity (such as pre-existing medical conditions, age, education) and social circumstances, which refer to the adaptive capacity or capacity to prepare, respond and recover (social networks and connectedness, income, migration background, for example). Some of these circumstances and characteristics are in close connection to societal norms and structures, and thus, latest view on adaptation justice is closely linked to the understanding of the need to address the structures creating inequalities and disadvantages in the first place and thus addressing the root causes of climate vulnerabilities.

There are four dimensions in adaptation justice which are presented below and then will be applied to the three governance framework pillars:

Recognitional justice refers to the acknowledgements of the diversity of people and their needs in climate adaptation and resilience stemming from differing vulnerabilities to climate change, as well as the of the societal structures norms that create part of these vulnerabilities through various forms of inequality. These may include socio-economic, political, intergenerational, or cultural structures creating structural vulnerabilities (Chu and Cannon 2021).

Distributive justice refers to the acknowledgement that climate impacts and risks are distributed unequally across society, as well as concerns the distribution of rights and responsibilities of adaptation (Juhola et al. 2022; Chu and Cannon 2021). In the first case, the distribution of risks and impacts depends on the biophysical phenomena, or what climate events will take place and where, as well as on the vulnerabilities of people and assets at that specific moment in time and in the place where hazard occurs. In the second case, distribution of rights and responsibilities means identifying who enjoys the benefits of adaptation and who bears the burden of the costs or of possible negative outcomes (maladaptation).

Procedural justice concerns equitable participation of actors and stakeholders in the adaptation process, from planning to implementation, monitoring, evaluation, and re-planning. Participation should extend beyond public sector actors and include citizens, private and third sectors, groups vulnerable to climate change as well as those possibly negatively affected by adaptation. Participation should also be meaningful extending beyond information dissemination to consultation and continuous collaboration, from participation by invitation towards a fully open and transparent process (Juhola et al. 2022; Chu and Cannon 2021). The inclusion and participation of actors is closely linked to identifying groups vulnerable to climate change, as well as those will benefit or be affected negatively by adaptation, as well as those are carrying the burden of adaptation costs (distributive and recognitional justice).

Restorative justice concerns the acknowledgment and attribution of unequal distribution of damage as well as of outcomes of adaptation, both positive and negative. Additionally, emerging adaptation research and practice suggests the consideration of compensation for the existing structural inequalities in planning adaptation action, by for example, prioritizing marginalized, segregated or communities experiencing other injustices (Juhola et al. 2022).

Next, these justice dimensions are examined in relation to each governance pillar of the CR governance framework (Figure 2).

Structure

The inclusion of a variety of actors is essential for governance effectiveness, and this is in line with all four justice dimensions. From the perspective of *procedural* justice, a variety of stakeholders need to be meaningfully involved into all stages of adaptation process, starting from negotiation to implementation, evaluation, and re-planning, and this involvement should be transparent and open. The identification of actors from the *recognitional and distributive* justice dimensions requires careful examination of existing risks and vulnerabilities to them, which are conducted with the help of climate risk and vulnerability assessment in the planning phase. In the same planning phase, a careful assessment of adaptation outcomes and their fair distribution needs to be carried out. From the *restorative* justice perspective, in cases of unequal distribution of adaptation benefits or maladaptive outcomes, as well as of costs of adaptation, marginalized and vulnerable communities need to be compensated and/or prioritized in adaptation planning and re-planning. In adaptation implementation phase, responsibilities to act need to be distributed in an equitable manner, with all actors and stakeholders participating in adaptation (*distributive justice*).

Process

In this pillar, the focus is on vertical and horizontal implementation. Vertically, there are questions of the distribution of adaptation costs across the levels of governance (*distributive justice*). For example, in cases of delegating of adaptation planning and implementation from national to local levels without funding allocation, there is a question of whether it is equitable to distribute the burden of adaptation implementation considering the municipal budgets vary to begin with, resulting also in inequitable distribution of outcomes for the residents. *Procedural* justice needs come forward in terms of including stakeholders in the decision-making and negotiation specifically in cases with top-down governance.

Mechanisms

The participation of actors and stakeholders can be steered through four main mechanisms, the use and rationale of which depend on the governance context and the power of the state. From the *distributive justice* perspective, the participation of actors and stakeholders in the implementation phase through “hard” mechanisms using binding regulatory or financially penalizing instruments needs to be carefully aligned with adaptation outcomes and costs action or inaction with the aim to avoid inequitable burden distribution and to ensure equitable attribution. Similarly, within the market mode of governance it is critical to ensure that basic human rights are insured in adaptation action, through e.g., state intervention or regulatory instruments.

Informational instruments especially in terms of knowledge generation and climate service need to cater not only for hazard assessments but also the assessments of vulnerabilities to cater for *recognitional and distributive justice* goals. This requires the provision of useful and usable climatic and non-climatic services, such as climate projections, risk and vulnerability mappings and assessments as well as information on how to use these assessments in adaptation planning. Furthermore, this information can and should be used in to conduct ex-ante or ex-post assessment or adaptation outcomes and thus consider it in adaptation re-planning as well as for possible compensation for unequal burdens, inequitable distribution of positive outcomes or for maladaptive outcomes *(restorative justice).*

3. Index of Climate Resilience Governance Effectiveness

In this section, the General Framework for Just and Effective Climate Resilience (CR) governance (see Figure 2) is tailored to the regional level and transformed into the Index of CR Governance Effectiveness to further assess CR governance structures and processes in each region (see Table 3).

3.1. Index Design

To construct the Index of CR governance, an ordinal scale scoring method was used enabling a scale to compare how well the conditions for each governance category have been met. Each category in the index is assessed using the scoring system from 0 to 3. The scores (0, 1, 2 and 3) are attributed a clear definition, a qualitative narrative, that builds on the indicators as presented in Table 3 for each governance category. In the scoring logic, 3 represents the most optimal conditions to steer CR, while 0 demonstrates that the conditions haven't been met. The analysis and scoring method is described in more detail in Chapter 4.1.

3.2. Index Categories and Indicators

3.2.1. Structure

Governance context

The administrative structure of each country participating in the R4C project is analysed to determine whether the R4C region functions as an independent administrative unit, a subdivision of a larger region, or an area with overlapping jurisdictions. To further evaluate regional governance capacities and provide CR governance recommendations, the analysis emphasizes the region's legislative and regulatory capacities (see Table 2). Next, the governance context scoping is focused on CR governance by identifying whether CR is primarily steered at the national, regional, and/or local levels, and what regulatory or legislative connections between these are. The analysis in this section is descriptive and is not utilizing the assessment scale.

Table 2. Governance context scoping.

Category	Questions
Region's profile	Is the region an administrative unit? What is the region's level of autonomy and/or self-regulation?

Legislative power	Does the region have legislative power? If yes, over which sectors and which law takes precedence?
Self-governing power	Does the region have self-governing (regulatory, budgetary) power? If yes, over which sectors?
Steering of climate resilience	Is CR steered primarily at the national, regional, or local level? What are the main documents and organisations steering CR in the region? Is there a climate law that sets out the requirements for the region to adapt? Is there a regional CR / adaptation strategy or plan? If yes, is it based on voluntary initiative or required by national/regional legislation?

Actors

It has been suggested that the involvement of a variety of actors in adaptation governance contributes to the effectiveness of adaptation. This includes especially public, private and third sectors, as well as individuals and households (Lorenz, Porter, and Dessai 2019; Klein et al. 2018; Petzold et al. 2023). The weighing of actors here is related to the "impact" of actors' involvement in adaptation planning, implementation, monitoring, and evaluation. For example, the role of private sector is critical in adaptation implementation, while governmental organizations & public sector involvement is required at all stages of the process, regardless of the governance mode. Individuals are one of the most commonly involved actor profile in adaptation (Petzold et al. 2023), but their engagement is relevant to the implementation phase mainly. With regards to the public sector, including governments at all levels, their role is mainly in the planning and funding, especially in terms of allocated funding in dedicated mainstreaming approach, while implementation gap has been noted (Petzold et al. 2023). The indicators used to assess this category and the scoring is presented in Table 3.

Private sector

Private sector participation is critical in adaptation financing and implementation; however, global evidence suggests that private sector engagement is largely lagging (Petzold et al. 2023). The goal of this question is to evaluate the participation of private sector and the sufficiency of steering efforts to engage it. The indicators used to assess this category and the scoring is presented in Table 3.

3.2.2. Process

Vertical implementation

Adaptation as a coordinated effort takes place within a multi-level governance context, including international, national, regional, and local levels (Corfee-Morlot et al. 2011). This poses the need for connectedness and

synchronization of actors, structures and processes and alignment of policies across all levels of governance to increase adaptation effectiveness (Bennett and Satterfield 2018). Within multi-level governance context, there is a need to ensure that regional adaptation governance is aligned with national and local governance as well as planning and financing processes (Termeer et al. 2011), with some countries passing legislation to ensure the alignment of policy goals across levels (e.g., Australia, Baker et al. 2012). Additionally, there is a need to consider governance contexts in which adaptation takes place in terms of division of legislative and regulatory power at different levels, as the lack of mandate or competences at regional or local levels has been pointed out as one of the most common barriers to local and regional adaptation (Baker et al. 2012). The indicators used to assess this category and the scoring are presented in Table 3.

Horizontal implementation

Horizontal implementation refers to two types of implementation: mainstreaming - the integration of policy goals into other sectors at the same level of government, and dedicated (stand-alone) (Runhaar et al. 2018; Uittenbroek et al. 2014).

In this category, the scoring is different for dedicated and mainstreaming approaches. *Dedicated* approach can be determined by the presence of a dedicated legal framework (adaptation/resilience law, strategy, or plan) and a dedicated specialized institution or addition of a function to an existing institution (responsible person/department) that coordinates adaptation. Adaptation is a political commitment and is framed as a core value and objective. *Mainstreaming* approach can be determined by the absence of a specialized institution or added functions to the existing institutions as well as the absence of dedicated frameworks, while adaptation is added as a policy goal or considered while formulating policy goals in other sectors (e.g., spatial planning, regional development, sustainable development, water management, etc) (see Table 1 for more details on differentiating the two implementation approaches).

In many cases the approach is mixed. This can be, for example, evident in cases with an existing stand-alone adaptation strategy that includes provisions for integrating climate adaptation objectives into other sectoral work (Saito 2013; Wamsler 2015); or using climate-related funding to hire dedicated staff to facilitate the integration of adaptation as a central theme of sectoral policies (Stiller and Meijerink 2016; Wamsler 2015). In the cases of mixed approaches, the study considers what would be the prevalent approach focusing on whether adaptation is steered primarily through sector policies or is a stand-alone policy sector, and the scoring is made for the prevalent approach.

The effectiveness of a mainstreaming approach is conditioned by such factors as: a) coordination and collaboration between departments within and across policy domains, b) clear formulation of goals and c) sufficient resources. The dedicated approach requires at least the following conditions: a) availability of dedicated funds, b) specialized institutions, c) a clear legal framework, and d) horizontal alignment (Runhaar et al. 2018; Stiller and Meijerink 2016; Wamsler 2015). The indicators used to assess this category separately for dedicated and for integrated approaches and the scoring logic are presented in Table 3.

3.2.3. Mechanisms

Steering with regulatory instruments

The scoring in this category starts off with the perspective that regulatory mode of governance or the use of legally binding frameworks is most certain to steer adaptation, with network, information and market instruments

supporting the legislation and/or regulation. This mode of governance, however, is only available for the regions with legislative and/or self-governance power who can pass binding legislation or regulation at the regional level. For the regions without these capacities, national or local level legislation or regulation to steer adaptation may come into place, with regional level focusing on other types of instruments to support it. This is taken into account in the recommendations (Chapter 5). In the assessment, the index is calibrated to take into account either regional or national/local legislation and regulation. The indicators used to assess this category and the scoring is presented in Table 3.

Steering with financial instruments

Financial instruments vary including incentivizing and penalizing instruments, public procurement, and PPPs, as well as dedicated public funds for adaptation. Incentivizing financial instruments may include subsidies, grants, insurances, green bonds or loans, tax incentives, research funding, etc. Penalizing instruments can include, e.g., taxes or user charges. Other types of funding include project-based (for research, planning, implementation) or allocation of dedicated budget (which can be for the whole cycle or various parts of it). The indicators used to assess this category and the scoring are presented in Table 3, assessing two categories separately: financial instruments and allocated funding.

Steering with informational instruments

Knowledge generation includes climate services such as projections, scenario development and assessments that can be used specifically for regional planning e.g. regional risk assessments, as well as participation in knowledge-generating projects. Participation in formalized networks (e.g., ICLEI, Covenant of Mayors, C40, local climate/resilience networks) enhances learning and steers adaptation due to established guidance and reporting mechanisms. Mobilization of local knowledge in addition to enhancing the knowledge base, also increases legitimacy of adaptation through trust and acceptance.

Table 3 summarizes the Index elements, adaptation requirements, indicators used and the scoring system.

Table 1. Index of CR governance effectiveness.

Governance element	**Adaptation requirement**	**Indicators**	**Scoring**
Structure			
Governance context	Governance context is a given	1) administrative unit 2) degree of autonomy 3) legislative power 5) self-governing power 6) level of CR steering (national/regional/local)	not assessed, descriptive
Actors	Polycentricity	1) Public sector 2) Private sector 3) Individuals & households 4) Third sector	3p - All actors 2p - Public sector + private sector + individuals OR third sector 1p - Public sector + individuals OR third sector 0 – actors not defined

Private sector engagement	Private sector role is prominent in financing and implementation stages, while globally participation is largely lagging	1) legal requirement to participate in adaptation 2) financial incentives 3) voluntary participation	3p – Private sector is legally required to participate in adaptation 2p - Private sector is incentivized financially to participate (through taxes, subsidies, etc) 1p - Private sector participates voluntarily (e.g. through PPPs) 0p – private sector is not active in adaptation
Process			
Vertical implementation	Adaptation is most successful when it is aligned across all (applicable) levels of governance (vertical) – to ensure connectivity and coherence	1) Legal framework that regulates the coherence and alignment 2) Tasks are assigned and conferred to the appropriate levels of government 3) Legal division of responsibilities to adapt	3p – there is a legal framework that regulates the coherence from national/regional to local, tasks are conferred to the appropriate levels and there is a legal division of responsibilities across levels 2p – no framework, however, tasks are divided and conferred 1p – no framework, there is a division of tasks but there are challenges in alignment OR tasks are conferred to the lower levels but there is lack of clarity 0p - not aligned, no division of responsibility, conflicts in goals, mandates or resources
Horizontal implementation **1) dedicated** **2) mainstreaming**	**Dedicated:** effectiveness requirements are dedicated funds, specialized institutions and a clear legal framework, and horizontal alignment	1) dedicated funds 2) specialized institutions 3) clear legal framework 4) horizontal alignment	3p – dedicated funding, specialized institutions, clear legal framework, and horizontal alignment of objectives 2p – clear legal framework that sets the responsibilities horizontally, dedicated funding, specialized institutions 1p – clear legal framework 0p – none of the above
	Integrated: As the integrated approach risks “diluting” CR in other sectoral policies, clear formulation of goals and coordination	1) coordination and collaboration between departments within and across policy domains 2) clear formulation of goals 3) sufficient resources	3p – adaptation integrated into all relevant policy sectors at the applicable level, goals are clearly formulated, there are sufficient resources 2p - adaptation integrated into all relevant policy sectors at the

	are critical. Funding and human resources are important		regional level + goals are clearly formulated 1p - goals are clearly formulated OR coordination is established AND sufficient resources 0 – none of the above
Mechanisms			
Regulatory steering	Adaptation is most effective when there is a legal requirement to adapt. In the absence of a climate law that sets out adaptation requirements, strategies and plans complemented by voluntary policies need to be in place.	1) Climate laws (national or regional if autonomies) 2) Climate strategies / plans 3) Voluntary policies	3p - Climate law + regional strategy (or a requirement to develop one) 2p – No climate law or climate law exists but doesn't steer regions to adapt; there is a regional strategy based on voluntary initiative with formalized coordination 1p - Voluntary action but not coordinated by the regional council (voluntary policies only) 0p - No regional strategy or voluntary policies for adaptation
Financial steering	Incentivizing and penalizing instruments, various procurement and PPP programmes	- type of financial instrument: incentives, penalizing instruments, public procurement, PPPs - regularity of instrument (ad-hoc/sporadic, for example, project grants vs established like taxes, subsidies)	3p – the region is using a mix of financial instruments, and the instruments are regular (established, e.g. taxes, subsidies) 2p – the region is using a mix of financial instruments, but they are sporadic (e.g., ad hoc grants or projects) OR one established (e.g., subsidy or tax) 1p – the region is using one type of financial instruments and their use is ad hoc/sporadic (irregular) 0p – there are no financial instruments used
	Allocation of dedicated budget should be reserved for the whole policy cycle (planning, implementation, M&E, re-planning).	-dedicated funding -project-based funding	3p – funding is continuous and secured for the whole policy cycle including M&E & re-planning 2p – Funding for planning and/or implementation 1p – Project-based funding 0p – No funding allocated

Information steering	These instruments include knowledge generation services (e.g., climate services, such as risk assessments, scenarios, etc), science-policy instruments & organizations, mobilization of local/indigenous knowledge, participation in networks, and public outreach	- knowledge generation - public outreach - participation in networks - mobilization of local/indigenous knowledge	3p – knowledge generation, networks/boundary organizations + any other information instrument 2p - knowledge generation + one any other information instrument 1p - knowledge generation 0p - none of the above

4. Research approach

4.1. Materials and methods for the governance assessment

Scoping

The entry point of the analysis is regional level. Within R4C project context, this pertains to autonomous territories, regions, coalitions of municipalities, etc = below national and above local/municipal. Thus, when we construct the basic governance profile for the region, we are examining whether resilience efforts in a region are steered at the regional level, or rather national and/or municipal. Some regions may have regional strategies, which rather provide guidance than regulation. In this case, we are looking for the regulation that has the most impact on resilience efforts' progress in the region (e.g., national legislation/plans, municipal plans).

As climate adaptation and resilience building are deliberate efforts that concern a large extent of societal goals, risking "concerning everything" (Huitema et al. 2016), there is a need to draw boundaries as to what constitutes adaptation and resilience in the analysis. For the purposes of this study, the scope is limited to interventions (policies or actions) that intentionally address climate impacts (observed) and risks (not yet realized, but possibly in the short- to long-term) or intentionally aim to enhance resilience to impacts and risks. This means, that only efforts that intend to or significantly contribute to the reduction of hazards, exposure, and vulnerability and/or enhance adaptive capacity are considered. This scoping pertains to both interventions as well as actors involved. For the policies and actions, high intentionality and low intentionality/high substantiality policies and interventions are included (Dupuis and Biesbroek 2013). Depending on the risk in question, these may include:

- *Adaptation- and resilience policies and actions*
- *Disaster risk reduction policies and actions*
- *Flood management and similar*

As this study focuses on the interventions that directly refer to the core goal of adaptation and resilience (enhancing adaptive capacity, reducing vulnerability and exposure of systems/regions in question), factors influencing systems' exposure and vulnerability in a more indirect way are excluded. More specifically, these include interventions that do not directly target climate risk reduction and adaptation AND do not have substantial effect on risk reduction or resilience building (for example, general equity promoting or well-being enhancing policies, universal healthcare, sustainable development, regional development, etc.). This is done for two reasons. First, to reduce the amount of analysed policies to a reasonable level. Second, the actions enhancing resilience may be diluted in sectoral policies, unless sectoral policies have specifically adaptation and resilience enhancing goals at their core. As an example, the study does not consider the benefits of equity policies in general, but rather the equity aspects directly affecting exposure and vulnerability to climate risks (e.g. equal access to early warning systems among stratified populations/communities).

In short, this deliverable excludes sector-specific strategies and possible climate resilience mentions in those, but rather climate resilience and adaptation strategies and plans (general and sectoral), which further delegate actions and assign responsibilities further to the sectors or specific actors.

Data collection

The data for the CR governance assessment was collected through the survey to the R4C partner regions. The survey was active during the period of June-August 2024, and several iterations of answer collection have been undertaken to ensure receiving as full set of answers as possible. On average, every region has revised and clarified the answers to the survey twice. The questions were formulated in a way to avoid the need to assess regional performance by the regional partners and representatives. The questions were built on the base of the indicators of CR governance (see Table 3) and included yes/no questions, multiple-choice and open-ended questions. The respondents to the survey were in all cases regional representatives of relevant authorities as well as representatives of R4C regional RTOs with relevant expertise. Answering of the survey was possible collectively (several respondents per one survey form) to seek for internal consensus in each region and avoid several conflicting answers.

To corroborate and amend survey answers in the analysis, we have also included the analysis of the central guiding documents in each region. The identification of these documents was done through the survey. These documents included NASs, NAPs, Climate laws, regional adaptation strategies or plans, and in rare cases local adaptation strategies and plans. In the cases where evidence was scarce, scientific literature was also searched to amend and corroborate the survey answers.

Data analysis

Structured expert judgement was used to conduct the assessment (Mach et al. 2017), based on the survey answers and policy documents. To arrive at the scoring, the experts carefully collected, evaluated, synthesized, and validated the evidence for each indicator from the survey and policy documents, according to the developed assessment protocol (Table 3). To increase the robustness and transparency of the results, each scoring is attributed a confidence level (please, see below). Structured expert judgement was selected here to reduce possible bias inherent to self-assessment techniques, albeit it is impossible to eliminate subjectivity in its entirety. The assessment was carried out by four co-authors of the Deliverable, with each expert assessing cases they are most familiar with. In cases of doubt, challenging scores and categories have been discussed to verify the final scoring. Finally, the completed assessments have been validated by the regional partners. This has been done via e-mail with the request to provide comments or corrections where applicable to the final assessment results, and the final corrections have been incorporated accordingly.

Confidence levels

To further enhance the robustness of the results, confidence levels are attributed to the scores, and expressed qualitatively (3 levels: Low, Medium, High; Table 4). Confidence levels are attributed by the experts on an individual basis and for each of their respective local case studies and each assessed category separately. Confidence levels use the level of evidence as a proxy to the confidence level. To assess levels of evidence, each expert weights approximately 50/50 the following two considerations:

1. *The robustness of the information (from publications, datasets, interviews, etc.) used to decide for a score.*
2. *The sufficiency of the information to achieve the expectations of the score.*

As a rule, in this Deliverable, high confidence level denotes that the assessment has been conducted on the basis of survey and validated with policy documents, and the quantity of information was sufficient. Medium

confidence level denotes that the assessment was based only on the survey answers, the quantity of information was sufficient, and the evidence from the survey was coherent. Low confidence level denotes that only survey was used in assessment, and survey evidence was either fragmented or inconclusive, or the evidence was insufficient.

Table 2. Confidence level in structured expert judgement.

Confidence levels		Brief description
	Low	Limited evidence (insufficient or inconclusive evidence from a single source)
	Medium	Medium evidence (sufficient quantity and quality of evidence, one source of evidence OR several source with insufficient quantity/quality)
	High	Robust evidence (sufficient quantity and quality of evidence, corroboration from several sources)

4.2. Materials & methods for the analysis of governance barriers and enablers

This part of the study has used the data collected for the D6.1" Common Innovation Framework & Solutions Portfolio". The relevance of data was ensured through collaborating with SPI in the formulation of survey questions. The study utilizes specifically the answers to the questions concerning the governance barriers and enablers' relevance for innovation in general and in terms of R4C regions IPs specifically.

