



**IMPETUS**

*Turning climate commitments into action*

# **Deliverable Report**

## **Multi-level governance assessment in the demo sites: governance challenges for climate change solutions**

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## Abbreviations

Abbreviation / Acronyms	Description	Use in the report
BEK	Berlin Energy and Climate Protection Programme	DS1
BWB	Berliner Wasserbetriebe	DS1
CA	Climate Adaptation	General
CC	Climate Change	General
CM	Climate Mitigation	General
CoP	Conference of the Parties	General
DS	Demo Site	General
EC	European Commission	General
EEA	European Environment Agency	General
ESCACC	<i>Estratègia Catalana d'Adaptació al Canvi Climàtic</i> (Catalan Strategy for Adaptation to Climate Change)	DS2
EU	European Union	General
DAS	German Strategy for Adaptation to Climate Change	DS1
GAT	Governance Assessment Tool	General
GHG	Green House Gas	General
KLiVO	<i>Klimavorsorge</i> (Climate Preparedness Portal)	DS1
MCCP	Ministry of Climate Crisis and Civil Protection	DS3
MEEN	Ministry of Environment and Energy	DS3
MLGAF	Multi-Level Governance Assessment Framework	General
MoEPRD	Ministry of Environmental Protection and Regional Development	DS6
MTDP	Maritime Terrestrial Public Domain	DS2
NAS	National (climate) Adaptation Strategy	General
NCCAC	National Climate Change Adaptation Committee	DS3
NECP	National Energy and Climate Plan	General
NGO	Non-Governmental Organization	General
OCCC	<i>Oficina Catalana del Canvi Climàtic</i> (Catalan Office for Climate Change)	DS2
PAA	Policy Arrangement Approach	General
PBA	Planning and Building Act	DS5
PNACC	National Climate Change Adaptation Plan	DS2, DS7
RAAP	Regional Adaptation Action Plan	DS3
RV	<i>Ricības Virzieni</i> (Course of Action)	DS6
SNACC	National Climate Change Adaptation Strategy	DS7
SproSS	<i>Strategia provinciale per lo Sviluppo Sostenibile</i> (Provincial Strategy for Sustainable Development)	DS7
ToC	Theory of Change	General
UNFCCC	United Nations Framework Convention on Climate Change	General



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## Executive Summary

*This document, Deliverable 1.3, describes the research activities undertaken between June and November 2022 under WP1, Task 1.3 of the IMPETUS project.*

Climate Adaptation (CA) is a societal challenge that involves a high knowledge demand, a pressing need for policy alignment, and the urgency of cross-sector collaboration. As such, CA is, besides a question of technological innovation, above all a governance challenge.

Governance, in this context, is understood as “a range of political, institutional and administrative rules, practices and processes (formal and informal) through which decisions are taken and implemented, stakeholders can articulate their interests and have their concerns considered, and decision makers are held accountable”<sup>1</sup>.

This deliverable (D1.3) analyses the governance structures and challenges for specific CA actions in the IMPETUS Demonstration Sites (DSs). It asks: What are the main multi-level governance challenges for climate change solutions in each DS?

In so doing, this deliverable supports other tasks in IMPETUS, especially those pertaining to stakeholder engagement in the DSs. The insights presented here will assist the DSs in preparing the ground for implementation of CA solutions, while they continue to develop them. In particular, the insights of this report help DSs to identify which actors might require special attention during the stakeholder engagement process, which policy gaps they might have to address in order to be able to implement solutions, and which rationalities and discourses they might have to take into account when engaging in dissemination activities.

The overview of governance structures and challenges in this deliverable is the result of a desk analysis of international, national, regional, and local policies on CA. In many cases, especially at the local and regional levels, these policies are still under development. Furthermore, we interviewed 23 key stakeholders from across the public, private, and knowledge sectors, as well as civil society, in each DS.

For the analysis of the policy documents and interview data, we developed a multi-level governance assessment approach drawing insights from three existing governance assessment frameworks. The result is a comprehensive multi-level governance framework that identifies a number of attributes that should be in place for effective multi-level governance and the related multi-level governance challenges that emerge when these attributes are lacking. These attributes are:

- 1) Actors and networks (inclusiveness, collaboration, and information challenges);
- 2) Rules and responsibilities (policy coherence, accountability, and administrative challenges);
- 3) Resources (funding, capacity, and power challenges);
- 4) Discourses (rationality and urgency challenges).

The results outlined in this report are not meant to be read as comprehensive, but rather as indicative of governance barriers that may be of specific relevance to the activities of IMPETUS partners in the DSs. Nonetheless, the results may be highly relevant to other regions of Europe and beyond, which may share similar climatic and geological conditions, governance structures, or socio-cultural backgrounds. Furthermore, a number of common and recurring governance challenges has been identified:

- Obtaining a comprehensive overview of CA policies and initiatives, and knowing how to make use of possibilities is difficult. This is especially true for actors that operate at smaller scales, such as municipalities and local-level organisations that already face capacity problems. Hence, there is a need for better cross sectoral and interregional exchange.
- Knowledge exchange between researchers, policy makers and practitioners remains limited;
- Communication gaps exist between different levels of government, especially between national and regional governments or between national governments and municipalities.





- While localised place-based solutions are fundamental to successful CA, policies tend to be implemented in a top-down fashion with limited flexibility or policy learning for and from the municipalities.
- The CA policies that are currently being developed or implemented lack a view on social concerns such as poverty, education levels, age, and gender. Making CA responsive to social inequalities is crucial for CA policies to gain societal support.
- CA is generally not perceived as a primary concern in people's lives. Especially energy prices and inflation are currently obstructing the prioritisation of CA.
- The preventive nature of many CA actions means that the impact of CC is to be averted, and therefore might not reach the necessary level of urgency needed for decision-making. Positive experiences from when CA measures have been successful may receive less attention than CC-related emergencies that show a failure to adapt.
- The private sector has only been involved in developing and implementing CA measures with variable success. CA appears to still largely be understood as a problem for governments and knowledge institutions to tackle. A more concerted effort to involve the private sector is needed.
- CA interventions tend to require long-term planning and investment that exceed four or five-year election cycles, which complicates the prioritisation of CA at the local level.
- Ensuring financial continuation for localised public coordination of climate adaptation will be crucial in the years to come.

These common challenges are likely to be found in other contexts as well, and can be considered highly relevant to European, as well as national and local decision-making.

While this deliverable focuses on challenges and obstacles to CA, solutions are sought, and in many cases also found. To name a few: gaps in knowledge exchange have been addressed by establishing thematic workgroups and new public-private information sharing; frictions between different levels of government are being addressed through national representation in local spatial planning and participation of municipalities in regional policy development; and the early involvement of stakeholders in the development of policies generates a shared sense of urgency and ensures continuity in the face of fluctuating politics. Generally, we observed that particularly public actors are taking responsibility, show a willingness to engage, and are seeking ways to incorporate CA actions. This is also highly necessary given the fact that CA is a new field of action for many public and private actors.

The main governance barriers for effective CA identified in this report may not only contribute to the adoption of the IMPETUS solutions in the DSs regions, but may also contribute to Europe's initiatives to strengthen smarter, swifter and more systemic climate adaptation actions.



# 1 Introduction

Climate Adaptation (CA) is a societal challenge that involves a high knowledge demand, a pressing need for policy alignment, and the urgency of cross-sectoral collaboration. As such, CA is, besides a question of technological innovation, above all a governance challenge. Governance, in this context, is understood as “a range of political, institutional and administrative rules, practices and processes (formal and informal) through which decisions are taken and implemented, stakeholders can articulate their interests and have their concerns considered, and decision makers are held accountable”<sup>1</sup>.

This report analyses the governance structures and challenges that currently set the stage for CA in the IMPETUS Demonstration Sites (DSs). It does so by outlining policy frameworks at transnational, national, regional, and local levels, and by identifying key actors and their relations in the seven project’s bioregions.

In its core task of developing CA actions, IMPETUS naturally operates within these governance structures. However, IMPETUS also actively shapes them, by developing knowledge, creating solutions packages, and building stakeholder relations across all sectors.

To this end, this report highlights challenges for specific CA actions in each DS. Accordingly, the research question addressed in this study is: *What are the main multi-level governance challenges for climate change adaptation in each demo site?*

By answering this question, this deliverable (D1.3) will identify key governance challenges for the implementation of CA solutions in the DSs regions. Such challenges will inform changes to the DSs’ Theories of Change (ToCs describe how the DSs expect to contribute to local and regional CA by identifying causal linkages between the project activities and the desired impact in their regions) and the related stakeholder engagement roadmaps, which will be captured in deliverable 1.1, forthcoming end of January 2023. Ultimately, the identified governance challenges (or a subset of them) will be discussed by the DSs with their stakeholders to identify possible solutions. Moreover, this research builds on, and should be read in conjunction with, deliverable 3.1, which focuses on metrics and indicators for climate change vulnerability, resilience, and adaptation. Many of these indicators are governance related. DSs together with their stakeholders will have to identify the indicators relevant to their specific DSs activities. The governance challenges identified in this report will help DSs to identify the relevant governance indicators to monitor progress on addressing the challenges. In sum, this deliverable provides information to the DSs to further refine their stakeholder engagement plans to include discussions on governance challenges and related indicators, thus enabling DSs to engage more effectively with the relevant stakeholders.

The governance barriers for effective CA identified in this report may not only contribute to the adoption of the IMPETUS solutions in the DSs regions, but may also contribute to Europe’s initiatives to strengthen smarter, swifter and more systemic CA actions.

Chapters 2 and 3 of this report describe the methodology and conceptual framework that have been used for this study. Chapter 4 presents the results, outlining the international policy context (4.1) and CA governance structures and challenges per DS (4.2 to 4.8). Chapter 5 provides conclusions, including common governance challenges across the DSs and next steps for IMPETUS.



## 2 Methodological approach

The analysis presented here is based on a series of interviews (23 in total) and an analysis of policy documents. The DSs in IMPETUS each address a number of CC-related concerns and localities. For the purposes of this report, the scope of the analysis was limited either to a single climate change effect or to a single locality for each DS. To identify this focus, as well as potential stakeholders to be selected for the interviews, the authors held one-on-one meetings with the lead partners in the DSs (as defined in the project's grant agreement).

Relevant state-level, regional, and local policy documents on Climate Change (CC), Climate Mitigation (CM), and climate Adaptation (CA) were collected by the authors in consultation with the DS leads. These documents were translated where necessary, and analysed using a targeted reading of sections that addressed 1) the CC impact and CA measures relevant to the DS, 2) the allocation of responsibilities and resources between actors, and 3) the relation between different policy documents.

For the interviews, stakeholders were selected from the public, private, and knowledge sectors, as well as civil society. Herein we follow the designations and terminology of the Quintuple Helix of Innovation Model.<sup>2</sup> Given the focus on CA policies in each region, we gave priority to public sector stakeholders. As a result, half of the interviews were conducted with actors in the public sector (12), and the other half with actors in civil society (4), the knowledge sector (3) and the private sector (4). Because the thematic focus was different and the DSs partners raised different questions in each region, we catered the selected stakeholder types, as well as the number of interviews, to the individual DSs. In the text below, numbers between square brackets, e.g., [1.1], refer to the respective respondents. Written consent was obtained from all interviewees. See Annex I for a numbered list of interview participants.

The interviews were held online using Microsoft Teams or similar software and the conversations were recorded after consent of the interviewee. In a few cases, the interview was not recorded but documented in writing on request of the interviewee. The interviews with stakeholders in Germany, Greece, and Norway were held in English. The interviews in Catalunya were held in Catalan or Spanish. The Interviews in the Netherlands were held in Dutch. In Latvia and Italy, a translator was present in some of the interviews to provide translation between English and Latvian or, and English and Italian. The interviews were transcribed non-verbatim in interview reports. The reports were analysed using deductive, theoretical coding based on the conceptual framework outlined in chapter 3. The same coding was applied to all interviews using NVivo software.

After completing the initial analysis of policy documents and after completion of the interviews, the results were validated. If necessary, DSs complemented the reported results. Due to the focus on specific DS contexts, the results outlined in this report are not meant to be read as comprehensive, but rather as indicative of governance barriers that may be of specific relevance to the activities of IMPETUS partners in the DSs. Nonetheless, the results do provide overall insights to overarching CA governance challenges in bioregions with similar contextual factors, as highlighted in chapter 5.1. For more information about CC-related policies in each country, please refer to the European CA platform Climate Adapt,<sup>3</sup> the OECD Environmental Performance Reviews,<sup>4</sup> and the International Energy Agency's country analyses.<sup>5</sup> For more information about CA financing, see the notes of the International Monetary Fund on planning and mainstreaming adaptation to climate change in fiscal policy.<sup>6</sup>



### 3 Analytical framework

The concept of ‘governance’ is defined and applied differently across disciplines and practices. This variety of understandings have led to the emergence of different governance models, each highlighting specific characteristics of governance systems.<sup>7, 8</sup> In general, governance is about ‘structures and processes’, about ‘decision-making, organising, managing, and controlling’ and about ‘actors’ with emphasis on rules and qualities of systems, cooperation to enhance legitimacy and effectiveness, and the attention for new processes and public-private arrangements.<sup>8</sup>

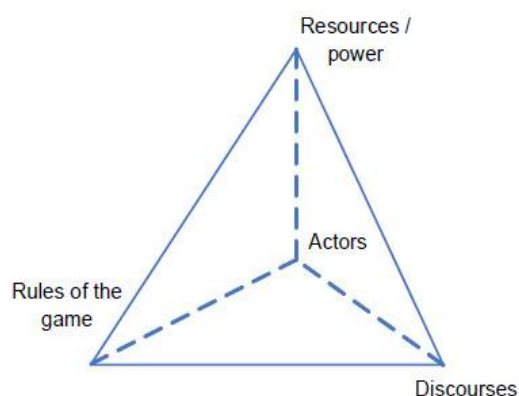
For the purpose of understanding the multi-level governance challenges of CA in the IMPETUS DSs, we developed a multi-level governance assessment approach drawing insights from three governance assessment frameworks:

1. The Policy Arrangement Approach (PAA) of Van Tatenhove and Arts.<sup>9</sup>
2. The Multi-level Governance Assessment Framework (MLGAF) of the water programme of the Organisation of Economic Cooperation and Development (OECD).<sup>10, 11</sup>
3. The Governance Assessment Tool (GAT) of Bressers et al.<sup>12</sup>

The PAA analyses change and stability in policy processes. A policy arrangement is “the temporary stabilisation of the content and organisation of a particular policy domain at a certain policy level or over several policy levels”.<sup>13</sup> Four interrelated dimensions are used to describe the policy arrangement:

- (1) the actors and actor coalitions involved in the policy domain,
- (2) the rules and regulations (both formal and informal) that play a role,
- (3) the (division of) resources (e.g. money, knowledge, facilities) and related power, and
- (4) discourses that capture the view and narratives of actors involved.<sup>14</sup>

The PAA hypothesizes that a change in one of the four dimensions (see figure 1) automatically implies that other dimensions change too. The PAA fits the purpose of this work because it accounts for a variety of contextual settings while including relevant governance dimensions, thus providing a flexible structure for the multi-level governance assessment in this study. While such a flexible approach may make it difficult to derive overarching conclusions, this is not a problem for this research since the scope of this study is to prioritize contextualised interpretation of findings for each of the 7 different DS regions. Furthermore, the PAA highlights an important attribute of effective governance systems, namely balanced power distribution. Power is considered in the PAA a resources. Managing power asymmetries across sectors and scales when engaging stakeholders is crucial for ensuring acceptance and subsequent implementation of CA solutions.



**Figure 1** The policy arrangement approach<sup>9</sup>



The MLGAF characterizes the mutually dependent relationships – vertical, horizontal, or networked – between public actors and policies situated at different levels of government<sup>15</sup>. The framework, in its latest conceptualisation by OECD in the water governance domain, identifies seven governance “gaps” emerging from the vertical and/or horizontal inter-dependencies between government levels: (i) administrative, (ii) information, (iii) policy, (iv) capacity, (v) funding, (vi) objective and (vii) accountability (see table 1 for an illustration).<sup>10</sup> The MLGAF fits the purpose of this work because it particularly emphasizes the multi-level governance dimension of a policy domain. This is in line with the goal of this study and its central research question, i.e. the investigation of multi-level governance challenges in the CA policy domain across 7 different contexts. Furthermore, this approach complements the bottom-up oriented PAA with a more top-down pre-identification of governance challenges. Such combination of a bottom-up, flexible approach with a top-down structured approach provides guidance to the investigation of governance challenges, while remaining open to also account for context specific challenges.

