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Operationalising Resilience in Climate Action (ORICA)

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Lead organisations: Irish Climate Analysis and Research UnitS (ICARUS), Maynooth University

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Rialtas na hÉireann
Government of Ireland

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4. Office of Radiation Protection and Environmental Monitoring
5. Office of Communications and Corporate Services

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What did this research aim to address?

The Operationalising Resilience in Irish Climate Action project aimed to strengthen Ireland's ability to build climate resilience by examining how resilience is currently framed and put into practice across national, sectoral and local adaptation policies. As Ireland continues to scale up its climate action, developing a shared understanding of resilience is essential to support effective planning and help practitioners deliver meaningful outcomes for communities. This work is important for policymakers, local authorities, state agencies and communities, who are increasingly involved in adaptation decision-making. A clear and coherent approach to resilience can enhance coordination and help make adaptation more effective and equitable.
The project adopted an innovative mixed-methods approach that combined detailed analysis of national and local policies, systematic mapping of adaptation actions, and engagement with practitioners, particularly in the water sector. This integrated perspective allowed the research to assess resilience across multiple governance levels and identify opportunities to enhance implementation. The approach is novel in its focus on both the evolution of policy and the practical experience of those implementing it.

What did this research find?

The research found that Ireland has made steady progress in integrating resilience into climate adaptation policy, with newer national frameworks placing greater emphasis on long-term planning, governance and equity. Stakeholder interviews with practitioners in government, local authorities and the water sector reinforced this, highlighting a growing awareness of resilience and a genuine willingness to improve adaptation practice.

At the same time, interviews highlighted several challenges that limit how effectively resilience is being put into action. Many practitioners reported that resilience is defined differently across national, sectoral and local plans, making it difficult to align work and measure progress. They also described capacity pressures – such as limited staff, competing responsibilities and short-term funding – as major barriers to moving from planning to concrete implementation. Fragmented governance structures can lead to duplication of effort or uncertainty about roles. Despite these hurdles, stakeholders pointed to real strengths: local authorities are emerging as important drivers of community-focused and nature-based adaptation, and national policy is evolving in ways that can support more coherent action. Overall, the findings suggest that, while strong foundations are in place, clearer guidance, better coordination and sustained investment are needed to fully operationalise resilience across Ireland.

How can the research findings be used?

The research offers practical guidance on how Ireland can build on recent progress and strengthen its approach to climate resilience. Policymakers can use the findings to refine future versions of the National Adaptation Framework and sectoral plans by providing clearer definitions, setting measurable resilience targets and improving consistency across documents. This would help practitioners understand what resilience looks like in practice and how best to deliver it. Local authorities can draw on the results to support ongoing community engagement, expand nature-based solutions and build on their emerging strengths as leaders of place-based adaptation. The study also highlights the importance of long-term investment and sustained staffing to ensure that planning efforts translate into action on the ground. National and local bodies can use the insights to improve coordination, streamline responsibilities and develop shared tools or guidance that make implementation easier. The findings also point to opportunities for deeper public engagement and more collaborative decision-making. Future work could focus on monitoring adaptation outcomes and exploring resilience in other sectors. Overall, the research provides a foundation for more coherent, practical and people-centred climate adaptation across Ireland.

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DISCLAIMER

This report is based on research carried out/data from 2023 to 2024. More recent data may have become available since the research was completed.

The EPA Research Programme addresses the need for research in Ireland to inform policymakers and other stakeholders on a range of questions in relation to environmental protection. These reports are intended as contributions to the necessary debate on the protection of the environment.

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Executive Summary

Ireland faces increasing climate risks, requiring a robust and coordinated approach to adaptation. Resilience is central to national climate adaptation strategies, yet its operationalisation varies across policy documents and governance levels. The Operationalising Resilience in Climate Action (ORICA) project evaluates how resilience is framed, implemented and integrated across scales, with a focus on identifying leverage points for systemic change. In doing so, the project employs a mixed-methods approach to assessing how resilience is operationalised in Irish climate policy, combining policy analysis, adaptation action mapping and practitioner interviews.

Our results show that the framing of resilience influences policy implementation. Ireland's adaptation policies via the National Adaptation Framework (NAF) have evolved from focusing on maintaining stability (NAF18) to integrating governance, equity and long-term transformation (NAF24). However, inconsistent definitions of resilience across policy documents create confusion, hindering alignment and effectiveness in implementation. At the national level, adaptation emphasises planning over action, with limited engagement of civil society, academia and the private sector. Most actions (95%) at the national scale (from NAFs, Climate Action Plan 2024 and sectoral adaptation plans) focus on building resilience within existing systems rather than transformative change. There is a strong focus on management and planning (42% of actions), encompassing risk assessments of future climate impacts and data collection, rather than proactive adaptation. At the local level, adaptation shows greater potential for transformation. Local authority climate action plans have a higher proportion (25%) of transformative actions than national adaptation plans. Local authorities integrate nature-based approaches and community engagement more effectively, but require considerably more support and coordination.