The data are fragmented, and the quantity of responses per region varies (see Table 5). Available resources (i.e., number of regional partners involved, existing knowledge and capabilities, budget, etc.) can vary considerably from one project region to another, which is one of the main reasons for the different degree of response. When this occurs, the technical project partners try to offer alternative solutions to mitigate potential differences and maintain the participation and interest of all regions. There are no survey data available for Nordic Archipelago, Sitia, and Burgas. For these regions, the analysis of governance barriers and enablers is based on the results of governance assessment. For other regions, the number of responses varied from 1 to 4 respondents per region. Only the responses from RTOs involved in the IP and Regional Partners were considered, and average score was calculated for the regions with more than one response. Only the barriers and enablers ranked as 4 (relevant) and 5 (most relevant) are presented in Chapter 5 and used in developing the Governance Recommendation. Full ranking results of the barriers and enablers are presented in Annex 8.

Table 3. Number of responses in the survey on governance barriers to and enablers of R4C innovations.

R4C region	RTO	Regional partner

Basque Country	1	1
South Aquitaine	1	-
Tuscany	1	-
Azores	1	1
Koge Bay	-	2
Uusimaa	1	1
Pärnumaa	1	3
Burgas	-	-
Sitia	-	-
Troodos	1	-
Nordic Archipelago	-	-
Castilla y Leon	1	-

5. Governance assessment results and recommendations

5.1. Basque Country

5.1.1. Baseline governance assessment

Governance structure

Spain is a unitary decentralized country, where the division of powers across the country is asymmetrical (de facto resembles federation) **with legislative powers at the sub-national** (Regional) level. There are 17 autonomous communities and two autonomous cities. Basque Country is an autonomous community (first-level political and administrative division), encompassing three provinces Alava, Biscay and Gipuzkoa. As an autonomous community, Basque Country has legislative and administrative competences over a number of relevant sectors[1].

Climate resilience governance

At the national level, adaptation is steered by national climate law (*The Law on Climate Change and Energy Transition* 7/2021). Due to the high degree of autonomy and legislative capacities, the main guiding frameworks in the Basque Country include the regional energy transition and climate change law (*Basque Law on Energy Transition and Climate Change Law* 1/2024) and the regional adaptation strategy (*Climate Change Strategy of the Basque Country to 2050*). In particular, the energy transition and climate change law requires municipalities to develop local climate change plans that include the adaptation perspective and emphasize interinstitutional coordination and citizen participation around the major challenges raised by climate change, while likewise fostering the cohesion of the urban, social, and economic frameworks[2].

5.1.2. Governance barriers for and enablers of innovation actions

Among the relevant governance barriers to the adaptation innovations in Basque Country are difficulty and lack of collaboration / connection among the stakeholders (business-academy/science-territory) as well as bureaucracy. Among the most important enablers are government's innovation policies promoting a culture of collaboration and facilitation, R&D expenditure in the public sector, knowledge and technology transfer between university, government and industry, active networking, training programs and educational services, cross-border cooperation, access to funding and digital infrastructure. All the listed barriers and enablers have been also identified as relevant specifically for the Basque Country IPs.

[1] https://portal.cor.europa.eu/divisionpowers/Pages/Spain-intro.aspx
[2] https://climate.ec.europa.eu/document/download/c6ef0679-f0da-491f-86e9-ec62985adf2d_en?filename=summary_fiche_es_en.pdf

5.1.3. Assessment of CR governance and Recommendations

Overall, Basque Country CR governance assessment demonstrates high performance across most categories, with high scores in all three pillars of governance (structure, process, mechanisms) (Figure 3).

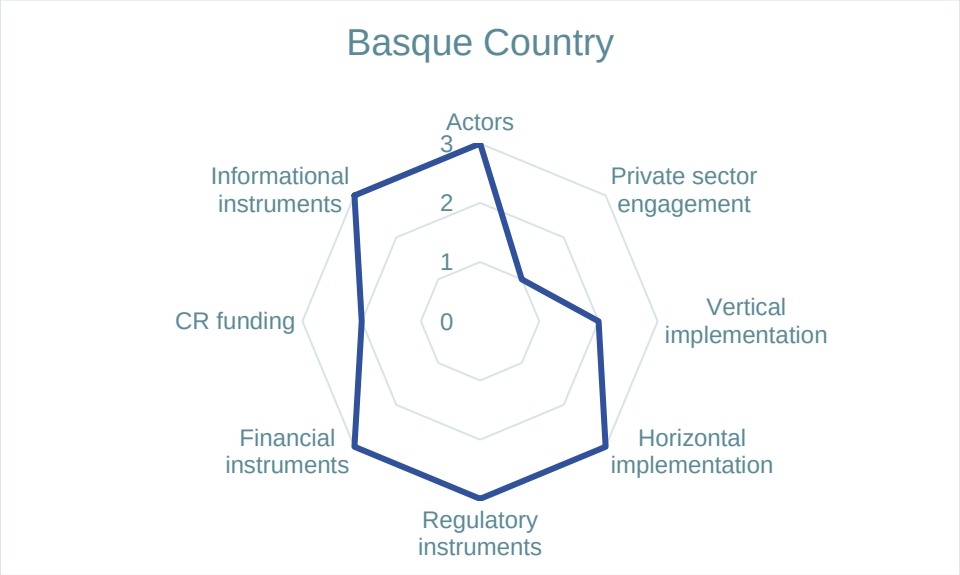

Figure 3. Basque Country performance in the assessment of CR governance.

Basque Country is engaging a wide variety of actors in climate resilience (Table 6). **The engagement of private sector, however, is currently voluntary and could be strengthened further with the use of various regulatory or financial instruments**, for example, the introduction of tax incentives for companies that adopt climate resilience measures, or mandatory climate risk disclosures as part of corporate reporting, could encourage greater private sector involvement. Additionally, the creation of green bonds or climate resilience funds could provide financial support for businesses investing in climate adaptation strategies, while ensuring alignment with regional sustainability goals

With regards to implementation of adaptation, there is room for improvement in terms of vertical implementation (Table 6). The scoring in this category is still high stating that the tasks & responsibilities are assigned and conferred to the lowest appropriate level (subsidiarity), and the national and regional climate laws call for coherence and alignment across government levels. However, there is no specific framework or regulation to ensure that yet in place, and **passing such regulation or amending existing regulation in that regard could enhance clarity and nestedness of tasks across the levels of governance**.

In terms of horizontal implementation, the approach in Basque Country is mixed: there are stand-alone frameworks for adaptation with clearly formulated adaptation goals, coordinating institutions and allocated budget, while the regional climate law requires that all sectoral plans with impact on land use consider adaptation in their plans by accounting for the climate risks and planning adaptation measures. Thus, while the approach in Basque

Country is mixed, with clear elements of dedicated approach through dedicated frameworks, institutions, and resources, as well as agenda setting, the law also ensures mainstreaming by setting requirements for the sectors to mainstream adaptation into relevant sectoral and territorial plans. This approach minimizes the risk of silos and conflicts in sectoral agendas. The arrangements for horizontal implementation are thus advanced and provide ground for effective steering of adaptation.

Basque Country is also advanced in using a variety of regulatory, informational, and financial instruments (Table 6). Considering that Basque Country has legislative power to pass binding legislation and regulation, the regional law sets obligations for the municipalities to develop their adaptation place in the most effective regulatory instrument. With regards to adaptation funding, funding is available for planning and implementation. As adaptation progresses in the region**, it is advisable to secure continuous funding** that would allow for monitoring and evaluation of adaptation progress as well as for further re-planning or adjustments, if needed.

Basque Country also uses a wide variety of financial instruments to steer actors in adaptation, including project-based funding and grants, as well as penalizing instruments for non-compliance both in terms of mitigation and adaptation, according to the regional strategy. However, the criteria for the application of the mechanism are specified for mitigation so far and could be further defined also for adaptation. Furthermore, if the region aims at more certain **engagement of private sector, there is space to do that with regulatory instruments, as well as incentivizing or penalizing financial instruments** as so far, the engagement of private sector in implementation has been voluntary (through PPPs, for example).

There is wide range of institutional instruments and information providers in Basque Country, including various research networks and knowledge generating organisations. Public outreach includes, for example, ASTEKLIMA - Climate and Energy Week – organized by the Basque Government's Ministry of Economic Development, Sustainability, and the Environment.

With regards to the innovation package, the **barriers and enablers** identified as relevant for the Basque Country IP highlight the need for closer collaboration and transfer of knowledge among different stakeholders and actors, especially private and third sectors, which can be achieved with the **help of formal or informal networks, working groups, or boundary organisations promoting relevant adaptation issues, with the main focus on active networking, knowledge generation & experience sharing among different actors**. There are several relevant organisations and networks promoting e.g., cross-border cooperation (Transborder Scientific Interest Group "Littoral Basque"), municipal cooperation (UDALSAREA local governments for sustainability) or research cooperation (Basque Research & Technology Alliance). In addition to that**, it would be valuable to establish or utilize existing closer cross-actor collaboration platforms** (as part of the existing networks, as informal working groups or networks, or as an event series) that would bring together private and third sectors. Public expenditure for R&D has been marked as a relevant enabler, and Basque Country has a number of grants and funding programs for innovation and implementation of projects related to environmental protection, climate change adaptation and sustainable development goals.

Table 4. Results of the Basque Country CR governance assessment, scoring justification and confidence level.

Assessment category	*Score*	*Justification*	*Confidence level*
STRUCTURE			

Actors' involvement	3	Public, private and third sectors are involved into implementation (Any climate change policy must manage to bring all the stakeholders of society onboard. The public administration therefore needs to act as a driving motor for change, setting an example with visible measures that guide the action at all levels). Also, based on the climate adaptation strategy, participatory processes have been held to build the strategy, including private citizens.	high (survey; (*Climate Change Strategy of the Basque Country to 2050*)
Private sector engagement	1	Based on the survey answers, private sector is not required legally or incentivized to participate, private sector participates voluntarily or through PPPs.	medium (survey)
PROCESS			
Vertical implementation	2	There is no proper and specific regulation, however there is a National and the Regional Energy Transition and Climate Change Law that call for coherence and alignment across governance levels. Tasks are assigned and conferred.	medium (survey)
Horizontal implementation	3	The region declared to have a mixed approach as the law requires all plans with impacts on land use, both integrated planning as well as sector planning particularly in relation to energy, rivers and streams and coastal planning to consider climate change related risks and define adaptation measures. The scoring is done for the dedicated approach, as while the law requires that other sectors consider adaptation in their planning, there are stand-alone legal frameworks for adaptation, supported by the coordinating institutions and an allocated budget, with adaptation agenda set as the main objective and goals are clearly formulated within these frameworks.	high (survey; (*Basque Law on Energy Transition and Climate Change Law* 1/2024; *Climate Change Strategy of the Basque Country to 2050*)
MECHANISMS			

Regulatory steering	3	Basque Country has a regional Energy Transition and Climate Change Law (Law 1/2024, 8 of February, Climate Change and Energy Transition of the Basque Country) and a regional strategy (Basque Country Climate Change Strategy 2050, Regional/Basque Climate Change Strategy KLIMA 2050)	(survey; *Basque Law on Energy Transition and Climate Change Law 1/*2024; *Climate Change Strategy of the Basque Country to 2050*)
Financial steering: financial instruments	3	There is wide mix of financial instruments used in the Basque Country, including various project funding and grants, but also an established penalty mechanism in place for non-compliance pertaining to both adaptation and mitigation, even though the criteria are specified for mitigation mainly.	High (survey; *Climate Change Strategy of the Basque Country to 2050*)
Financial steering: allocated funding	2	Funding is available for planning and implementation, and it is project-based. The regional climate law states that European Social Funds will be used for adaptation and mitigation. Also it highlights that within 18 months from the law start (01-01-24) budget will be developed (In order to comply with the objectives set out in this law, it is established that, within 18 months of its entry into force, the Basque Government department responsible for energy and climate change, together with the department responsible for budgetary matters, shall draw up guidelines for the identification and creation of the budget items to be allocated for compliance with this law).	High (survey; (*Basque Law on Energy Transition and Climate Change Law* 1/2024)
Information steering	3	Several climate services and networks are in place to promote knowledge mobilisation, generation and sharing.	medium (survey)

5.2. South Aquitaine

5.2.1. Baseline governance assessment

Governance structure[3]

France is a unitary state on a decentralized basis **without legislative powers at sub-national level.** There are three sub-levels of governance in France: the Regions (régions), the Departments (départements) and the Municipalities (communes). They are not bestowed with legislative powers but exercise their functions by means of regulations for some fields and through the execution of their budget (self-governing). The principle of freedom of administration by local authorities is explicitly enshrined in the Constitution and is completed by the principle of financial autonomy of the local, intermediate, and regional authorities. Local, intermediate, and regional authorities (LRAs) have general competence for the exercise of their functions. As a result, **shared competences** are the rule. There is no hierarchy between regional, intermediate, and local government. Local authorities may carry out “local experiments". Regions are specifically responsible for:

- *Regional transport, including regional transport plans, civil airports, non-autonomous harbours.*
- *Departmental transport, including school transport, interurban transports, passenger transport, roads, commercial and fisheries ports, civil airports, non-autonomous harbours and railways.*
- *Education, in particular high schools (lycées).*
- *Vocational training and apprenticeship.*
- *Culture, including cultural heritage and monuments, museums, archives, artistic vocational training and learning.*
- *Regional planning.*
- *Economic development.*
- *Environment, and*
- *Scientific development.*

The R4C region “South Aquitaine” is not an administrative unit but is part of the larger administrative region Nouvelle Aquitaine. This assessment is completed with this in mind, while focusing on the Communauté d’Agglomeration Pays Basque (CAPB), which is an administrative unit that covers part of the South Aquitaine territory. CAPB is a public body for inter-municipal cooperation that was created in 2017 from the fusion of 10 communities of municipalities and agglomeration communities (communautés d’agglomération) and covers the 158 municipalities of the Pays Basque. The agglomeration community automatically exercises the following powers in place of the member municipalities (Article L5216-1, *Code Général Des Collectivités Territoriales* 2015):

- *Economic development: creation, development, maintenance, and management of industrial, commercial, tertiary, craft, tourist, port or airport activity zones; local trade policy and support for commercial activities of community interest; promotion of tourism,*
- *Certain matters of community spatial planning: territorial coherence plan and sector plan*
- *Matters of social balance of housing: local housing programme, actions, and financial aid in favour of social housing of community interest*

[3] https://portal.cor.europa.eu/divisionpowers/Pages/France-Introduction.aspx

- *Are of urban policy: drawing up a diagnosis of the area and defining the guidelines for the urban contract; leading and coordinating contractual measures for urban development, local development and economic and social integration.*

Climate resilience governance[4]

At **the national level**, climate resilience is steered by the Loi Climat et Résilience /Climate and Resilience law of 2021. Article 237 of the law's Chapter V on climate adaptation (Chapitre V - Adapter les territoires aux effets du dérèglement climatique) sets out the basis for the integrated coastline management strategy at national and local level (*Climate and Resilience Law (France)* 2021). At national level, it establishes a national strategy for integrated coastline management (SNGITC), which is led by the State and is drawn up in consultation with local and regional authorities, the Conseil national de la mer et des littoraux, and other actors (Cerema 2021). At the local level, the Climate and Resilience Law gives local authorities or their groupings responsible for flood and coastal defence the option of drawing up local integrated coastline management strategies (SLGITC) (Cerema 2021).

At the **regional** level, adaptation is addressed in other sectoral documents such a State-Region collaboration contract for economic development of the territory (CPER), as well as the Regional Economic Development, Innovation, and Internationalisation Plan, but no dedicated regional adaptation strategies or plans exist.

Overall, adaptation is mainly steered through **local** level plans, such as the Plan Climat Pays Basque (Basque Country Climate Plan) adopted by the Communauté d'Agglomeration Pays Basque (CAPB). It is the framework document for the territory's climate-air-energy policy to combat climate change and to adapt to its projected local effects. It sets out long-term objectives and short-term actions. Within this frame, the Plan Climat-Air-Énergie territorial (PCAET - Territorial Climate-Air-Energy Plan) locally articulates the international and national objectives and is part of the regional policy for ecological and energy transition. At the local level, the territorial climate-air-energy plans (PCAET) have been compulsory for all inter-municipal bodies with more than 20,000 inhabitants since 2019. Another strategy for the Basque Country area is the Stratégie locale de gestion des risques littoraux de la côte basque (SLGRL) - plan d'actions 2023-2028 (Local coastal risk management strategy for the Basque coast - 2023-2028 action plan).

When it comes to risk management, the CAPB supports municipalities in drawing up local documents listing the natural and technological risks that a town and its inhabitants may face (DICRIM - Document d'Information Communale sur les Risques Majeurs) (CAPB 2021). At municipal level, Municipal Safety plans (Plans Communaux de Sauvegarde – PCS) also serve as overall organisation documents for managing crisis situations affecting the population, depending on their nature, scale, and evolution. The PCS is mandatory if the municipality is exposed to at least one major risk and brings together all the documents that contribute to preventive information and the protection of the population. Additionally, Local flood risk prevention plans (PPRI - drawn up when municipalities are affected by a flood risk) and Coastal risk prevention plans (PPRL, drawn up when municipalities are affected by the risk of flooding due to marine submersion) focus specifically on the coastal risks.

[4] https://climate.ec.europa.eu/document/download/faab8d94-ab28-48f1-87e2-3a98fc67fbc3_en?filename=country_fiche_fr_en.pdf

5.2.2. Governance barriers for and enablers of innovation actions

The following governance barriers for the South Aquitaine IP have been identified in the survey: lack of necessary knowledge or understanding and lack of funding. Additionally, the respondent from the South Aquitaine region has raised the question of arising costs stemming from the dynamic management of the waterfront (maintenance of real time monitoring and forecasting systems, safety measures when a storm is approaching, etc.). The most relevant enablers include R&D expenditure in the public sector, cross-border cooperation, access to funding and digital infrastructure (see the full table of barrier and enabler ranking in Annex 1).

5.2.3. Assessment of CR governance and Recommendations

Overall, South Aquitaine shows highest scoring in structure (actors and involvement of private sector), while the steering mechanisms and vertical implementation are scored low (Figure 4; Table 7 for scoring details and justifications).

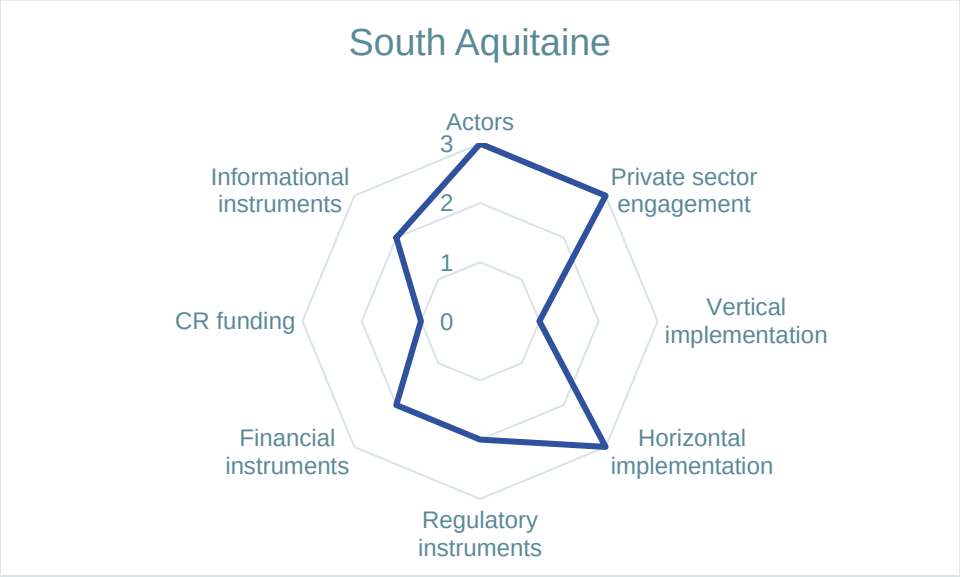

Figure 4. South Aquitaine performance in the assessment of CR governance.

In South Aquitaine, a variety of actors is involved in adaptation, including private, public, third sectors as well as households/citizens. Private sector is required legally as well as financially incentivized. Citizens are mentioned as key actors in the Basque Country Climate Plan (Table 7).

The scoring of vertical implementation in South Aquitaine **highlights the need in enhancing the coherence and alignment across the levels of governance.** According to the data consulted, while the tasks, including coastal risk management, are assigned to the local level in line with its mandates, they are not aligned across levels. There is a lack of coherent articulation of mandates between regional and local level (Table 7). Overall, **vertical implementation could be improved and clarified with the help of a framework the sets coherence and alignment of climate resilience goals across levels, as well as a division of responsibilities to adapt**

particularly at the regional and local levels. In terms of horizontal implementation, the region uses a mixed approach, and the scoring here is done for the dedicated approach as there are dedicated frameworks, and coordinating/responsible organisations. According to the survey, adaptation is integrated into main policy sectors at all levels (national, regional, local). At the local level, goals are clearly formulated in the Basque Country Climate Plan, and budget and resource allocation is provisional (*Plan Climat Pays Basque* 2021).

Climate resilience is steered primarily through local-level regulatory frameworks, such as the Basque Country Climate Plan. There is no regional strategy at Nouvelle Aquitaine level, and the frameworks (while binding) cover only the CAPB (Community Agglomeration of Basque Country). The region is using a variety of financial instruments, including both at the national and the regional level (Table 7). These financial instruments, however, are not regular in character and mainly include a variety of funds and grants (Green Fund, locally managed European funds for agriculture, grants for ecosystem restoration). Establishment of regular financial instruments, as well as expanding to the use of incentivizing and/or penalizing instruments could increase the variety of instruments for financial steering. However, since there is a strong regulatory steering in the region, there is no complete reliance on financial incentives as a primary steering mechanism. Rather, a **favourable mix of regulatory, financial, and informational/networking instruments is advised.** Adaptation funding, while it is provisional as per the Basque Country Climate Plan (*Plan Climat Pays Basque* 2021), it's not yet fully secured and will consolidate as the process unfolds. **Secured funding for the whole process of planning, implementation, monitoring, and evaluation, as well as replanning, is always advisable.** This is especially relevant also considering the challenges mentioned in association with the South Aquitaine IP regarding the arising costs associated with the dynamic waterfront management, and overall concern with the lack of funding.

Among the barriers identified, lack of necessary knowledge and understanding was also pointed out as relevant. There are several informational instruments available in the region, mainly referring to knowledge production and mobilization by the public interest groups such as the GIP Littoral of Nouvelle Aquitaine or GIS Littoral Basque (Basque Coast Scientific Interest Group). **Formal or informal networks, groups or activities that would mobilize a diversity of actors including also private sector and citizens, or strengthen collaboration between R&D, educational institutions and private sector could be useful** in addressing this barrier.

Table 5. Results of the South Aquitaine CR governance assessment, scoring justification and confidence level.