**Table 1: Multi-level governance gaps<sup>10, 11</sup>**

<b>Multi-level governance gaps</b>	<b>Description</b>
<b>Administrative gap</b>	Geographical mismatch between the governmental/administrative boundary and the area in which the problem is focused.
<b>Information gap</b>	Asymmetry of information (quantity, quality, type) across horizontal and vertical levels of government and across local actors involved in a policy domain, either voluntary or not. Information gap can create win-lose situations by specific use of information not in the possession of the other party.
<b>Policy gap</b>	Sectorial fragmentation of tasks between different governmental departments and/or public agencies which leads to lack of policy coherence.
<b>Capacity gap</b>	Insufficient scientific, technical, and infrastructural capacity of actors across vertical and horizontal levels to design and implement policy.
<b>Funding gap</b>	Unstable or insufficiency revenues undermining effective policy implementation at the different vertical and horizontal governmental levels
<b>Objective gap</b>	Diverging or contradictory rationales between the different vertical and horizontal governmental levels creating obstacles for adopting convergent long-term objectives across policy domains.
<b>Accountability gap</b>	Difficulty ensuring the transparency of practices across the different constituencies, mainly due to insufficient commitment, lack of concern, awareness, and participation.

The Governance Assessment Tool (GAT) assesses water governance systems based on the understanding of policy implementation as the interplay of multi-actors at different levels. Grounded on the Contextual Interaction Theory, actors’ motivations, cognitions, and resources are viewed in relation to their contexts<sup>16</sup>. From this perspective the capacity of governance instruments and structures to support implementation of policies is assessed. The GAT includes five governance dimensions (i.e., scales, actors, perspectives, instruments and responsibilities, in line with the PAA) evaluated according to four qualities of the governance context: (i) coherence of policy and action, (ii) flexibility of the governance system to explore multiple solutions, (iii) intensity of the action taken in relation to a sense of urgency and (iv) extent to which all quality criteria are exploited.<sup>12</sup> The GAT with its focus on actors’ dynamics brings to light a number of attributes of effective governance specifically related to actors, namely inclusiveness and collaboration.

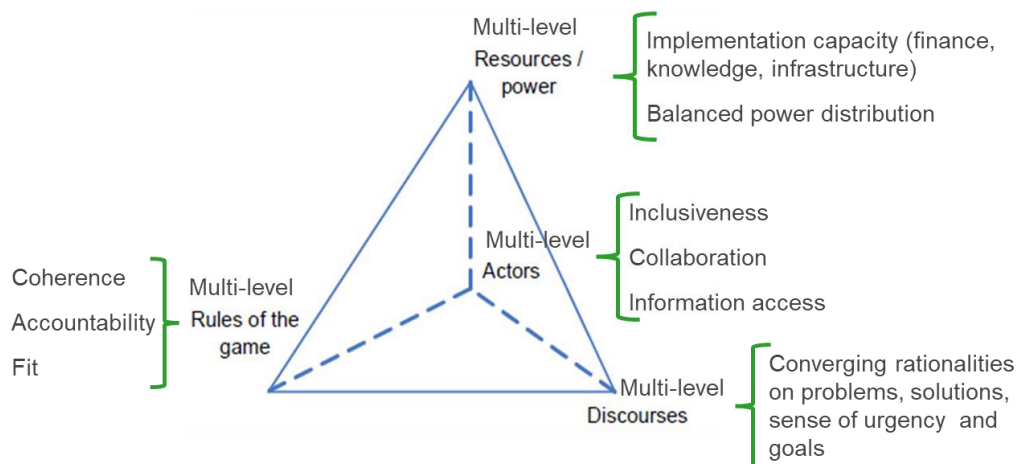


### 3.1 Multi-level governance framework to assess the governance challenges in the IMPETUS demo sites

The PAA, the MLGAF and the GAT were used as basis to develop a multi-level governance assessment framework tailored to the needs of this study. Specifically, in this study the PAA was applied as analytical tool to characterise key governance dimensions and the dynamics between them in a specific context. Per governance dimension of the PAA (i.e., actors, resources, rules, and discourses), the multi-level governance challenges of the MLGAF were used to identify governance attributes that an effective multi-level governance system needs to possess to function effectively. Additional multi-level governance attributes were derived from the PAA for the dimension 'resources', namely balanced power distribution and from the Governance Assessment Tool of Bressers et al. for the dimension 'actors', namely inclusiveness and collaboration.

The result is a comprehensive multi-level governance framework (Figure 2) that identifies for each governance dimension a number of multi-level governance attributes that should be in place for effective multi-level governance and the related multi-level governance challenges emerging from the lack of these attributes. Such governance challenges are the object of the multi-level governance assessment of a given governance system and constitute the unit of analysis of this study (Table 2). Additional governance challenges specific to the context under investigation can emerge from the governance assessment and should be added.

**Figure 2: Multi-level governance framework: governance dimensions and attributes of multi-level governance**





**Table 2: Governance challenges arising from the lack of multi-level governance attributes**

<b>Governance dimensions</b>	<b>Attributes of multi-level governance</b>	<b>Multi-level governance challenges</b>
<b>Actors and networks</b>	Inclusiveness Collaboration Access to information	<b>Inclusiveness challenges:</b> excluded actors from certain sectors or scales; presence of dominant actors; lack of agents of change <b>Collaboration challenges:</b> conflicts, lack of trust between sectors and scales <b>Information challenges:</b> information asymmetries across sectors and scales
<b>Rules and regulations</b>	Coherence Accountability Fit	<b>Policy coherence challenges:</b> sectoral policy decision approaches within responsible governmental institutions and agencies across sectors and scales <b>Accountability challenges:</b> difficulty in ensuring clear responsibilities and mandates across sectors and scales; lack of clear authority <b>Administrative challenges:</b> “Mismatch” between functional areas and administrative boundaries (lack of appropriate scale of intervention in relation to the problem)
<b>Resources</b>	Implementation capacity Balanced power distribution	<b>Funding challenges:</b> unstable or insufficient revenues across sectors and scales undermining effective implementation of responsibilities <b>Capacity challenges:</b> insufficient scientific, technical, infrastructural capacity across sectors and scales undermining effective implementation of responsibilities <b>Power challenges:</b> power asymmetries across sectors and scales undermining effective implementation of solutions
<b>Discourses</b>	Converging rationalities on problems, solutions, sense of urgency and goals	<b>Goal challenges:</b> Different rationalities on problems, solutions, ambitions and urgency across sectors and scales creating obstacles for adopting convergent goals



## 4 Multi-level governance structure and challenges for climate change in the DSs

This chapter first describes the international policy and governance frameworks for CA, discussing (i) the UNFCCC, CoP, and Paris Agreement, (ii) the European Commission, (iii) transnational CA networks and platforms, and (iv) other international actors. Then, it moves on to discuss the multi-level governance system structures and governance challenges for each DS. Following each DS assessment, a summarising table will be provided that outlines the key findings.

### 4.1 International climate governance regime

#### 4.1.1 The UNFCCC, the COP, and the Paris Agreement

The United Nations Framework Convention on Climate Change (UNFCCC) sets the stage for international and national CC policies, particularly through the Conference of the Parties (CoP). At present, the CoP is comprised of 197 nations and territories (the parties). It reviews and adopts decisions to promote the implementation of the Convention, and adopts new legal instruments annually. Through the adoption of the Convention in Rio de Janeiro in 1992, the 1997 Kyoto Protocol, and up to the 2015 Paris Agreement, actions and policies developed by the CoP/COP have been primarily focused on CM. Nonetheless, CA has been on the agenda at least since the adoption of National Adaptation Programmes of Action in 2001, to support least developed countries in dealing with the adverse impact of CC. In 2010, the COP established the Adaptation Committee and introduced National Adaptation Plans, through which the parties have begun to identify adaptation needs and CA strategies.

The Paris Agreement, a legally binding international treaty on CC, was adopted in 2015 and signed by 194 parties, including all the IMPETUS DS states, as well as the European Union (EU).<sup>17</sup> The Paris Agreement set the target to limit global warming well below 2 °C, preferably 1.5 °C. As follows logically from this aim, the agreement is mostly focused on CM, although it does include an article on CA (art. 7), as well as an article on averting, minimising, and addressing loss and damage as a result of CC (art. 8). By signing the agreement, the DS countries in IMPETUS have committed to taking adaptation action that follows “a country-driven, gender-responsive, participatory and fully transparent approach, taking into consideration vulnerable groups, communities and ecosystems, and should be based on and guided by the best available science and, as appropriate, traditional knowledge, knowledge of indigenous peoples and local knowledge systems, with a view to integrating adaptation into relevant socioeconomic and environmental policies and actions, where appropriate” (art. 7.5). The Agreement further stipulates that each country should develop an “adaptation communication” as a part of or in conjunction with a national adaptation plan, which may include the country’s priorities, implementation needs, and plans and actions. Finally, while the Paris Agreement operates chiefly on the level of states, it does mention the role and responsibilities of regional and local authorities as well as civil society and the private sector. The agreement was further operationalised in the Katowice Package in 2018.<sup>18</sup>

#### 4.1.2 The European Commission

As one of the signatories of the Paris Agreement, the EU has taken a proactive stance towards CM and CA. In 2013<sup>19</sup> the European Commission (EC) first presented the predecessor to the current EU Climate Adaptation Strategy, which was adopted in 2021.<sup>20</sup> The general aim of this strategy is to transition towards a fully climate-resilient society by 2050. Its objectives are

1. to improve knowledge of climate impacts and solutions (dubbed “smarter adaptation”). As part of this objective, Climate-ADAPT functions as the European CA knowledge platform. It outlines European climate policies, sector-specific CA instruments, regional focus areas, and country-specific adaptation policies (unfortunately, not all the pages are up to date). Climate-ADAPT is a partnership between the EC and the European Environment Agency (EEA).
2. to improve planning and climate risk assessment; and
3. to accelerate adaptation action.





Accordingly, the various European CA policies and mechanisms tend to focus on funding and information sharing, particularly regarding CC estimations, vulnerabilities in regions and sectors, and CA solutions, tools, and pilots. This Strategy is part of the European Green Deal, which aims to decouple economic growth from resource use and sets targets of 55% Green House Gas (GHG) reduction by 2030 (compared to 1990 levels) and climate neutrality by 2050. The EU Climate Law (Regulation (EU) 2021/1119) is a legal component of the Green Deal. This law turns the CM component of the Green Deal, the emissions targets for 2030 and 2050, into legally binding objectives.<sup>21</sup> The law also includes provisions for CA. However, these are included not as binding objectives but as a “framework for achieving progress.” This framework stipulates, among other things, that CA policies must be coherent, mutually supportive, and co-beneficial, must integrate CA in other policy areas, must focus on the most vulnerable and impacted populations and sectors, must be based on consultation with society and scientific evidence, and must promote nature-based solutions and ecosystem-based solutions.

### 4.1.3 Transnational CA networks and platforms

In order to deliver the CA Strategy, the EU launched its Mission Adaptation to Climate Change<sup>22</sup>, which invites regions and local authorities to join. It provides a community of practice on CA, a platform for knowledge exchange, support on stakeholder and citizen involvement, and funding opportunities (through Horizon Europe). In this way, it aims to support the signatories (215 as of September 2022), in building resilience against the impact of CC.

The European Climate Pact<sup>23</sup> is similar to the Mission in that it invites local actors to participate in climate actions, but where the Mission focuses on local authorities, the Climate Pact asks citizens, businesses, organisations, and cities to make a pledge to take CM actions. The Climate Pact, which has been signed by three million EU citizens, does not have a focus on CA.

The Global Covenant of Mayors for Climate and Energy<sup>24</sup> (and its sub-network, the Covenant of Mayors for Climate and Energy Europe<sup>25</sup>) is a key platform for the development of CA actions at a local level, focused on municipalities. It functions as an exchange network for knowledge development and sharing, and bundling resources to adhere to common policies and ambitions. When joining the Covenant, municipalities commit to developing a Sustainable Energy and Climate Action Plan, which should describe the steps towards their 2020 or 2030 climate targets.

Other networks for regional climate adaptation information sharing include regional exchange platforms, such as the Climate Change Expert Group of the Union for the Mediterranean (UfMCCEG), which focuses on climate dialogue between the EU member states and the southern and eastern Mediterranean countries. Another example is the Alpine Climate Board, a thematic working group of the Alpine Convention, which has adopted a declaration to work towards the goal of “Climate-neutral and Climate-resilient Alps” by 2050.<sup>26</sup>

### 4.1.4 Other international actors

While the UN has a major impact on IMPETUS DSs through the UNFCCC and the COP, its Environment Programme on CA involves few projects in the EU and none in the IMPETUS DS countries.<sup>27</sup> Also the World Bank, as a major funder of CC-related investments in developing countries, is not directly involved in CA projects or financing in the DSs. The OECD published a Recommendation on the Governance of Critical Risks in 2014, which focused on the development of national risk management policies, public private partnerships, and awareness raising and stakeholder engagement.<sup>28</sup> It has established a Task Force on Climate Change Adaptation (TFCCA) which aims at facilitating exchange between CC research, CA experts, and policy-makers through annual meetings.<sup>29</sup> The OECD also commonly involves CC and CA in its regular environmental performance reports per country. The International Monetary Fund (IMF) focuses on the development of fiscal and macroeconomic policies pertaining to CM, CA, and the transition to a low-carbon economy. Through its Staff Climate Notes, the IMF further provides advice on the calibration and prioritisation of subsidies for adaptation.



## 4.2 DS1 – Continental: Berlin-Brandenburg, DE

### 4.2.1 Multi-level governance system structure

The initial German Strategy for Adaptation to Climate Change was published in 2008.<sup>30</sup> It outlines the projected CC impact on 15 selected fields of action and in so doing sets the parameters for focus areas in CA. Furthermore, it provides broad outlines for measures and activities, including awareness raising and dissemination, dialogue and participation and knowledge development in a range of fields. The strategy was updated in 2015 and 2020. As part of its evaluation in 2020, the strategy was updated with action plans for the period 2020-2024. This action plan focuses on 6 themes: water, infrastructure, land, health, economy, and cross-cutting actions. Still, the policy text remains fairly general which may be attributed to the delegated responsibility of the federal states.

#### CA in the federal states

Since the reunification of East and West Germany in 1990, the country comprises 16 federal states (*Bundesländer*). Operating under the Strategy for Adaptation to Climate Change, the *Bundesländer* are responsible for further specification and development of CA policies. All the *Bundesländer* have adopted CA strategies or action plans. In addition, several states have adopted CA-related legislation.<sup>31</sup>

The *Bundesländer* set their own priorities for CA strategies, based on regional needs. Methodological work already performed at federal level can also be used by the *Bundesländer* to develop methods for evaluation of adaptation strategies. Some *Bundesländer* make use of funding programmes that exist at the federal level (such as the Urban Development Support Programme, which was re-designed in 2020, and the programme of the Federal Ministry for Environment, Nature Conservation and Nuclear Safety to support measures for adapting to climate change) and EU level (such as the European Social Fund). In some cases, the *Bundesländer* supplement these programmes with their own specific funding schemes. Almost all the *Bundesländer* carry out or are in the process of developing indicator-based monitoring of CC as well as climate impacts and CA measures.

The German Climate Preparedness Portal (KLiVO) is one example of cooperation between the federal government and the *Bundesländer* with regard to CA strategies. This federal government portal collects data and information on CC and CA. The *Bundesländer* are involved in the portal's conceptual development and provide their own CA services.<sup>32</sup>

#### CA in Berlin

The federal state of Berlin was one of the *Bundesländer* that took its current form in 1990. Berlin is thus both a municipality and a state under the German constitution.

The central instrument for achieving the Berlin climate goals is the Berlin Energy and Climate Protection Programme (BEK 2030).<sup>33</sup> This includes a reduction of 70% in GHG emissions compared to 1990 by 2030, and climate neutrality by 2045. Berlin has legally anchored its ambition to become climate neutral in the Berlin Energy Transition Act. The BEK 2030 programme is developed in phases, the current being the implementation period 2022-2026. The BEK 2030 was developed with input from representatives of civil society, utilities, start-ups, networks, small and medium-sized companies, and the Berlin public administration. While the BEK 2030 programme focuses primarily on CM, it also includes funding for CA, aimed at supporting projects that serve to increase resilience for unavoidable consequences of CC. This fund is mainly focussed on the development of green spaces and rainwater management measures in urban or industrial areas, including the unsealing of land. The funding supplements and expands the existing funding within the Berlin Programme for Sustainable Development.