Key challenges in operationalising resilience emerge from planning and capacity constraints at all levels, particularly fragmented adaptation governance and inadequate financial and human resources. Conflicting priorities are often apparent and frequently associated with the absence of clear, measurable resilience targets and guidance, making it difficult to achieve coherence among practitioners and resulting in conflicting aims and ad hoc implementation. Political buy-in is often perceived to be lacking. Engagement with adaptation via the NAF is only mandatory for departments that agree to inclusion. While sectors named in the NAF have committed to developing and implementing adaptation plans, other sectors are seen as missing and have not engaged. The lack of a people-centred approach is evident, particularly at the national scale. While reviews of public engagement are undertaken, this tends to be at the end of the process once draft reports are complete, with participation from the public being limited.

Opportunities for transformation include:

- establishing a unified definition and understanding of resilience across all climate adaptation policies to ensure coherence and integration;
- enhancing cross-sectoral and multilevel governance to improve coordination between national, sectoral and local adaptation plans, to ensure consistency, integration and avoidance of conflicting priorities;
- shifting from planning to implementation by increasing investment and prioritising funding and capacity building to facilitate transformative adaptation;
- ensuring inclusive and equitable adaptation by expanding participatory decision-making processes to integrate public and stakeholder input into adaptation planning.

Ireland's adaptation policies are evolving, and progress is being made, but operationalising resilience effectively requires stronger governance, financial investment and inclusive decision-making. Shifting from a risk-based planning model that is dominated by science, projections and a view of climate as the only challenge towards proactive, community-driven implementation will be critical to ensuring a climate-resilient future.

1 Introduction

1.1 Resilience, Definition and Operationalisation

Resilience in climate policy is most often deployed in the context of adaptation to climate change. It is a potentially useful concept because it has purchase across sectors, academia and practitioners (Bahadur *et al*., 2013). The term is heavily integrated into adaptation policy at the global, national and local scales. The Paris Agreement (UNFCCC, 2016) calls for enhancing adaptive capacity, strengthening resilience and reducing vulnerability to climate change. Ireland's national climate policy position, established via the Climate Action and Low Carbon Development Acts 2015 to 2021, establishes the national objective of "the transition to a climate resilient, biodiversity rich, environmentally sustainable and climate neutral economy". While resilience is a central outcome and characteristic of this future vision of Ireland, the concept of resilience itself is relatively new in policy terms, and to the public. Despite its common purchase, it is used in different ways across disciplines and perspectives, with its precise meaning often open to interpretation, resulting in differing, and at times competing, definitions.

1.2 Two Broad Schools of Thought on Resilience

There is a burgeoning body of literature on resilience and its theoretical and practical framing (e.g. Adger *et al*., 2011; Nelson, 2011; Morecroft *et al*., 2012; Davidson *et al*., 2016; Abeling *et al*., 2018). In broad terms, the concept of resilience has evolved along two primary pathways. The first sees resilience as an equilibrium and climate change as something to be absorbed while maintaining the existing function of a system. Emphasis is placed on increasing the ability to recover and bounce back to pre-existing states ("bounce-back-ability" as it is sometimes called). Within this conceptualisation, resilience is about maintaining the status quo and rapid recovery following disturbance. Adaptation for resilience is aimed at increasing the ability of the existing system to resist climate change impacts and maintain functionality without significant degradation. This type of resilience does not necessarily address underlying exposure, vulnerability, governance or system structure.

The second pathway derives from ecology and complex systems research, and emphasises resilience as a character of both natural and social systems or so-called "socio-ecological systems" (SESs). This approach accentuates complexity, adaptivity and transformation. Emphasis is placed on developing the capacity of social and ecological systems to adjust to climate change by modifying behaviours, governance systems and ecological interactions (Folke *et al*., 2010). Attention is given to the transformability of a system or its capacity to reorganise or innovate in response to significant challenges. SES approaches to resilience often highlight connectivity, encouraging collaboration and coordination across systems, sectors, levels of governance and regions (Abson *et al*., 2017). These approaches recognise the importance of social capital or the networks, relationships and capacity within communities that facilitate action. To this end, policies often aim to strengthen community engagement and participation in planning and decision-making. Because resilience is seen as dynamic and changing, attention is given to learning from past experiences, monitoring the outcomes of interventions and innovating to address emerging and future challenges (Tschakert and Dietrich, 2010). With its greater emphasis on people, SES resilience is sometimes concerned with ensuring equity and justice by prioritising the fair distribution of resources, risks and opportunities. Justice in adaptation planning is often characterised by participation in planning (procedural justice), fairness in the benefits and burdens of outcomes (distributional justice), and the inclusion of marginalised voices (recognitional justice) (Newell *et al*., 2021). Finally, SES approaches to resilience often recognise the importance of ecosystem services (water, food, etc.) and aim to protect and restore nature, often through nature-based approaches, to support the capacity of natural ecosystems in supporting wider resilience.