Assessment category	*Score*	*Justification*	*Confidence level*
STRUCTURE			
Actors' involvement	3	Public sector and third sector are engaged in climate resilience, while private sector is said to be financially incentivised and legally required to participate. However, in the Basque Country Climate Plan, citizens are mentioned as key actors. For example, one of the operational objectives of Action No 8.7 (p. 162 of the Action Plan) is to "encourage and support projects by local players and citizens wishing to become	medium (survey, Basque Country Climate Plan, inconclusive evidence)

		involved in achieving the objectives of the Climate Plan".	
Private sector engagement	3	Private sector is both financially incentivised and legally required to participate in adaptation.	medium (survey)
PROCESS			
Vertical implementation	1	Climate resilience in the region is steered primarily through local climate strategies. Adaptation is integrated into main policy sectors at national, regional, and local levels. Climate resilience objectives are aligned at local level, but not across national/regional levels. There is no legal framework regulating the coherence and alignment of adaptation across levels of governance, nor a legal assignment of responsibilities to adapt across levels. However, tasks are assigned to the appropriate levels to align with the mandates and competencies. In short, the tasks are assigned to the local level in line with its mandates, but are not aligned across levels, also due to the lack of a framework. There seems to be in particular a lack of coherent articulation of mandates between regional and local level.	medium (survey; (*Climate and Resilience Law* 2021 consulted, but more in-depth research would be needed to assign the score with more confidence)
Horizontal implementation	2	Survey answers suggest that the region uses a mixed approach, and the scoring is made for the dedicated approach. At the local level, goals are clearly formulated in the Basque Country Climate Plan, which also formulates budget and resource allocation, albeit provisional. According to the survey, adaptation is integrated into main policy sectors. According to survey responses, adaptation coordination is added as a function to existing organisations. At the same time, for the implementation of the Basque Country Climate Plan, the CAPB has rendered permanent a governance set-up that was initiated for the development of the plan itself, which includes:	medium (survey; (*Plan Climat Pays Basque* 2021)

		• *A piloting committee* • *An engagement committee* • *A partnership committee*	
MECHANISMS			
Regulatory steering	2	There is a climate law but according to the survey answers it does not steer regions. There is no regional strategy at Nouvelle Aquitaine level, but there is the Loi Climat Pays Basque at the local level (coordinated by the CAPB)	medium (survey)
Financial steering: financial instruments	2	Financial instruments at the national level include financial incentives (Fonds vert), demonstration projects on publicly controlled land (adapting to the retreat of the coastline). Financial instruments for climate resilience at the regional level include public procurement and penalising instruments. Grants from other sectors have an influence on resilience (Grants for the Restoration and Conservation of Ecosystem, locally managed European funds for agriculture (FEADER / Natura 2000) can have positive/negative effect	medium (survey)
Financial steering: allocated funding	1	Funding for adaptation is project-based or for limited time only. Basque Country Climate Plan states that in terms of financial programming, most of the budgets set out below represent only provisional estimates, which the Basque Country Community will consolidate as the process unfolds. Main instrument at local level seems to be the multi-annual investment programme (PPI – Plan pluriannuel d'investissement). In general, there is no coherent strategy for the funding of climate adaptation action at local level.	medium (survey; (*Plan Climat Pays Basque* 2021)
Information steering	2	Survey answers identified GIP Littoral Basque (Basque Coast Scientific Interest Group) as key actor for knowledge mobilisation. The Basque Country Climate Plan includes scenario development. The process of development of	medium (survey; *Plan Climat Pays Basque* 2021)

		the Basque Country Climate Plan included input from several local groups, citizen movements, NGOs (Plan Climat Pays Basque – Plan d'Actions p. 6). At the level of Nouvelle Aquitaine: • BRGM / Observatoire de la côte Nouvelle Aquitaine • GIP Littoral (Public Interest Group) of Nouvelle-Aquitaine is a key actor animating public policies regarding the conversation and management of coastal areas in Nouvelle Aquitaine produces studies e.g. As part of "Littoral 2030: Succeeding in the transition of the Nouvelle-Aquitaine coastline" the GIP Littoral has been commissioned by its members to carry out regional studies on demographics, land use etc, supporting local authorities in drawing up planning tools and assisting them with coastal issues (link between risks and planning etc.).	

5.3. Tuscany

5.3.1. Baseline governance assessment

Governance structure[5]

Italy is a 'unitary' country with legislative powers at the sub-national level, recognising the principles of local autonomy and decentralisation. Regions have legislative and administrative competences, defined by their statutes. Regions have regulatory power in all other matters. Tuscany has an ordinary status.

Climate resilience governance[6]

At the national level, adaptation is steered through NAS (*Strategia Nazionale Di Adattamento Ai Cambiamenti Climatici* 2015), which provides guidelines, and NAP (*PNACC* 2023), that guides both national and regional level institutions in planning and implementing their adaptation. A few regions in Italy have produced and adopted regional adaptation plans, and in most of them, like Tuscany the main guiding documents are NAS and NAP. Adaptation is integrated into sectoral policies at the regional level. The NAP has been developed by the Directorate

[5] https://portal.cor.europa.eu/divisionpowers/Pages/Italy-Introduction.aspx
[6] https://climate.ec.europa.eu/document/download/57cecaa0-a23d-4a66-a4a7-2f26ca7b7b28_en?filename=country_fiche_it_en.pdf

on Climate and Energy of the Italian Ministry for the Environment, Land and Sea (MATTM), with inputs from national, regional and local level authorities and institutions. MATTM has also partial responsibilities for implementing some of the elements of NAP. Additionally, there was an Institutional Panel involved in the elaboration of NAP, which includes representatives from various sectoral national and regional institutions, as well as from the National Association of Italian Municipalities and the Union of Italian Provinces, which supported vertical and horizontal coordination.

5.3.2. Governance barriers for and enablers of innovation actions

The following governance barriers have been considered as relevant for the Tuscany IP: lack of knowledge or understanding (even awareness), lack of integrated planning frameworks, institutional fragmentation, and bureaucracy. Additionally, the respondent has identified the following challenges relevant for governance: maintenance of long-term funds and social acceptance and collaboration. Of the barriers in the questionnaire, none have been ranked as 5 (as most relevant). With regards to the enablers, all of the barriers were ranked as not highly relevant for the Tuscany IP (ranking 2-3). The full list of ranked governance barriers and enablers can be found in the Annex (section 8.1.3.).

5.3.3. Assessment of CR governance and Recommendations

Overall, Tuscany's climate governance performance shows moderate progress across all three pillars (structure, mechanisms, and processes) (Figure 5). **There is a need to improve processes for implementation vertically and horizontally, as well as overall steering mechanisms, and in terms of financial instruments and steering particularly with regards to the private secto**r (Table 8).

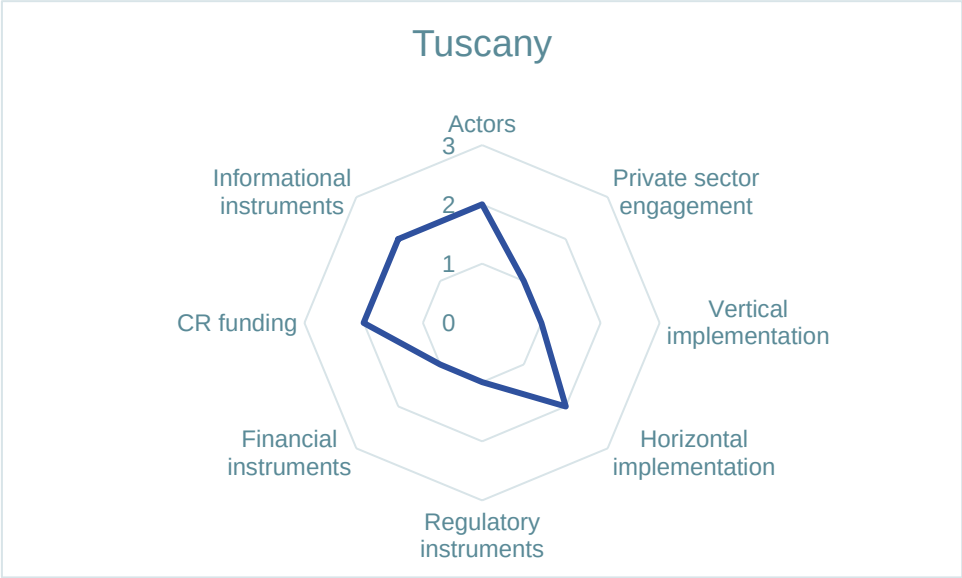

Figure 5. Tuscany performance in the assessment of CR governance.

Public and third sectors are actively involved in adaptation planning and also have responsibilities in implementation of adaptation, while the participation of private sector has been voluntary so far, mainly through various consultation projects and processes (Table 8). **To increase actor involvement, it could be beneficial to explore the possibilities and needs of including also private citizens. With regards to private sector, its engagement could be strengthened on the regulatory basis and/or with the use of various financial instruments**.

Despite Tuscany having power to pass binding legislative or regulatory frameworks for adaptation, the main guiding documents are still at the national level. **A legally binding framework setting obligations to the lower levels of governance, as well as steering different actors (e.g., private sector) would not only enhance actor involvement but also provide stronger basis for enforcing, as well as provide clarity in terms of task assignment, division of responsibilities, clarification of goals**. The assessment shows that vertical implementation has much room for improvement as the guiding frameworks are at the national level, do not set responsibilities of the regions and municipalities and there is a lack of clarity in terms of responsibility division Table 8). With regards to the horizontal implementation, the approach in Tuscany is mixed and is scored here for the integrated approach. The element of dedicated approaches is the presence of dedicated frameworks, such as NAS and NAP, but they are not binding, and their task is information provision and guidance in formulation of the sectoral goals. In terms of the integrated approach, goals are formulated in the NAS and adaptation is integrated into relevant sectors. However, due to the fragmented information on adaptation that is possible to find in several sectorial plans, **a regional adaptation plan would be beneficial in clarifying goals at the regional level as well, identifying clear actions and objectives**.

With regards to the instruments, **regulatory steering could be stronger** in Tuscany, especially considering the power to pass binding legislation and regulation. Current regulatory frameworks are voluntary and provide guidance but do not set obligations for the regions. With regards to the financial instruments, the region uses some financial instruments, but they are sporadic (e.g., grants or projects) and not fully focused on adaptation (Table 8). The region could benefit from **more financial instrument use (both incentivizing and penalizing) especially to increase the engagement of private sector** in adaptation implementation. These could include PPPs and/or procurement with embedded resilience requirements, new business models, user charges, loans, tax incentives, etc). With regards to the dedicated funding, there is funding available for planning/implementation in the Regional Development Programme 2021-2025. **Securing continuous funding for monitoring & evaluation, and if needed for re-planning or adjustment of the current programs is beneficial for long-term adaptation progress**. In terms of informational instruments, Tuscany highlights several types, including knowledge mobilization (for example, AMMIRARE Interreg project that aims at involving different stakeholders in CR), as well as mobilizes local knowledge and engages with local stakeholders through various projects mainly focused on sustainability. There is climate informational available, however, there is no central platform to access it thus far. **Centralized platform or portal that provides climate services** as well as guidelines on how to use climate information is usually considered beneficial in terms of informational steering of CR. Overall, there is a range of instruments available at different levels, mainly national and municipal, with room for **improvement in terms of information centralisation, accessibility, and usability, as well as focusing other instruments stronger on the CR issues**.

With regards to the IP, most relevant listed barriers both in general for innovation as well as for the Tuscany IP are related to navigating institutional arrangements: bureaucracy, institutional fragmentation, and lack of integrated planning frameworks. While it is not the task of adaptation governance to address the existing institutional fragmentation, and adaptation governance is rather embedded in the existing governance context, **the introduction of specifically regional binding adaptation / CR regulation or legislation with a clear delineation of**

responsibilities, tasks, goals, and resource allocation would be helpful in overcoming these barriers. Another barrier was related to the lack of awareness among key stakeholders and the public regarding the implications and urgency of climate adaptation. This gap in awareness can be addressed by the production and dissemination of **targeted climate services that provide actionable information on climate risks but also build capacity among local authorities, businesses, and communities to implement adaptation measures**.

Table 6. Results of the Tuscany CR governance assessment, scoring justification and confidence level.

Assessment category	*Score*	*Justification*	*Confidence level*
STRUCTURE			
Actors' involvement	1	Public and third sectors have been extensively engaged in planning and have responsibilities also in implementation. Private sector participates voluntarily, and participated in various consultation processes or projects, but is not assigned responsibilities in NAS or NAP.	high (survey; *PNACC* 2023)
Private sector engagement	1	Participation of private sector is voluntary. The NAS mentions the voluntary participation of the private sector and highlights the importance of exploring the possibility of PPPs between the public sector and private insurance companies ("Particular attention must be paid to the definition of 'voluntary' involvement mechanisms that promote the partnership of private individuals in the implementation of intervention objectives")	high (survey; *PNACC* 2023)
PROCESS			
Vertical implementation	1	NAS and NAP serve as a framework to coordinate responsibilities horizontally and vertically; however, the framework is not binding. According to the survey answers, it is unclear whether the tasks are assigned and conferred to the appropriate levels. The responsibilities to adapt are defined at the national level (survey). While there is a framework, it is not binding or coordinating adaptation at the regional level, and there is lack of clarity. Considering that the region has potentially capacity to adopt binding legal framework at the regional level, the scoring is 1p.	medium (survey; *PNACC* 2023). Evidence is of high quality, but survey answers are fragmented

Horizontal implementation	2	The scoring here is made for the integrated approach. The approach is mixed, as there is a coordinating institution and there are dedicated frameworks, but the goal of these frameworks is to provide information, responsibilities, and guidelines on considering adaptation in formulating sectoral goals. As identified in the survey, several legal framework or policy from other sectors have positive influence on adaptation and resilience in the region. In the Regional development programme 2021-2025, a dedicated funding is given to Adaptation (p. 136). In the NAS (p. 58) policy sectors and micro-sectors involved are listed. Goals are also formulated in the annexes of the NAS.	medium (survey)
MECHANISMS			
Regulatory steering	1	Adaptation and climate resilience in the region are primarily steered through the national adaptation strategy and integrated into sectoral policy at the regional level.	high (survey; *PNACC* 2023)
Financial steering: financial instruments	1	The region has sporadic financial instruments, and they are not completely focused just for adaptation measures.	low (survey, evidence quantity insufficient)
Financial steering: allocated funding	2	The answer is for planning and implementation as per the survey answers, additionally there is dedicated funding for adaptation in the Regional development programme 2021-2025.	medium (survey)
Information steering	2	Among the mapped knowledge instruments, adaptation is not explicitly mentioned. The knowledge instruments mapped by Tuscany region are mostly about sustainability in general, silvicultural interventions/wildfires. One project about climate (AMMIRARE Interreg Project 2024-2027) aims at involving different stakeholders in climate resilience. Municipalities are involved in Covenant of Mayors network. There is climate information available, however, there is no central platform to access it so far.	medium (survey)

5.4. Azores

5.4.1. Baseline governance assessment

Governance structure[7]

Portugal is an asymmetrical regionalized state with legislative powers at the sub-national level.

Azores is an autonomous region **with full legislative autonomy** except for foreign policy, defence, and internal security. Azores has legislative competences to pass binding CC frameworks (law, strategy and/or plan), and legislative and management competences over the key affected sectors. The responsibilities of the Autonomous Regions include:

- *Improvement of human resources and quality of life.*
- *Heritage and cultural creation.*
- *Environment.*
- *Protection of nature, public health, animals, and vegetation.*
- *Agricultural and fisheries development.*
- *Water, mineral and thermal resources, and locally produced energy.*
- *Planning, accommodation, urbanism, and regional planning.*
- *Transport, including roads, traffic and land transport, infrastructure, and maritime and air transport between the islands.*
- *Commercial and industrial development.*
- *Tourism, folklore, and crafts.*
- *Sports, and*
- *Organisation of regional administration and related services.*

Climate resilience governance

A **national** Basic Climate Law (Lei de Bases do Clima) was adopted in December 2021. The 2021 Basic Climate Law indicates autonomous regions as subjects of climate action. In fact, Article 14 reads: “The autonomous regions and local authorities shall programme and implement climate policies within the scope of their powers and competences, ensuring that they are consistent with territorial management instruments. (...) Within 24 months of the entry into force of this law, the regional coordination and development commissions shall draw up a regional climate action plan, to be approved by the regional council” (*Basic Climate Law (Portugal) / Lei de Bases Do Clima* 2021). Other steering documents at national level include the Plano de Ordenamento da Orla Costeira (Coastal Management Plan) and the Plano de Recuperação e Resiliência (PRR: Recovery and Resilience Plan).

At the **regional** level, the main document steering climate resilience governance is the Programa Regional para as Alterações Climáticas (PRAC) (Regional Climate Change Programme, 2019), which according to the 2021 Basic Climate Law is supposed to be updated every two years. At the moment of writing, Azores’ 2019 PRAC is in course of update. The Monitoring Reports (RM -PRAC) are presented, which will assess the implementation of the Program, using the indicators identified in the Monitoring Plan, every two years. The PRAC puts into action the Estratégia Regional para as Alterações Climáticas (ERAC) - Regional Strategy for Climate Change. The PRAC is a

[7] https://portal.cor.europa.eu/divisionpowers/Pages/Portugal-intro.aspx

sectoral plan within the meaning of article 40 of Regional Legislative Decree no. 35/2012/A and its scope is the territory of the Autonomous Region of the Azores, covering the nine islands and the nineteen municipalities that are part of it. The PRAC, as a sectoral policy instrument, is binding for all public entities, and it is the responsibility of special, inter-municipal and municipal spatial planning plans to ensure the programming and implementation of the policies and objectives defined (*PRAC* 2019, Article 3).

Other key documents at the regional level are:

- *Plano Regional de Ordenamento do Território dos Açores (Azores' Regional Spatial Planning Plan, 2010)*
- *Plano de Gestão da Rede Hidrográfica dos Açores 2022-2027 (Azores Hydrographic Network Management Plan)*
- *Plano de Gestão de Risco de Inundações da Região Autónoma dos Açores (PGRIA) (Azores Flood Risk Management Plan)*
- *Plano de Ordenamento Turístico da Região Autónoma dos Açores (Tourist Planning Plan for the Autonomous Region of the Azores)*
- *Açores 2030 (Azores 2030)*

At the regional level, cross-departmental coordination relies on the office of the Presidency of the Regional Government of the Azores. Structures and processes are established for multi-level coordination on key sectors, including the following main bodies:

- *SRAAC - Regional Secretariat for the Environment and Climate Action*
- *DRAAC - Regional Directorate for the Environment and Climate Action*
- *DROTHR - Regional Directorate for Spatial Planning and Water Resources*
- *GPPA - Environmental Planning and Promotion Office*

Following the 2021 National Climate Law, each Portuguese **municipality** must have adaptation strategies and action plans implemented by the end of 2023 (Ramalho, Ferreira, and Jóia Santos 2022). For example, the municipality of Ponta Delgada has published in 2024 a proposal for the Plano Municipal de Ação Climática (PMAC). Vila Franca do Campo already had a Municipal Strategy for Adaptation to Climate Change, developed in 2016 (Estratégia Municipal de Adaptação às Alterações Climáticas - Vila Franca do Campo). Another key planning document at municipal level is the Plano Diretor Municipal (Municipal Master Plan). The National Association of Portuguese Municipalities (ANMP) promotes the diffusion of Covenant of Mayors initiatives at national level and also articulation between municipalities, enhancing their participation in this framework, as established in a partnership agreement between ANMP and the European Commission.

5.4.2. Governance barriers for and enablers of innovation actions

Azores have identified the following barriers as the most relevant (ranked 5) for the R4C IP: lack of necessary knowledge or understanding (even awareness), lack of strategy/vision, lack of leadership, Difficult/Lack of collaboration/connection among the stakeholders (business -academy/science-territory), Lack of funding and lack of urgency / prioritization. Other relevant barriers include (ranked 4): Lack of integrated planning frameworks, Institutional fragmentation, and bureaucracy.

The most relevant enablers include governments' innovation policies including promoting a culture of collaboration and facilitation, R&D expenditure in the public sector, Knowledge/technology transfer between universities, government and industry, Mentorship and support through accelerators and incubators, Active networking, training programs and educational services, and access to funding. Additionally, digital infrastructure has been identified as relevant (4). The full list of ranked governance barriers and enablers can be found in the Annex (section 8.1.4.).

5.4.3. Assessment of CR governance and Recommendations

Overall, Azores score high on structure categories (actors and private sector engagement), as well as on regulatory steering (see Figure 6). The Recommendations focus here on the process categories - horizontal and vertical implementation, as well as on financial and informational steering.

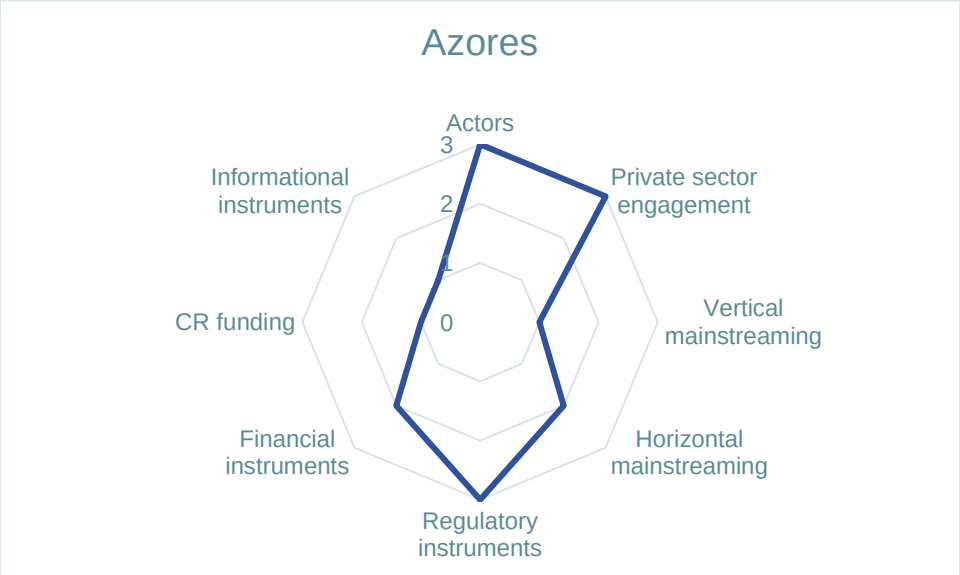

Figure 6. Azores performance in the assessment of CR governance.

The Azores region is advanced in actors' engagement and regulatory frameworks setting out requirements to plan and implement climate action at national, regional, and municipal levels. The scoring for the vertical implementation from the perspective of alignment and coherence of climate resilience goals and responsibilities across the levels of governance is 1, as while there are frameworks that set requirements to plan and implement CR actions at national, regional, and local levels, there is no framework that would regulate the coherence or assign specific tasks (Table 9). The survey responses reveal that indeed tasks are not assigned and conferred to the appropriate levels to align with the competencies and there is no legal division of responsibilities across levels. The Basic Climate Law sets requirements for the autonomous regions and for the local authorities to draw up regional climate action plans and to implement climate policies within the scope of their powers and competencies (*Basic Climate Law / Lei de Bases Do Clima* 2021, Article 14). At the regional level, the PRAC, as a sectoral policy instrument, is binding on all public entities, and it is the responsibility of special, inter-municipal and municipal spatial planning plans to ensure the programming and implementation of the policies and objectives defined (*PRAC* 2019),

Article 3). While there are frameworks that set requirements to adapt from national to regional and from national to local, there is no framework that would regulate the coherence of adaptation goals across levels. Considering this, it **is advisable to amend the existing regulation with a clearer multi-level (regional-local or across all levels) coordination to ensure that the tasks are in accordance with the competencies and that there is no conflict in goals**. **As the National Basic Climate Law sets processes for monitoring & evaluation of the progress to be completed every two years, and the PRAC should be updated every two years, the clarification of vertical goal and task alignment could be part of that process.**

In terms of steering instruments, Azores have a substantial regulatory foundation, that includes national climate law setting requirements for the regions and municipalities to develop regional and local strategies and plans, respectively (Table 9). A variety of financial instruments is used in the Azores to steer adaptation, including a variety of funds (e.g., Environmental fund) or penalizing instruments such as taxes or sanctions for environmental crimes, however, **more specific climate resilience and adaptation incentivizing instruments could be beneficial, or requirements / criteria within the existing instruments can be specified for adaptation.** There is no dedicated funding, which is expected as the implementation approach is integrated, which often means that funding for the sectoral planning and implementation is part of the sectoral budgets. **It is, however, beneficial to ensure the sufficiency of resource for all stages including also overarching strategy and plan preparation & updating**. Regarding the informational instruments, knowledge-generating (State of Spatial Planning Reports) and public outreach instruments are used, but **more focused climate services would be beneficial in general, as well as from the perspective of the regional IP**. Climate services typically include regular provision of climatic information (hazard and risk assessments, climate scenarios, simulations, etc.) as well as other information supporting adaptation planning (social vulnerability assessments and scenarios separately or integrated into climate risk assessments, as well as guidance on how to utilize this information). **Also, networks (formal or informal) could enhance the connection among different actors, including public, private and third sector, and steer information production and dissemination.**

With regards to the identified IP barriers and enablers, there is clearly a need for better vision or strategy and stronger leadership, as well as closer collaboration between private, public, and academic sectors. These barriers can be addressed through **better production and dissemination of climate information to increase the awareness and understanding of climate risks and adaptation needs in all relevant sectors, as well as to encourage closer collaboration of public and private sectors in specific adaptation solutions, e.g., through PPPs, innovation incubators,** etc. Institutional fragmentation and lack of integrated frameworks have been identified as a barrier and **the need to clarify and harmonize institutional arrangements, division of responsibilities and goal alignment has been discussed also in the context of vertical and horizontal mainstreaming above**.