CA actions are further developed through the Urban Development Plan for Climate (StEP Klima).<sup>34</sup> This plan highlights addressing urban heat and urban flooding as the core tasks of CA, and for these CC impact, key strategies are outlined. The plan further specifies CA measures for seven common building and area types in Berlin. Finally, it includes a section on integration of CA measures in other programmes and policy fields, as well as steps toward a more interdisciplinary approach. The plan



includes several reference projects and best practices as examples of how CA measures are already being implemented.

In September 2022, the Berlin senate (federal state of Berlin) published a CA plan that deals with water, the “*Masterplan Wasser Berlin*” (Master Plan on Water in Berlin)<sup>35</sup>. The Master Plan on Water assesses issues in surface water, wastewater and drinking water resources, examining how future changes will affect Berlin's water balance. It drafts strategies for action to ensure drinking water supply and other water uses, and develops measures to meet water management challenges such as droughts and long periods of low surface water and groundwater levels.

## 4.2.2 Multi-level governance challenges

### Actors and Networks

The Master Plan on Water in Berlin was drawn up in continuous collaboration and coordination with Berliner Wasserbetriebe (BWB), the utility that manages drinking water provision and wastewater treatment for Berlin. Interim results of the ongoing and completed sub-projects of the Master Plan on Water were already presented in 2020 and 2021 in the first stakeholder workshops of the Berlin DS. A first synthesis report was published in May 2021. This stakeholder participation will be continued with the submission of the first report, and broader public information and participation is also planned.

Data and information about CC and CA are collected at the German Climate Preparedness Portal (KLiVO). The knowledge base for CA measures has improved significantly over the last years. Still dissemination and access remain challenging. From the knowledge sector, it is not always clear who are the right people (in the right positions) to provide with information [1.2]. It has been noted that working with the Berlin administration comes with its own challenges, as municipal workers in planning and zoning commissions are perceived as not responding well to demands from higher levels or outsiders. Moreover, the role of researchers in knowledge communication could be improved, as researchers could be more plain in their messages. At present, researchers are only consulted when the problem is already urgent, whereas the added value of their work could be to look ahead and improve anticipatory planning [1.1].

Relations between public and private actors are not always smooth. For example, the mining industry works with old water rights and has a strong lobbying power. It is allowed to discharge sulphate-rich waters into the river Spree (Berlin). This discharge might cause higher costs to the BWBs water treatment facilities in the future. Relations with pharmaceutical industries can be challenging. BWB and pharmaceutical companies are working in roundtables but communication remains difficult and mutual acceptance of once interests and strategic objectives is limited [1.1]. The water infrastructure is locked in sunk investments and new infrastructure is planned decades ahead with little flexibility of intermittent developments. On the other hand, the industrial sectors are developing at a much faster pace than the public water utilities like the BWB can keep up with. Especially the often unknown or insufficient communicated changes in the wastewater composition can cause disruptions in wastewater treatment. Hence, there is an asymmetrical relationship between public and private and the collaboration between actors is considered insufficient. Although it should be noted that some sectors have been much more responsive to CA, such as the insurance industry, whereas others have not been actively integrating CA measures, such as the agriculture, infrastructure development, and health sectors. There is some hope that the implementation of the EU taxonomy (the EU Taxonomy Climate Delegated Act adopted in 2021 establishes screening criteria to determine the contribution of economic activities to CM and CA) will stimulate industries to develop more sensitivity to CC and CA, and to how they can work more with municipalities or infrastructure providers to prevent disruptions [1.1, 1.2].

Integration of CA in public administrations remains a challenge. At present, CA remains chiefly the responsibility of designated committees and departments, whereas successful integration would imply that CA is part of all governmental action fields. More integration could prevent the formation of silos in the public sector, although this does require additional efforts towards collaboration across departments and fields [1.2]. One sector that has been particularly absent from conversations about CA is the health sector. This is unfortunate, because several CC impact identified in policies at both the federal and state levels are related to detrimental health impact of heat and the potential of disease transmission associated with flooding [1.2].



## Rules and Responsibilities

Germany's federal structure means that policies are developed by the federal government and by the *Bundesländer* separately. These state laws tend to be more encouraging rather than directive or restrictive in nature. In some cases, this results in policy overlaps and duplications, such as overlapping funding of activities or repeated data collection. As a result, not all action points from the national or state plans have been implemented, while other measures have been implemented regardless of the plan. Coordination between national government and *Bundesländer* could be improved. For instance, the federal government has been monitoring the impacts of CC in Germany, but did not include the *Bundesländer* in a timely fashion. As a result, several states have developed their own monitoring systems which now operate in parallel to the national monitoring system. Also municipalities could have benefited from a more coordinated approach [1.2].

With regard to water management in Berlin, the BWB is responsible for drinking water as well as sewage and stormwater, which means it is in an excellent position to develop integrated interventions in the water system. However, the BWB has not been able to fully exploit its position, as the interests and needs of other stakeholders (including industry, federal states, and customers) may not always align with the BWB's strategic goals. The BWB could put more emphasis on advocating the role of water in CA in their communications, area-based planning, and lobbying work. In general, the water sector could speak up more about CC and raise concerns at earlier stages of development [1.1].

## Resources

A particular resource that poses challenges to CA in the Berlin area is the limited availability of space to implement CA measures [1.1, 1.2]. The population of Berlin is growing rapidly and there is an increasing need for affordable housing. The historically large open spaces in the city (about 25% of Berlin) have been designated as water protection areas and therefore protected from real estate development. Pressure is increasing to develop real estate in these spaces, which means sealing of the surface will occur, which might exacerbate CC impact (i.e., Urban heat islands and urban drainage flooding) [1.1].

Funding for CA has been growing and has come from different actors, with ministries, *Bundesländer* and municipalities all designating funding to CA. While this is certainly a positive trend for the feasibility of CA measures, it is also difficult to have an overview of the different funding schemes available [1.2]. Related to the provision of funding, is the question of how the national government or the states should interfere with municipalities. National funding that directly addresses measures at municipal level might be frowned upon as bypassing the *Bundesländer* [1.2]. Due to the long timespan of interventions in the water system and infrastructure development, early funding is needed to stimulate collaboration and consensus on challenges and solution pathways that are not urgent yet [1.1].

## Discourses

Awareness of CA has increased over the last 5 to 10 years, as extreme events associated with CC (droughts and floods) have occurred. Yet, willingness among politicians and private companies to prepare for worst case scenarios is limited [1.2]. Understanding of what is required for CA may also differ significantly between actors in different economic sectors (e.g., forestry, agriculture, industry, or urban development) and a key challenge is to bring such diverse perspectives together. Bigger companies tend to account for future scenarios and may incorporate CC into their business plans, but SME's generally are much less preoccupied with this or simply do not have the capacity to dedicate to strategy forming [1.2].

CA continues to generally be addressed in broad and abstract terms (e.g., resilience, robustness, etc.) that are not specific enough to motivate practitioners to define and implement specific CA goals. Hence, there is a need to make communication about CA more specific and place-based, so people can imagine it better and understand what it takes to reach CA goals. This could increase practitioner's willingness to strive for common objectives which requires investments and compromises [1.1, 1.2]. Moreover, our interviewees stressed that CA should be framed in a more positive way, as a more positive means of communication and collaboration should help in reaching compromises. However, it should be noted that behavioural science has also nuanced the effect of positive framing.<sup>36</sup>



Even if changes are unavoidable, this could be used to improve other socio-economic or environmental aspects as well [1.1, 1.2]. A gap in the current debates on CA is the question of how people in society are affected by CC differently. As such, CM and CA measures risk contributing to increasing inequalities. An intersectional approach (i.e., taking into account income, gender, ethnicity, age, etc.) to developing CA measures is needed. If done well, CA could avoid injustices or even contribute to a more just society [1.2]. However, our interviewees also indicated that policy-makers and funders appear to have been rather uninterested in, or reluctant towards such an approach to CA policy development.

## Summary of multi-level governance challenges

Table 3: Multi-level governance challenges in DS1

Governance dimension	Governance challenges	Summary description
<b>Multi-level actors</b>	Inclusiveness challenges	- The health sector has remained largely absent from conversations about CA
	Collaboration challenges	- Relations between public and private actors lack sufficient dialogue and trust
	Information challenges	- Dissemination requires improvement, both from the part of users of knowledge and researchers who could be more proactive
<b>Multi-level rules</b>	Policy coherence challenges	- Federal and <i>Bundesländer</i> policies and actions may overlap due to a lack of coordination
	Accountability challenges	- Federal involvement in municipalities may not be appreciated by <i>Bundesländer</i> governments
	Administrative challenges	- Integration of CA in public administrations remains insufficient
<b>Multi-level resources</b>	Funding challenges	- It is difficult to get an overview of funding schemes
	Capacity challenges	- Space is a limiting factor in the development of CA measures
	Power challenges	- Synchronised water management plans between federal states and their water suppliers are needed. The water sector could take a more centre stage position in CA
<b>Multi-level discourses</b>	Rationality challenges	- Current CA policies do not sufficiently take social inequalities into account - More appropriate ways of communicating about CA should be developed
	Urgency challenges	- Urgency and understanding, and resulting practices, differ between sectors





## 4.3 DS2 – Coastal: Coast of Catalonia, ES

### 4.3.1 Multi-level governance system structure

#### The General State Administration

The General State Administration (*Administración General del Estado*) has jurisdiction over the entire national territory, as opposed to the regional and local administrations. The Spanish state is made up of the Central Organisation, the Territorial Organisation and the State Administration Abroad. The current ministry with responsibility for the environment, coasts and CC is the Ministry of Ecological Transition and the Demographic Challenge (*Ministerio de Transición Ecológica y el Reto Demográfico*).

According to the Spanish government, adaptation to CC has been a priority objective for Spain since 2004. In fact, the Spanish Climate Change Office has existed since 2001 and aims to develop policies related to CC. Law 7/2021 is the current regulatory framework for CC in Spain.<sup>37</sup> This law aims to ensure Spain's compliance with the objectives of the Paris Agreement; to facilitate the decarbonisation of the Spanish economy; and to promote CA and the implementation of a sustainable development model that generates good employment and contributes to the reduction of inequalities.

The National Climate Change Adaptation Plan (*Plan Nacional de Adaptación al Cambio Climático*, PNACC),<sup>38</sup> is the Spanish government's tool for promoting coordinated and coherent action to address the impact of CC in Spain. The latest update of this plan (for the period 2021-2030) establishes strategic objectives and a system of indicators of impacts and adaptation to CC, as well as the preparation of risk reports. To this end, a new governance system has been established to ensure the coherence of climate action, and which entails new practices for public administrations in the way they legislate, plan, budget, manage and report. It also establishes new models for public-private participation and for advising and monitoring public policies, such as the "Committee of Experts on Climate Change and Energy Transition" or the "Citizens' Climate Change Assembly".

The Spanish coastline is governed through a separate entity, the Maritime Terrestrial Public Domain (MTDP). The Spanish Constitution states that the maritime-terrestrial zone, beaches, inland waters, the territorial sea and the natural resources of the economic zone and the continental shelf are assets of the MTDP, which is specified in the Coastal Law.<sup>39</sup> Regarding the protection of the coastline from the CC impact, the Strategy for Adaptation to Climate Change on the Spanish Coast was approved in July 2017.

#### The autonomous community of Catalonia

Spain is administratively divided into 17 autonomous regions, each with its own parliament and president which are elected every four years. Catalonia is one region with a wide-ranging capacity to dictate policy within its territory. In fact, in the Statute of Autonomy, Catalonia is defined as a nation.

Within the Government of Catalonia, (*Generalitat de Catalunya*), the Ministry of Climate Action, Food, and the Rural Agenda (*Departament d'Acció Climàtica, Alimentació i Agenda Rural*) oversees the Secretariat of Climate Action (*Secretaria d'Acció Climàtica*) with three Directorates. One of them is the Directorate of Environmental Quality and Climate Change (*Direcció General de Qualitat Ambiental i Canvi Climàtic*), which addresses issues including GHG emissions and air quality, noise and light pollution, environmental education, sustainability, and CC. Under this structure, the Catalan Office for Climate Change (*Oficina Catalana del Canvi Climàtic*, OCCC)<sup>40</sup> has been established in 2006, to promote and coordinate regulatory development, strategies, plans and objectives to address CC in Catalonia. It periodically analyses GHG emissions, makes assessments of vulnerabilities and the degree of implementation of CC policies. It also initiates actions and projects to improve adaptive capacity and the integration of adaptation into sectorial policies. Moreover, the OCCC initiates CC-related research activities of the Catalan scientific community and promotes awareness-raising and dissemination.

As the legal counterpart to the OCCC, law 16/2017 on Climate Change<sup>41</sup> regulates CM and CA measures. It defines the governance of CC within the public administration and includes taxing as a CM instrument. Under this law, the Climate Fund has been established to support policy implementation. The Catalan Strategy for Adaptation to Climate Change (ESCACC) is the Catalan planning element of the CA policies on the basis of which the departments of the *Generalitat* must develop their corresponding sectorial action plans. In the last few years, the OCCC has undertaken the technical work



for the preparation of the ESCACC 2021-2030 (ESCACC30), which is expected to be approved by the Government of Catalonia before the end of 2022.

Within this framework, and in collaboration with the Directorate of Citizen Participation, a participatory process has been initiated in September 2022 to discuss both the challenges that Catalonia faces because of CC and to formulate proposals to address them. What has been named as a Citizens' Assembly for the Climate will be composed of between 100 and 150 citizens, based on a "representative sample" of the entire Catalan population and will aim to "encourage citizen debate" and "identify points of consensus" on some areas such as energy, mobility, or water resources. The proposals agreed by the Citizens' Assembly for the Climate will be detailed in a report that will be submitted to the Government, sent to Parliament, and published on the *Generalitat's* participation portal.

## Province: Diputació de Tarragona

Each autonomous region is subdivided into Provinces. Catalonia has four; Barcelona, Lleida, Girona, and Tarragona. The Provincial Council is indirectly elected through the municipal elections. The function of the Provincial Council is to ensure that the municipal services meet the required quality standards. For this reason, the Province provides financial, technical, and legal support to small municipalities that cannot offer certain public services by themselves. State funds for infrastructure, culture or education are distributed through the *Diputació*.

The Ebro Delta is located in the province of Tarragona. With regards to CC and the environment, the *Diputació* generally acts more as an enabler rather than as a creator of strategy or policy objectives. Nonetheless, in 2013, Tarragona joined the European Covenant of Mayors as a territorial coordinating entity. In this role, the *Diputació* supports smaller municipalities in overcoming the administrative, financial, and technical difficulties that the development of CM and CA plans can entail. The registration of the municipalities in the Covenant is processed by the *Diputació* which monitors the development and implementation application of the municipal plans. Furthermore, the *Diputació* provides training and dissemination activities regarding CC and GHG reduction.

## County councils and municipalities

The Ebro Delta consists of two county councils, Montsià and Baix Ebre, which consist of 11 and 14 municipalities respectively. Theoretically, County Councils have two fundamental objectives: 1) to enhance the management capacity of the municipalities in the region and 2) to offer citizens an adequate level of services. The County Councils are currently in the process of creating a Plan for the Sustainability of the Montsià and Baix Ebre Regions.

In Catalonia, as in the rest of Spain, municipal governments are elected for a period of four years and enjoy a high degree of administrative and political freedom. Therefore, depending on the ruling party and politicians at any given time, it is possible for municipal councillors to initiate important environmental policies whilst enjoying a close relationship with citizens. As one of the municipalities in the Ebro Delta, Amposta currently has two departments led by appointed councillors which address environmental issues. The Department of Environmental Policies currently holds as its principal objectives the improvement of recycling and the selective collection of waste and the promotion of citizens' environmental awareness. The Department of Rural Environment and Green Spaces has created the Rural Environment and Green Spaces Council. Its mission is to '*preserve the environment and improve the quality of life of citizens*'. Agriculture, livestock, forestry and ultimately the management of the rural landscape, and all the activities that take place in it, are the competence of this council. While the focus of neither of these departments is on CA, their objectives include, among other things, the enhancement of the environmental commitment of citizens and encouraging respect for the rural environment.

### 4.3.2 Multi-level governance challenges

#### Actors and Networks

Our interviewees characterised the Spanish government system as hierarchical, wherein each level typically only interacts with the levels directly below or above it, and wherein decisions are made at the top.



Given the political tensions between the Spanish and Catalan governments, and the ongoing calls for independence of the Catalan territory, it should not come as a surprise that one of the key governance barriers in this DS is the relation between the Spanish government (often referred to as ‘Madrid’) and the autonomous community as well as the regional and local-level governments. Especially the administration of coasts and ports, which remains within the mandate of the Spanish state rather than local communities, has been a topic of political struggle whereby state policies have been perceived as disconnected from the local realities and needs [2.1, 2.2, 2.3].