1.3 Why Exploring Operationalisation is Important

Given the widespread deployment of resilience in climate policy as a guiding principle and policy outcome, it is important to understand what is meant by pursuing or implementing resilience (McEvoy *et al*., 2013). It is a term that is used in different ways across disciplinary and policy spheres, sometimes applied to individuals, collectives, infrastructure and broader systems. Inevitably, this has led to divergences and some contradictions in how resilience is mobilised, with evidence of inconsistent application (Aldunce *et al*., 2014; Wardekker, 2021). Resilience is often framed as the ability of a system to absorb perturbation and persist without having to change its fundamental structure (Holling, 1973). The idea of persisting and maintaining function evolved to include the ability to adapt to conditions with increasing focus on the social elements of systems (Adger *et al*., 2005). Sometimes this divergence is a reflection of the *focus* or *subject* of resilience, for example the resilience of infrastructure, the resilience of communities or the resilience of economies. In focusing on different areas of resilience, different values are made. Measuring the resilience of infrastructure considers the strength and durability of roads, electricity networks, etc.; assessing the resilience of communities could include a focus on wellbeing, health, employment and education; and assessments of the resilience of an economy often focus on gross domestic product and wealth (although this is changing with ideas around doughnut economics, for example). Having different subjects of resilience can often result in incommensurable methods of operationalising and measuring effectiveness – wealth, for example, is not necessarily an appropriate measure of resilient communities. Similarly, there are many challenges and pressures that systems need to be resilient to, with climate change being one, and therefore the nuances of climate resilience can get lost in the crowd. Bringing these aspects together to build general resilience can present challenges for policymakers, with certain framings often prevailing that do not accurately reflect climate change resilience across settings and populations.

These variations make the term “climate resilience” vulnerable to conceptual vagueness, resulting in the development of multiple norms, methods and priorities (Wardekker, 2021). Without consensus, it can be difficult to meaningfully measure resilience. Understanding different framings of resilience can be useful in unpacking synergies and potential gaps that may open when different people and organisations prioritise resilience in policy development (Walker, 2020). Framing refers to the processes by which issues and decisions acquire different meanings through highlighting certain aspects of a situation and different boundaries around an issue (Dewulf, 2013). Frames are essentially “structures of beliefs, perception and appreciation that underlie policy positions” (Wardekker, 2021). Framings of issues, such as climate change adaptation or resilience, have implications for how resources are directed. What is the subject of resilience? What values are prioritised through certain framings? Framings can be mobilised strategically by including or excluding particular aspects (Dewulf, 2013). Through framing, particular interests are communicated and promoted, setting frame-specific objectives and measures of success.

While these definitions provide a conceptual foundation and grounds for academic debate, a policy-relevant challenge lies in translating resilience into actionable strategies and tangible outcomes, that is, in determining how resilience can be operationalised (Allen *et al*., 2011; Davidson *et al*., 2016). Different framings of resilience can have advantages and disadvantages – including flexibility to context, ambiguity in policy and practice, fragmentation of implementation and inclusion/exclusion of the vulnerable – and can give rise to challenges in relation to deciding what the best data are for informing decision-making and how implementation and outcomes can be tracked, etc. Understanding how resilience is operationalised in the Irish context helps to determine which version of resilience is most likely to emerge in the future – one based on maintaining the current status quo or one with the capacity to transform systems for a more sustainable and just future (Abeling *et al*., 2018). Exploring how resilience is operationalised is crucial for ensuring that the concept translates effectively into practical measures, allowing a more structured approach to identifying gaps in current practices and fostering synergies across sectors and scales (Carpenter *et al*.,

2001). Understanding how resilience is operationalised is essential for ensuring that adaptation strategies address both immediate needs and systemic vulnerabilities. The concept of resilience is not without its critics (e.g. Cretney, 2014; Cutter, 2016; Chandler, 2020). Many argue that resilience embeds assumptions such as it being an inherently positive trait. However, bad systems, for example poverty traps and inefficient systems, can also be resilient. Cote and Nightingale (2012) have pointed out that resilience is often framed as inherently positive, overlooking the possibility that certain forms of resilience may perpetuate systemic inequalities or maladaptation. The operationalisation of resilience in policy has also been critiqued for its tendency to shift responsibility from state actors to individuals and communities, with an emphasis on self-reliance and local adaptation. Such approaches often neglect the structural drivers of vulnerability, such as social and economic inequality. Exploring how resilience is operationalised in an Irish context allows these potentially negative aspects to be evaluated and avoided.