Table 7. Results of the Azores CR governance assessment, scoring justification and confidence level.

Assessment category	*Score*	*Justification*	*Confidence level*
STRUCTURE			
Actors' involvement	3	Public sector, private sector, third sector, private citizens and households have been identified in	high (survey, (*Basic Climate Law (Portugal) /*

		the survey and are subjects of climate action in the Climate Law	*Lei de Bases Do Clima* 2021)
Private sector engagement	3	Private sector is financially incentivised and legally required by a climate/adaptation/resilience framework to participate in adaptation.	medium (survey)
PROCESS			
Vertical implementation	1	Survey indicates that climate resilience objectives are not aligned across different levels of government, as there is no legal framework regulating such alignment/coherence. Tasks are not assigned to the appropriate levels to align with mandates and competencies and there is no legal division of responsibilities to adapt across levels. At the same time, the national Basic Climate Law sets requirements for the autonomous regions and for the local authorities to draw up regional climate action plans and to implement climate policies within the scope of their powers and competencies (Article 14). At the regional level, the PRAC, as a sectoral policy instrument, is binding on all public entities, and it is the responsibility of special, inter-municipal and municipal spatial planning plans to ensure the programming and implementation of the policies and objectives defined (PRAC, Article 3). Therefore, there are frameworks that set requirements to adapt from national to regional and from national to local, but there is no framework that would regulate the coherence of adaptation goals across levels.	medium (survey)
Horizontal implementation	2	Scoring is conducted for the integrated approach. Climate resilience is integrated in some sectors such as land use planning, but it is still not even considered in other sectors. Integration of climate resilience in certain sectors takes place at national, regional, local levels.	medium (survey)
MECHANISMS			

Regulatory steering	3	National Basic Climate Law sets requirements to develop regional and municipal climate action plans.	high (survey, climate law)
Financial steering: financial instruments	2	The region is using a mix of financial instruments, but they are mostly sporadic (e.g., ad hoc grants or projects, like the LIFE IP CLIMAZ), apart from some instruments being established (Legal-financial regime to support the climate emergency).	medium (survey)
Financial steering: allocated funding	1	There is no dedicated funding, the funding is project-based. For example, the Environmental Fund often supports the work needed to overcome extreme events destruction and Açores 2030 programme covers a wide range of intervention priorities, including environmental sustainability and resilience to climate change	medium (survey)
Information steering	1	Knowledge-generating (State of Spatial Planning reports) and public outreach instruments are used. However, more focused climate services are needed	medium (survey)

5.5. Køge Bay

5.5.1. Baseline governance assessment

Governance structure[8]

Denmark is a unitary state on a decentralized basis with three levels of government - central, regional, and municipal. **Legislative** power is only at the national level. Regions and municipalities **do not have legislative powers** and must act according to the applicable law; there is no hierarchy between regions and municipalities. Municipalities and Regions **have self-governing capacities** and can pass binding local / regional level regulation. Municipalities can levy taxes; regions depend on the central and municipal funding.

Regions have responsibilities in the areas of 1) Public health and healthcare; 2) Hospital provision; 3) Health insurance; 4) Mental health treatment; 5) Social services and special education; 6) Regional development within climate, education, mobility and partnerships; 7) Environment; 8) Soil pollution; 9) Culture; and 10) Transport.

[8] https://portal.cor.europa.eu/divisionpowers/Pages/Denmark-Introduction.aspx

Municipalities are responsible for:

- *Social services: total regulatory, supply, and financing responsibility*
- *Unemployed service (local job centres) and labour market involvement.*
- *Childcare.*
- *Primary education, including special education for adults.*
- *Care for the elderly.*
- *Social psychiatry.*
- *Healthcare preventive treatment, care and rehabilitation, home care and treatment of alcohol and drug abuse, dental care.*
- *Integration and language education for refugees and immigrants.*
- *Environmental protection and waste management, water and preparation of local plans.*
- *Industrial and economic development.*
- *Rural and urban development.*
- *Local business service and local tourism.*
- *Local roads and public transport*
- *Culture and sports:*
- *Utilities and rescue services.*

Køge Bay as an R4C region is not administrative unit as such. It presents a stretch of shoreland, that includes 11 municipalities from Dragør, Copenhagen and south to Stevns Klint. Falls into Region Zealand (Sjaelland) and The Capital Region of Denmark (Hovedstaden).

Climate resilience governance

Overall, CCA is part of planning in relation to different sectors in Denmark at all levels. CCA is mainly addressed in terms of risk management and not resilience. At the **national** level, CR and adaptation are steered through the NAS and a NAP (2012, revision currently under way), and at the local level through the municipal adaptation plans. The Climate Act (2019) sets requirements only in terms of mitigation. NAS and NAP set out for all municipalities to conduct climate risk assessments and prepare municipal adaptation plans, all of which (98) have been completed by 2014. NAS stipulates that the national government's role is to create legal frameworks (laws, acts, regulations) that would steer municipalities, ensure coordination, and provide information (*NAS Denmark / Strategi for Tilpasning Til Klimaændringer i Danmark* 2008). The national government is responsible for setting adaptation objectives and creating a framework for adaptation. The Danish Coastal Authority (under the auspice of the Ministry of Environment) provides technical support, models, tools, data, economic assessments, and advice to municipalities with respect to coastal adaptation. As part of the legal obligations of the Flood Protection Act and the EU Floods Directive, the Danish Coastal Authority is responsible for screening and mapping flood and erosion risks and hazards on a national scale every sixth year. Furthermore, the appointed areas from the Flood Directive must develop risk management plans.

Danish **Regions** do not have formal responsibilities to adapt, however, all five regions are engaging in various activities including EU-funded projects to support adaptation in the region. The regions however have formal responsibilities over several relevant sectors, including regional environmental and nature development and soil contamination. There is no regional adaptation strategy, but there is a regional development strategy that supports the municipal implementation of climate plans and work with development projects in CCA. Responsibility for planning

and implementing adaptation lies on **municipalities,** emphasizing the role of local communities, private sector, stakeholders, citizens, etc. The government can override local/ municipal decisions if they contradict national laws.

The revised Planning Act (Planning Act Denmark, 2018) is one of the most important legal frameworks for adaptation as it legally binds the municipalities to consider coastal flooding and erosion in physical planning, as well as to propose adaptation measures for the exposed areas. This is fulfilled by the Danish Housing and Planning Authority. Service Level Act (2020) sets responsibilities for wastewater utilities to implement adaptation panning measures concerning stormwater and pluvial flooding, encouraging partnerships with private and public actors as well as monitoring for the most effective financing (Gram-Hanssen et al. 2023).

5.5.2. Governance barriers for and enablers of innovation actions

Lack of necessary knowledge or understanding (awareness) has been ranked as the most relevant governance barrier (ranked 5), followed by lack of strategy/vision, difficult/Lack of collaboration/connection among the stakeholders (business -academy/science-territory) (ranked 4). Furthermore, the respondents have raised the following barriers: low participation rates, interest and commitment of the stakeholders; dissatisfaction with the project and/or unmet expectations; insufficient communication with key stakeholders and in particular the target group.

With regards to enablers, access to funding and knowledge/technology transfer between universities, government and industry have been ranked as the most relevant (5) and active networking, training programs and educational services, and digital infrastructure as relevant (ranked 4). The full list of ranked governance barriers and enablers can be found in the Annex (section 8.1.5.).

5.5.3. Assessment of CR governance and Recommendations

Overall, Køge Bay shows high scoring on the structure categories (actors and private sector engagement) as well as the use of informational and financial steering instruments (see Figure 7). The recommendations will focus on the process category (horizontal and vertical implementation) as well as regulatory steering.

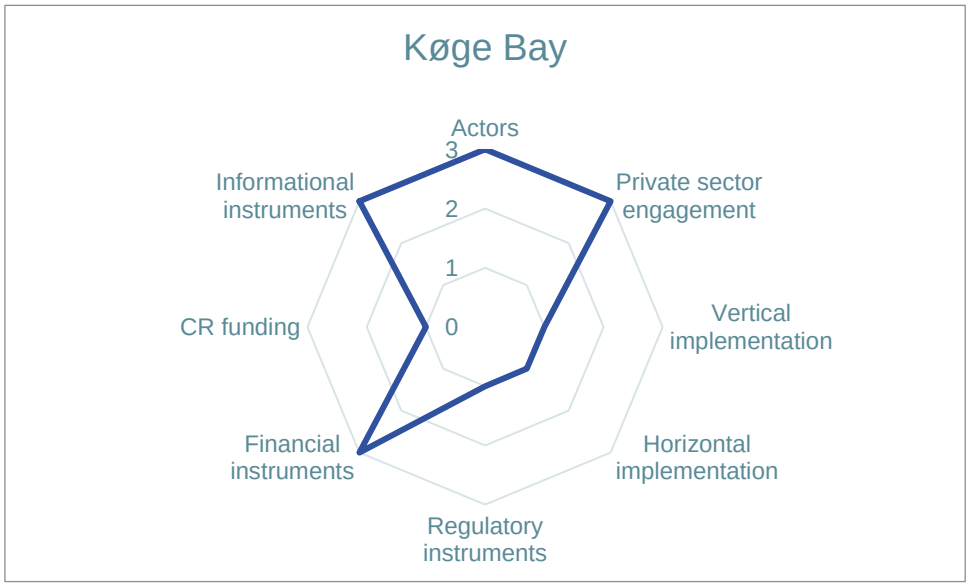

Figure 7. Køge Bay performance in the assessment of CR governance.

Køge Bay as an R4C region is advanced in actors' engagement, with public, private and third sectors as well as landowners participating in different stages of adaptation (Table 10). Furthermore, private sector is formally obligated (wastewater utility companies) as well as financially incentivized to participate in adaptation through PPPs, for example (Table 10). The areas that need improvement in Køge Bay pertain mainly to adaptation implementation both vertically and horizontally. The survey indicates that there is a lack of clarity in terms of task and responsibility division, alignment of goals across levels as well as in the alignment of tasks with capacities of different actors, and there could be a benefit to reassess the capacities and scope of action of regions in terms of planning within water geography boundaries. On the other side, this can also be achieved **through steering cross-regional collaboration or networking mode of governance encouraging closer collaboration and alignment of goals among the authorities and other actors operating in a shared geographical area.** Overall, regions have the power to **pass binding regulation or use more voluntary instruments (such as e.g. regional adaptation strategies and plans) within their respective sectors and thus could contribute to the clarification of responsibilities and alignment of goals across and within the levels of governance, focusing on the trans-municipal issues, or there were municipalities do not have mandate or resource to act.**

Also from the regulatory steering perspective, while the regions in Denmark are active in guiding and steering municipal collaboration in adaptation, this is more of a voluntary and project-based work, while **a formalized coordination through e.g. regional adaptation strategy would be more beneficial. Such formalized and/or authority-controlled coordination could mobilize actors from relevant municipalities and private sector in the planning phase, which aids in commitment to implementation.** There is a wide range of financial instruments used in the region, mainly at the municipal level (Table 10). There is no dedicated adaptation funding, which is in line with the chosen integrated approach of implementation as well as with the character of adaptation steering ta the regional level (voluntary focused on supporting and guiding municipalities). There is, however, **a need to ensure the sufficiency of resources at the municipal level, and in case of formalizing coordination at the regional level, it is beneficial to ensure dedicated funding at least for planning and updating.**

The identified governance barriers relevant for the Køge Bay IP point at the need of closer collaboration among various stakeholders, specifically private, third and public sectors, with the need for stronger vision in the region, as well as to increase knowledge sharing and learning. These could be achieved by **utilizing the existing networks (most of which are at the national level, e.g., DK2020, DNNK) or creating focused multi-stakeholder formal or informal networks.**

Table 8. Results of the Køge Bay CR governance assessment, scoring justification and confidence level.

Assessment category	*Score*	*Justification*	*Confidence level*
STRUCTURE			
Actors' involvement	3	A variety of actors are involved and steered in Denmark to participate in adaptation, including public sector & governmental organisations at national and municipal levels, utilities, private sector, landowners, and other local stakeholders.	high (survey; Gram-Hanssen et al. 2023)
Private sector engagement	3	Private sector is required to participate legally but is also financially incentivized and participates through voluntary instruments (PPPs). It is landowners' responsibility to adapt at their property, however, this is voluntary, and landowners determine themselves the level of adaptation (if any)	high (survey; Gram-Hanssen et al. 2023)
PROCESS			
Vertical implementation	1	There is no legal framework that regulates the coherence. Tasks are assigned/divided, but there are questions towards the alignment or appropriateness of scope of action at different levels / among different actions and actors. More specifically, the regions may wish for a larger responsibility to be able to plan considering water geography (e.g., catchment areas or coastlines that span over regional borders). Same time, not all municipalities have resources to tackle adaptation on their own. Utility companies may also wish for a larger mandate.	medium (survey)
Horizontal implementation	1	Adaptation in Denmark is implemented through integrated approach by considering adaptation needs when formulating policy goals at national	medium (survey)

		and local levels. There is a national adaptation strategy and plan, however, they act as guiding documents for the sectors to consider in formulating their policy goals. Survey responses indicate that the policy goals are not always aligned or coherent. There is no dedicated funding (which is not essential for integrated approach), but municipalities use their own budget for adaptation initiatives (sufficiency is arbitrary and contextual, but sufficient for the purpose of scoring). There is also a project-based fund for coastal protection created by the national government. Regions aid in coordinating adaptation across municipalities, albeit this is a voluntary initiative.	
MECHANISMS			
Regulatory steering	1	There are regional development strategies, but no regional adaptation / CR strategies are in place. Adaptation is steered through NAS/NAP and municipal adaptation plans. Regions are very active in adaptation and in coordinating adaptation across municipalities through different projects and initiatives. Coordination at the regional level could be formalized to improve regulatory steering.	high (survey; Gram-Hanssen et al. 2023)
Financial steering: financial instruments	3	There is a variety of instruments used in the region (not by the regions, but rather municipalities), incl. municipal allocated budgets for CR projects, fund coordinated by the Danish Coastal Authority for state co-financing of municipal coastal protection projects annually since 2023, “benefit principle” – payment for benefitting from adaptation, and a range of funding instruments for projects.	high (survey; Gram-Hanssen et al. 2023)
Financial steering: allocated funding	1	Municipalities use their own budgets for planning and implementation, but this is not dedicated funding. The state has created a project-based fund for the implementation of coastal adaptation projects.	high (survey; Gram-Hanssen et al. 2023)

Information steering	3	There is a wide range of informational instruments available in the region, including: knowledge generation (climate services, risk assessments and similar, provided by the DMI and Danish Coastal Authority, broad public outreach, including and mobilization of local knowledge & input (e.g., Young Climate panels, dike association groups, project-based citizen engagement), participation in networks as well as various boundary instruments and organizations).	high (survey; Gram-Hanssen et al. 2023)

5.6. Uusimaa

5.6.1. Baseline governance assessment

Governance structure[9]

Finland is a unitary decentralized state with three levels of governance – national, regional, and municipal. **Legislative** powers at the sub-national level are at the municipal and wellbeing services counties' level. **Self-government** at the regional level is limited. Municipalities are self-governed and have regulatory power and high degree of autonomy in terms of decision-making, including land use and resource allocation (*Kuntalaki* 2015).

Regional Councils are stipulated in the Finnish law and represent mandatory joint municipality authorities and have administrative duties. Six Regional State Administrative Agencies (AVI) and 15 Centres for Economic Development, Transport, and the Environment (ELY) are responsible for the implementation of national level policies at the regional level.

Climate resilience governance

Overall, climate resilience is steered in Finland at the national level through coordination of responsibilities at the national level and through information dissemination, while actual planning and implementation lies at the municipal level. Various regional authorities act as "extended" arms of the national government and perform administrative function in adaptation-related areas.

At the **national** level, CR is coordinated by the Ministry for Agriculture and Forestry (MAF). Relevant legal frameworks at the national level include 1) Climate Act, 2019, which covers adaptation as well but does not set obligations for the regions or municipalities to adapt, and 2) National Adaptation Plan (2022), which sets targets and assigns responsibilities at the national level until 2030. The climate law sets obligations for the relevant national authorities (ministries) to develop plans for their respective administrative branches.

[9] https://portal.cor.europa.eu/divisionpowers/Pages/Finland.aspx

At the **regional** level, AVI and ELY centres are responsible for enforcing national level regulation. The relevant competencies of ELY centres include land use, transportation, environmental & biodiversity protection, construction and built environment, flood management, water resources use and management, and relevant tasks in agriculture and fishery sectors. In addition to that, adaptation is part of regional development steered by ELY Centres through the means of advisory, funding and development services for the private sector, as well as information dissemination and learning (MAF 2022). While many of the tasks of ELY centres require the acknowledgement of and alignment with adaptation needs, not all work is recognized as adaptation (MAF, 2022). As of lately, regional steering of adaptation has advanced through the allocation of dedicated funding for adaptation positions in ELY centres, for example. Finally, Regional Councils, as joint municipality authorities, advise and guide municipalities in adaptation. Currently, in the Uusimaa region, Helsinki-Uusimaa Regional Council is developing a regional strategy for adaptation, which will serve as a voluntary steering and coordinating instrument.

Additionally, there is another “layer” of specialized regional governance in Finland – Wellbeing Services Counties, which are different from regions/provinces. These units are self-governed, have elected governments and own finances. Many of the adaptation-related sectors (healthcare, social care, and rescue services) have been moved from municipalities towards these units (Gram-Hanssen et al. 2023).

Adaptation planning and implementation is mainly at the **municipal** level; municipalities have a high degree of autonomy over adaptation-related sectors, and many are advanced in adaptation, voluntarily. In Uusimaa, this mainly concerns large cities, such as those in Helsinki Metropolitan Area (Helsinki, Vantaa, Espoo). Adaptation-relevant competencies within municipalities concern mainly built environment, while other relevant functions have been transferred to Wellbeing Services Counties, including rescue services, health, and social care (Gram-Hanssen et al. 2023).

5.6.2. Governance barriers for and enablers of innovation actions

Among the most relevant governance barriers for the regional innovation action have been identified the following: institutional fragmentation, difficult/lack of collaboration/connection among the stakeholders (business - academy/science-territory) (ranked 5); and lack of funding and lack of urgency/prioritization (ranked 4). The two latter barriers have been marked as relevant in general for the innovation in adaptation. The full ranking table can be found in Annex 8.1.6.

Respondents have additionally raised such governance barriers as stakeholder participation, starting from identifying the relevant groups to ways of engaging and ensuring commitment.

5.6.3. Assessment of CR governance and Recommendations

The governance context in Uusimaa sets specific frameworks to adaptation governance in the region both horizontally and vertically. Regions in Finland do not possess legislative or regulatory capacities and their role in adaptation is limited to guidance and information provision. In that regard, Uusimaa demonstrates high performance in the utilization of informational instruments and in engaging municipalities in climate resilience efforts (Figure 8). As Uusimaa as a region cannot enforce binding frameworks on the municipalities, climate resilience is steered through networking mode of governance by using informational and networking instruments. The upcoming regional strategy will further support municipalities in planning and implementing adaptation, and active engagement of municipalities in the planning phase provides ground for municipalities to plan their efforts in a more coordinated manner.

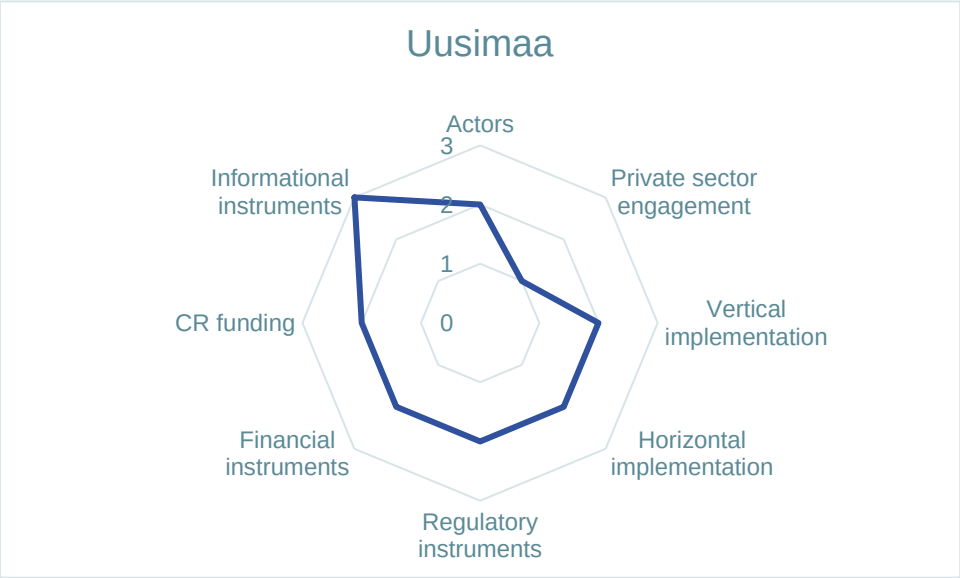

Figure 8. Uusimaa performance in the assessment of CR governance.

With regards to the engagement of different actors in adaptation, private and public actors are active in adaptation, with private sector's engagement being incentivized through PPPs, for example (Table 11). As regulatory power is only at the national and municipal levels, the region's capacity to steer actors to participate in adaptation is through informational instruments mainly. **Highlighting to the municipalities the importance of engagement of private and third sectors as well as individuals using a variety of instruments, also including market and regulatory instruments is advisable**. **Overall, the engagement of individuals, households and private sector can benefit from three main components: 1) scoping the climate risks and adaptation options available for different actors and stakeholders; 2) highlighting the benefit of adapting vs not adapting and 3) building a long-term collaboration or active network of different stakeholders, with the goal to raise awareness, share information and enhance learning, as well as enfranchise various actors by including them in the negotiation of goals, means and processes.**

With regards to adaptation implementation, vertical implementation scores sufficiently well considering that the regions in Finland cannot assign responsibilities to the municipal level of governance (Table 11). Adaptation at the municipal level would benefit from the national level legislation setting obligations for the municipalities to adapt, this is however out of scope of regional capacities. In that regard, Uusimaa region can and is preparing a voluntary legal framework – a regional adaptation strategy, that can enhance coordination across the municipalities. In terms of horizontal implementation, goals are clearly formulated, and adaptation policy objectives are integrated into the relevant policy goals, but there is a lack of resources at the regional level. As adaptation is to be integrated into relevant policy sectors, **there is a need to ensure that there is competence and commitment in each policy sector to formulate policy goals with adaptation in mind. Considering regional capacities this can be achieved through networking and informational instruments and with the help of a responsible person at the regional level.** Such positions have already been added to ELY and to HURC, which enhances adaptation consideration. As Finland has introduced a new specialized government level (Wellbeing Services Counties), which

is now responsible for adaptation relevant sectors and tasks that have previously belonged to municipalities**, there is a need to engage with this level of government in steering adaptation in their respective domains (rescue services, social and health care).** As this has been a recent change, there is still a lack of clarity in terms of responsibilities.