However, it would be an oversimplification to ascribe this fraught relationship only to the political struggle between Catalunya and Spain. The relation between the Spanish state and regional territories have been subject of political struggle in other parts of the country as well, even though these struggles may “get more politicized in complex ways” in the Catalan case [2.3]. Furthermore, a lack of trust and collaboration not only concerns the Spanish state, but also the relationships between the *Generalitat* and local and regional governments [2.2]. Relations between municipal and provincial-level governments appear to be much closer, as our interviewees referred to collaborations between municipalities and the province of Tarragona.

While a move toward more “integrated management” of the Ebro basin is happening, this is still obstructed by a lack of consensus between stakeholders at multiple scales. CA in the Ebro delta is a concern of many different actors, public administrations, and competencies that will need to be included in the development of solutions. The Ebro water is of vital to different industries, including hydropower plants, the tourism sector, the primary sector, and irrigators upstream. While local stakeholders in the Delta are well organised, active, and aware of the consequences of CC, stakeholders along the Ebro upstream are less involved in the problems of the Delta. These include hydropower plants and irrigators. As such, CA in the Delta is at risk of remaining being considered as a local problem, even though viable solutions require involvement that transcends the local level [2.3]. Because of this intersection of interests across stakeholder groups, regions, and scales, our interviewees pointed at the importance of an intervention by the Spanish state. Despite a lack of confidence in its ability to develop policies that would fit with the local level, the state is still seen as the competent authority, with the necessary mandate to take measures.

At a local and regional level, several collaborations and knowledge-sharing initiatives exist that explicitly deal with CA in the delta. A problem signalled by our interviewees is that it is not always clear what data different CA policies are based on, and that the information that is used is sometimes out-dated [2.1, 2.3]. This points to a need for more transparent knowledge-sharing among policy-makers at different levels and in collaboration with knowledge institutions. Our interviewee in the knowledge sector affirmed that CC-related problems in the delta are well understood, as are the different CC scenarios. However, bringing this knowledge into the action remains a challenge. A lack of capacity (people, time, and funding) in the knowledge sector may be a limiting factor to achieve the necessary translation from data into policy [2.3].<sup>42</sup> Also the common project-based structure of research activities on CA was mentioned as posing a problem, in that it causes a fragmentation and repetition of work, and is leading to research fatigue among stakeholders being involved in stakeholder engagement programmes that largely lack tangible results.

## Rules and Responsibilities

In general, the Catalan and Spanish CA plans for the Ebro Delta do not align well. The “Madrid plans” are being criticised at a local level for only trying to win time by making minor adjustments to the Delta, which is seen as resulting in the loss of the Delta in the long run [2.1, 2.3]. As one interviewee put it: “Madrid sees the delta as a lost cause” which will have as a consequence that “the land you fought for will be lost” [2.1]. The “Catalan plans” on the other hand receive much more appreciation from our interviewees, as they are more explicitly oriented towards “saving” the Delta. Especially the goal to reconstruct the coastline to protect the low-lying Delta from incoming tides is met with support. However, the plan requires approval from the state. A key challenge, then, is the disconnect between initiatives and plans at a local and regional scale, and state policies. State policies are being criticised for being untransparent [2.1]. The tense relation between Madrid and Catalunya may obstruct the alignment of plans and policies [2.1]. (Note that we did not speak with representatives of the Spanish national government to verify or challenge these standpoints).

Between the provincial and county levels, a duplication of work can occur due to unclear and sometimes overlapping responsibilities of both bodies with regard to the management and support of municipal services and activities.





## Resources

Our interviewees pointed out that financing for CA and CM measures is generally insufficient [2.1, 2.2, 2.3]. Some institutions that could play an important role in CA operate without structural funding, including public institutions, knowledge centres and collaborations between stakeholders. One example is the Catalan Resilience Institute which has no structural budget or legal framework to support its activities.

However, our interviewees also acknowledged that funding is not the main barrier to CA in the Delta. They rather ascribed this to political willingness and conflicting interests. They indicated feeling somewhat powerless in the face of more powerful actors such as hydropower organisations and higher-level governments. Also the unequal distribution of power between upstream irrigators and downstream communities has been mentioned.

## Discourses

Awareness of CC and its implications for the Delta are widely shared within the region [2.1, 2.2, 2.3]. The urgency of this has become particularly pertinent following floodings in 2020. However, there is significant discrepancy between different views on whether, and how, the Delta should be “saved” from the implications of CC. Some actors have suggested to withdraw human activities from the Delta altogether and give the land back to nature. Other local actors are arguing for measures to maintain the current socio-cultural and economic configurations of the area. In-between these and other standpoints, a delicate balancing act is taking place between different interests and understandings of the problem. As noted above, these understandings have become incorporated into regional politics. Despite a broadly shared sense of urgency, political decision-making has remained limited.

This discrepancy in understandings relates to a shift towards environmental protection that is currently taking place. Rural development in Spain has long been focussed on infrastructure development, hydropower, and irrigation. Many institutional structures still reflect this emphasis on civil engineering, which means that CA might require changing a change in discourse and the way the environment is being managed [2.3]. The increasing demand for environmental protection may prompt such change in environmental management.

Even though awareness of CC is understood to be shared by most actors, CM and CA are often not the first priority of municipalities. Adding to this, the problems of environmental and river-basin (mis)management that the delta is facing, including sedimentation and flooding, may be aggravated by CC [2.3].



**Summary of multi-level governance challenges****Table 4: Multi-level governance challenges in DS2**

<b>Governance dimension</b>	<b>Governance challenges</b>	<b>Summary description</b>
<b>Multi-level actors</b>	Inclusiveness challenges	- A lack of involvement from stakeholders upstream and beyond the Delta, while problems and solutions transcend the local level
	Collaboration challenges	- Tense relations between levels of government, especially between Catalonia and the Spanish state - A hierarchical top-down decision-making obstructs collaboration across scales - A lack of consensus between stakeholders on appropriate solutions.
	Information challenges	- A need for more transparent knowledge-sharing among and between knowledge institutions, policy-makers, and civil society - “Research fatigue” among stakeholders
<b>Multi-level rules</b>	Policy coherence challenges	- Discrepancies between Catalan and Spanish CA policies
	Accountability challenges	- Accountability disputes between different levels of government
	Administrative challenges	- Spanish (coastal) policies and local authorities are not aligned and at times conflicting
<b>Multi-level resources</b>	Funding challenges	- A lack of structural allocation of government funding for CA actions in the Delta
	Capacity challenges	- A lack of capacity in the knowledge sector to transfer knowledge
	Power challenges	- Unequal distribution of power between stakeholders within and beyond the Delta.
<b>Multi-level discourses</b>	Rationality challenges	- Different views on how and to what extent the Delta should be “saved.” I.e., engineering vs. environmental thinking - Problems may be understood as being caused by environmental management being aggregated by CC rather than primarily CC impacts
	Urgency challenges	- Urgency might not be shared by stakeholders and broader society outside the region



## 4.4 DS3 – Mediterranean: Region of Attica, GR

### 4.4.1 Multi-level governance system structure

Since the financial crisis of 2008, Greece has undergone a series of policy reforms aimed at decentralisation, reducing administrative burden, government policy coordination, and the “streamlining” of regional and municipal authorities.<sup>43</sup> However, also after these reforms, Greece has a relatively large public sector which remains one of the most centralised administrative systems of the EU.<sup>44</sup>

CM and CA are governed in Greece through newly created national and regional plans. Local initiatives have to relate to the regional plans, which contain specific guidelines for municipalities and local actors. In this way, the CM and CA governance structure makes use of existing ways of intergovernmental working, whereby the state interacts indirectly with municipalities through regional levels.

Greece has outlined its CM policies in a National Energy and Climate Plan (NECP), which integrates climate objectives and energy planning up to 2030 and provides a long-term strategy for 2050. Regarding CA, the National Adaptation Strategy (NAS, implemented since 2016) sets out general objectives, guiding principles and implementation tools.<sup>45</sup> It lists potential measures for 15 priority sectors. “Water resources” is one of these. The NAS is under the responsibility of the Ministry of Environment and Energy (MEEN, sometimes abbreviated as MoEE), and monitored by the National Climate Change Adaptation Committee (NCCAC). The aim of the NCCAC is to advise the MEEN and drive the NAS implementation. Particularly, the NCCAC operationalizes adaptation policies, contributes to awareness and capacity building, and reviews regional CA plans. It is chaired by the MEEN and comprises representatives from other government authorities, as well as from industry, civil society, and the knowledge sector. The NCCAC has been criticised for convening on an irregular basis.<sup>46</sup>

Under the current national legislature, a new ministry was created in September 2021: the Ministry of Climate Crisis and Civil Protection (MCCP). Many of its tasks were previously part of the MEEN, and some CA-related tasks still are, as the MEEN’s main objective is to govern housing, urban and natural environments, biodiversity, forests, and ecosystems – all of which are affected by CC as well as CA actions. Rather than taking over the subjects of previous ministries, the MCCP is supposed to coordinate all ministries dealing with CA related topics, including for example the ministries of infrastructure and agriculture. In par with the establishment of this Ministry, a new Climate Law was issued, one of Europe’s first national CC laws (Law 4936/2022 - GG A/105/27.05.2022), aiming at establishing a coherent framework for improving the climate resilience of Greece. Compared to the previously established NECP and NAS, the new climate law includes both CM and CA measures and adds a level of detail with regard to CM. In particular, long-term CC adjustment plans are to be revised both at national and at regional level. These plans will include analysis of the targets set and the strategy to achieve them, an assessment of the most significant climate changes expected to affect Greece, and will define sectors that will need to be addressed as a matter of priority. For example, this law includes targets for reduction of GHG emissions by 2030 and 2050 and a pathway to make this change across various economic levels of the country. It includes provisions on the governance of CM measures and designates responsibilities and instruments that should be used (including specific provisions for the use of electric cars, forest restoration and the phasing out of lignite power plants). An important aspect of the law is the establishment of a National Observatory for the Adaptation to Climate Change, which aims to facilitate the dialogue and exchange of information among public authorities and scientific and academic institutions. Further, an online forum dedicated to dialogues on climate is provided for the purpose of facilitating public consultation on sectorial carbon budgets, the revision of climate targets and the annual progress report on CA. With regard to CA, its provisions remain virtually the same as those outlined in the NAS. Water resources are not explicitly addressed in this law, and CC or CA have not yet been integrated into water management plans.<sup>45</sup>

### Regional Adaptation Action Plans

Greece is divided into 13 regions, each of which have been required to develop regional CA action plans (RAAPs). These RAAPs intend to analyse the feasibility of regional-level CA measures and analyse the required sectorial policies, so as to implement and operationalise the NAS. The RAAPs further identify local vulnerabilities and prioritise actions accordingly, as well as ensure policy coherence. They also outline budgeting and monitoring mechanisms, although budgeting is not



defined directly through the RAAPs but needs to be allocated by the regional authorities as part of regular financing decisions. Notably, the regional plans also identify potential international collaborations. The framework for these plans was developed through the NAS and is reviewed by the MEEN.

The RAAP for Attica provides an extensive description of the region's morphology, addressing geological features, ecosystems, and water resources.<sup>47</sup> Additionally, it contextualizes the plan in the region's socio-economic, land use, and infrastructural features. It provides a fairly detailed assessment of CC vulnerabilities and risks for 11 selected sectors and areas, including agriculture, health, the built environment, water resources, and others. On water resources, the plan outlines the impact of CC on the availability of water, which might result in degradation of the natural environment, and a reduction of water resources for human activities. It presents national and international panel on climate change data on projections of water resource availability in different CC scenarios. The most extreme scenario points at a nearly complete exhaustion of water resources between 2050 and 2080. However, the plan also points out that the data presented might be too extreme or conservative because data accuracy is limited due to the region's particular morphology, land cover, and precipitation patterns.

The plan includes an assessment of CA measures according to their economic, environmental, and social benefits. These measures include, among other things, introducing water reuse recycling technologies and encouraging the use of recycled water for irrigation. However, these are assessed as second-priority measures with relatively low economic and environmental impacts. The RAAP further identifies compatibility of the proposed CA measures with other, existing policies and the RAAPs of neighbouring regions. These latter chapters are fairly brief and do not go into detail or provide action points.

## 4.4.2 Multi-level governance challenges

### Actors and Networks

The newly established MCCP and CC legislation shows the active stance that the Greek government has taken in recent years towards developing and implementing CA. Especially after several extreme events that have taken place over the past few years. Particularly in the region of Attica, the Greek authorities have prioritised the development of CA policies. This could pave the way for innovative and effective CA measures that are responsive to local, regional, and national climate vulnerabilities. However, since the MCCP is by design a ministry that overlaps with other ministries, it might also run the risk of becoming a source of additional bureaucracy, centralised and relatively inflexible. Similarly, as the climate law is highly specific on some topics, such as electric vehicles, and simultaneously rather broad on other topics, such as water resources, this too has the potential of becoming both a source of guidance and a hurdle for the governance of CA initiatives. How, when and in which ways these complex dynamics are to play out remains to be seen in the coming years.

In 2021 the EC signalled a lack of consultation in the Greek public administration.<sup>43</sup> However, our interviewees, especially the national government representative, challenged this by stressing that the government is "taking big steps" [3.3]. At different levels, authorities are seen as taking action towards development and implementation of CA policies: regions have been preparing RAAPs through consultation processes, and municipalities have signed the Covenant of Mayors. Also the involvement of NGOs and industries was regarded positively. While this often happens on the basis of a shared sense of urgency (see also below), our interviewees noted that European legislation and the new Climate Law can be leveraged to enforce CA and CM actions also beyond the public sector [3.1, 3.2, 3.3]. Public consultations were said to be well attended. Nonetheless, it was noted that people with lower education levels tend to be underrepresented in consultations. This means especially advanced and innovative technological interventions (such as the sewer mining development in this DS) might not reach all layers of society [3.2].

This relates to a broader problem of the transfer and use of CC knowledge and solutions, and a need for accessible and easily understandable information [3.1, 3.2]. All our interviewees identified a knowledge gap, albeit approaching it from different angles. The government representative [3.3] thought that while the research sector is generally involved in pilot projects, it is also lagging behind in developing ready-to-use knowledge and solutions or best practices. Our interviewee from the knowledge sector [3.2] was more positive about the involvement of knowledge institutes and knowledge sharing, but acknowledged that in some fields there are still no good indicators of the impact of CC, or the consequences of CM and CA actions. This was especially emphasized with



regard to water resources. Our interviewee who was active in dissemination through education [3.1], noted that access to the right knowledge and translating this into understandable formats is a key challenge. Especially since actors involved in knowledge transfer and implementation (such as teachers, municipalities, and NGOs) may not be experts in all fields and do not have the capacity to stay up to date with developments in research, there is a need for closer exchanges with the knowledge sector.

Greece has been planning to launch a national observatory for CC and a platform for information sharing. This platform would enable stakeholders to access information, data, forecasts, and related CC services, with the aim of improving collaboration between stakeholders and to make participation and consultations in CA actions more accessible. The implementation of this platform was planned for 2020 but has been delayed due to limited resources, and is supposed to go live in 2022 or 2023 [3.3].<sup>45</sup> With regard CC monitoring through the National Observatory and the participation of the public through the online forum, it remains to be seen how stakeholders will be engaged and motivated to be part of these procedures.

## Rules and Regulations

There are some issues with collaboration between governmental levels in Greece, as these have worked with different processes and perspectives, and partly due to a lack of capacity at regional and local levels. Also the distinct objectives of different ministries have in the past created collaboration barriers [3.3]. For CA, such barriers are not an issue yet, because its development is rather recent. Moreover, the new MCCP has the potential to solve some of these issues and is thus seen in government circles as a useful intragovernmental committee that supervises the Climate Law implementation [3.3]. The MCCP and Climate Law are expected to make CC and CA a more of everyday issue by integrating it with other policy fields. In itself, the new legislation could solve some of the policy overlaps and gaps, as every new project and policy with environmental impact should now take CC impacts into account. How this will work out in practice, remains to be seen as the law becomes implemented in the coming years.

Our interviewees noted that the responsibilities of different actors are generally clear between government actors, as well as between sectors [3.2, 3.3]. Especially when it comes to planning and project development our interviewees showed some confidence that the different actors know who is responsible for what. However, in some cases many organisations have been involved and responsibility has been passed on between actors. An example of this diffuse responsibility has been the societal response to the recent wildfires (at least in the initial phases of the emergency) [3.1].