Nationally, this is an opportune moment to assess and reflect on how resilience is operationalised. Policy on delivering climate resilience is currently being updated in Ireland. The National Adaptation Framework (NAF) (DECC, 2018, 2024) was updated in 2024 based on an in-depth consultative process with practitioners and academics. The first iterations of sectoral adaptation plans (SAPs), published in 2018, are now nearing completion, with lessons having been learned about what is working and what is not. Updated SAPs are due in 2025, while local authorities have recently (2024) published their climate action plans, which include priority actions for mitigation and adaptation over the coming years. These action plans provide the opportunity to identify how resilience is being operationalised at the local level.

1.4 ORICA Project Aims and Objectives

Within this context, the Operationalising Resilience in Climate Action (ORICA) project sought to map understandings, definitions and framings of climate resilience and explore how climate resilience is being formally operationalised and implemented across scales in Ireland. In doing so, the project aims to identify key leverage points and opportunities for enabling more cooperative and holistic approaches that go beyond a singular focus for resilience in Ireland. The report is organised into five chapters, each of which addresses a core aim of the project work. Chapter 2 examines actions set out in key policy documents, primarily in SAPs and local authority climate action plans (LACAPs), to discern what these actions tell us about how resilience is framed and deployed, along with the responsibilities for action across sectors and scales in Ireland. Chapter 3 describes close engagement with practitioners in the water sector, a core sector for national resilience and also an exemplar for the complexities involved in operationalising resilience. The project team conducted interviews with key stakeholders across the sector to explore in more depth the meaning of resilience and the challenges encountered in its implementation. Chapter 4 continues with the analysis of these interviews to highlight what transformation would look like from the perspective of these practitioners. This chapter also focuses on the lessons learned, pointing to ways of better operationalising resilience and actions that would be transformative (i.e. addressing perceived limitations and allowing scaling up and more integrated adaptation) from the perspective of the practitioners who took part in our interviews. Finally, Chapter 5 draws key conclusions from the project and makes recommendations for policy and practice.

2 Resilience: Framing, Actions and Responsibilities in Irish Adaptation Policy and Plans

2.1 Introduction

This chapter examines how resilience is framed in Irish climate policy, in particular how framing can influence how resilience is operationalised through the types of actions identified and the responsibilities and linkages that emerge. First, we focus attention on the meaning of resilience in national policy, examining the definition of resilience and its framing in the NAFs published in 2018 (DECC, 2018) and 2024 (DECC, 2024), henceforth NAF18 and NAF24. These key policy documents have provided the framework for delivering climate resilience across the national and local levels over the past 8 years. Next, moving from framing to practice, we explore how resilience is operationalised in current sectoral adaptation and national and local climate action plans.

2.2 Framing of Resilience in the National Adaptation Framework

Different definitions of resilience appear in key climate action documents nationally, sometimes even in the same document. For instance, two different definitions of resilience even appear within each of NAF18 and NAF24. Resilience is defined in the glossaries of these NAFs as "... the ability of a social or ecological system to absorb disturbances while retaining the same basic ways of functioning, and a capacity to adapt to stress and change" (definition 1) (DECC, 2018, 2024).
In the main text of each NAF, resilience is defined as "The capacity of a system, whether physical, social, or ecological, to absorb and respond to climate change and, by implementing effective adaptation planning and sustainable development (including governance and institutional design), to reduce the negative climate impacts while also taking advantage of any positive outcomes" (definition 2) (DECC, 2018, 2024). The latter definition is in line with the definition used by the Intergovernmental Panel on Climate Change. While such differences in definition may seem trivial, they can have important implications for how resilience is operationalised (see Table 2.1).