With regards to the instruments, a Climate law setting obligations for municipalities to adapt could steer adaptation more effectively from the regulatory perspective; this is, however, out of scope for Uusimaa as it doesn't have legislative power to pass binding legislation nor regulation. Uusimaa is currently preparing a regional adaptation strategy, which, considering the lack of legislative and regulatory capacities, is the most effective regulatory instrument available. **The regional strategy is intended as a voluntary guidance and information framework for the municipalities, and could, for example, highlight the power of regulatory frameworks for municipalities in preparing their own adaptation strategies and plans. Similarly, Uusimaa could support municipalities with more information and guidance on other instruments in general, and to steer private sector, in particular. These could include a variety of financial incentivizing instruments (grants or loans), tax deductions, subsidies, to penalizing instruments for not complying or not participating in adaptation. Finally, from the regional perspective, the strategy could inform and guide municipalities in exploring the coherence of their sectoral policy objectives from the adaptation perspectives, and if needed, on creating coherence regulating mechanisms or framework to ensure seamless integration of adaptation horizontally at the local level. Furthermore, it is beneficial to engage in closer collaboration with other regional governments (more specifically, Wellbeing Services Counties) or governance agencies (ELY, AVI) to ensure clear delineation of adaptation responsibilities and coherence and alignment of goals and competences within the regional and in the regional to local perspective.**

With regards to the specific IP of the region and the identified governance barriers presented in section 5.6.2., there is a clear need for strengthening the collaboration and networking among different stakeholders, which can be done through formal and informal networks. Uusimaa as a region, as well as Uusimaa municipalities are part of several formal networks (e.g., Covenant of Mayors), as well as **informal national adaptation networks including mainly public and third sectors, which could be leveraged for increasing awareness of the Uusimaa IP and increasing participation.** Similarly lack of urgency and prioritization, while being a multi-factor driven phenomenon, can **benefit from increased awareness and information sharing, as well as provision of targeted climate and non-climatic services – identifying risks and adaptation options, as well as guidance on how to utilize this information.**

Table 9. Results of the Uusimaa CR governance assessment, scoring justification and confidence level.

Assessment category	***Score***	***Justification***	***Confidence level***
STRUCTURE			
Actors' involvement	2	Public and private actors are engaged in adaptation and are steered by NAP and municipal adaptation plans.	high (survey; (MAF 2022)
Private sector engagement	1	Private sector is incentivized through PPPs and voluntary initiatives.	high (survey; (MAF 2022)

PROCESS			
Vertical implementation	2	There is no legal assignment of responsibilities nor framework that would assign responsibilities across levels (NAP mainly looks at the national level), but the objectives are aligned/coherent across national, regional, and local levels and tasks are divided/conferred according to the administrative branches and policy sectors.	high (survey; (Gram-Hanssen et al. 2023; MAF 2022)
Horizontal implementation	2	The approach in Uusimaa is mixed, scored for integrated. NAP, local plans and the forthcoming regional adaptation plan stipulate that adaptation is to be integrated into goals and actions of relevant policy sectors and administrative branches. Adaptation-related responsibilities are added to some relevant positions in different sectors, but these are scattered. At the national level, MAF coordinates adaptation, at the regional level, adaptation positions have been added to ELY centres and adaptation function has been added to the position at HURC, however, limited to the provision of information and guidance. Overall, as per the survey there's no "holistic" view on adaptation at the regional level, so the approach here is integrated. Adaptation is integrated into all relevant policy sectors, goals are formulated at the national and municipal levels, there is funding for planning at the national level.	medium (survey)
MECHANISMS			
Regulatory steering	2	Climate Act does not impose obligations on regions or municipalities to adapt. In Uusimaa, a regional adaptation plan is currently under development, with HURC as a coordinating organisation. The plan is intended as a guiding voluntary framework for the municipalities. While it is not a formal coordination framework, it is planned in participatory manner together with municipalities, which contributes to the regional coherence.	medium (survey)
Financial steering: financial instruments	2	The region is using different types of financial instruments, including insurances and various projects to steer adaptation, but no established regular instruments.	medium (survey)
Financial steering: allocated funding	2	Adaptation planning is funded at the national level as the role of managing adaptation is assigned for MAF, but implementation is to be	high (survey; Gram-Hanssen

		done by integrating adaptation as part of normal duties of different ministries.	et al. 2023; MAF 2022)
Information steering	3	There is a wide variety of information instruments available in the region (some coming down from national), including climate services, networks, research projects, boundary organizations, regional risk assessments.	high (survey; Gram-Hanssen et al. 2023; MAF 2022)

5.7. Pärnumaa

5.7.1. Baseline governance assessment

Governance structure[10]

Estonia is a unitary state **with legislative power only at the national level (Parliament**). Local self-government is at the level of municipalities. There is no regional government and counties are a devolved level of central government. Counties are administrative level units without any other significant independent competence. Currently counties operate as lowest co-operation level of municipalities. Counties coordinate and organize the implementation of centrally managed policies and their competencies are limited. Local authorities are responsible of basic management and independent organization of local issues in pursuance of law and in securing the needs of residents. Central government is responsible for the national sovereignty issues, adaptation-relevant sectors, and the following:

- *Maintenance of public order, rescue services.*
- *Infrastructure development and maintenance.*
- *Industry and commerce.*
- *Education.*
- *Labour policy.*
- *Health management; and*
- *Motorways.*

Municipalities have their own budgets for and are responsible for:

- *Education (nursery, primary, and secondary levels).*
- *Upkeep of public areas.*
- *Social welfare and services.*
- *Welfare services for the elderly.*
- *Youth work.*
- *Provision of public services and amenities.*
- *Housing and utilities.*
- *Water supply and sewer maintenance.*
- *Local planning.*

[10] https://portal.cor.europa.eu/divisionpowers/Pages/Estonia-Introduction.aspx

- *Maintenance of local public roads.*
- *Local public transport.*
- *Municipal libraries and museums.*
- *Sports and leisure facilities.*

Pärnumaa county, as a R4C region is an administrative unit. It includes the 7 municipalities of Pärnu City, Häädemeeste Parish, Kihnu Parish, Lääneranna Parish, Pohja-Pärnumaa Parish, Saarde Parish and Tori Parish.

Climate resilience governance[11]

Overall, climate resilience is steered in Estonia at the **national** level through the NAP (2017), and at the local level through the **municipal** adaptation plans. There is a Climate Act being developed at the national government level. With this in mind, the current assessment may need to be revisited as the Climate Law has been passed.

The NAS highlights the importance of accounting for climate risks in local level planning. The NAS takes a sectoral approach to harmonise adaptation approaches across different national and sectoral documents. It states that the state and authorities have the obligation "to create favourable societal adaptation structures for groups and individuals: the legal framework, information and mentorship, technical support" (*Estonia NAP* 2017, p. 24). The national government is responsible for setting adaptation objectives and creating a framework for adaptation. Counties do not have competencies to plan policies but rather act as municipality coordinators and implement national level policies at the regional level. Municipalities in their turn play an important role in adaptation planning & implementation. However, through its Pärnumaa Development Centre (Pärnumaa Arendukeskus), which is under the Pärnumaa Association of Local Authorities, the county pro-actively coordinates development planning across the county, including adaptation planning. They also monitor, review, report and update the plans, including the regional development plan and the Sustainable Energy and Climate Action Plan (SECAP), which is an annex. Their approach emphasises stakeholder participation more than other counties. In other counties, SECAP development is outsourced to a consultant, but this has in other areas resulted in lack of stakeholder acceptance.

While there is no regional adaptation strategy, there is a Pärnumaa SECAP, which is an Annex of the County Development Plan. The Pärnumaa SECAP covers all the municipalities in the county, except for Pärnu City which has its own SECAP. Other municipalities do not necessarily have Adaptation Plans or SECAPs but might mention adaptation in their Municipal Development Plan. According to the Pärnumaa SECAP, the municipalities play a key role in the implementation of climate adaptation policy across the county. Responsibility for planning and implementing adaptation lies on municipalities.

5.7.2. Governance barriers for and enablers of innovation actions

The following governance barriers have been identified as relevant (ranked 4) for Pärnumaa IP: lack of necessary knowledge, understanding or awareness, lack of leadership, lack of integrated frameworks, difficulty/lack of collaboration among the stakeholders (business -academy/science-territory), lack of urgency/prioritization and lack of funding. None of the governance barriers have been ranked as highly relevant. Additionally, the respondents raised the following challenges: lack of resources for development of desired tools; lack of engagement/interest from local

[11] https://climate.ec.europa.eu/document/download/4f78b41a-3acf-4d91-a16e-f3310a8090a2_en?filename=country_fiche_ee_en.pdf

businesses/organisations, lack of initiative from local partners; not involving/interacting with right stakeholders at the right time, and poor dissemination of project outcomes.

With regards to governance enablers of innovation of the Pärnumaa IP the following have been marked as the most relevant: active networking, training programs and educational services; cross-border cooperation and access to funding. Furthermore, the enablers ranked 4 (relevant) include governments' innovation policies including promoting a culture of collaboration and facilitation, R&D expenditure in the public sector, knowledge/technology transfer between universities, government and industry, mentorship and support through accelerators and incubators, and digital infrastructure. The full barrier and enabler relevance ranking results can be found in Annex 8.1.7.

5.7.3. Assessment of CR governance and Recommendations

Overall, all governance categories are in need of improvement in climate resilience governance in Pärnumaa (Figure 9); however, it is important to note that the governance situation may change with the passing of the Estonian Climate Act (the Climate Proof Economy Law), thus current scoring and recommendation need to be treated as the snapshot of governance situation at the time of the assessment (autumn 2024).

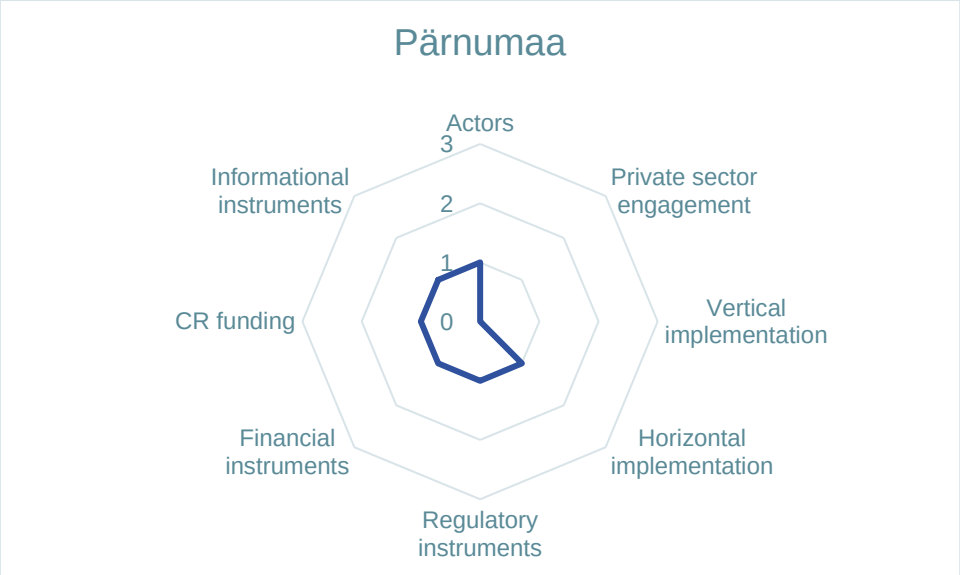

Figure 9. Pärnumaa performance in the assessment of CR governance.

There is a need for more diverse engagement of actors, as currently only public and third sectors participate in adaptation (Figure 9; Table 12). Private sector is not incentivized nor required to participate in adaptation and has not been marked as an active actor. **It is advisable to consider how different actors can participate in adaptation, including citizens, landowners, and private sector. This participation can be both in planning and in implementation of adaptation action, steered with a variety of voluntary or binding instruments.**

Overall, there is a need to clarify the multi-level governance of CR in Pärnumaa. In Estonia climate governance being steered by NAP (and only central government has legislative power), while municipalities have self-government capacities and locally adaptation is steered mainly through the municipal plans and strategies. The

survey results reveal that there is no legal framework regulating alignment across levels of government, tasks are not assigned and conferred to appropriate levels to align with mandates and competencies, and there is no legal division / assignment of responsibilities to adapt across levels. **It is advisable to ensure coherence of CR goals, tasks, and division of responsibilities on a national-local axis, with regions mainly coordinating and guiding trans-municipal efforts**. This category may also change with the passing of Climate Act, which is currently under preparation.

With regards to horizontal implementation, there is more coherence in terms of responsibility of divisions, as laid out in SECAPs (Table 12). Overall, the approach is mixed, and the scoring here was done for the dedicated approach, based on the survey answers. There are dedicated frameworks steering CR (Pärnumaa SECAP), however, there is no institution responsible for coordination and there are no dedicated resources. If CR is a stand-alone policy area and its implementation relies on the dedicated approach, **there is a need for a coordinating organisation (either dedicated or CR coordination can be added as a function to an existing organisation) as well as securing dedicated funding for planning, implementation, monitoring & evaluation, and possible re-planning.** Similarly, as with the previous category, the scoring and recommendations here are made with the current situation in mind and are subject to change depending on the content of the Climate Act.

All categories of steering instruments can be improved and diversified in Pärnumaa (Figure 9, Table 12). The regulatory base may change depending on the Climate Act, and Pärnumaa does not have competencies to pass more binding regulation with its role mainly concerns guidance and coordination of municipalities. In this regard, Pärnumaa **could enhance efforts in the provision of information on CR steering at the municipal level through regulatory instruments in the sectors where municipalities have self-governing capacities (for example, standards considering CR in local planning, water supply and sewer management, housing, and utilities). Similarly, municipalities can be guided and advised on financial instruments steering the participation of the private sector in relevant areas, including both incentivizing or penalizing instruments (for example, PPPs, taxes or tax reduction, user charges). Finally, there is a need to enhance efforts in informational instruments, including regular provision of climate services, which is currently mainly done through R4C project (UHI modelling and landslide risk assessment).** Furthermore, barriers for and enablers of R4C IP also reveal the need for closer cooperation between the private and public sectors, and academia to increase knowledge generation and transfer, as well as timely and relevant stakeholder engagement. This could be achieved by **establishing formal or informal working groups or networks for relevant actors and stakeholders engaged in CR planning as well as relevant innovation. Furthermore, there is need to enhance the support of innovation both financially, as well as through incubators or accelerators, which can also be done in collaboration with the public sector.**

Table 10. Results of the Pärnumaa CR governance assessment, scoring justification and confidence level.

Assessment category	*Score*	*Justification*	*Confidence level*
STRUCTURE			
Actors' involvement	1	Public and third sectors are engaged in CR & adaptation.	medium (survey)
Private sector engagement	0	Private sector is not required to participate in adaptation and is not engaged. PPPs are suggested to be a potential area.	medium (survey)

PROCESS			
Vertical implementation	0	There is no legal framework regulating alignment across levels of government, tasks are not assigned and conferred to appropriate levels to align with mandates and competencies, and there is no legal division / assignment of responsibilities to adapt across levels.	medium (survey)
Horizontal implementation	1	The approach is mixed, and the scoring is done for the dedicated approach, as there are dedicated frameworks. However, the framework (SECAPs) is clear in terms of responsibility division, there is no institution responsible for coordination and there are no dedicated resources.	medium (survey)
MECHANISMS			
Regulatory steering	1	Pärnumaa has regional/county development strategies, for which the county SECAP is an annex. It is not binding but in Pärnumaa it is approved by the municipalities and goes through extensive co-development process. Adaptation is formally steered through NAS and municipal adaptation plans/SECAPs. Pärnumaa Arendukeskus is very active in adaptation and in coordinating adaptation across municipalities through different projects and initiatives. They developed a SECAP for Pärnumaa and SECAP for Pärnu City at the same time in parallel (and Pärnu City is not covered by the Pärnumaa SECAP) and now they are under revision (every 2 years).	medium (survey)
Financial steering: financial instruments	1	There is only project-based or limited time only funding, and one answer was “there is no dedicated funding”. There is use of ad hoc grants or project funding as well as budget allocation for flood detection, but not much else adaptation related. The interviews from R4C D2.1 also mention that county SECAP development received funding from the State (2022).	medium (survey)

Financial steering: allocated funding	1	Funding is project-based and for limited time only.	medium
Information steering	1	Climate services development (landslide risk assessment and urban heat island modelling) takes place through project work, e.g. Regions4Climate.	medium (survey)

5.8. Burgas

5.8.1. Baseline governance assessment

Governance structure[12]

Bulgaria is a unitary state, **without legislative powers at the sub-national** level, but recognition of **local self-government**. Bulgaria has three levels of governance: central, districts and municipalities. The territory of Bulgaria is divided into 28 districts/provinces and 264 municipalities, divided into 6 regions. The district of Burgas is one of the 4 districts located in the Southeastern Region.

Burgas province/district consists of 13 municipalities (Aytos, Burgas, Kameno, Karnobat, Malko Tarnovo, Nessebar, Pomorie, Ruen, Sozopol, Sredetz, Sungurlare, Primorsko and Tsarevo).

Districts have mainly administrative and statistical functions. Decentralization is at the municipal level, with municipalities having administrative competencies and some financial autonomy. Municipalities are the only level at which self-government is exercised. Districts are fully financially dependent on the central government and governors are appointed centrally. Regions (districts) have administrative functions and are responsible for the implementation of regional policies and implementation of state governance at the local level.

Local governments are elected locally and have decision-making power over:

- *the municipal property, the municipal enterprises, the municipal finance, taxes and fees, the municipal administration;*
- *the structure and the development of the territory of the municipality and of the settlements in it;*
- *the education;*
- *the health care;*
- *culture;*
- *public works and communal activities;*
- *the social support;*
- *protection of environment and rational use of the natural resources;*
- *the maintenance and the preservation of cultural, historic and architectural monuments;*

[12] https://portal.cor.europa.eu/divisionpowers/Pages/Bulgaria-Introduction.aspx

- *the development of sports, recreation and tourism;*
- *disaster protection.*

Climate resilience governance

In Bulgaria, the ultimate responsibility for climate policy is with the Parliament, as stipulated in the Climate Change Mitigation Law adopted in 2014. Its focus was on climate mitigation, but climate adaptation was referred to in several articles aiming to “ensure the long-term planning of measures on climate change adaptation” (Kazakova-Mateva, 2023). The Council of Ministers has the overall responsibility for any policy implementation, and the climate policy is within the competences of the Ministry of Environment and Water (Kazakova-Mateva, 2023, p. 148). There is a single institution with a mandate on climate change adaptation – the Climate Policy Department in the Ministry of Environment and Water (Kazakova-Mateva, 2023). Two other institutions have specific climate change mandates, but they are focused on mitigation – the Executive Environmental Agency and Executive Forestry Agency.

Bulgaria adopted a National Climate Change and Adaptation Strategy and Action Plan in 2019, which provided a baseline assessment and sectors’ prioritization. In 2023, Bulgaria provided only the mandatory reporting with no additional information on climate adaptation (Kazakova-Mateva, 2023).

Therefore, climate adaptation is steered by a National Adaptation Strategy and plan that sets out actions and responsibilities, but not a law. At the regional level there is currently no adaptation/climate/resilience strategy, but the NAS sets out for the regional adaptation strategies to be developed. Adaptation is mainstreamed in all regional development plans according to the EU Cohesion Policy, but no dedicated regional plans or strategies have been yet developed.

At sub-national level, a relevant planning instrument for climate adaptation is the Flood Risk Management Plan for the period 2022-2027 for the Black Sea Basin Management Region.

Key instruments steering climate adaptation at local (municipal level):

- *General Master Plan of the city of Burgas*
- *"Municipal program for disaster risk reduction 2021/2024" Annual plan for implementation*
- *Disaster Protection Plan (incl. Flood Risk Management) – Burgas*
- *Integrated Development Plan of Burgas Municipality (PIRO 2021-2027)*
- *Sustainable Energy and Climate Strategy and action plan 2021-2030 – Municipality of Burgas*

5.8.2. Assessment of CR governance and Recommendations

Overall, Burgas CR governance assessment shows highest scoring in terms of actor involvement and the use of informational instruments, with room for improvement in terms of private sector engagement, mainstreaming both vertically and horizontally, and in terms of financial and regulatory steering (Fig. 10).

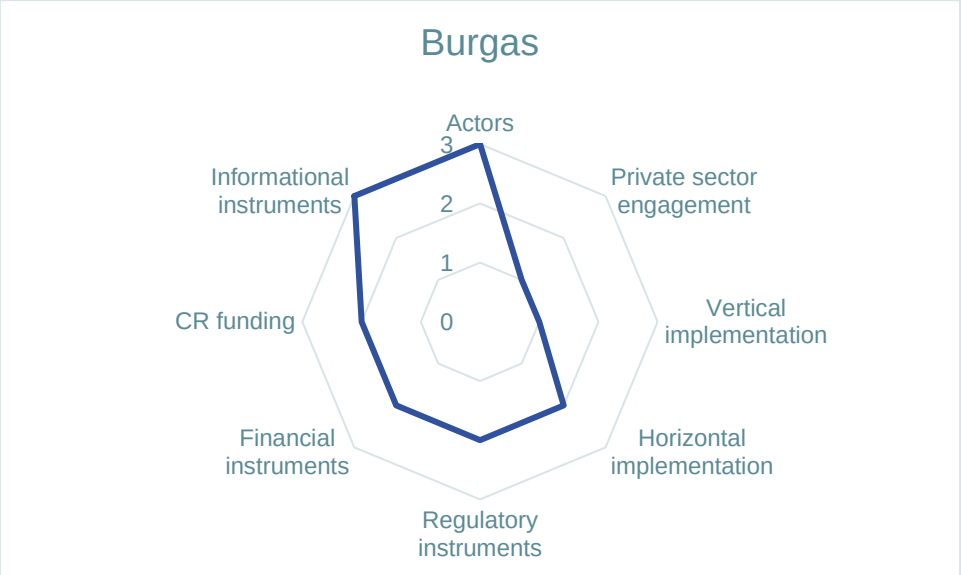

Figure 10. Burgas performance in the assessment of CR governance.

A variety of actors participates in CR in Burgas, including public, private and third sectors as well as citizens/household (Table 13). **Private sector participates voluntarily and through PPPs and its involvement can thus be strengthened with financial incentives or requirements to adapt.**

In terms of vertical implementation, there is a **need for better alignment of climate resilience objectives and responsibilities across governance levels, which can be achieved by delineating/assigning responsibilities clearly across levels, as well as ensuring the coherence of CR objectives in relevant frameworks**. With regards to horizontal implementation, adaptation is implemented through the integrated approach. The integration takes place mainly at the local level (Table 13). To increase the effectiveness of implementation through the integrated approach, it is advisable **to ensure sufficient resources (both financial and human resources) to reduce the risk of policy dilution.**

In terms of steering, Burgas performs well in all instrument categories (Figure 10 and Table 13). **To enhance regulatory instruments, a regional adaptation strategy development is advisable**. **Considering that regions in Bulgaria have mainly administrative purposes, the strategy function would mainly concern municipal guidance and coordination especially for the climate risks or adaptation that would be geographically or administratively spanning several municipalities.** Funding is allocated for adaptation planning and implementation, but as adaptation progresses it is beneficial to **secure funding also for monitoring & evaluation as well as for possible re-planning/updating of national, regional, and local plans and strategies.**

Table 11. Results of the Burgas CR governance assessment, scoring justification and confidence level.