## Resources

As noted above, the Greek government structures have been criticised for being highly centralised. The renewed responsibility assigned to regions with regard to CA, seems to significantly divert from this. As the regional plans are currently being implemented, it can be expected that the conventional forms of collaboration between levels of government might have to be revised. This may concern flows of funding, capacity building at regional levels, and information sharing.<sup>45</sup> Furthermore, the collaboration among different regional and local authorities with the same area of competence is a key issue for implementing CM and CA actions. This flow of resources from the central administration to lower levels is a known, and often highlighted challenge.<sup>43</sup>

Our interviewees pointed out that funding for CA projects in many cases comes entirely from European funds. These are channelled through ministries and universities and complemented with national funds [3.3]. Obtaining funding at the local level proves difficult and has been uncommon. [3.1, 3.2]. Municipalities are generally open to collaborations, as long as their own investment remains limited because they often struggle with budget. Moreover, they rarely take the lead in organising collaborations to address CC related issues [3.1]. An underlying problem is that many smaller municipalities are understaffed, and moreover they are staffed with people who are elected every four years and tend to work with short-term agendas. This means that personnel is not always well informed about CA, and may have narrow views on the temporal scope and spatial scope of their mandate [3.1]. Hence, one challenge is to develop programmes that can be implemented without additional local-level funding. A complicating factor in financing initiatives at the local level is that public organisations, such as schools, are not allowed to hold money on a bank account. This means all financing is processed through external organisations and project partners. Some funding for CA





comes from Greek industries and businesses, who for example adopted and restored forests following wildfires, showing involvement from the private sector and individual initiatives.

The different CA policies and measures that are included in the RAAPs are difficult to implement as funding needs to be approved by the Regional Authority and be included in the regional budget. Even though an initiative or a technological solution is provisioned in the RAAPs, there is a need for further maturation through the competent regional authority, which is often not the case due to other priorities and limitations in resources. For more horizontal actions, e.g., awareness and consultation procedures, the ministries are responsible for implementing these tasks, which might be more efficient in terms of resource allocation.

Another possible obstacle to implementing CA actions might be the resistance to passing the costs on to citizens or companies. While people may be generally positive to CA and to innovative technologies as possible solutions for water scarcity, increasing water prices are not easily accepted. This is especially pertinent following the financial crisis and subsequent austerity measures and the current energy prices [3.2].

## Discourses

Our interviewees all noted that the central government's increased focus on CC and CA is mostly supported in society. The Greek public has become sensitive to CC impact because it has already faced some of them, including fires and floods that have caused casualties and damage to infrastructure and properties. Also the extreme and persistence heatwaves of the recent years have increased awareness and the sense of urgency among stakeholders in general. These high-profile events may also have sensitized people to other CC related effects that may not form an imminent threat yet. Stakeholders generally seem prepared to take measures, and some companies have also assumed CA expenses [3.3].

Also, with regard to water resources, understanding of the problem is generally shared in society, even if water shortages are not perceived as an immediate, pressing problem, and are projected as a future effect of CC. However, prioritising water saving is not self-evident in all sectors. The agricultural sector, civilians, and municipalities were mentioned as examples, as these could do more to save water by reducing crop irrigation, limiting garden irrigation, or installing water-saving appliances in public buildings [3.1]. While water is widely understood as problematic, the sense of urgency for water saving may not equally be shared, due to the artificially low price of this resource.

Finally, a significant obstacle to the actions developed in this DS is likely to be the perception of wastewater in the general public. The general public may not fully understand or trust wastewater treatment technologies. The use of treated wastewater could thus raise concerns regarding hygiene and health [3.1, 3.2]. This increases the importance of dissemination and consultation activities, as well as behavioural change tactics, which as noted above, already suffer from a lack of exchange between actors.



**Summary of multi-level governance challenges****Table 5: Multi-level governance challenges in DS3**

<b>Governance dimension</b>	<b>Governance challenges</b>	<b>Summary description</b>
<b>Multi-level actors</b>	Inclusiveness challenges	<ul style="list-style-type: none"> <li>- Consultations have been lacking, although with some improvement</li> <li>- People with lower educations have been underrepresented in consultations</li> </ul>
	Collaboration challenges	<ul style="list-style-type: none"> <li>- Potential limitations due to traditional top-down relations in public administration</li> </ul>
	Information challenges	<ul style="list-style-type: none"> <li>- A lack of access to, and exchange of knowledge for policy development and dissemination;</li> <li>- A knowledge gap in specific CC impacts per sector or environmental fields.</li> </ul>
<b>Multi-level rules</b>	Policy coherence challenges	<ul style="list-style-type: none"> <li>- Potential overlap between different ministries due to the creation of a new ministry that deals with CC affairs (MCCP)</li> </ul>
	Accountability challenges	<ul style="list-style-type: none"> <li>- While generally clear on paper, responsibilities are in some cases passed on between actors</li> </ul>
	Administrative challenges	<ul style="list-style-type: none"> <li>- Difficulty of adopting CA measures that exceed four year mandate in local-level governments</li> </ul>
<b>Multi-level resources</b>	Funding challenges	<ul style="list-style-type: none"> <li>- A lack of local-level funding</li> <li>- Inability of public organisations to allocate funds;</li> <li>- Limited capacity of lower and medium-income citizens to absorb increasing costs</li> </ul>
	Capacity challenges	<ul style="list-style-type: none"> <li>- A lack of well-trained, permanently appointed personnel at a local level</li> </ul>
	Power challenge	<ul style="list-style-type: none"> <li>- See <i>collaboration challenges</i></li> </ul>
<b>Multi-level discourses</b>	Rationality challenges	<ul style="list-style-type: none"> <li>- The perception of wastewater requires an increased emphasis on dissemination activities</li> </ul>
	Urgency challenges	<ul style="list-style-type: none"> <li>- Energy cost and energy poverty (which was already a problem before the current crisis) may for a substantial share of the population limit the prioritisation of CA actions;</li> <li>- Water saving is not a top priority to many actors</li> </ul>



## 4.5 DS4 – Atlantic: Province of Zeeland, NL

### 4.5.1 Multi-level governance system structure

The Dutch government consists of four main levels: a national government, regionally there are 12 provincial governments (amongst others responsible for groundwater management) 21 regional water authorities (“*Waterschappen*”, responsible for surface water quality and flood risk management), and locally the Netherlands has 345 municipalities. All are publicly elected. Furthermore, 25 Safety Regions, SR (*Veiligheidsregio*’s) have been established, which are responsible for fire brigades and the disaster preparedness and emergency response. Parallel to these institutional structures, there are different types of regional collaborations in the context of climate adaptation, including so-called “*Metropoolregio*’s” (metropolitan areas), “*Gebiedsoverleggen*” (Area-based Collaborations) and “*Werkregio*’s” (Working Regions).

At a national level, climate change adaptation has been incorporated into two main policies. These are the “*Deltaprogramma*” (Delta Programme)<sup>48</sup> and the National Climate Adaptation Strategy (NAS).<sup>49</sup> The Delta Programme has its origins in the 1950s when a large-scale flood prevention measures were taken in the Netherlands as a response to a large flood event in Zeeland that led to more than 1800 casualties. In the past decades, this programme has been broadened from its narrow focus on nationally coordinated flood prevention and hydroengineering to include directives (“*Deltaplannen*”) on freshwater supply, spatial adaptation, and protection from water nuisance as well. While the Delta Programme is arguably the most potent policy directive with regard to climate adaptation in the Netherlands, this is supplemented with the NAS. The NAS includes an assessment and overview of climate risks and an executive programme to address these.

### Regional implementation of the Delta Programme

As part of the Delta Programme, the Netherlands has been divided into Area-based Collaborations and subdivided into 45 Working Regions. Through these divisions, the Delta Programme not only covers national, but also regional directives and strategies.

Of relevance to DS4 is the Area-based Collaboration “Zuidwestelijke Delta”, which covers the province of Zeeland, the southern delta, and parts of the Rotterdam metropolitan area. This includes the Working Regions 29 - Zeeland and 30 - Goeree-Overflakkee. Many of the Working Regions are established according to pre-existing collaborations in the water chain, and are comprised of representatives of the national government, the Interprovincial Council (IPO), the Union of Water Boards, and the Association of Dutch Municipalities. The main role of the Working Regions is to execute the Delta Programme, and specifically its directives regarding Spatial Adaptation.

The working regions, area-based collaborations, and safety regions in some cases (largely) overlap, but this is not always the case, which means that climate adaptation (managed by the working regions) and crisis management (responsibility of the safety regions) may be organised along different regional divisions. The fact that the province of Zeeland consists of, and coordinates a single Working Regions and a single Safety Region (as well as a single regional water authority), can be expected to reduce the complexity of regional collaborations with regards to climate adaptation.

Compared to other provinces in the Netherlands, Zeeland is home to a relatively coherent CA approach, which is secured through the CA Covenant Zeeland, signed by all government bodies in the region (including municipalities and regional water authorities), the creation of a “Core Team CA” (comprised of municipalities, the WB, a regional wastewater collaborative, and the provincial government), and a provincial CA strategy (KasZ).<sup>50</sup>

This CA strategy involves an agenda for collaboration on pilots for climate adaptation and defines four key climate effects: three of them related to extreme weather (water nuisance; heat; drought) and one related to sea level rise: (coastal) flooding. The strategy also stimulates the execution of Climate Stress Tests by municipalities and others as a basis for dialogue among parties.

Particular to the Dutch governmental structure is the governance of surface water through regional WBs. WBs and provinces or municipalities do not necessarily share the same borders, although in the province of Zeeland they do. Regional water authorities are also not specifically charged with CA, but take part in the working regions. Given their specific mandate, their role in CA is most pertinent in relation to flooding and droughts. Of relevance to DS4 are the Regional water authorities





“Scheldestromen” (which overlaps with the province of Zeeland) and “Hollandse Delta” (which includes the strongly urbanised and industrialised Rotterdam area).

### Local level: Schouwen-Duiveland

The island-municipality of Schouwen-Duiveland has actively participated in several European projects related to flood risk management and climate change mitigation. The municipality performed a mandatory Climate Stress Test in 2017. Four focal points are listed in this report, namely heat stress, water safety, water nuisance, and drought. Heat is explicitly mentioned as an underestimated problem; that little is known about heat stress implication in the region, yet that its impact may be severe. One concern for the municipality is that the temperature of surface water may rise to critical levels during prolonged periods of high temperatures. This might affect water quality and aquatic biodiversity and reduce the ability of the region to cool down at night.

## 4.5.2 Multi-level governance challenges

As a significant part of the Dutch climate adaptation strategies are incorporated in the existing Delta Programme, the topic of flood prevention is being addressed through an elaborate governance structure that is tested and proven efficient. With regard to spatial planning and CA, the many organisations and overlapping regional collaborations involved may be overly intricate and a source of overlaps and gaps in responsibilities between actors. The question of heat stress, however, is not traditionally part of the national and regional environmental or climate adaptation strategies. This could imply that the existing governance structure might be insufficiently capable to combat heat stress. Yet, a lack of existing structures may also offer room to create new strategies and practices. The fact that the province of Zeeland consists of a single working region may somewhat reduce the complexity of regional collaborations.

### Actors and Networks

All our interviewees appreciated the close collaborations between actors in Zeeland, including the province, municipalities, regional water authorities, as well as the private sector and knowledge institutions. The province takes on an important, coordinating role in these collaborations. Both of the two government employees we spoke with at the municipal level [4.1] and the province level [4.3] indicated that they collaborated closely with people at the other level, whom they referred to as “colleagues.” Zeeland being a small province of about 380.000 inhabitants and small municipalities, our interviewees also stressed the necessity to collaborate, as none of the actors have the capacity to take on the task of CA on their own.

While the experience of local and regional collaborations is very positive, the relation with the national level is much less appreciated. This is specific to CA policy and particularly the case in the relation between the municipalities and the state. With regard to other (environmental) policy fields, this relationship is usually better and two-directional communication is normally integrated into the workflows of different actors; consultations between the state and municipalities take place on a regular basis and the different actors know of each other plans development as this is relevant. However, in CA policy, this line of communication with the state (represented by the *Deltacommissaris*) is absent [4.1, 4.3]. An example of this is the recently launched national programme to develop a “measuring rod” for CA (generally a series of indicators). Three municipalities in Zeeland had already been working on this, jointly developing a measuring system for the impact of CC, including drought, water nuisance and heat stress. However, this initiative was not taken into account at the national level. Rather, the CA policy is characterised as top-down, whereby local initiatives have a minor opportunity to be heard [4.1, 4.3]. The province, being closer to the national level, has sought to use some of its regular encounters with state actors to represent such regional and local CA initiatives, to variable success [4.3]. Moreover, for individual municipalities to stay up to date with what happens at a national level is close to impossible [4.1, 4.3].

The private sector and civil society have been involved in the establishment of the provincial CA strategy. This includes agricultural organisations, conservation NGOs, the (rather substantial) tourism industry, and others. These actors were enabled to edit and comment on versions of the strategy, and many have signed the provincial CA covenant. Still, the practical execution of CA plans and strategies



continues to reside largely with the public sector. Private and civil actors are involved less directly, and there is a challenge of translating the strategy and covenant into concrete actions [4.3]. The different interests of various actors are likely to play a role in this [4.1, 4.3].

Particular sectors that have been on the side-lines of CA actions, and who our interviewees would like to see as take a more active role, are social housing organisations, project developers and spatial planners [4.1, 4.2, 4.3]. Also the health sector could contribute more to the implementation of CA strategies and plans [4.3]. Especially with regard to heat stress, health care providers, such as hospitals, have largely remained absent from consultations despite being invited. Given the substantial health impact that heatwaves already cause in the Netherlands (see for reference also IMPETUS deliverable 3.1), the municipal health services (GGD) are being asked to activate their networks of local health institutions, including general practitioners.

Another inclusiveness challenge emerges in the link between CA and the social domain. More specifically, concerns have been raised with regard to the effect of heat stress on vulnerable groups (including for example elderly people, people with obesity, people with autism, or people living in poorly insulated buildings lacking financial means to improve their living conditions), which is not well integrated in the CA approach [4.1]. Furthermore, CA actions at the local level tend to attract people with higher levels of education and higher incomes, while the same initiatives generate lower responses or participation in low-income neighborhoods. While this is in itself problematic, this might be exacerbated as concerns with social inequalities and vulnerabilities are not reflected in CA policies [4.2].

Information is being shared on a regular basis between the actors involved in regional collaborations. Knowledge institutions such as universities generally participate in these collaborations. Some of the research questions taken up by universities are being raised by municipalities or the province, but in many cases researchers also take initiative for joint projects themselves. There is a lot of research being done by a large variety of actors, including universities, consultancy firms, NGOs, and public institutions, and a lot of CC-related localised knowledge is available.

Still, access to information is dispersed and fragmented [4.1, 4.2, 4.3]. It remains difficult for local actors to know about the available information and to get access to it. This means that, on the one hand, municipalities may lack data to support CA decisions and face a difficulty of asserting authority on the subject [4.1]. On the other hand, there are a large number of studies and climate tools that are highly complex and have not been prepared for implementation of municipal CA actions [4.2]. This particularly applies to smaller municipalities that have limited staff and resources.

Several knowledge gaps persist with regard to heat stress. One gap that is significant to municipalities, is the effect of materials used in public spaces on the retainment of nightly heat, such as specific types of asphalt or greenery [4.1]. In this regard, acting on heat stress still requires the development of indicators and design standards [4.2, 4.3]. Another knowledge gap pertains to the effect of abundant surface water (particularly in urban areas) on night temperatures during prolonged periods of summer heat.

## Rules and Responsibilities

One challenge for the development of CA policies at the regional and local levels, is that the relationship with national CA policy (*Deltaprogramma*) is not sufficiently clarified. The national policy has not been operationalised at the regional and local level. For example, “climate robustness” (one of the central aims of the Dutch climate policies is for the country to become “climate robust” by 2050) has not been defined at the national level, but is left to regions to operationalise without clear guidelines or incorporation of local experiences in the formulation of such guidelines [4.3]. As a result, CA remains mostly on a voluntary basis and is dependent on the ambitions of decentralised actors in the public domain [4.2]. The policy frames currently do not translate clearly into regulations and actions.

A reason for this might be that national CA policies are being developed quickly, and therefore the applicability in local contexts might be ill-considered [4.1]. CA, and particularly heat stress, is a new policy domain and a relatively poorly understood phenomenon (especially compared to other water-related topics that have a longer history of institutionalisation). On the positive side, the relative openness of the CA policy field means that there is substantial freedom for municipalities to develop local plans. This, however, requires a level of responsibility and level of expertise that not all municipalities might be willing or able to take [4.2].