Definition 1 emphasises only social and ecological systems and is more closely aligned with maintaining stability and incremental change than definition 2. Definition 2 expands the scope of resilience to include physical systems, broadening operationalisation to critical infrastructure, urban planning and technology, alongside social and ecological systems. It offers a more integrated and cross-sectoral approach that leverages coordination across sectors and demands a structured and well-governed implementation framework, requiring dedicated resources, policy alignment and institutional collaboration. Rather than simply seeing resilience as the maintenance of the status quo, definition 2 allows for responding and adapting, with opportunities for innovation and sustainable development, emphasising a balance between stability and transformation. It also highlights the potential for positive outcomes (e.g. economic, social or environmental opportunities) through well-planned adaptation and encourages proactive,

Table 2.1. Differences in operationalisation emphasis in the resilience definitions in NAF24

Operationalisation	Definition 1	Definition 2
Emphasis	Stability and control	Being proactive, seeking opportunity and possible transformation
Scale of change	Incremental adjustment	Transformation towards sustainable development
Governance	Implied but less emphasised	Central role in planning, governance and institutional design
Time horizon	Focus on short- to medium-term continuity	Long-term forward-looking planning
Opportunity framing	None emphasised	Actively seeks to leverage positive outcomes
Justice/equity implications	None emphasised	Aims to address inequalities and promote inclusivity

Definition 1 is used in the glossary and definition 2 in the main text of NAF24 (DECC, 2024).

opportunity-seeking strategies, which might involve innovation, rather than solely defensive measures.

Plans emanating from and mandated by the NAFs have not always persisted with the same definitions or framing of resilience. For example, different definitions of resilience can be found in sectoral plans and even within the National Climate Change Risk Assessment (NCCRA), where a much narrower view of resilience is taken, defined as "the capacity of built assets and infrastructure to endure acute shocks and chronic stresses while successfully adapting to long term changes" (EPA, 2025). Such a framing is entirely focused on infrastructure and built assets, omitting underlying social and ecological resilience and emphasising engineering resilience, the maintenance of the status quo, top-down engineering and technical planning, in direct contrast to the framing of resilience in NAF24. Given the centrality of resilience to climate policy, such proliferation of different definitions runs the risk of creating confusion, and even conflicting actions in operationalisation (see Chapter 3).

Despite the same definitions of resilience appearing in NAF18 and NAF24, the framing of resilience within NAF24 has evolved to emphasise justice, collaboration and equitable participation in adaptation processes. This is achieved by accompanying the above definition with the aim of just resilience, which highlights the fair distribution of adaptation benefits and inclusive decision-making. NAF24 encompasses social, ecological and economic systems, with a strong emphasis on community-level engagement and marginalised groups. By comparison, NAF18 is more explicitly concerned with infrastructure, economy and critical systems resilience, with a secondary focus on social aspects. These broader framings within the NAFs have implications for how resilience is operationalised. Within NAF18, resilience is typically operationalised through top-down planning, mainstreaming resilience into sectoral plans, capital investment and infrastructure projects. A typically centralised governance structure is emphasised, prioritising the role of government agencies to drive implementation. Public engagement is noted but facilitated through high-level vehicles such as the National Dialogue on Climate Action and Citizens' Assembly. Measurement of resilience is focused on risk-based metrics of future climate change impacts (e.g. percentage change in heavy rainfall) and technical evaluations of risks that are more easily quantifiable. Barriers to resilience implementation are noted as relating to finance, insufficient governance and lack of knowledge.

In NAF24, resilience is embedded though inclusive decision-making, participatory governance and a focus on justice. New approaches to nature-based approaches and the co-benefits of actions for adaptation and mitigation come to the fore. NAF24 encourages greater collaboration across all domains and scales, including civil society, to ensure that resilience planning is equitable and reflective of diverse needs. It more strongly recognises the importance of collaboration for dealing with cross-sectoral risks. Monitoring of resilience is focused on outcome-based indicators such as reduced vulnerabilities, improved community capacity and enhanced equity in adaptation efforts. Barriers to resilience are extended to include issues such as inequality, lack of trust and inadequate engagement, and solutions include transparent dialogue and empowering marginalised groups.

2.3 Operationalisation of Resilience at the Sectoral and Local Levels

Moving from the framing of resilience to its implementation, this section explores the adaptation actions outlined within SAPs and LACAPs, to shed light on how resilience is being operationalised on the ground. Our analysis is presented at the national/sectoral and local levels. For the national assessment, we also include adaptation actions noted in NAF18 and NAF24, in addition to the national Climate Action Plan 2024 (CAP24). It is important to recognise that existing SAPs were formulated in the context of NAF18, while LACAPs and CAP24 were formulated in the transition from NAF18 to NAF24. This offers an opportunity to examine if and how changes in the framing of resilience lead to different actions.