Assessment category	*Score*	*Justification*	*Confidence level*
STRUCTURE			

Actors' involvement	3	Public, private and third sector, and private citizens and households are identified as actors engaged in adaptation.	medium (survey)
Private sector engagement	1	Private sector participates voluntarily and through PPPs (but NOT legally required to participate)	medium (survey)
PROCESS			
Vertical implementation	1	Adaptation is integrated into main policy sectors at local level. At local level, tasks and mandates are assigned. However, alignment of climate resilience objectives and responsibilities across governance levels seems to be missing.	medium (survey)
Horizontal implementation	2	Horizontal implementation through integrated approach. Adaptation is integrated into main policy sectors at the local level. At local level, tasks and mandates are assigned.	medium (survey)
MECHANISMS			
Regulatory steering	2	Bulgaria has a Climate Change mitigation and adaptation law, and a National Adaptation Strategy that sets out for the regional strategies to be developed. At the regional level, however, there is currently no adaptation/CR strategy. Adaptation is mainly steered at the municipal level, through documents such as the Disaster Protection Plan (incl. Flood Risk Management); the Integrated Development Plan of Burgas Municipality (PIRO 2021-2027) and the Sustainable Energy and Climate Strategy (Action Plan 2021-2023). At sub-national level, a relevant planning instrument for climate adaptation is the Flood Risk Management Plan for the period 2022-2027 for the Black Sea Basin Management Region.	medium (survey)
Financial steering: financial instruments	2	A number of incentivising financial instruments at national level were identified, incl. the "National plan for recovery and sustainability of the republic of Bulgaria" and the "Development	medium (survey)

		of the regions" Programme 2021-2027. National government financial resources are used for restoration of damaged public infrastructure, communication services, etc. caused by climate change resulting disasters. Funds of state origin are provided for implementation of protection and maintenance activities as cleaning of gullies and waterbeds to ensure better permeability during high water levels. At local level, climate adaptation is funded through projects with and without co-financing requirements e.g. LIFE, Interreg, Horizon Europe projects. Additionally, some innovative financial instruments are in use, including Energy Cooperative and a Municipal Program for startup development, funding the creation of recreation and green areas. https://business-burgas.com/	
Financial steering: allocated funding	2	Funding for adaptation is available for planning and implementation	medium (survey)
Information steering	3	Knowledge generation at local level takes place for example thanks to the Water Management Information System of Burgas Municipality, which accumulates measurements and flooding susceptible areas models, which enable the management of the monitoring process and the determination of the flood risk level in the Burgas Municipality, as well as the effective implementation of policies and measures to increase the level of population protection and prevent adverse consequences related to floods. In addition to this, Burgas engages in knowledge mobilisation and sharing thanks to the Local Unit for Climate Resilience and Adaptation, which is a multidisciplinary advisory body initiated within R4C project designed to actively support and participate in the process of adapting to and mitigating the risks and challenges associated with climate change from now on, and to enhance the resilience of communities at the local level.	medium (survey)

		Burgas is also engaged in networks such as the Covenant of Mayors (CoM) and ICLEI.	

5.9. Sitia

5.9.1. Baseline governance assessment

Governance structure

Greece is a unitary decentralized **state without legislative power at sub-national level**[13]. There are three levels of government: national consisting of seven decentralized administrations (single units of state), 13 regions and 325 municipalities. **Both regional and municipal levels are self-governed** and are responsible for the administrative affairs in respective areas, shaping, planning, and implementing reginal and local policies under the principles of sustainable development and social cohesion, taking into consideration national and EU laws.

Regions exercise their responsibilities/ competences within the framework of the relevant laws and administrative regulations, in the fields of:

- *Planning/Programming and regional development including investment.*
- *Agriculture/livestock and fisheries.*
- *Natural resources, energy, and industry; (water management, mineral wealth, energy, industry, and manufacturing).*
- *Employment, trade, and tourism.*
- *Transport and communications.*
- *Public works, urbanism, spatial planning, environment.*
- *Health.*
- *Education, culture, and sport.*
- *Civil protection – logistics.*

Municipalities exercise their powers/responsibilities according to the relevant legislation, regulations and management regulations adopted by them (local regulatory decisions) in the fields of:

- *Development.*
- *Building permits and urban planning applications.*
- *Environment.*
- *Quality of Life & Cities' proper Functioning.*
- *Employment.*
- *Social protection and solidarity.*
- *Education, culture, and sport.*
- *Agricultural Development, livestock, and fisheries.*

[13] https://portal.cor.europa.eu/divisionpowers/Pages/Greece.aspx

- *Civil protection.*
- *Issuing professional licenses.*
- *Transport infrastructure.*
- *Local development initiatives.*
- *Tourism.*

Sitia, as a R4C region is an administrative unit (municipality) in Lasithi province / Crete Region.

Climate resilience governance

Overall, climate resilience is steered in Greece at the **national** level through the NAS, which is **implemented through 13 regional adaptation action plans**. Crete has its own regional climate adaptation Plan (2021) called the Regional Plan for Climate Change Preparedness (PRCCPCP). It looks at vulnerability and adaptation priorities across sectors and geographical areas. It also includes support to promote municipal climate adaptation plans and provides incentives to various actors for climate actions[14].

5.9.2. Assessment of CR governance and Recommendations

Overall, Sitia shows high scoring in the assessment of governance specifically in the categories of actors' involvement, vertical mainstreaming, and financial steering (Figure 11), with the Recommendations mainly focusing on strengthening the engagement of the private sector, horizontal implementation and steering through regulatory and informational instruments. It is pertinent to note, that the confidence level is medium to low in most categories, as the evidence stems mainly from the survey, and could not be corroborated through the policy documents.

[14] https://climate.ec.europa.eu/document/download/e36bd121-f221-4dce-bfc8-947949ef8d97_en?filename=summary_fiche_gr_en.pdf

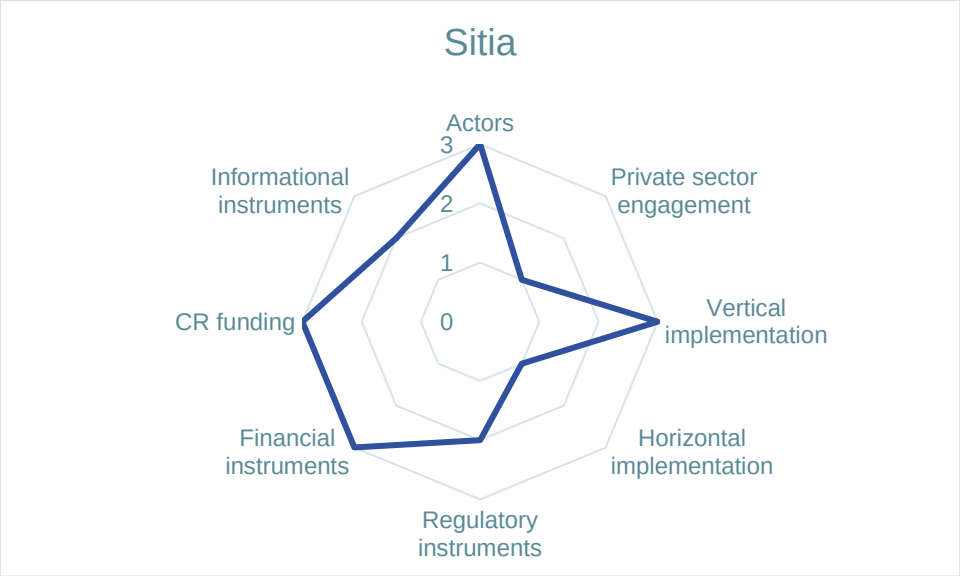

Figure 11. Sitia performance in the assessment of CR governance.

A variety of actors are engaged in adaptation in Crete, including public, private and third sectors as well as individuals/households. Private sector is participating voluntarily, there are no requirements for the private sector to participate (Table 14).

From the multi-level governance perspective, the responsibilities are assigned and divided, and tasks are conferred to the appropriate levels (Table 14). At the national level, CR is steered through the NAS, which is implemented through regional adaptation action plans, the one concerning Sitia is Crete's Regional Plan for Climate Change Preparedness (CRPCCP). At the local level, there is a Sitia SECAP. With regards to horizontal implementation, the approach is mixed but closer to dedicated. There are dedicated frameworks, such CRPCCP, which cuts across sectors and provides measures across sectors. While its goals are general, the actions are specific and clearly formulated. There is also dedicated funding available for the different phases of policy cycle (planning, implementation, monitoring & evaluation, and re-planning) but it is scattered across different sectors (Table 14). To support the effectiveness of dedicated implementation**, it is advisable to ensure that there is a coordinating organization for adaptation (a dedicated work group, task force, organisation, or it is added as a function to an existing organisation).**

Sitia is using a variety of financial instruments, including various grants, incentivizing, and penalizing instruments, and project-based funding to steer different actors (Table 14). **Other types of instruments to steer specifically private sector should be considered, for example, PPPs.** The evidence from the survey suggests that the funding is available for all stages of adaptation process, but it is scattered across the sectors. Considering, the mainstreaming approach is closer to dedicated**, it is advisable to ensure dedicated funding and avoid sectoral fragmentation.** In terms of informational instruments, there is a range of various networks mainly connecting third and public sectors, as well as individuals. **Engagement of private sector into formal or informal networks to steer knowledge exchange, learning as well as networking and collaboration is advised.** This is especially important from the perspective of the Sitia IP, which focuses on close collaboration between local businesses and citizens.

Table 12. Results of the Sitia CR governance assessment, scoring justification and confidence level.

Assessment category	*Score*	*Justification*	*Confidence level*
STRUCTURE			
Actors' involvement	3	Public, private, third sector, and private citizens and household actors are engaged in climate resilience in Sitia.	medium (survey)
Private sector engagement	1	Private sector is not required to or incentivised to participate in adaptation but is engaged.	medium (survey)
PROCESS			
Vertical implementation	3	The NAS is implemented through regional climate adaptation plans. The Crete's Regional Plan for Climate Change Preparedness also includes support to promote municipal climate action plans. The survey reveals that tasks are assigned and conferred to appropriate levels and there is a legal division of responsibilities.	medium (survey)
Horizontal implementation	1	The approach is mixed. CR is integrated at national and regional level. However, there is also the Crete regional adaptation plan that is a standalone plan that cuts across sectors and provides measures across sectors. The goals are quite general, but the actions are quite specific and clearly formulated. The plan includes a section on available mechanisms and funding sources at European, National and Regional level for the implementation of the actions and measures proposed. There is also dedicated funding. The scoring is made for the dedicated approach.	medium (survey)
MECHANISMS			
Regulatory steering	2	Crete has a regional adaptation plan. It is unknown whether it is binding. In Table 1, there are regulations that are authority controlled. What the regulations are, is unknown. Municipal SECAP are also contribute to climate resilience with localised actions	low (survey, evidence fragmented)

Financial steering: financial instruments	3	There is a variety of financial instruments, including taxes, incentives, penalizing and incentivizing instruments.	low (survey, evidence fragmented)
Financial steering: allocated funding	3	According to the survey, funding exists for all stages, but it is funding across different sectors.	low (unable to verify whether the funding is sector- or adaptation-specific)
Information steering	2	Knowledge generation is "developed in collaboration with national academic institutions" and also climate stations (R4C) and flood stations from Hellenic Marine Center are mentioned but whether they produce climate services is not explicitly mentioned. Additionally various networks are mentioned.	low (survey, fragmented evidence)

5.10. Troodos

5.10.1. Baseline governance assessment

Governance structure

Cyprus is a centralized country **with legislative powers at the national and local levels**[15]. Provinces / districts are the administrative units, which are a devolved form level of the central government, ensure the implementation of central government & ministries policies. There is a comprehensive system of local governments, which comprises of municipal councils and community councils. National laws allocate administrative responsibilities to local governments (municipalities). It is ruled based on the principle of local self-administration.

Municipal and community responsibilities are:

- *The cleaning and the hygiene of the municipality.*
- *Transport: maintenance of roads within their boundaries.*
- *Street lighting.*
- *Public areas, including parks and cemeteries.*
- *Environment, including waste disposal.*
- *Municipal markets.*
- *Local tax system.*

[15] https://portal.cor.europa.eu/divisionpowers/Pages/Cyprus-Introduction.aspx

Troodos, as a R4C region, is not an administrative unit, but rather a geographical mountainous region that spans both the Limassol and Nicosia Districts. The Troodos region is governed by local community councils.

Climate resilience governance

Overall, climate resilience is steered in Cyprus at the **national l**evel through the NAS and NAP (2017). They are currently being revised. The NAS includes an evaluation of climate impacts on 11 sectors and adaptation measures for each. The Department of Environment of the Ministry of Agriculture, Rural Development and Environment (MARDE) is the authority responsible for CC in Cyprus. There is no requirement for municipalities to develop local adaptation plans in Cyprus, and this work is in progress. Vertical coordination mechanisms to enable subnational administration to influence policymaking were “in progress”.

5.10.2. Governance barriers for and enablers of innovation actions

The most relevant governance barriers to R4C IP include lack of integrated planning frameworks, institutional fragmentation, and lack of funding, while also lack Difficult/Lack of collaboration/connection among the stakeholders (business -academy/science-territory) is marked as relevant. The most relevant enablers include R&D expenditure in public funding and access to funding, while Governments’ innovation policies including promoting a culture of collaboration and facilitation is also considered relevant. The full table of barriers ranking can be found in Annex 8.1.8.

5.10.3. Assessment of CR governance arrangements

Overall, the progress of adaptation below national level in Cyprus is quite modest (Figure 12) and thus the Recommendations will focus on all the categories. It is pertinent to note that the confidence level is medium for all the assessment, as the current NAS is under revision, and thus it was not possible to corroborate survey evidence with the policy documents.

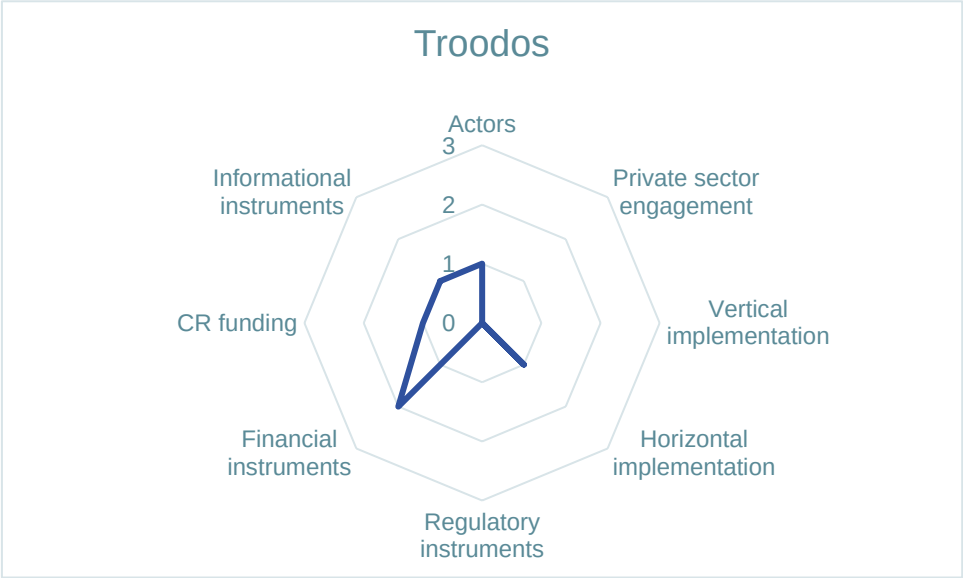

Figure 12. Troodos performance in the assessment of CR governance.

In Troodos, public and third sectors are engaged in adaptation, while private sector is not. Private sector is not required nor incentivized to participate in adaptation (Table 15). There is a need to enhance the participation of private sector as well as of individuals/households, especially from the perspective of the R4C IP. **Considering the governance context and the capacities in Troodos region, private sector can be steered with informational, networking, and voluntary financial incentives.**

In terms of adaptation mainstreaming, most progress on adaptation is at the national level with NAS and NAP. However, NAS and NAP are currently under revision, and it is unclear whether the situation will change in terms of responsibilities assignment, or goal clarification. Currently, there is no legal framework regulating alignment across levels of government, tasks are not assigned and conferred to appropriate levels to align with mandates and competencies, and there is no legal division / assignment of responsibilities to adapt across levels (Table 15). In terms of horizontal implementation, the approach in Troodos is closer to dedicated. Adaptation is a stand-alone policy and is not integrated into other policy sectors. There is no clear legal framework beyond non-binding NAS and NAP, which are currently under revision. While there is a NAS/NAP, there seems to be incoherence in terms of goals, actions and responsibilities, and there is no dedicated funding (Table 15). **In general, there is need for clear legal frameworks that assign responsibilities to adapt both horizontally and vertically, while ensuring the coherence of goals, as well as securing funding for all stages of adaptation cycle including planning, implementation, monitoring & evaluation, and re-planning.**

In terms of steering instruments, the regulatory basis for adaptation is currently unclear with the main guiding documents being under revisions. In any regard, NAS/**NAP are non-binding, and the introduction of binding frameworks would benefit adaptation both nationally and locally. Considering there is an absence of a regional / local adaptation strategy relevant for the region, it is advisable to develop one, even if it is a voluntary document meant for guidance, coordination and information dissemination for the relevant communities and actors.** In terms of financial instruments, most relevant include grant schemes (for CCA promotion in rural councils and for forest fire protection zones and hoses in communities), and the local community councils

can submit a budget request to the Ministry of Interior with a budget category also for CCA projects. Considering the governance context in Troodos, specifically limited regulatory and budgetary capacities, the use of financial instruments is sufficient. **It is advisable to also direct these instruments to the private sector.**

Table 13. Results of the Troodos CR governance assessment, scoring justification and confidence level.

Assessment category	*Score*	*Justification*	*Confidence level*
STRUCTURE			
Actors' involvement	1	Public and third sector actors are engaged in adaptation.	medium (survey)
Private sector engagement	0	Private sector is not required to participate in adaptation and is not engaged	medium (survey)
PROCESS			
Vertical implementation	0	There is no legal framework regulating alignment across levels of government, tasks are not assigned and conferred to appropriate levels to align with mandates and competencies, and there is no legal division / assignment of responsibilities to adapt across levels.	medium (survey)
Horizontal implementation	1	Scoring is done for the dedicated approach. Adaptation is a stand-alone policy and is not integrated into other policy sectors. There is no clear legal framework, but there is a national strategy and plan that assign responsibilities but are not binding. Adaptation is steered nationally, and the most important strategies are national, with the ministry responsible for coordination. While there is a NAS/NAP, there seems to be incoherence in terms of goals, actions and responsibilities, and there is no dedicated funding.	medium (survey)
MECHANISMS			
Regulatory steering	0	No regional adaptation strategy exists or voluntary policies for adaptation. There is a regional development strategy which mentions climate change and the need to adapt a few times.	medium (survey)

Financial steering: financial instruments	2	While there is no dedicated funding, it is apparent from the survey that there are various grants available for CCA (CCA in rural councils, for forest fire protection zones and hoses in communities), and the local community councils can submit a budget request to the Ministry of Interior with a budget category also of projects. These can also be used for CCA projects.	medium (survey)
Financial steering: allocated funding	1	As per the survey, there is no dedicated funding, but there is some project-based funding.	medium (survey)
Information steering	1	Climate services/knowledge generation are not mentioned in the survey, but they are in R4C and other projects.	medium (survey)

5.11. Nordic Archipelago

5.11.1. Baseline governance assessment

Governance structure

Nordic Archipelago as a "Regions4Climate" project area includes Stockholm, Uppsala, Sörmland and Östergötland counties, and the provinces of Southwest Finland, Uusimaa, Kymenlaakso, and autonomous Åland islands, thus spanning over two countries, Finland, and Sweden, and including multiple regions and municipalities. In this Deliverable, we are examining the governance context separately for Finnish and Swedish areas.

The Swedish part of the Nordic Archipelago includes Stockholm, Uppsala, Sörmland and Östergötland counties**. Sweden** is a unitary decentralized state**. Local self-government** is recognized in certain areas. **Regions** and municipalities do not have legislative powers, but have **executive** competencies in certain areas, with no hierarchy but different areas of responsibility.

Regional competences include:

- *Public health, including healthcare and medical services.*
- *Cultural institutions.*
- *Public transport.*
- *Responsibility for growth and development.*

Municipal competences include:

- *Transport, including local roads and public transport.*
- *Social welfare.*
- *Education.*

- *Planning and building issues.*
- *Emergency and rescue services.*
- *Health protection.*
- *Environment, including environmental protection, refuse and waste management, water, and sewage.*
- *Housing.*

Responsibilities on a voluntary basis are:

- *Leisure activities and culture, except libraries.*
- *Energy.*
- *Industrial and commercial services.*
- *Employment.*
- *Tourism.*

The Finnish part of the Nordic Archipelago includes Southwest Finland (Varsinais-Suomi, including Turku Archipelago), Uusimaa, Kymenlaakso, and Åland islands. Southwest Finland, Uusimaa and Kymenlaakso are Finnish regions, while **Åland islands are an autonomous self-governed region, having full legislative power** and its legislative power is not delegated, meaning that the Finnish parliament cannot legislate on the matters belonging to Ålands' competencies. There is no hierarchy between Åland and Finnish acts.

Finland is a unitary decentralized state with three levels of governance – national, regional, municipal. **Legislative powers at the sub-national level are at the municipal and wellbeing services counties' level.** Self-government at the regional level is limited. **Municipalities are self-governed** and have regulatory power and high degree of autonomy in terms of decision-making, including land use and resource allocation (*Kuntalaki* 2015).

Regional Councils are stipulated in the Finnish law and represent mandatory joint municipality authorities and have administrative duties. Six Regional State Administrative Agencies (AVI) and 15 Centers for Economic Development, Transport, and the Environment (ELY) are responsible for the implementation of national level policies at the regional level.

Climate resilience governance

In Finland, adaptation is steered **at the national level** through NAS horizontally and at the regional through the regional agencies (AVI, ELY) that have specific competencies. Additionally, **regions** have Regional Councils that coordinate and support adaptation planning, but do not have legislative power. Municipalities are strong in Finland with self-governing power and own funding. Most adaptation at the sub-national level is carried out at the **municipal** level steered by voluntary adaptation plans and strategies. Regional level is getting more traction in adaptation through the allocation of funding to adaptation positions in ELY centres. Uusimaa is currently developing a regional adaptation strategy under the guidance of HURC; Southwest Finland's regional adaptation strategy was adopted in 2011 (until 2020), Kymilaakso has adopted a regional adaptation plan in 2022. In Åland islands, The Climate change and Energy Strategy is focused on emission reduction, while adaptation is mainly referred to in the context of the Finnish NAS.

In **Sweden,** adaptation is mainly steered at the **national** level through the NAS (2023) that assigns responsibilities across different stakeholders and is coordinated by the Ministry of Climate and Environment. The

Ordinance on climate adaptation, the Planning and Building Act and the Land Act (2018) form the legislative backbone of adaptation in Sweden. Additionally, Swedish Environmental Act advances adaptation-relevant issues. The **self-governed municipalities** play central role in adaptation at the local level, particularly within the domains of spatial planning, water management and natural disaster prevention. At the **regional** level, County Administrative Boards (CABs) are the government authorities that liaise between national and municipal levels and ensure the implementation of national regulation at the regional and municipal levels. In terms of adaptation and climate, resilience CABs operate within the **ordinance on climate adaptation for national authorities and CABs** (Ministry of the Environment and Energy 2018), which strengthened and formalized their role in adaptation. Thus, CABs support municipalities in their adaptation as well as monitor and coordinate adaptation across municipalities, while also supporting regional sectoral adaptation. Municipalities have legal obligation to assess climate risks in their spatial planning and have been granted a stronger mandate within spatial planning, water management and natural disaster prevention through the amendments to the Planning and Building Act and the Land Act (2018). The Ordinance on climate adaptation, however, did not put any direct obligations on municipalities in terms of adaptation. Thus, the CABs can initiate and support municipal adaptation including conducting risk & vulnerability assessments and developing goals and action plans for adaptation (Gram-Hanssen et al. 2023), but municipalities are not obliged to report to CABs on the progress. The Ordinance for CABs also includes the revision of climate risks and adaptation with neighbouring countries if relevant, thus setting ground for transboundary cooperation. The Regional Councils in Sweden do not have a statutory role in adaptation but have competences over relevant issues that advance overall climate resilience at the regional level.