Another challenge that public authorities are facing is the internal integration of CA policies [4.1, 4.3]. While much attention has been paid to external collaboration between and among public and private actors, CA and heat stress are yet to be fully integrated into the different departments of the governments themselves, i.e., in all aspects of municipal planning and governing. Examples mentioned are the role of communications divisions, who might need to communicate about heat stress at times when temperatures are low, and not only when a heat wave occurs [4.1]; improving coordination between spatial planning department that designs cool corridors in urban areas and the urban gardening division that needs to maintain these [4.1]; or unhelpful distinctions made between residential and business districts which obstruct integrated CA planning [4.3].

CA measures and policies are not particularly prone to political shifts, as they tend to have been secured in long-term policy lines or statutes [4.3].

## Resources

Despite the positively experienced collaborations between municipalities and the province, it is ultimately up to municipalities to develop the national CA framework into locally applicable policies. However, the municipalities in Zeeland tend to cope with capacity problems and do not always have sufficient personnel with the right expertise to execute this task. While this is not a CA-specific governance barrier, it does affect CA as this is a relatively new field of policy-making for which additional capacity building is necessary [4.1, 4.2]. In many cases, multiple, complicated issues are the responsibility of a single person. CA is then added to the existing workload without increased capacity [4.3].

The decentralisation of CA and the significant responsibility of municipalities also requires each municipality to develop communication about CA topics, which is considered ineffective, as communication at larger scales would potentially reach more people [4.1]

There are no subsidies available that focus on heat stress only. The national “impulse regulation” – a subsidy for municipalities to cover one third of the costs of CA measures – cannot be requested for measures that only address heat stress, as the focus of this programme tends to be on water nuisance.

## Discourses

The sense of urgency for heat and heat stress has generally been marginal, although this is gradually improving. Public knowledge and understanding of heat stress is still rather limited. Actors who work on the topic (such as civil engineers) have become more knowledgeable in the past years [4.1]. A possible mismatch exists between CA measures currently being developed for heat, and many people not being aware of the pressing problem that some already face or others are likely to experience within a matter of years. These measures may then also face resistance from citizens, for example due to competition over limited available space, or when green solutions are being designed that do not fit with the (aesthetic) preferences of some [4.1, 4.2]. Also due to capacity problems, acute problems at the local level, are likely to be prioritised over heat adaptations.

Some of the CA measures that are being developed might not systematically address the problem but function more as awareness raising campaigns. One example are campaigns to stimulate green sedum roofs, which have evoked mixed responses, whereby some argue that these function as water buffers, decrease indoor temperatures, and may positively affect biodiversity, whereas others insinuate that their CA effects are limited, yet popular because they are a highly visible intervention [4.2].



## Summary of multi-level governance challenges

**Table 6: Multi-level governance challenges in DS4**

Governance dimension	Governance challenges	Summary description
<b>Multi-level actors</b>	Inclusiveness challenges	<ul style="list-style-type: none"> <li>- CA remains largely with public sector, private sectors could be more involved;</li> <li>- Social diversity and vulnerability is insufficiently taken into account in CA policies</li> </ul>
	Collaboration challenges	<ul style="list-style-type: none"> <li>- Collaboration on CA between local/regional level and the state is poor</li> </ul>
	Information challenges	<ul style="list-style-type: none"> <li>- Knowledge exchange is fragmented;</li> <li>- Significant knowledge gaps about heat limit data-based decision making</li> </ul>
<b>Multi-level rules</b>	Policy coherence challenges	<ul style="list-style-type: none"> <li>- Centralised CA objectives lack guidelines for operationalisation at local level</li> </ul>
	Accountability challenges	<ul style="list-style-type: none"> <li>- Municipalities carry a lot of responsibility in operationalizing national CA policies. They risk having to reinvent the wheel</li> </ul>
	Administrative challenges	<ul style="list-style-type: none"> <li>- The coexistence of a plethora of regional subdivisions, and collaboration platforms can overly complicate CA;</li> <li>- The relationship between the national CA strategy and local-level initiatives is unclear;</li> <li>- More work is needed to integrate CA policies internally and externally in and between actors</li> </ul>
<b>Multi-level resources</b>	Funding challenges	<ul style="list-style-type: none"> <li>- There are no funding programmes specifically for heat and heat stress</li> </ul>
	Capacity challenges	<ul style="list-style-type: none"> <li>- Smaller municipalities face significant capacity challenges. CA is added to the existing workload</li> </ul>
	Power challenge	<ul style="list-style-type: none"> <li>- Not identified</li> </ul>
<b>Multi-level discourses</b>	Rationality challenges	<ul style="list-style-type: none"> <li>- The effectiveness of some (high-visibility) measures is still subject of debate</li> </ul>
	Urgency challenges	<ul style="list-style-type: none"> <li>- There is generally a low sense of urgency for heat and heat stress</li> </ul>



## 4.6 DS5 – Arctic: Troms & Finnmark, NO

### 4.6.1 Multi-level governance system structure

While Norway is not part of the EU, it works within the internal market and has aligned its climate policies with the EU Green Deal. Norway is a frontrunner in the implementation of CC-related measures such as the use of renewable energy, electric vehicles, and emissions taxation.<sup>51</sup> At the same time, it is also one of the world's largest energy exporters. The Climate Action Plan for 2021-2030 sets CM targets, including the ambition for Norway to become climate neutral by 2030, and measures to achieve these targets per sector. The ambition of climate neutrality includes offsetting emissions through the use of international emissions trading, as the Climate Action Plan aims at GHG emissions of up to 55% by 2030 compared to 1990 levels.

Norway adopted its first national CA plan in 2013.<sup>52</sup> In this White Paper, the state established a common framework for CA, and explicitly stated that CA is the responsibility of “everyone,” including authorities, industries, businesses, and individuals. At the same time, it states that “the local character of the impacts of climate change puts the municipalities in the front line in dealing with climate change” (p.6), allocating significant responsibility for CA to the local level. The White Paper also describes in broad terms the roles and responsibilities of different sectors, including nature conservation, agriculture, fishery, health, built environment, and business. A separate chapter is dedicated to CC and CA in the arctic, which focuses on northern waters and the archipelago of Svalbard.

#### Troms and Finnmark county and the city of Tromsø

The national state is represented at the municipal and county level by a regional governor (*Statsforvalter*, lit. state manager or administrator). This national level representatives are often former parliamentarians, whose role is to ensure regions follow national principles, with regard to for example nature conservation and CC. As such, the Statsforvalter forms an important link between the two levels of government.

Following territorial reform in 2020, which merged some of the existing counties, Norway now has 13 counties. As part of this reform, the counties of Troms and Finnmark were merged into a single county by the name of Troms and Finnmark. It has been decided that by 2024 this county will be split up again. While the political reasons for this are beyond the scope of this analysis, it merits mentioning as the merger and subsequent split of regional councils might be a source of uncertainty with regard to procedures, policy alignment, and accountability. Also, this has resulted in substantial capacity being focused on organisational, rather than substantive, issues.

Under the previous national Planning and Building Act (PBA), county-level development plans (“fylkesplan”) were obligatory. Under the current Act, operative since July 2009, this is optional. At the same time, regional “planning strategies” (RPS) were mandated. The municipalities, as well as state sectorial agencies, are obliged to base their planning on this RPS (PBA §7-2). However, for a county administration to make a formal objection to a municipal planning proposal, it has to be at odds with the regional planning provision, which is an instrument that is still tied to the (no longer obligatory) county development plan rather than the new RPS. In the RPS, the county council decides what concrete thematic plans are to be developed in the ensuing years. In Troms and Finnmark, the RPS states that the county shall develop a regional plan for climate transformation (CM and CA), and this process should start in 2021.<sup>53</sup>

Within the counties, municipalities have significant autonomy and responsibilities. This is certainly the case with regard to environmental and area planning. Within the municipality of Tromsø, CA is largely the responsibility of the urban development division, which is also responsible for spatial planning. The municipality of Tromsø has outlined its climate ambitions in the Climate, Environment and Energy Plan 2018-2025.<sup>54</sup> This plan primarily focuses on CM by setting targets for the reduction of GHG emissions and proposing measures to achieve these in an action plan. The section on CA quantifies the benefits of CA measures in terms of financial saving on potential damages. It further aligns its environmental objectives with national environmental targets and indicators; other than that, it remains fairly general.

Some of the aims of the plan have since it was adopted been developed further in sub-plans, such as the Municipal Sub-Plan for Water and Sewage 2021-2023<sup>55</sup> and the Municipal Sub-Plan for Surface Water 2019-2032.<sup>56</sup> These plans form a strategy for how Tromsø can improve its preparedness for more intense rainfall, longer periods of snowmelt, flooding from streams and more intense storms.





They outline the municipal vision and objectives, in this case regarding water catchments, treatment, distribution, and discharge, as well as technical parameters. The focus is specifically on the expected increase in stormwater due to CC.

## 4.6.2 Multi-level governance challenges

### Actors and Networks

Municipalities have substantial autonomy in developing plans, albeit through a procedural relation with the state. Municipal plans are checked by the County Governor (*Statsforvalter*) for compliance with national level policies, and adapted accordingly. Interestingly, compared to other policy fields, the relation between the municipality and the state appears to be substantially closer with regard to CA plans [5.2]. At the time of writing, the Tromsø municipality is in the process of revising its 10 year city plans. At the same time, Tromsø together with the county is applying for an urban growth agreement to get additional national funding for larger, transport-related infrastructure projects. As part of this funding application, the national authorities have taken a seat at the table of municipal area planning, and the state, the County Governor, and the municipality have been meeting on a monthly basis. While these meetings are officially about traffic and infrastructure, CA-related topics are discussed as well and are part of the state's demands. For example, landslides and the deposits of snow from the city streets during winter, two major CA issues in Tromsø, are discussed as CA implementation in the plans for new roads. The state further demands that investments are made so that the car dependent volume of traffic does not rise, which is a premise for planning in all urban areas in Norway. Such close collaborations are not common, but in this case set up as part of the large infrastructure investment deal.

The municipality has been largely dependent on consultants to obtain detailed knowledge on regional priorities of CA intervention. Cooperations with knowledge institutions such as universities are limited [5.3]. The existing open source risk maps used by municipalities are considered not detailed enough by both public authorities and private sector actors [5.1]. Private actors, such as insurances, are considered to have an excellent knowledge base, but at the moment there is no dialogue with insurance companies about the exchange of data [5.3]. The insurance sector itself has been feeding data into the database of the Directorate for civil protection and emergency planning. Currently, this platform is still in development, but it is expected to present aggregated knowledge from insurance companies that municipalities can access for their risk analyses. The exchange of knowledge between public and private sectors can be expected to improve as a result [5.1].

The relationship between the private and public sectors is ambiguous when it comes to CA [5.3]. The private sector is considered to have more capacity for investment, while municipalities are expected to set the parameters to make sure that private activities contribute to a common goal. For this, the EU taxonomy has been used as a tool to steer large private investments. In this regard, internal goals of the municipality, such as attracting industries versus CM and CA measures, might also need further alignment [5.3]. Tromsø does not have a big industry, except for 'artisanal' fishing and the development of fish farms.

Generally, the role of the fossil industry in climate policies would merit more clarity and reflection. The fossil industry is known to have a strong voice in municipalities where they are present (e.g., the natural gas industry in Finnmark, in Tromsø this is less the case) as well as at the national level [5.2, 5.3]. According to the OECD, Norway "should develop a plan to phase out support to fossil fuel and other environmentally harmful forms of support."<sup>51</sup>

### Rules and Responsibilities

Due to its distinct geography, our interviewees pointed out that CA measures in Tromsø will be distinct from other cities, which means it sometimes takes significant work to adapt national policies to the local level and to negotiate about compliance [5.2, 5.3]. The municipal CC plans have defined goals that need to be reached by 2025 and 2032, but reporting and accountability should be clarified in order to assess progress on these goals [5.3].

Between public and private sectors, responsibilities could be clarified. An example from the insurance sector is that insurance companies are stimulating customers to adapt to CC by helping them understand and mitigate risks, in order to prevent the coverage premiums from rising too much.



However, CA is not formally a responsibility of insurance companies, and they cannot enforce measures. Municipalities can enforce CA measures through local planning, but may have different priorities [5.1, 5.3].

## Resources

While local authorities have substantial autonomy over environmental planning in Norway, resources for CA are limited, both in terms of funding and capacity [5.3, 5.1]. Tromsø municipality faces capacity problems, which means integrating CA into the work of all departments is a challenge. Moreover, within a tight municipal budget, large-scale investments that might only have effects on a longer term are not popular with local politicians who work in four-year electoral cycles [5.3]. The local ambition to becoming climate neutral by 2030 was dropped when an EU funding application for this was not approved. Also at a national level, there is limited capacity. Norway is a high cost country with high efficiency, and in several sectors (e.g., public sector, health institutions) is operating at maximum capacity (in the sense that the cost of staff is relatively high, meaning that labour intensive sectors such as public planning, are relatively expensive). The recent involvement of the state in area planning has been criticised for being a too much interfering with local decision-making procedures, but was also considered by our interviewees to add competence at the local level.

A small number of urban developers, who are also land owners, are considered to have significant power to put pressure on the municipality, which may further complicate the development and implementation of CA measures [5.2].

The funding of CA is closely linked to the allocated responsibilities of different actors. This makes the unclear allocation of responsibilities in the national CA plan more problematic. Generally, the question of CA funding is not sufficiently clarified. Municipalities can apply for up to 80% funding from the Norwegian Water Resources and Energy Directorate (NVE) for physical measures to secure existing buildings against flooding and snow/landslides.<sup>57</sup> About half of these applications are rejected due to limited funds.<sup>58</sup> Municipalities and counties can also apply for funding from the Norwegian Environment Agency (MD) for projects that boost their in-house knowledge on the impact of CC and the need for CA.<sup>59</sup>

## Discourses

CA is a relatively new topic in Tromsø. Our interviewees all agreed that communication about CA has not been adequate. The municipal officer [5.3] considered that politicians need to be better informed about the consequences of decisions (or of not taking actions). The insurance sector employee [5.1] signalled a need to make CC communications more relatable to people. Also the journalist [5.2] confirmed that using more place-based communications at the local level is necessary in order to get to a shared sense of urgency. Currently, they all stressed that the sense of urgency is not shared widely enough. Most municipal departments continue to prioritise immediate issues rather than long-term CA. This may be a result of authorities having to choose between economic, social, and environmental goals due to limited capacity.<sup>51</sup> Prioritising CA is further complicated as measures that avert risks might not become tangible to people, making it difficult to visualise the benefits of investments [5.1]. Nonetheless, awareness about CA is growing, as the consequences of CC are becoming more concrete and several incidents related to CC have happened in recent years [5.1, 5.2].



## Summary of multi-level governance challenges

**Table 7: Multi-level governance challenges in DS5**

Governance dimension	Governance challenges	Summary description
<b>Multi-level actors</b>	Inclusiveness challenges	- A general challenge is to communicate, and anchor, a sufficient sense of urgency. Lacking this, several potential or latent stakeholders do not self-mobilise, or do not respond to invitations to participate
	Collaboration challenges	- Current close collaboration between municipality and state is exceptional, temporary, and contingent;
	Information challenges	- Information sharing between private, public and knowledge sectors is insufficient
<b>Multi-level rules</b>	Policy coherence challenges	- National policies do not easily apply to the Tromsø region due to locally specific concerns
	Accountability challenges	- Roles and responsibilities of public and private sectors require clarification
	Administrative challenges	- The recent merger and planned split of Troms and Finnmark county may cause challenges for policy coherence and procedures
<b>Multi-level resources</b>	Funding challenges	- Funding for CA is limited at the regional and local levels
	Capacity challenges	- Capacity problems (personnel) persist across the public sector
	Power challenge	- Large private actors (including developers and fossil industry) may have too much influence on CA measures
<b>Multi-level discourses</b>	Rationality challenges	- There is a discrepancy between Norway's green profile and its relation to fossil fuel industries
	Urgency challenges	- CA is often not prioritised due to long-term effects and limited visibility; - Relatability of communications could be improved in general





## 4.7 DS6 – Boreal: Zemgale region, LV

### 4.7.1 Multi-level governance system structure

#### Latvia's climate change adaptation strategy until 2030

Latvia's CA strategy is defined in the National Climate Change Adaptation Strategy until 2030<sup>60</sup> and further specified in the National Plan for Adaptation to Climate Change until 2030<sup>61</sup>, both of which are established by the Ministry of Environmental Protection and Regional Development. For the development of the national strategy, two working groups have been formed: the Climate Change Adaptation Expert Working Group and the Inter-Institutional Working Group on Adaptation to Climate Change.