The methods employed are outlined in Figure 2.1. We collated a dataset of 292 adaptation actions at the national/sectoral level and 348 adaptation actions from LACAPs. Adaptation actions were categorised into typologies developed by Biagini *et al*. (2014), who proposed 10 different adaptation types following a global assessment of adaptation actions (Figure 2.2 and Table 2.2). The distribution of actions across each typology was evaluated and responsibilities/collaborations for implementing

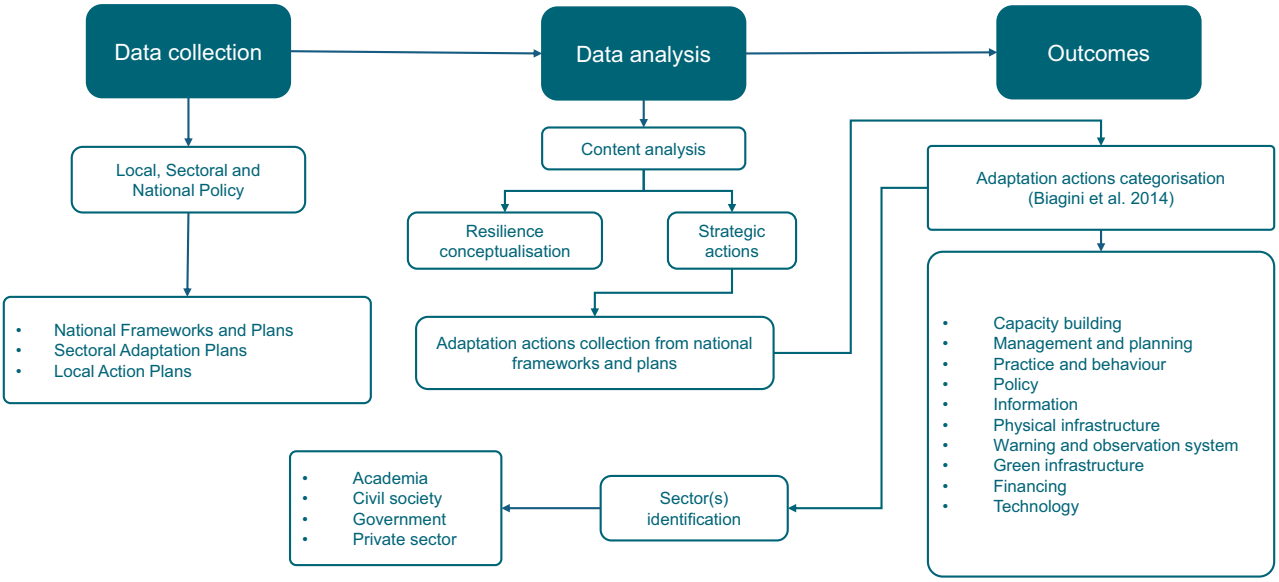

Figure 2.1. Data and methods employed for the assessment of resilience in Irish policy at the national and local scales.

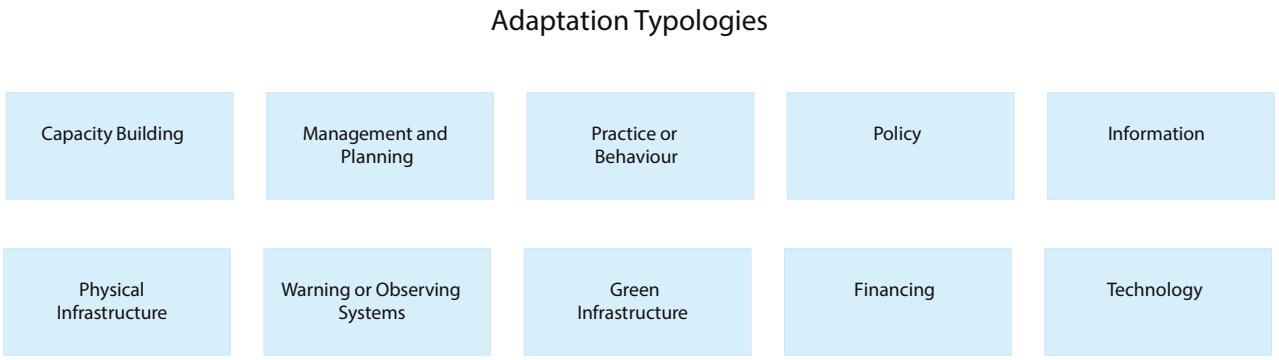

Figure 2.2. Adaptation typologies developed by Biagini *et al*. (2014) and used to categorise adaptation actions in sectoral and local plans.

actions mapped across four broad realms, namely government, academia, civil society and the private sector. This mapping was conducted at the sectoral and local levels independently.