In terms of transboundary cooperation, there is a number of relevant strategies that deal with adaptation-related questions, such as the Baltic Sea Action plan, EUSBSR Action Plan. There are no dedicated adaptation strategies spanning the region. There are also transnational cooperation programs, e.g., Interreg Baltic Sea Region 2021-2027, and BALTADAPT, which took place in 2011-2013.

5.11.2. Assessment of CR governance arrangements

The governance assessment of Nordic Archipelago as a R4C partner region is rather challenging as it spans over the jurisdictions of two countries, with regions and municipalities of different level of autonomy, self-governance, and competences. Thus, the assessment shows the scoring for the mainland Finland, mainland Sweden and Åland islands separately, while recognizing that in these cases there are internal differences in adaptation progress at the regional level. Overall, the progress in CR governance is higher in mainland Finland and in mainland Sweden, while the Åland islands' adaptation is in early phases, thus scoring low in most categories (Figure 13). It is It is pertinent to note, that the confidence level is medium to low in most categories, as the evidence is fragmented, stems mainly from the academic literature and official reports, while the survey answers have been fragmented.

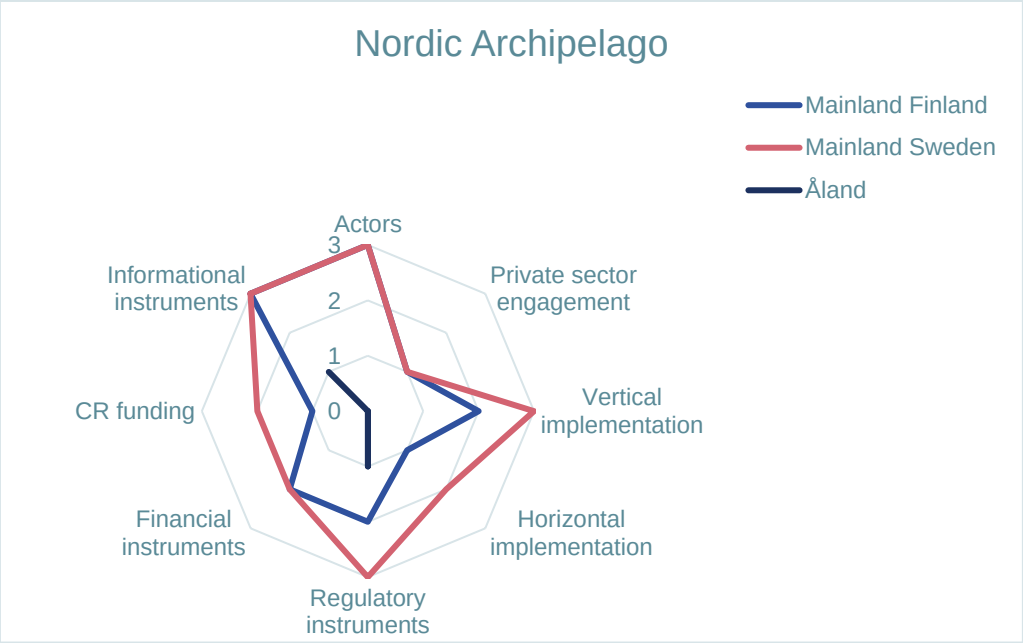

Figure 13. Nordic Archipelago performance in the assessment of CR governance.

Across all cases, the engagement of private sector requires stronger steering, for example, through regulatory and financial instruments.

In Åland islands, there is an overall gap in adaptation governance (Figure 13) in terms of absence of a regional adaptation strategy or plan, with the Finnish NAS being the main guiding document (MAF 2022). **Considering the legislative and regulatory capacities of Åland islands, there is a possibility to pass binding legal frameworks for adaptation that are tailored specifically to the region, taking into account the local geographical and economic context as well as specific climate risks, sectors of interest and adaptation needs. Alternatively, the existing Climate and Energy strategy 2030 can be revised or operationalized through a plan with more specifically formulated goals and planned actions for adaptation as well, in addition to the current focus on mitigation**. Although climate risks are accounted for to some extent in various sectoral documents, there is a risk of policy dilution, absence of joint intersectoral vision and objectives without a guiding adaptation framework, even if the implementation approach is integration into sectoral policies. This especially relevant from the point of view of the R4C IP, which is archipelago-focused int terms of involved sectors, livelihoods, and associated challenges (sustainable transportation, high seasonality in tourism).

The scoring is overall higher for mainland Sweden than for mainland Finland across many categories, specifically due to the difference in competencies between Swedish counties and Finnish regions (Figure 13, Table 16) due to the fact, that the Swedish regional authorities (CABs) have a strengthened mandate through the Ordinance on climate adaptation for national authorities and CABs. CABs can initiate and support municipal adaptation including conducting risk & vulnerability assessments and developing goals and action plans for adaptation, as well as coordinate adaptation across municipalities. Thus, the regulatory base in mainland Sweden has a stronger vertical connection and alignment in CR governance. The role of regions in Finland is limited to guidance, information provision, funding procurement though various projects, and coordination of adaptation across municipalities, on the voluntary basis. Comparison here is redundant, rather the recommendations pertain to the favourable mix of steering

policy instruments within the scope of each country's regional capacities. **For mainland Finland, the main effort could be placed on aiming for a more integrated view on adaptation, perhaps through clearer division of adaptation responsibilities horizontally to ensure alignment and coherence (specifically pertaining to AVI, ELY, municipalities and Wellbeing Services Counties landscape) and to reduce adaptation fragmentation**. In terms of instruments, **focus could be placed on steering of the private sector with incentivizing financial instruments, as well as involving private sector in formal and informal networks to increase cooperation and information sharing.** For mainland Sweden, similar recommendation pertains with the addition that there is a **possibility to consider more regulatory instruments and penalizing financial instruments for the private sector engagement.**

Table 14. Results of the Nordic Archipelago CR governance assessment, scoring justification and confidence level.

Assessment category	*Score*	*Justification*	*Confidence level*
STRUCTURE			
Actors' involvement	3	in mainland Finland and in Sweden, a variety of actors are involved in adaptation, albeit private sector, households, and landowners on a voluntary basis. There is no sufficient evidence for Åland islands.	low (insufficient fragmented evidence: survey and Gram-Hanssen et al. 2023)
Private sector engagement	1	in mainland Finland and in Sweden, participation of private sector in adaptation is voluntary. There is no sufficient evidence for Åland islands.	low (insufficient evidence; survey, Gram-Hanssen et al. 2023)
PROCESS			
Vertical implementation	2 (mainland Finland)	There is no legal assignment of responsibilities nor framework that would assign responsibilities across levels (NAP2030 mainly looks at the national level), but the objectives are aligned/ coherent across national, regional, and local levels and tasks are divided/conferred according to the administrative branches and policy sectors.	medium (survey; (MAF 2022)

	0 (Åland)	Åland islands have an adaptation package in their Climate and energy strategy 2030 (the strategy is mitigation focused). The adaptation package has high-level goals but does not set any specific targets or measures. Adaptation implementation has not started yet, there are no concrete plans, measures, tools, nor assigned responsibilities. The strategy refers to the Finnish National Adaptation strategy 2030 and its objectives. Additionally, Åland islands development and sustainability agenda lists enhancing adaptive capacity and resilience and reducing climate change risks as its objectives. There is also flood directive in place, according to which, however, Åland doesn't have significant flood risks.	low (evidence is of high quality, but insufficient. (Gregow et al. 2021)
	3	The Ordinance lays out provisions and tasks for the national, regional to municipal levels. Municipalities are steered through the national level Acts. Overall, there is a clear division of tasks across levels and across sectors or policy domains within the sectors, that are aligned with the administrative responsibilities of each governance level.	medium (Gram-Hanssen et al. 2023)

Horizontal implementation	1 (mainland Finland)	For mainland Finland the scoring is done for the integrated approach. The approach is mixed in every region, and progress varies. There is a NAP at the national level, municipalities have their own plans and strategies, regional adaptation plan is forthcoming in Uusimaa, Southwest Finland's regional adaptation strategy was adopted in 2011 (until 2020), and Kymenlaakso has adopted a regional adaptation plan in 2022. All these strategies and plans stipulate that adaptation is to be integrated into goals and actions of relevant policy sectors and administrative branches. Adaptation-related responsibilities are added to some relevant positions in different sectors, but these are scattered. At the national level, MAF coordinates adaptation, at the regional level, adaptation positions have been added to ELY centres. The function, however, is limited to the provision of information and guidance. Overall, as per the survey there's no "holistic" view on adaptation at the regional level, so the approach identified here is integrated.	low (fragmented evidence)
	0	Åland islands have an adaptation package in their Climate and energy strategy 2030 (the strategy is mitigation focused). The adaptation package has high-level goals but does not set any specific targets or measures. Adaptation implementation has not started yet, there are no concrete plans, measures, tools, nor assigned responsibilities. The strategy refers to the Finnish National Adaptation strategy 2030 and its objectives. Additionally, Åland islands development and sustainability agenda lists enhancing adaptive capacity and resilience and reducing climate change risks as its objectives. There is also flood directive in place, according to which, however, Åland doesn't have significant flood risks.	low (insufficient evidence; (Gregow et al. 2021)

	2 (mainland Sweden)	The scoring for mainland Sweden is for the dedicated approach as there is a clear legal framework, specialized institutions that are mandated to advance adaptation (CABs) and specialized funding for them. There is not enough evidence to assess the horizontal alignment of objectives.	medium (Gram-Hanssen et al. 2023)
MECHANISMS			
Regulatory steering	Mainland Finland 2	Uusimaa is currently developing a regional strategy, Kymenlaakso and Southwest Finland have previously developed regional strategies or plans. These instruments are voluntary but show a degree of coordination.	medium
	Åland 1	There is a regional strategy that is mainly focused on mitigation, but also contains adaptation package with high-level goals. The steering is weak and participation voluntary.	medium
	Mainland Sweden 3	The Ordinance on adaptation obliges the regional authorities CABs to initiate, support and evaluate adaptation in counties and across neighbouring counties.	medium (Gram-Hanssen et al. 2023)
Financial steering: financial instruments	2	Mainland Finland and Sweden use a variety of financial irregular instruments, such as grants, project fundings, etc. No evidence for Åland islands.	medium (survey; Gram-Hanssen et al. 2023)
Financial steering: allocated funding	1 (mainland Finland) / 2 (Sweden)	Project-based funding in mainland Finland, no evidence for Åland islands, dedicated funds in Sweden (for CABs) in addition to project funding.	medium
Information steering	3	A variety of information instruments for mainland Finland and Sweden at the national and at the regional level (including climate services, biannual information dissemination through the Swedish Association of or Local and Regions, a variety of boundary organisations and networks in Finland). No	medium (Gram-Hanssen et al. 2023).

		evidence specifically for Åland, who use Finnish and Swedish climate services.	

5.12. Castilla y León

5.12.1. Baseline governance assessment

Governance structure

Spain is a unitary decentralized country, with an asymmetrical division of powers across the country (de facto resembles federation) and **with legislative powers at the sub-national level**. There are 17 autonomous communities and two autonomous cities[16].

Castilla y León is an autonomous community that includes 9 provinces (Province of Ávila, Province of Burgos, Province of León, Province of Palencia, Province of Salamanca, Province of Segovia, Province of Soria, Province of Valladolid, and Province of Zamora).

Climate resilience governance

At the **national** level, adaptation is mainly steered through the National Climate law and NAS. At the **regional** level, the Regional Climate Strategy (Estrategia Regional contra el Cambio Climático en Castilla y León) steers adaptation.

5.12.2. Governance barriers for and enablers of innovation actions

The following governance barriers have been identified as relevant for the Castilla y León R4C IP (ranked 4): Lack of necessary knowledge or understanding (even awareness); Lack of strategy/vision; Lack of integrated planning frameworks; Institutional fragmentation; Difficult/Lack of collaboration/connection among the stakeholders (business -academy/science-territory); lack of funding; bureaucracy; lack of urgency/prioritization. No barriers have been ranked as highly relevant (5). With regards to enablers, the following have been identified as relevant (ranked 4): Governments' innovation policies including promoting a culture of collaboration and facilitation; R&D expenditure in the public sector; Mentorship and support through accelerators and incubators; Active networking, training programs and educational services; Cross-border cooperation; access to funding; digital infrastructure. No enablers have been ranked as most relevant (ranked 5). All the results of barrier and enabler ranking can be found in the Annex 8.1.9.

[16] https://portal.cor.europa.eu/divisionpowers/Pages/Spain-intro.aspx

5.12.3. Assessment of CR governance and Recommendations

Overall, Castilla y León performs well across many categories, with the highest scores in actor involvement, vertical implementation, and regulatory steering (see Figure 14 and Table 17 for scoring details). While actors in Castilla y León are diverse, and private sector's participation is incentivized financially**, it is possible to steer private sector through regulatory instruments as well by e.g., setting requirements to adapt**. Currently, the national Climate Law encourages the collaboration of private and public sectors without stronger requirement.

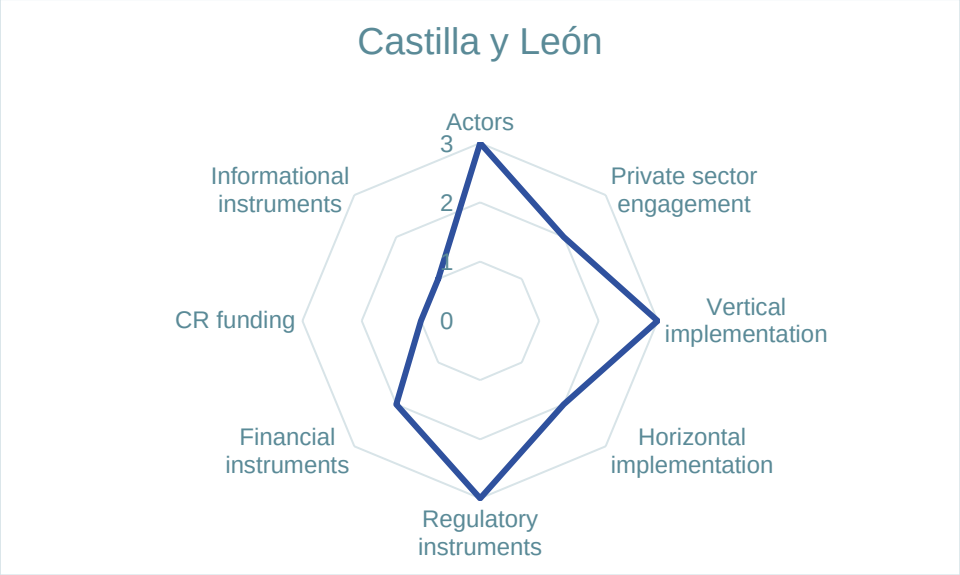

Figure 14. Castilla y León performance in the assessment of CR governance.

In terms of horizontal implementation, the approach in Castilla y León is integrated (Table 17). The survey reveals that the goals are aligned horizontally, and there are clear legal frameworks that divide the responsibilities to adapt. Even though the implementation approach is integrated, sufficient or secured funding is important, and thus project-based funding is considered as insufficient. **Securing funding for some or all of stages of policy cycle, also in different sectors, will contribute to more effective implementation.**

Castilla y León has an advanced regulatory base to steer adaptation, with Climate Law and NAS at the national level, as well as regional adaptation strategy at the regional level (Table 17). Furthermore, a regional climate law is currently in preparation. With regards to financial instruments, there is a variety of instruments used, for example, EU Horizon projects, grants and direct programming expenditure for planning and implementation measures. These instruments are sporadic, and **more established instruments are advisable (tax reductions, subsidies, user charges, taxes). For example, there are taxation instruments in place for mitigation, but not for adaptation.**

There are various informational instruments used in Castilla y León, including sustainability networks, projects with local residents, educational portals, however, a critical informational instrument is missing, namely climate services (Table 17). Especially considering the requirement to adapt, **there is a need to produce useful and usable knowledge on climate risks, including biophysical informational in hazards as well as socio-**

economic information (e.g., on asset, infrastructure and population exposure and vulnerability). Moreover, this information could be constantly updated to enable timely adjustment and to aid in monitoring and evaluation of adaptation progress and its outcomes. The provision of climate services could be mandated to a research institution, and in many regions, this is stipulated in the NAS or NAP.

With regards to the IP barriers, there are a few major themes evident. First is related to the lack of clarity in terms of institutional arrangements: the respondent has raised the issue of lack of integrated frameworks and institutional fragmentation, accompanied by lack of vision, awareness, funding, and prioritization. While the adaptation regulatory base is strong in Castilla y León, there is perhaps a need to clarify cross-cutting issues in terms of adaptation integration into relevant sectors, particularly, for agriculture and energy production as these are the focus sectors in the IP. Furthermore, the barriers highlight the absence of specialized networking and informational instruments that would help increase the awareness and overcome barriers in stakeholder involvement. For example, there is network for the sustainability in municipalities and regional cluster cooperatives; however, crating formal or informal networks with diverse actors involved (third sector, including climate services providers, public and private sectors) is advisable.

Table 15. Results of the Castilla y León CR governance assessment, scoring justification and confidence level.

Assessment category	*Score*	*Justification*	*Confidence level*
STRUCTURE			
Actors' involvement	3	All actors are involved based on the survey answers and on the climate law and the national plan for climate adaptation (PNACC). The law states that public and private sector need should collaborate on adaptation issues.	high (survey; *The Law on Climate Change and Energy Transition (Spain)* 2021)
Private sector engagement	2	Based on the survey answers, the private sector is financially incentivized. The national adaptation plan dedicates a section on mobilization of private financing and highlights the importance of private sector participation in adaptation. They suggest several engagement types like "the development of guidelines and methodologies to guide the design of actions in each area of work (or sectoral area); the integration of adaptation to climate change in public funding lines that involve leveraging private funding; the creation of incentives for adaptation in companies; etc." (p. 73).	high (survey; NAP)
PROCESS			

Vertical implementation	3	According to the survey, a legal framework that regulates the coherence and alignment of adaptation across levels of governance exists. At the same time, tasks are assigned and conferred to the appropriate levels to align with the mandates and competencies and there is a legal division / assignment of responsibilities to adapt across levels, specifically defined at national and regional level.	medium (survey)
Horizontal implementation	2	The scoring is done for the integrated approach. Goals are clearly formulated according to the survey. Additionally, legal frameworks identified by the region have a positive influence on adaptation (Energy sector, Urban planning laws and land-use planning guidelines, Common Agricultural Policy). Resources are not considered sufficient since they are project based.	medium (survey)
MECHANISMS			
Regulatory steering	3	A national climate law (Ley de Cambio Climático y Transición Energética (Ley 7/2021)) is in place and steers adaptation. There is a regional Adaptation Strategy (Estrategia de Adaptación al Cambio Climático de Castilla y León 2019-2030). Additionally, a regional climate law is currently under development.	high (survey; *The Law on Climate Change and Energy Transition (Spain)* 2021)
Financial steering: financial instruments	2	High mix of financial instruments for adaptation, but most of them are not regular and established over a period of time. Tax instruments are just for mitigation.	medium (survey)
Financial steering: allocated funding	1	Adaptation funding is project-based.	medium (survey)
Information steering	1	Some knowledge services are in place but not completely focused on climate and resilience, nor adaptation. The region participates in the Network of Municipalities for the Sustainability of Castilla y León (REDCyL), not completely focused on climate/resilience.	medium (survey)

6. Conclusions

To summarize, the progress in CR governance in partner regions varies, with some regions scoring high in most categories (e.g., Basque Country), while in other regions CR governance is yet to be arranged (e.g., Troodos, Pärnumaa). It is notable, that all front-runner regions (Basque Country, Køge Bay, and Sitia) have scored high in the governance assessment as well. As progress in CR depends on many factors, including but not limited to experienced climate events and expected risks, and leadership (Berrang-Ford et al. 2021), it is not the purpose of this Deliverable to track and compare progress in partner regions. The aim is rather to provide tailored recommendations on how to improve CR governance within the existing governance context in each partner region. Furthermore, the regions can learn from other regions with similar governance contexts. For example, regions with legislative or self-governing capacities can draw lessons in terms of regulatory frameworks (laws, plans, regulations) to steer different actors, including private sector, as well as in terms of clear assignment and delegation of responsibilities. From R4C regions, these regions could be Basque country or Castilla y León, who overall perform high in the assessment but also demonstrate a strong and coherent regulatory base for adaptation. Regions without legislative and regulatory capacity can lean more into exploring favourable mixes of policy instruments including informational and networking, as well as voluntary regulatory instruments such as strategies. The aim of such policy mixes is to enable different actors to engage in adaptation, voluntarily. An example of such a region can be Uusimaa, which doesn't have legislative or self-governing capacity, but is currently developing a regional adaptation strategy, which will serve as a guiding instrument. Finally, regardless of the governance capacities, all actors and all regions are in need of climate services to support adaptation planning and implementation. While the progress in that regard varies from region to region, the regular provision of climate services can be mandated through climate laws or NAS/NAPs or regional frameworks. For example, in Denmark, the Danish Meteorological Institute is providing authoritative advice on climate to the Danish government under the Climate Law, or in Finland, the Finnish Climate Change Panel established under the Climate Act, is mandated to comment on the government's climate plans annually. Furthermore, centralized portals that combine climate information as well as information on how to use it in planning are a useful instrument in enabling actors, enhancing public outreach as well as centralizing climate-related information.

There is a need to strengthen both vertical and horizontal implementation

Overall, in all the regions there is a need to improve both vertical and horizontal implementation, regardless of the governance context. Only two regions have scored highest on vertical implementation (Sitia and Castilla y León). Horizontal implementation at the regional level has been scored the highest in South Aquitaine and Basque Country. Both implementation categories rely heavily on the legal frameworks, such as laws, strategies, and plans, specifically in terms of division of responsibilities both horizontally and vertically, as well as the alignment of these and of the goals. Horizontal implementation progress varied significantly also due to the different approaches – dedicated vs mainstreaming. In most regions, the approach has been mixed, showing elements of both.

Mixes of instruments and steering tools are used to drive and promote CR

All regions use a variety of steering instruments to advance and support CR. This is the category where the main differences in organizing CR governance at the regional level are prominent and linked to the overall governance context, and more specifically to jurisdictions and the division of power at different levels of governance. More specifically, regions without legislative or regulatory capacities cannot pass binding legal frameworks, and thus

their dominating mode of governance is either market- or information- & network-based, evident in the broad use of various financial and informational instruments. For example, Uusimaa focuses on providing information and guidance to the municipalities, including on the cross-border issues, and the upcoming regional adaptation strategy is a guidance document. Regions with legislative capacities (e.g., Castilla y León, Basque Country, Azores) have passed or are in the process of preparation of binding legal frameworks, varying form regional adaptation plans to regional climate laws, while Tuscany, while having legislative power hasn't passed any binding legal frameworks as of the time of writing. As the regulatory mode of governance sets requirements for different actors to adapt, there is also a need for enabling instruments, of which most important include regular provision of climate service and financial incentives to steer actors. Regions with regulatory/self-governance capacities can utilize regulatory and market instruments within their respective policy areas, thus in these contexts vertical coordination and alignment is especially important.