This strategy outlines key CC concerns for Latvia, namely changes in air temperature, precipitation, wind speed, sea and (seasonal) river levels, and extreme weather. The plan is based on an analysis of CC impact in Latvia to date and scenarios up to 2100, and CC impact and risk assessments for six societal domains (i.e., construction and infrastructure planning; civil protection and emergency planning; health and well-being; biodiversity and ecosystem services; agriculture and forestry; tourism and landscape planning).

The plan defines the overarching goal of adaptation to climate change and five strategic goals: 1) the protection of the health and well-being of people; 2) an adaptive economy; 3) climate-resistant infrastructure and construction; 4) the preservation of cultural and historical values; and 5) the establishment of science-based and integrated policies. Under each of these strategic goals, two or three Directions of Action (14 in total) are defined, which are further specified in up to 20 measures (89 in total). Some of these measures are sector-specific while other are more general. For each of these measures, a responsible institution, collaborating institutions, the term of action, and funding sources are defined. This means that the responsibility of specific CA measures is designated in the national plan, which includes references to ministries and municipalities, as well as higher education and health care institutions, among others. The regional level is not mentioned in this plan. The plan also includes CC indicators that are to be used for monitoring and evaluation of the plan. Parallel to this strategy, emissions-related concerns are addressed in the National Energy and Climate Plan 2021–2030<sup>62</sup>.

#### Regional Level: Zemgale

Latvia is divided into five planning regions, namely Riga, Vidzeme, Latgale, Zemgale, and Kurzeme. A planning region is a derived public person; its Council is being elected from the councillors of the local governments located within the planning region. Planning regions ensure the planning and coordination of regional development and cooperation between local government and other State administration institutions. The Ministry of Environmental Protection and Regional Development (MoEPRD) supervises the activities of planning regions and local governments and is the leading institution for the drawing up, implementation, and supervision of the State regional policy, and the coordination of implementation of support measures for spatial development.

With regard to CA, no plans or strategies have been developed at the regional level, where the topic of CA has been mentioned in other regional planning documents. Also the Zemgale Planning Region does not have a climate adaptation plan. However, it does have a Sustainable Development strategy for 2015 – 2030<sup>63</sup>, as well as a general Regional Development plan for 2021 – 2027.<sup>64</sup> The sustainable development strategy predates the national climate change adaptation strategy and defines the long-term development vision, strategic goals, priorities, and spatial development perspectives of the Zemgale region. It does not explicitly mention CC but deals with several climate-related issues such as sustainable use of local resources, and ecology, as well as industrial development.

The Regional Development plan for 2021 – 2027 does mention CC as one of nine development priorities. For CC, it defines six courses of action which are each provided with actionable indicators and implementation actions and tasks. The Courses of Action (RVs) include: 1) Promotion of energy efficiency, renewable energy resources; 2) Preservation of biological diversity, creation of green infrastructure; 3) Climate change adaptation and mitigation; 4) Environmental infrastructure development; 5) Promoting the implementation of circular economy; and 6) Remediation of degraded areas and historically polluted places.



## Municipal Level: local climate action plans

Since 2021, the current administrative division of Latvia comprises 43 local government units including 36 municipalities (*novadi*) and seven state cities (*valstspilsētas*).

Several municipalities in Zemgale have developed local Sustainable Energy and Climate Action Plans. These include the region's two cities, Jelgava<sup>65</sup> and Jēkabpils<sup>66</sup>, and the county-municipality of Bauska<sup>67</sup>. These municipalities explicitly align their plans with the Covenant of Mayors. These plans primarily focus on GHG emissions reduction (focussing on energy consumption and transport), whereby urban growth and intensified electricity use is a key challenge. Nonetheless, all claim to comply to, or surpass, the set objective of 20% CO<sub>2</sub> reduction.

CA plays a minor role in these municipal plans and is identified as a 'secondary goal'. For this, key climate risks in the municipalities are listed, which include damage to the built environment and infrastructure as a result of heat, excessive precipitation, and fluctuations in the groundwater levels. CA measures that are proposed include the construction of green infrastructure, adaptation of drainage systems, and adaptation of buildings and structures.

### 4.7.2 Multi-level governance challenges

#### Actors and Networks

Relations between the regional and municipal level are close, as municipalities are commonly represented in thematic regional working groups. Latvia is a country with a small population of less than two million people, and government representatives at different levels tend to know one another well, especially within regions [6.3, 6.4]. Sometimes they also take on multiple roles (for example as an official in both a municipality and a planning region) [6.3]. Collaborations between knowledge institutions and municipalities are limited and could be improved. In general, municipalities could take a more active role in CA and environmental planning [6.1].

Knowledge exchange goes well, as our interviewees were generally satisfied with their relations and ability to access information [6.1, 6.2, 6.3, 6.4]. The researcher we spoke with indicated that the results of studies are taken up well by various stakeholders, and data exchange occurs between different knowledge institutions [6.1]. These stakeholders include governmental actors, such as the Ministry of Agriculture, the Zemgale Planning Region, which have made use of university studies in the development of environmental policies regarding, for example, the management of river catchments and the implementation of water quality measures. Also, relations with farmers (via farmers' organisations) are good and have improved over time. For example, researchers have worked directly with farmers' organisations in European Horizon projects. This relationship was characterised as mutual, whereby researchers share interpreted and summarised results and can learn from farmers about the social and economic feasibility of water interventions and soil health interventions. A benefit from these collaborations is that decisions by the ministry are better understood and accepted by farmers because they have been involved at an early stage [6.1].

However, knowledge institutions such as universities could do more to disseminate knowledge and to make it accessible and understandable to a broader audience. Access to knowledge for civil society, as well as private actors could be improved [6.1, 6.4]

Knowledge may also be provided by civil society actors, who may inform authorities about illegal waste disposal or the presence of specific protected species in a region [6.2]. While this may not be directly related to CA, the platforms for knowledge exchange such as public monitoring programmes are in place and are being used by both civil society and the public sector. Between local NGOs and municipalities, collaborations are generally good, although initiatives often come from the NGOs rather than the public sector [6.4].

The private sector has been (or is being) involved in the drafting of regional CA plan, and their agreement is required for the final adoption of the plan, which means companies would support the plans and are mentioned in it [6.3]. Developing nature-based solutions has proved difficult, as willingness among landowners (both public and private) to dedicate land for these environmental purposes are a limiting factor [6.1].



## Rules and Responsibilities

Responsibilities of different actors are generally clear. For example, while multiple organisations are involved in the maintenance and management of rivers, all streams are registered in a digital cadastre system. Municipalities are responsible for drainage systems and streams within their territory, except for streams that are designated to be of “national significance,” which are the responsibility of the Ministry of Agriculture and State limited company “Ministry of Agriculture, Real Estate” [6.1].

Also with regard to CA, policies align well with one another. However, the development of plans has been a long process, with several rounds of consultation with municipal councils, private and civil society stakeholders, and internal political reviews of the different drafts [6.3]. Additionally, CA currently remains within planning documents at a general level. How the regional plans and strategies should be implemented in concrete terms is less clear [6.1, 6.3]. This means the practical implementation of CA depends a lot on the initiatives of individual municipalities and other stakeholders mentioned in the plans. Shifting politics at regional or local level due to elections are have ostensibly little impact on the development of the regional CA plans [6.3].

The relation between regional and state levels is less smooth. Coherence can be improved between regional and national plans. The development of these plans has been occurring within different timeframes, and the national plan remains at a general level, lacking concrete action points. Different ministries may be led by different political parties which means they may have different viewpoints among them, as well as different views from regional level governments. From the regional perspective, ministries are experienced as working slowly and a more proactive stance from state actors in developing CA actions at a national level would be appreciated [6.3].

Since the regional administration operates under the ministry and is supervised by municipalities, drafting a regional CA plan can be expected to be an act of balancing national and local concerns and priorities. Proper consultation across administrative levels will be paramount to the plan’s success. However, the municipal CA actions are currently fairly brief and provide room for more comprehensive CA approaches at the regional level. Furthermore, CA and CM are mentioned in the Zemgale Planning Region Development Programme 2021 – 2027 as a separate course of action (RV 5.3) and with a number of actions, tasks and responsibilities already defined, which will be of relevance when developing a regional CA plan.

## Resources

Funding is understood to be the main limiting factor for CA by actors in both the public sector and civil society [6.1, 6.3]. CA currently needs to be implemented within the existing budgets, which means immediate needs will be prioritised. Due to the lack of detail on financial resources in the national CA plan, regions have to develop concrete financial sources for CA implementation in cooperation with the state, which may have different views on which actions to prioritise [6.3]. The responsibility of regions in developing CA policies might be undermined by state-led financial decision-making. Civil society organisations, such as local NGOs, deal with structural deficits and capacity problems. Many smaller NGOs are volunteer-based and are limited in both the time, expertise and funds they can dedicate to actions. They also may not have the capacity to follow up on projects or to research upcoming topics [6.4]. Local NGOs may be resistant to requesting or accepting municipal funds as doing so might jeopardize their independence [6.2, 6.4].

## Discourses

The sense of urgency for CA is shared widely across all levels of government and in society due to recent extreme events (e.g., the 2017 floodings and 2018 droughts). These events expose weak points in the governance of CC impact and show the relevance of CA.

However, as these events fade from memory, other issues might be prioritised. Especially for businesses, CA has not been a top priority. Measures that could intervene in forestry industries, waste management, and mobility, have faced resistance from stakeholders involved [6.4]. Also, municipalities could do more to implement nature-based solutions to CC-related problems, such as creating green areas to provide shadow and regulate temperatures or water storage [6.4]. However, at the municipal level socio-economic problems have been prioritised, which are exacerbated by the current energy crisis and war in the Ukraine.



Despite the general sense of urgency, understanding of CA is limited [6.1]. We noticed in our interviews with local level civil society actors [6.2 and 6.4] that CA, CM, nature conservation and other environmental concerns were at times used interchangeably. In this regard, there is a need to disseminate and explain the meaning of different measures [6.1]. Structural involvement in dissemination from the Ministry of Education and Science has been lacking and could aid regional and local level actors to implement CA measures.

## Summary of multi-level governance challenges

**Table 8: Multi-level governance challenges in DS6**

Governance dimension	Governance challenges	Summary description
<b>Multi-level actors</b>	Inclusiveness challenges	- Not identified
	Collaboration challenges	- Not identified
	Information challenges	- Access to knowledge for civil society and private actors needs improvement
<b>Multi-level rules</b>	Policy coherence challenges	- Regional and national plans lack coherence; national plan lack concrete action points; - Regional CA plans need to balance between national and local priorities
	Accountability challenges	- The implementation of CA depends on the initiatives of individual stakeholders; - Municipalities could take a more active role in CA and environmental planning
	Administrative challenges	- Not identified
<b>Multi-level resources</b>	Funding challenges	- CA needs to be implemented within existing budgets
	Capacity challenges	- Civil society organisations face structural capacity problems
	Power challenges	- Not identified
<b>Multi-level discourses</b>	Rationality challenges	- Understanding of CA may be limited and confused with CM and nature conservation
	Urgency challenges	- Urgency has not been a top priority in the private sector - Socio-economic problems tend to be prioritised, especially in the current energy crisis



## 4.8 DS7 – Mountainous: Valle dei Laghi area, IT

### 4.8.1 Multi-level governance system structure

The Italian National Climate Change Adaptation Strategy<sup>68</sup> (SNACC) was finalised in 2015. The plan outlines key CC concerns at the national level and for specific sectors, including tourism and agriculture. Noteworthy, with regard to tourism, is the particular focus in this strategy on the impact of CC on cultural heritage. Key CC concerns listed include an increasing pressure on water resources and particularly the reduction of glaciers and snow cover in the Alps and the pressure on the Apennine water reservoirs, due to precipitation variability and rising temperatures. The strategy pays specific attention to Alpine and Apennine regions, as these are considered to be particularly vulnerable to CC. Because energy consumption increases, Italy has a significant need for water in hydropower plants and for cooling systems. Hence, the effects of the decreasing availability of water are noted in relation to health, drinking water, and ecosystems, but also in relation to energy production. The national CA strategy further involves the establishment of a national research system on climate, climate change, impacts and vulnerability, bringing together government actors, knowledge institutions, and funding programmes, and identifying knowledge gaps. It also dedicates a section to decision-making in the face of uncertainty.

This strategy is further specified and implemented through the 2018 National Climate Change Adaptation Plan (PNACC).<sup>69</sup> This plan identifies climate scenarios and vulnerabilities at a regional scale; sectorial risks and adaptation actions; and responsibilities and coordination between the different levels of government. It also outlines required resources, data-sharing, monitoring and evaluation approaches. The adaptation plan consists of a total of 361 sectorial adaptation actions, specifying the climatic areas to which they apply, and with reference to four themes: 1) geological, hydrological, and hydraulic instability; 2) coastal zone management; 3) biodiversity; and 4) urban settlements. However, the PNACC is still awaiting the final approval following the conclusion of the strategic environmental assessment process. Also the definition of specific actions and the identification of competent actors to implement these still need to be finalised.

Next to these CA-focussed policies, the National Sustainable Development Strategy aligns the national policy with the UN 2030 sustainable development agenda.<sup>70</sup> The Ecological Transition Plan,<sup>71</sup> which is part of the NextGen EU-funded National Plan for Recovery and Resilience (established in 2022<sup>72</sup>), outlines specific directives on drinking water networks, as well as recycling, energy transitions, and the adaptation of built structures. Finally, the 2019 Integrated National Energy and Climate Plan<sup>73</sup> deals with questions regarding energy transitions and the reduction of GHG emissions.

### The Autonomous Province of Trento

Considering the large variety of landscapes, from the Alps in the north, along the Apennine mountains and its long coastline to the Mediterranean south, the impact of CC in Italy can be expected to vary significantly between regions.

The Autonomous Province of Trento (also: Trentino) enjoys a high level of autonomy within the Italian constitution, as one of several autonomous regions. However, this autonomy is limited to topics including health, education, and infrastructure. Environment, natural resources, and climate are thus not within the mandate of the autonomous province but remain under the Italian state administration.

Nonetheless, Trentino, like many other Italian regions, has developed a Provincial Strategy for Sustainable Development (SproSS), which promotes integrated territorial development and cohesion between policies and actors.<sup>74</sup> Securing water quantity and quality is one of 20 sustainability objectives listed in this strategy, among a number of social and economic factors such as work and education, as well as environmental concerns such as biodiversity.

Climate is addressed through the objective to reduce GHG emissions, and as part of the carbon-free transition in Trentino. Aside from a general view on the impact of CC (such as changes in the hydrological cycle, melting glaciers, permafrost degradation, and changing ecosystems), the SproSS does not provide detail on the action to be taken. A coordinated Provincial Strategy for Mitigation and Adaptation to Climate Change is currently being developed under the programme “Trentino Clima 2021-2023”<sup>75; 76</sup> and is expected to involve a novel governance framework (which includes a technical board of provincial departments, a scientific committee and a forum dedicated to communication and education) and to adopt a novel approach aimed at participation, consultation, and access to information. The mitigation actions are essentially those already specified by the Provincial





Environmental and Energy Plan 2021-2030,<sup>77</sup> while the adaptation actions will be identified according to the results of the technical and participatory activities of “Trentino Clima 2021-2023”.

## Valle dei Laghi municipalities

In Trentino, municipalities that are located in the same valley can collaborate in a “*Comunità di Valle*” (Valley Community), an administrative level that acts as supra-municipal institution. This entity has some specific competences, among which territorial planning and social services. The Valley Community “Valle dei Laghi” is the one of interest for this DS, and includes the territory of three Municipalities: Vallelaghi, Madruzzo, and Cavedine. Since 2016, several mergers of Municipalities have occurred in the Province of Trento, including some of the municipalities in the Valle dei Laghi area. Currently, no adaptation plans have been developed at local level, while some actions have been put in place concerning CC mitigation. For instance, a Sustainable Energy Action Plan has been developed by three former Municipalities of Valle dei Laghi and was submitted in 2015 under the Covenant of Mayors initiative. In addition, the new Urban Plan of Madruzzo Municipality was approved in 2019 together with an Energy Attachment that is focused on measures to enhance the energy performances of the historic buildings.

## 4.8.2 Multi-level governance challenges

### Actors and Networks

Relations between government levels are generally good, although some exchanges could be smoothed out. Starting at the local level, Municipalities in the Valle dei Laghi area work together in regional collaborations to address shared problems, and work closely with the Province of Trento, for example in developing the CA agenda for 2030 as part of the “Trentino Clima 2021-2023” programme. As Trentino has a relatively small population of about 500,000 inhabitants, communications between municipalities and the province are close and frequent [7.1, 7.2]. However, at the provincial level, it has been difficult to obtain a complete overview of local initiatives, as small and big initiatives are continuously developing. In this sense, the relation with municipalities has been somewhat unclear, especially when the province has sought to be involved in local initiatives and events [7.2].