Each adaptation action was also categorised as being focused on resilience, resistance or transformation, henceforth known as their resilience, resistance and transformative (RRT) categorisation (Peterson St-Laurent *et al*., 2021). Resistance actions were identified as those aimed solely at protecting existing systems, often without adaptation to future risks. Resilience actions were categorised as those aiming to prepare for, adapt to and recover from specific climate risks without fundamentally changing underlying systems. Finally, transformation actions were those that could be considered to embrace systemic changes, long-term thinking and innovation, to address the structural causes of vulnerability, while aligning with broader sustainability objectives (Kareiva and Fuller, 2016). This study design facilitates not just the assessment of adaptation typologies but also the assessment of whether adaptation actions merely defend against climate risks, build adaptive capacity or fundamentally shift systems to align with a climate-resilient future.

2.3.1 National and sectoral adaptation plans

In total, 292 adaptation actions were identified across SAPs, both NAFs and CAP24. Each action was mapped to a specific adaptation typology (Figure 2.3). The most dominant typology was “Management and Planning”, which accounted for 133 (42%) actions.

Table 2.2. Description of each adaptation typology developed by Biagini *et al*. (2014) and deployed here

Typology	Definition
Capacity Building	Developing human resources, institutions and communities, equipping them with the capability to adapt to climate change
Financing	New financing or insurance strategies to prepare for future climate disturbances
Green Infrastructure	Any new or improved soft, natural infrastructure aimed at providing direct or indirect protection from climate hazards
Information	Systems for communicating climate information to help build resilience towards climate impacts (other than communication for early warning systems)
Management and Planning	Incorporating understanding of climate science, impacts, vulnerability and risk into government and institutional planning and management
Physical Infrastructure	Any new or improved hard physical infrastructure aimed at providing direct or indirect protection from climate hazards
Policy	The creation of new policies or revisions of policies or regulations to allow flexibility to adapt to changing climate
Practice or Behaviour	Revisions or expansion of practices and on-the-ground behaviour that are directly related to building resilience
Technology	Develop or expand climate-resilient technologies
Warning or Observing Systems	Implementation of new or enhanced tools and technologies for communicating weather and climate risks, and for monitoring changes in the climate system

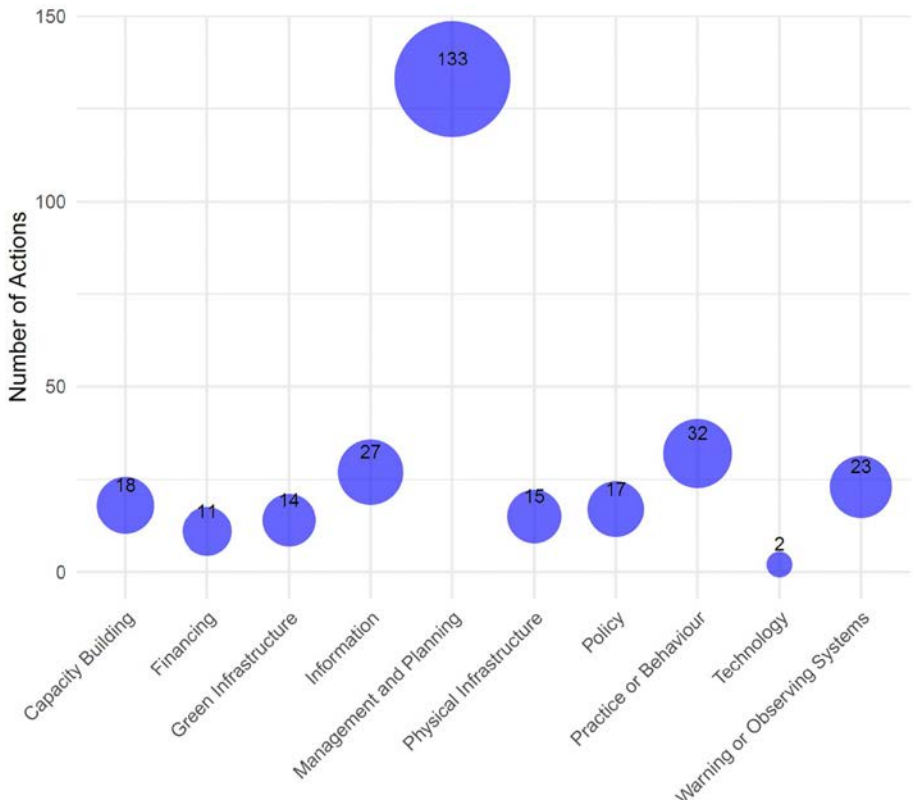

Figure 2.3. Bubble diagram of actions associated with each of the 10 adaptation typologies (see Table 2.2) in the NAFs and SAPs.