Steering private sector participation is still an unsolved challenge

The need to steer private sector to participate in adaptation is evident in most of the regions. In Azores, South Aquitaine and Køge Bay private sector is required to participate through the main legal frameworks in the region, while in other cases private sector participation is voluntary and sometimes financially incentivized. However, these incentives are often sporadic and thus the engagement of private sector can be low and fragmented. This category is closely linked to the division of power and to the regional capacities. More specifically, only regions with legislative or self-governance capacities can set requirements for the private sector, while in other cases regions have only informational and networking instruments at hand. Regions with self-governance capacities or with budgetary independence can also focus on financial steering of the private sector.

Widespread stakeholders´ engagement, networking and knowledge sharing is still a must

Along with the lack of private sector engagement, many regions have raised the challenges relevant for their IPs related to engaging stakeholders, networking, and knowledge exchange across different actors, including public, private and third sectors, as well as citizens. This highlights the need to steer a variety of actors, and this can not only be done by setting requirements to adapt, but also by creating formal and informal networks, or boundary organisations to facilitate networking and science-policy-practice interface. Similarly, there is a need for support of innovations from the government, not only through funding but also mentoring, innovation accelerators and incubators.

Climate services are seen critical and still lacking in adaptation planning

Finally, it is worth pointing out that in many regions important informational instruments have been missing, specifically climate services. Some regions demonstrate regular availability of useful and usable climate services such as climate projections or risk and vulnerability assessments at different levels (Basque Country, Uusimaa, Køge Bay). On the other hand, in other regions there are knowledge services but not specifically climate- or resilience-focused, or there are no services available. As these services are critical in adaptation planning, and are also required to raise awareness, urgency, and prioritization of the problem, it is pertinent to establish their provision. In Køge Bay and in Uusimaa, for example, research institutes are mandated with the provision and updating of relevant climate information.

While considering these recommendations, it is important to remember that scoring and recommendations are a snapshot at the time of the assessment (autumn 2024), as many regions and countries are currently active in

CR. Several important legal frameworks have been under development or revision at the moment of the assessment (e.g., Pärnumaa and Estonia Climate Proof Economy Law; Troodos and revision of the national adaptation strategy). This means that some materials were unavailable for review in the process of assessment, and some of the content of the previous versions considered in this deliverable may not be pertinent in the future.

7. References

Baker, Ingrid, Ann Peterson, Greg Brown, and Clive McAlpine. 2012. “Local Government Response to the Impacts of Climate Change: An Evaluation of Local Climate Adaptation Plans.” *Landscape and Urban Planning* 107 (2): 127–36. https://doi.org/10.1016/j.landurbplan.2012.05.009.

Basic Climate Law (Portugal) / Lei de Bases Do Clima. 2021. https://apambiente.pt/clima/lei-de-bases-do-clima. Accessed: 28.11.2024

Basque Law on Energy Transition and Climate Change Law. 2024. https://bideoak2.euskadi.eus/2023/05/16/news_85701/Anteproyecto_de_ley_de_transicion_energetica_y_cambio_climatico_version_castellano_para_el_Consejo_de_Gobierno.pdf. Accessed: 2.12.2024

Bauer, Anja, and Reinhard Steurer. 2014. “Multi-Level Governance of Climate Change Adaptation through Regional Partnerships in Canada and England.” *Geoforum* 51 (January):121–29. https://doi.org/10.1016/j.geoforum.2013.10.006.

Bednar, Danny, and Daniel Henstra. 2018. “Applying a Typology of Governance Modes to Climate Change Adaptation.” *Politics and Governance* 6 (3): 147–58. https://doi.org/10.17645/pag.v6i3.1432.

Bennett, Nathan J., and Terre Satterfield. 2018. “Environmental Governance: A Practical Framework to Guide Design, Evaluation, and Analysis.” *Conservation Letters* 11 (6). https://doi.org/10.1111/conl.12600.

Berrang-Ford, Lea, A R Siders, Alexandra Lesnikowski, Alexandra Paige Fischer, Max W Callaghan, Neal R Haddaway, Katharine J Mach, et al. 2021. “A Systematic Global Stocktake of Evidence on Human Adaptation to Climate Change.” *Nature Climate Change* 11:989–1000. https://doi.org/10.1038/s41558-021-01170-y.

CAPB. 2021. “Risques Naturels, Risques Majeurs : Prévenir et Informer.” 2021. https://www.communaute-paysbasque.fr/a-la-une-2/actualites/actualite/risques-naturels-les-risques-majeurs-prevenir-et-informer. Accessed 28.11.2024

Cerema. 2021. “La Loi Climat et Résilience Renforce l’adaptation Des Territoires Littoraux Au Recul Du Trait de Côte.” 2021. https://www.cerema.fr/fr/presse/dossier/vote-loi-climat-resilience-communique-du-cerema. Accessed 28.11.2024

Chu, Eric K, and Clare EB Cannon. 2021. “Equity, Inclusion, and Justice as Criteria for Decision-Making on Climate Adaptation in Cities.” *Current Opinion in Environmental Sustainability* 51 (August):85–94. https://doi.org/10.1016/j.cosust.2021.02.009.

Climate and Resilience Law (France). 2021. https://www.legifrance.gouv.fr/jorf/id/JORFTEXT000043956924.

Climate Change Strategy of the Basque Country to 2050. 2015. https://www.ihobe.eus/publications/climate-change-strategy-of-the-basque-country-to-2050. Accessed 2.12.2024

Code Général Des Collectivités Territoriales. 2015. https://www.legifrance.gouv.fr/codes/article_lc/LEGIARTI000031020478. Accessed 28.11.2024

Corfee-Morlot, Jan, Ian Cochran, Stéphane Hallegatte, and Pierre-Jonathan Teasdale. 2011. “Multilevel Risk Governance and Urban Adaptation Policy.” *Climatic Change* 104 (1): 169–97. https://doi.org/10.1007/s10584-010-9980-9.

Dupuis, Johann, and Robbert Biesbroek. 2013. “Comparing Apples and Oranges: The Dependent Variable Problem in Comparing and Evaluating Climate Change Adaptation Policies.” *Global Environmental Change* 23 (6): 1476–87. https://doi.org/10.1016/J.GLOENVCHA.2013.07.022.

Gram-Hanssen, Irmelin, Carlo Aall, Martin Drews, Sirkku Juhola, Alexandra Jurgilevich, Richard J.T. Klein, Mikael Allan Mikaelsson, and Villy Lyngtorp Mik-Meyer. 2023. *Comparison and Analysis of National Climate Change Adaptation Policies in the Nordic Region*. TemaNord. Nordic Council of Ministers. https://doi.org/10.6027/temanord2023-525.

Gregow, H., A. Mäkelä, H. Tuomenvirta, S. Juhola, and J. Käyhkö. et al. 2021. Ilmastonmuutokseen Sopeutumisen Ohjauskeinot, Kustannukset Ja Alueelliset Ulottuvuudet. Suomen Ilmastopaneeli 2/2021. https://doi.org/https://doi.org/10.31885/9789527457047.

Henstra, Daniel. 2016. “The Tools of Climate Adaptation Policy: Analysing Instruments and Instrument Selection.” *Climate Policy* 16 (4): 496–521. https://doi.org/10.1080/14693062.2015.1015946.

Huitema, Dave, William Neil Adger, Frans Berkhout, Eric Massey, Daniel Mazmanian, Stefania Munaretto, Ryan Plummer, and Catrien C. J. A. M. Termeer. 2016. “The Governance of Adaptation: Choices, Reasons, and Effects. Introduction to the Special Feature.” *Ecology and Society* 21 (3): art37. https://doi.org/10.5751/ES-08797-210337.

Jordan, Andrew, Dave Huitema, Harro van Asselt, and Johanna Forster, eds. 2018. *Governing Climate Change: Polycentricity in Action?* Cambridge University Press. https://doi.org/10.1017/9781108284646.

Juhola, Sirkku, Milja Heikkinen, Taru Pietilä, Fanny Groundstroem, and Janina Käyhkö. 2022. “Connecting Climate Justice and Adaptation Planning: An Adaptation Justice Index.” *Environmental Science & Policy* 136 (October):609–19. https://doi.org/10.1016/J.ENVSCI.2022.07.024.

Kazakova-Mateva, Y. (2023). *Institutions and mandates for climate change adaptation in Bulgarian rural areas*. Conference Proceedings „Innovative development of agricultural business and rural areas“, 28, 146, Sofia. DOI: https://doi.org/10.37075/idara.2023.14 (Retrieved from: https://idara.unwe.bg/Uploads/Conference/Conference%202023.pdf#page=146)

Klein, Johannes, Malcolm Araos, Aasa Karimo, Milja Heikkinen, Tuomas Ylä-Anttila, and Sirkku Juhola. 2018. “The Role of the Private Sector and Citizens in Urban Climate Change Adaptation: Evidence from a Global Assessment of Large Cities.” *Global Environmental Change* 53 (November):127–36. https://doi.org/10.1016/j.gloenvcha.2018.09.012.

Kuntalaki. 2015. Oikeusministeriö. https://www.finlex.fi/fi/laki/alkup/2015/20150410#Pidp446510288.

Legal Information Institute. 2024. https://www.law.cornell.edu/wex/legislative_power. Accessed 2.12.2024

Levi-Faur, D. 2012. *The Oxford Handbook of Governance*. Edited by D. Levi-Faur. Oxford: Oxford University Press.

Lorenz, Susanne, James J. Porter, and Suraje Dessai. 2019. “Identifying and Tracking Key Climate Adaptation Actors in the UK.” *Regional Environmental Change* 19 (7): 2125–38. https://doi.org/10.1007/s10113-019-01551-2.

Mach, Katharine J., Michael D. Mastrandrea, Patrick T. Freeman, and Christopher B. Field. 2017. “Unleashing Expert Judgment in Assessment.” *Global Environmental Change* 44 (May):1–14. https://doi.org/10.1016/j.gloenvcha.2017.02.005.

MAF. 2022. “The National Climate Change Adaptation Plan 2030 (NAP2030).” Helsinki. https://urn.fi/URN:ISBN:978-952-383-814-7.

Ministry of the Environment and Energy, Sweden. 2018. Ordinance on climate adaptation work on the part of government agencies. https://www.smhi.se/en/theme/climate-centre/ordinance-on-climate-adaptation-work-on-the-part-of-government-agencies-1.168052

Molenveld, A., A. van Buuren, and Ellenm GJ. 2020. "Governance of Climate Adaptation, Which Mode? An Exploration of Stakeholder Viewpoints on How to Organize Adaptation." *Climatic Change* 162:233–54. https://doi.org/https://doi.org/10.1007/s10584-020-02683-9.

Möller, V., R. van Diemen, J.B.R. Matthews, C. Méndez, S. Semenov, J.S. Fuglestvedt, and A. (Eds.) Reisinger. 2022. "IPCC 2022: Annex II: Glossary." In *Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*, 2897–2930. Cambridge University Press, Cambridge, UK and New York, NY, USA. https://doi.org/10.1017/9781009325844.029.2897.

Nalau, Johanna, Benjamin L. Preston, and Megan C. Maloney. 2015. "Is Adaptation a Local Responsibility?" *Environmental Science and Policy* 48 (April):89–98. https://doi.org/10.1016/J.ENVSCI.2014.12.011.

NAP/Climate Change Adaptation Development Plan until 2030 (Estonia). 2017. https://faolex.fao.org/docs/pdf/est178660.pdf.

NAS Denmark / Strategi for Tilpasning Til Klimaændringer i Danmark. 2008. https://kyst.dk/media/4apjz430/strategifortilpasningtilklimaaendringeridanmark.pdf.

Petzold, Jan, Tom Hawxwell, Kerstin Jantke, Eduardo Gonçalves Gresse, Charlotta Mirbach, Idowu Ajibade, Suruchi Bhadwal, et al. 2023. "A Global Assessment of Actors and Their Roles in Climate Change Adaptation." *Nature Climate Change* 13 (11): 1250–57. https://doi.org/10.1038/s41558-023-01824-z.

Plan Climat Pays Basque. 2021. https://www.communaute-paysbasque.fr/fileadmin/user_upload/mediatheque/Transition_ecologique_et_energetique___Agglomeration_citoyenne/Plan_Climat_Pays_Basque/Strategie_Plan_Climat_Pays_Basque_09_06_2021.pdf.

Planning Act Denmark. 2018. https://www.retsinformation.dk/eli/lta/2020/1157.

PNACC Piano Nazionale Di Adattamento Ai Cambiamenti Climatici. 2023. https://faolex.fao.org/docs/pdf/ita218832.pdf.

PRAC Regional Climate Change Programme (Azores). 2019. https://ot.azores.gov.pt/ot/1213/prac

Ramalho, Margarida, José Carlos Ferreira, and Catarina Jóia Santos. 2022. "Climate Change Adaptation Strategies at a Local Scale: The Portuguese Case Study." *International Journal of Environmental Research and Public Health* 19 (24): 16687. https://doi.org/10.3390/ijerph192416687.

Runhaar, Hens, Bettina Wilk, Åsa Persson, Caroline Uittenbroek, and Christine Wamsler. 2018. "Mainstreaming Climate Adaptation: Taking Stock about 'What Works' from Empirical Research Worldwide." *Regional Environmental Change* 18 (4): 1201–10. https://doi.org/10.1007/s10113-017-1259-5.

Saito, Norio. 2013. "Mainstreaming Climate Change Adaptation in Least Developed Countries in South and Southeast Asia." *Mitigation and Adaptation Strategies for Global Change* 18 (6): 825–49. https://doi.org/10.1007/s11027-012-9392-4.

Stiller, Sabina, and Sander Meijerink. 2016. "Leadership within Regional Climate Change Adaptation Networks: The Case of Climate Adaptation Officers in Northern Hesse, Germany." *Regional Environmental Change* 16 (6): 1543–55. https://doi.org/10.1007/s10113-015-0886-y.

Strategia Nazionale Di Adattamento Ai Cambiamenti Climatici. 2015. https://www.mase.gov.it/sites/default/files/archivio/allegati/clima/documento_SNAC.pdf.

Termeer, Catrien, Art Dewulf, Helena van Rijswick, Arwin van Buuren, Dave Huitema, Sander Meijerink, Tim Rayner, et al. 2011. “The Regional Governance of Climate Adaptation: A Framework for Developing Legitimate, Effective, and Resilient Governance Arrangements.” *Climate Law* 2 (2): 159–79. https://doi.org/10.1163/CL-2011-032.

The Law on Climate Change and Energy Transition (Spain). 2021. Spain. https://www.boe.es/eli/es/l/2021/05/20/7.

Uittenbroek, Caroline J., Leonie B. Janssen-Jansen, Tejo J.M. Spit, Willem G.M. Salet, and Hens A.C. Runhaar. 2014. “Political Commitment in Organising Municipal Responses to Climate Adaptation: The Dedicated Approach versus the Mainstreaming Approach.” *Environmental Politics* 23 (6): 1043–63. https://doi.org/10.1080/09644016.2014.920563.

Wamsler, Christine. 2015. “Mainstreaming Ecosystem-Based Adaptation: Transformation toward Sustainability in Urban Governance and Planning.” *Ecology and Society* 20 (2): art30. https://doi.org/10.5751/ES-07489-200230.

8. Annex

8.1. Governance barriers and enablers of innovation

Barriers and enablers ranked as 4 or 5 (relevant and most relevant) are highlighted in green.

8.1.1. Basque Country

Barriers	Relevance in general for innovation	Relevance for R4C IP
Lack of necessary knowledge or understanding (even awareness)	4	3
Lack of strategy/vision	2	2
Lack of leadership	3	3
Lack of integrated planning frameworks	2	2
Institutional fragmentation	2	2
Difficult/Lack of collaboration/connection among the stakeholders (business -academy/science-territory)	4	4
Lack of funding	4	3
Bureaucracy	4	4
Lack of urgency / prioritization	3	3

Enablers	Relevance in general for innovation	Relevance for R4C IP
Governments' innovation policies including promoting a culture of collaboration and facilitation	4	4
R&D expenditure in the public sector	4	4
Knowledge/technology transfer between universities, government, and industry	4	4

Mentorship and support through accelerators and incubators	2*	3
Active networking, training programs and educational services	3	4
Cross-border cooperation	4	4
Access to funding	4	4
Digital infrastructure	4	4

** based on 1 response only (RTO)*

8.1.2. South Aquitaine

Barriers	**Relevance in general for innovation**	**Relevance for R4C IP**
Lack of necessary knowledge or understanding (even awareness)	4	4
Lack of strategy/vision	2	2
Lack of leadership	2	1
Lack of integrated planning frameworks	2	2
Institutional fragmentation	3	2
Difficult/Lack of collaboration/connection among the stakeholders (business -academy/science-territory)	1	1
Lack of funding	3	5
Bureaucracy	3	2
Lack of urgency / prioritization	3	3

Enablers	**Relevance in general for innovation**	**Relevance for R4C IP**
Governments' innovation policies including promoting a culture of collaboration and facilitation	4	3
R&D expenditure in the public sector	5	4

Knowledge/technology transfer between universities, government, and industry	5	3
Mentorship and support through accelerators and incubators	2	1
Active networking, training programs and educational services	3	2
Cross-border cooperation	5	5
Access to funding	5	5
Digital infrastructure	5	5

8.1.3. Tuscany

Barriers	**Relevance in general for innovation**	**Relevance for R4C IP**
Lack of necessary knowledge or understanding (even awareness)	3	4
Lack of strategy/vision	5	2
Lack of leadership	4	2
Lack of integrated planning frameworks	5	4
Institutional fragmentation	4	4
Difficult/Lack of collaboration/connection among the stakeholders (business -academy/science-territory)	4	2
Lack of funding	3	3
Bureaucracy	5	4
Lack of urgency / prioritization	4	3

Enablers	**Relevance in general for innovation**	**Relevance for R4C IP**
Governments' innovation policies including promoting a culture of collaboration and facilitation	5	3
R&D expenditure in the public sector	2	3

Knowledge/technology transfer between universities, government and industry	3	2
Mentorship and support through accelerators and incubators	2	2
Active networking, training programs and educational services	3	2
Cross-border cooperation	3	2
Access to funding	3	3
Digital infrastructure	2	2

8.1.4. Azores

Barriers	**Relevance in general for innovation**	**Relevance for R4C IP**
Lack of necessary knowledge or understanding (even awareness)	5	5
Lack of strategy/vision	5	5
Lack of leadership	5	5
Lack of integrated planning frameworks	5	4
Institutional fragmentation	4	4
Difficult/Lack of collaboration/connection among the stakeholders (business -academy/science-territory)	4	5
Lack of funding	5	5
Bureaucracy	4	4
Lack of urgency / prioritization	5	5

Enablers	**Relevance in general for innovation**	**Relevance for R4C IP**
Governments' innovation policies including promoting a culture of collaboration and facilitation	4	5
R&D expenditure in the public sector	5	5

Knowledge/technology transfer between universities, government, and industry	5	5
Mentorship and support through accelerators and incubators	5	5
Active networking, training programs and educational services	5	5
Cross-border cooperation	4	3
Access to funding	5	5
Digital infrastructure	4	4

8.1.5. Køge Bay

Barrier	**Relevance in general for innovation**	**Relevance for R4C IP***
Lack of necessary knowledge or understanding (even awareness)	4	5
Lack of strategy/vision	2	4
Lack of leadership	4	3
Lack of integrated planning frameworks	5	2
Institutional fragmentation	4	2
Difficult/Lack of collaboration/connection among the stakeholders (business -academy/science-territory)	3	4
Lack of funding	4	3
Bureaucracy	3	1
Lack of urgency / prioritization	5	3

**based on the responses of 1 regional partner*

Enablers*	**Relevance in general for innovation**
Governments' innovation policies including promoting a culture of collaboration and facilitation	3
R&D expenditure in the public sector	3

Knowledge/technology transfer between universities, government, and industry	5
Mentorship and support through accelerators and incubators	3
Active networking, training programs and educational services	4
Cross-border cooperation	2
Access to funding	5
Digital infrastructure	4

**based on the responses of 1 regional partner*

8.1.6. Uusimaa

Barriers	**Relevance in general for innovation**	**Relevance for R4C IP**
Lack of necessary knowledge or understanding (even awareness)	1	2
Lack of strategy/vision	3	3
Lack of leadership	4	2
Lack of integrated planning frameworks	3	3
Institutional fragmentation	4	5
Difficult/Lack of collaboration/connection among the stakeholders (business -academy/science-territory)	5	5
Lack of funding	4	4
Bureaucracy	2	3
Lack of urgency / prioritization	4	4

Enablers	**Relevance in general for innovation**	**Relevance for R4C IP**
Governments' innovation policies including promoting a culture of collaboration and facilitation	4	1
R&D expenditure in the public sector	4	3
R&D expenditure in the private sector	5	3

Knowledge/technology transfer between universities, government, and industry	4	4
Mentorship and support through accelerators and incubators	5	2
Active networking, training programs and educational services	4	2
Cross-border cooperation	3	4
Access to funding	5	4
Digital infrastructure	5	2

8.1.7. Pärnumaa

Barriers	**Relevance in general for innovation**	**Relevance for R4C IP**
Lack of necessary knowledge or understanding (even awareness)	5	4
Lack of strategy/vision	4	3
Lack of leadership	4	4
Lack of integrated planning frameworks	4	4
Institutional fragmentation	3	3
Difficult/Lack of collaboration/connection among the stakeholders (business -academy/science-territory)	4	4
Lack of funding	5	4
Bureaucracy	4	3
Lack of urgency / prioritization	5	4

Enablers	**Relevance in general for innovation**	**Relevance for R4C IP**
Governments' innovation policies including promoting a culture of collaboration and facilitation	4	4
R&D expenditure in the public sector	4	4

Knowledge/technology transfer between universities, government, and industry	4	4
Mentorship and support through accelerators and incubators	3	4
Active networking, training programs and educational services	4	5
Cross-border cooperation	4	5
Access to funding	4	5
Digital infrastructure	4	4

8.1.8. Troodos

Barriers	**Relevance in general for innovation**	**Relevance for R4C IP**
Lack of necessary knowledge or understanding (even awareness)	5	2
Lack of strategy/vision	3	3
Lack of leadership	4	3
Lack of integrated planning frameworks	5	5
Institutional fragmentation	5	5
Difficult/Lack of collaboration/connection among the stakeholders (business -academy/science-territory)	5	4
Lack of funding	5	5
Bureaucracy	3	1
Lack of urgency / prioritization	4	3

Enablers	**Relevance in general for innovation**	**Relevance for R4C IP**
Governments' innovation policies including promoting a culture of collaboration and facilitation	2	4
R&D expenditure in the public sector	5	5

Knowledge/technology transfer between universities, government, and industry	3	3
Mentorship and support through accelerators and incubators	2	3
Active networking, training programs and educational services	2	3
Cross-border cooperation	4	3
Access to funding	5	5
Digital infrastructure	3	2

8.1.9. Castilla y León

Barriers	**Relevance in general for innovation**	**Relevance for R4C IP**
Lack of necessary knowledge or understanding (even awareness)	3	4
Lack of strategy/vision	3	4
Lack of leadership	3	3
Lack of integrated planning frameworks	4	4
Institutional fragmentation	4	4
Difficult/Lack of collaboration/connection among the stakeholders (business -academy/science-territory)	4	4
Lack of funding	4	4
Bureaucracy	4	4
Lack of urgency / prioritization	4	4

Enablers	**Relevance in general for innovation**	**Relevance for R4C IP**
Governments' innovation policies including promoting a culture of collaboration and facilitation	2	4
R&D expenditure in the public sector	2	4

Knowledge/technology transfer between universities, government, and industry	3	3
Mentorship and support through accelerators and incubators	3	4
Active networking, training programs and educational services	3	4
Cross-border cooperation	3	4
Access to funding	4	4
Digital infrastructure	4	4