Municipalities are often also in direct contact with the state through the ministries. These relations are considered to be more difficult, due to the institutional and geographical distance between state actors and municipal actors. Usually, the province mediates between local and national level governments [7.1].

Private-public relationships with sector organisations tend to be close. Municipalities may be in good relations with locally active agricultural cooperatives and collaborate in projects with them. Farmers’ cooperatives and lobby groups have been involved in data sharing, developing adaptation tools, and disseminating CA knowledge and practices. [7.1, 7.4]. Also mutual insurance companies and industry collectives often work in agreement with municipalities and/or provincial governments and are involved in developing sector-specific policies [7.3, 7.4].

One of the actors that could be more involved in local CA discussions and actions, are ‘*consorzi irrigui*’, irrigation consortia, the associations of farmers that manage irrigation water. The perspectives, needs, and future prerogatives of these consortia are not well-known to public authorities [7.1]. However, the Federation of irrigation consortia and land improvement (COMIFO) is actively involved in CA discussions and actions at the provincial level to sustain local agriculture by offering technical, financial, and legal services to its associates. Furthermore, the Federation acts as a broker between the local consortia and the province in order to meet irrigation requirements in distress situations (e.g., approval of the derogation proposal to the minimum river flow in summer 2022 to face water scarcity in agriculture). Despite the dynamic role played by the Federation, the decentralisation of local irrigation consortia, which are mainly working on a voluntary basis and are deeply rooted into their local communities, acts as a deterrent to their engagement in local CA discussions.

Also, the tourism sector has been shying away from participating in CA discussions. Especially winter tourism is affected by decreasing snow cover, yet the ski sector has not been seen to develop a long-term CA perspective and has resorted to the use of artificial snow (causing additional GHG emissions [7.2].





Hydropower companies have been mentioned as a particular category of private sector actors with whom communications have been difficult [7.1, 7.2]. The larger companies pay the environmental compensation fees to the province and collaborate with the civil protection department, which coordinates their water basins to regulate floods and water levels. The smaller hydropower companies do not pay water concessions and interactions between the province and these companies have been arduous. At the municipal level, conflict over water resources with hydropower companies is experienced as unequal, as they have significant influence at the provincial and national levels and there are national and regional interests in energy production from hydropower. Municipalities may then appear as minor actors in the dispute [7.1]. Hydropower companies will be involved in participation phase of provincial CA strategy development [7.2].

It should be noted that in the development of provincial CA plans, the official public participation and consultation process had not started yet at the time of writing. A scientific report on the status of the climate, its sectorial impacts and future provincial scenarios is currently being developed along with technical activities aimed at identifying and prioritising future CA options. The private sector, civil society, and sector-based cooperatives are to be involved in participation in a later stage [7.2].

The knowledge base for the development of CA measures is generally good, although there are some knowledge gaps and issues with information sharing. The scientific community is involved in provincial policy development: a scientific committee has been established that includes scientific institutes in the province and it is coordinated by the provincial environment agency, which has the role of general coordinator for the implementation and development of the Trentino Clima 2021-2023 strategy. This group is active and has generated a positive knowledge exchange. Furthermore, there are discussion tables and interactions between the provincial and municipal governments aimed at supporting municipalities to implement CM and CA actions [7.2].

Still, data is generally available but not readily accessible and the challenge is putting the information into practice. Every basin/water district has an Observatory for water use that produces data and reports monthly, which can be used by technicians. While this means that technical data is available, a good synthesis of this data into communications for a broader audience (including policy-makers) is lacking [7.5]. Moreover, knowledge circulation between institutions requires amendments to be in accordance with privacy regulation [7.4]. Data sharing between regions and basin/water districts has been obstructed by institutional barriers and different administrations work with different models [7.5]. This problem is especially pertinent with regard to data on droughts because the problem is new and indicators have not been developed or standardised [7.5].

The development of indicators that can aid in transitioning from scientific knowledge to informed decision-making has been a knowledge gap in CA policy development. Our interviewees stressed that technical knowledge is available, but that more work is needed to be able to make the translation into political decision-making (see IMPETUS deliverable 3.1 for more information about indicators). The problem of water scarcity has been a prime example of this issue, as the existing data on water levels and precipitation has not been developed into indicators to manage the water needs of different sectors, including hydropower, agriculture, and tourism [7.2, 7.5].

## Rules and Responsibilities

Italy generally has very well-defined competences across ministries and government levels. This is mainly the case in relations between national, provincial, and municipal levels, which have been defined in the Italian constitution. With regards to water districts (the borders of which may cross local/regional administrations), responsibilities are less clearly defined. Also with regard to newly emerging concerns, such as drought, competences and responsibilities might need to be renegotiated as there are fewer past decisions to draw on [7.2, 7.4, 7.5].

National plans for CA (the SNACC) are relatively detailed and explicitly address the regional level. This means that the transition to regional and local levels requires adapting already detailed plans to local needs, geographies, and stakeholders' interests. Because of this, it was suggested that the national government should be more receptive of local needs. All regions in Italy have been working on CA plans, but there has been little coordination or methodological guidance from the State regarding the development of these regional policies [7.2]. Also the SNACC itself is not yet approved and operational, which is currently a source of uncertainty with regard to its eventual effects.

Collaboration between regions occurs through *reti di pubblico interesse* (public interest networks). These networks may be strong and the base of close collaborations, or they may be weak, taking the



form of negotiation platforms or memoranda of understanding. For water management, the regional networks are generally quite weak, which means they have little power to develop mandatory decisions [7.5]. At a local level, there are some gaps and overlaps in water policies that also pertain to CA. The relations between different actors are not clearly defined and there is no shared water management [7.1]. Developing a shared regional water management plan would fit well within the provincial aim of fostering cohesion in its territorial development.

The cycle of political changes may cause consistency problems and delays at both the regional and local levels (five years for municipal elections). However, some mechanisms are in place to embed CA policies. At the regional level, the effect of changes in political leadership is limited as policy decisions need to take place in light of past decisions and norms [7.5]. At the municipal level, attempts are made to develop CA through the involvement of stakeholders including citizens, businesses, and farmers, which reduces the impact of changes in municipal government [7.1].

## Resources

At the moment there are no pressing funding issues, although it should be noted that CA measures at the regional and local levels are in the early stages of their development (thus, not yet in the implementation phase). There are some uncertainties among actors regarding where the funding for the implementation of current adaptation measures would eventually come from. The EU is expected to contribute, and some national and provincial funds are expected to be allocated to the newly developing policies [7.2, 7.4], but the extent to which CA implementation measures will be covered is not known.

More generally, the main concern with the implementation of CA measures appears not to be with funding, but with the interests of and relations between stakeholders. Unequal power relations between local actors, including municipalities, and large (private) organisations such as hydropower companies are a matter of concern when it comes to distributing responsibilities for CA [7.1].

## Discourses

The urgency of acting towards CA has been increasing among most stakeholders, especially the 2022 water scarcity crisis in Northern Italy, and the related water conflicts that have ensued, have raised concrete concerns. However, this differs slightly per sector (especially tourism and health sectors are noted as exceptions having shown a lower sense of urgency). Historically, water scarcity has not been a concern to the region, and the idea that water is abundant is still persistent. This means actors are also not used to working together in this field [7.1]. Generally, actors that are directly affected by CC are well aware, and have been trying to develop coping strategies [7.2]. Mutual insurance companies and cooperatives have increasingly been attentive to the impact of CC, by developing funding mechanisms and technical solutions and trainings [7.3, 7.4].

Our interviewees indicated that some of the standards and solutions that are currently in place or envisioned might not fit well with the changing reality of CC. For example, existing thresholds and indicators for water use and availability might need to be updated, as the water quantities needed for irrigation might change as a result of changing temperatures and precipitation patterns [7.5]. Also technical solutions and parameters that do not take the local socio-economic and natural environment into account have been considered problematic and could potentially become examples of maladaptation, especially in the agricultural sector [7.2].



**Summary of multi-level governance challenges****Table 9: Multi-level governance challenges in DS7**

<b>Governance dimension</b>	<b>Governance challenges</b>	<b>Summary description</b>
<b>Multi-level actors</b>	Inclusiveness challenges	- While the federation of irrigation consortia (COMIFO) is active at the provincial level, the individual associates (similarly to winter tourism companies) are noted as poorly participating in CA discussions
	Collaboration challenges	- An overview of local CA initiatives is lacking; - Relations between public authorities and hydropower companies are tense and in some cases may form a conflict of interests
	Information challenges	- Data is not readily accessible to stakeholders; - Good indicators to inform decision-making are lacking
<b>Multi-level rules</b>	Policy coherence challenges	- National CA plans are very detailed but lack attentiveness to the local level
	Accountability challenges	- Responsibilities and modes of collaboration in the water sector and water districts are not clear
	Administrative challenges	- There has been little national guidance for the development of regional CA plans
<b>Multi-level resources</b>	Funding challenges	- Sources of funding for CA are not clear to stakeholders
	Capacity challenges	- Not identified
	Power challenge	- Unequal power relations between local actors and larger organisations
<b>Multi-level discourses</b>	Rationality challenges	- Maladaptive technological solutions in agriculture and tourism
	Urgency challenges	- Awareness of water scarcity could be improved



## 5 Conclusions

In this deliverable (D1.3) we have examined the main governance challenges facing CA policy development and implementation in each IMPETUS DS. To a large extent, the relations between actors and the coherence of policies and responsibilities are specific to the national and regional context. In this sense, the results outlined above cannot be generalised across Europe. Still, there are a number of common threads that can be identified. Below (section 5.1), we highlight these common challenges, after which we present implications and next steps for the IMPETUS project.

While this deliverable (D1.3) has focused on challenges and obstacles to CA, we should note that solutions are sought, and in many cases also found. To name a few: gaps in knowledge exchange have been addressed by establishing thematic workgroups (DS4) and new public-private information sharing (DS5); frictions between different levels of government are being addressed through national representation in local spatial planning and participation of municipalities in regional policy development (DS5, DS6); and the early involvement of stakeholders in the development of policies generates a shared sense of urgency and ensures continuity in the face of fluctuating politics (DS4, DS7).

Surely, CC is changing environmental conditions in many places and the actors involved need to reassess their relation to the environment, and renegotiate their relations to each other. Generally, we observed that particularly public actors are taking responsibility, show a willingness to engage, and are seeking ways to incorporate CA actions. This is also highly necessary given the fact that CA is a new field of action for many public and private actors.

### 5.1 Common governance challenges across the DSs

Several governance challenges can be identified that transcend the local level. One such governance challenge that emerges from this analysis is the sheer vastness of CA policies, frameworks, platforms, projects and cooperations. Sharing knowledge between researchers, policy makers and practitioners proves particularly difficult. While Climate-ADAPT provides a gateway into this at European and national levels, and the Covenant of Mayors at the local level, obtaining a comprehensive overview of policies and initiatives, and knowing how to make use of possibilities, can be a daunting task. This is especially true for actors that operate at smaller scales, such as municipalities and local-level organisations that already face capacity problems.

More generally, the exchange between different levels of government appears in many cases to be riddled with communication gaps. Our interviewees pointed at a lack of interaction with higher levels of government, including the state and the EU. EU and national level policy-makers were considered particularly difficult to reach. The EU is unmistakably a key driver of CA actions through its various funding programmes and CA taxonomy. However, beyond the provision of financial resources, the role of, and relationship to, the EU or EC was in many cases not sufficiently clear to our interviewees.

Related to this, a recurring theme across the DSs is that CA urges for localised place-based solutions whereas CA is often implemented in a top-down fashion with limited flexibility or policy learning for and from the municipalities. Given the pertinent capacity issues at the municipal level, this is rather problematic, particularly for smaller municipalities and regions that also face aging and declining populations.

While the Paris Agreement states that CA and CM measures should take a “gender-responsive, participatory and fully transparent approach, taking into consideration vulnerable groups, communities and ecosystems,”<sup>17</sup> our interviewees in the different countries tended to agree that the CA policies that are currently being developed or implemented lack a view on social concerns such as poverty, education levels or age and gender. Hence, there is much work to be done to make CA responsive to social inequalities. This step is crucial for CA policies to gain societal support.

Another governance challenge we identified across DSs is the variable urgency of adapting to CC impact. In most cases, CA is not perceived as the primary concern in people’s lives. Especially in the current moment where energy prices and inflation are at an all-time high, prioritising CA is a serious challenge. Our interviewees from various DS regions pointed out that the sense of urgency for CA has definitely increased in recent years, and especially when extreme events have happened such as floods, droughts, or wildfires. However, they also voiced the concern that this sense of urgency could quickly diminish as these events recede from collective memory. Moreover, the preventive nature of



many CA actions means that the effects of CC are to be averted, and therefore might not reach the necessary level of urgency needed for decision-making. Moreover, positive experiences from when CA measures have been successful may receive less attention than CC-related emergencies that show a failure to adapt.

Getting the private sector involved in developing and implementing CA measures is a major challenge and this has been achieved to variable success. This may be ascribed to the different models of consultation and participation with which the various DS countries and regions have been working. As a result, CA appears to still largely be understood as a problem for governments and knowledge institutions to tackle. In general, a more concerted effort to involve the private sector into taking responsibility is needed.

Another challenge is related to the temporal character of CA. CA is, by definition, a long-term endeavour. Interventions made now may not yield results for many years. This type of hyperbolic discounting means that local politicians, who might feel the need to deliver results within their four-year re-election period, are facing decisions between long-term CA measures that may be unpopular and require large investments in the present, and actions that address societal challenges of a more visible and immediate nature. Moreover, CA policy itself is new and developing. As with any policy field, it takes time for the necessary knowledge to spread, policies to crystallise, and relationships to grow. At the same time, knowledge about CC and CA are developing rapidly, as is CC itself, setting a challenge for all actors to keep up with the pace of the changes.

Finally, although this research did not focus specifically on funding structures, interviewees in all DSs indicated that they experienced or expected insufficient funding for CA. In many cases, CA measures are expected to be implemented within the existing capacity and funding of the public sector, or funding is limited to EU programmes and Horizon projects. As a result, many (local) actors are facing capacity problems to address CA. Ensuring financial continuation for localised public coordination of climate adaptation will be crucial in the years to come.

## 5.2 Next steps

The analysis conducted in this study provided an overview of key multi-level governance challenges for CA solutions in the seven IMPETUS DSs. Each DS will identify a sub-set of these governance challenges to be discussed with their stakeholders over the course of the IMPETUS project. Specifically, DSs will plan moments of discussion with their stakeholders in their stakeholders engagement roadmap, which they are currently developing in the context of T1.1 and that will be collected in deliverable 1.1 due by the end of January 2023 and revised at M24 of the project in deliverable 1.2. Additionally, as the DSs identify the governance challenges they will focus on, they are encouraged to involve the insights from deliverable 3.1, which focuses on metrics and indicators for CC vulnerability, resilience, and adaptation. Ultimately, it is expected that DSs and their stakeholders will formulate ideas and proposals for overcoming these governance challenges to support the implementation of the IMPETUS solutions in their region and to identify the most appropriate indicators to monitor progress. The outcome of such discussions will be reported in deliverable 1.4 due by M48.





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## Annex: List of interviews

DS	Interview Nr	Sex	Sector type	Specification
DS1	1.1	F	Public	Water utility
	1.2	M	Private	Insurance company
DS2	2.1	M	Civil	Conservation NGO
	2.2	M	Public	Municipal government
	2.3	M	Knowledge	Research centre
DS3	3.1	F	Public	State education board
	3.2	M	Private	Water utility
	3.3	F+M	public	National government
DS4	4.1	F	Public	Municipal government
	4.2	M	Knowledge	University
	4.3	M	Public	Provincial government
DS5	5.1	M	Private	Insurance company
	5.2	F	Civil	Media and journalism
	5.3	F	Public	Municipal government
DS6	6.1	M	Knowledge	University
	6.2	F	Civil	Conservation NGO
	6.3	M	Public	Provincial government
	6.4	F	Civil	Conservation NGO
DS7	7.1	M	Public	Municipal government
	7.2	F	Public	Provincial government
	7.3	F+M	Private	Insurance company
	7.4	F	Public	Agriculture cooperative
	7.5	F	Public	Provincial government

### Total

Nr of interviews	23
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Male participants	13
Female participants	11

Public sector	12
Civil society	4
Knowledge sector	3
Private sector	4