These typically refer to actions that seek additional scientific analysis to inform the expected impacts of climate change, reviews of national plans and assessments of observed coastal change, flood risk and vulnerability, etc. (see Table 2.3). The typologies "Practice or Behaviour" (11%), "Information" (9%) and "Warning or Observing Systems" (8%) were the next most frequent (see Table 2.3 for examples). Less frequently mentioned typologies included "Capacity

Table 2.3. Example actions associated with the four most dominant typologies, as shown in Figure 2.3

Typology	Example actions
Management and Planning	Assessment of appropriate adaptation measures for existing flood relief schemes, where climate change may in time affect the current standard of protection (OPW, 2019, p. 74)
	Build and refine Irish-specific climate change epidemiology relating to air pollution and identify risk groups (DOH, 2019, p. 51)
	Commission a study to identify common criteria to define critical assets within the transport, communications and energy sectors (DTTS, 2019, p. 87)
Practice or Behaviour	Consider adaptation needs in contracts, performance delivery agreements and service-level agreements (DTTS, 2019, p. 90)
	Implementation of forest protection and health measures (DAFM, 2019, p. 84)
	Proposals submitted under the Minor Works Programme should take account of the potential impacts of climate change to ensure, where possible, that any measures proposed are adaptable to possible future changes (OPW, 2019, p. 74)
Information	Build public awareness of the risks of climate change (in general and for heritage) and of efforts to mitigate and adapt to it (DCHG, 2019a, p. 68)
	Continue to develop and improve communications and information provision to users, and public awareness (DCCAE, 2019, p. 87)
	Maintain and update on an ongoing basis the National Flood Event Database (www.floodinfo.ie) (OPW, 2019, p. 74)
Warning or Observing Systems	Establish and implement an all-island invasive species programme to monitor the spread of terrestrial, aquatic and marine invasive species in a changing climate, and control invasive species where their spread is considered problematic (DCHG, 2019b, p. 49)
	Implementation of a monitoring programme and research to understand changes in distribution of species (DHPLG, 2019, p. 100)
	Monitor phenological change, including in phenological gardens (DCHG, 2019b, p. 51)

Building" (6%), "Policy" (6%), "Green Infrastructure" (5%), "Physical Infrastructure" (5%), "Financing" (4%) and "Technology" (1%). For "Capacity Building", actions tended to focus on building relationships with stakeholders (most often other government departments), training of existing staff, sharing of data and supporting local authorities.

In terms of RRT categorisation, the vast majority (95%) of actions were categorised as resilience focused, with just under 5% of actions being categorised as potentially transformative (Table 2.4). The latter tended to fall within the "Green Infrastructure", "Financing", "Capacity Building" and "Practice or Behaviour" typologies. More than half of these transformative actions were associated with actions noted in NAF24 or CAP24 and related to climate action guiding social, economic and cultural development, investment in critical infrastructure, and doubling the climate finance component of international development assistance. Across the SAPs, the highest number of potentially transformative actions were associated with the biodiversity plan and related to nature-based approaches as novel additions to the adaptation toolkit.

Our analysis also facilitated the identification of actors associated with actions. We mapped actions within each typology in terms of their interlinkages across four actor types (academia, civil society, government and the private sector). The results are shown in Figure 2.4. The dominance of government actors in implementing actions across all typologies is evident. The government is responsible for 81% of actions, with academia and the private sector being associated with 8% and 7% of actions, respectively. The smallest cohort is civil society, associated with only 4% of actions. This speaks to the dominance of government in driving resilience, with very little engagement with those outside national or local government. Academia is typically associated with actions in "Management and Planning" (e.g. impact assessments) or "Capacity Building" (e.g. training). The private sector has links to "Physical Infrastructure", often due to the ownership by semi-state organisations of critical infrastructure nationally (e.g. EirGrid, Uisce Éireann). For civil

Table 2.4. Actions within each typology that can be categorised as having a focus on resilience, resistance and/or transformation

Typology	Resilience	Resistance	Transformation	Total
Capacity Building	15	1	2	18
Financing	7		4	11
Green Infrastructure	8		6	14
Information	27			27
Management and Planning	132	1		133
Physical Infrastructure	15			15
Policy	17			17
Practice or Behaviour	30		2	32
Technology	2			2
Warning or Observing Systems	23			23
Total	**276**	**2**	**14**	**292**

See Table 2.2 for typology definitions.

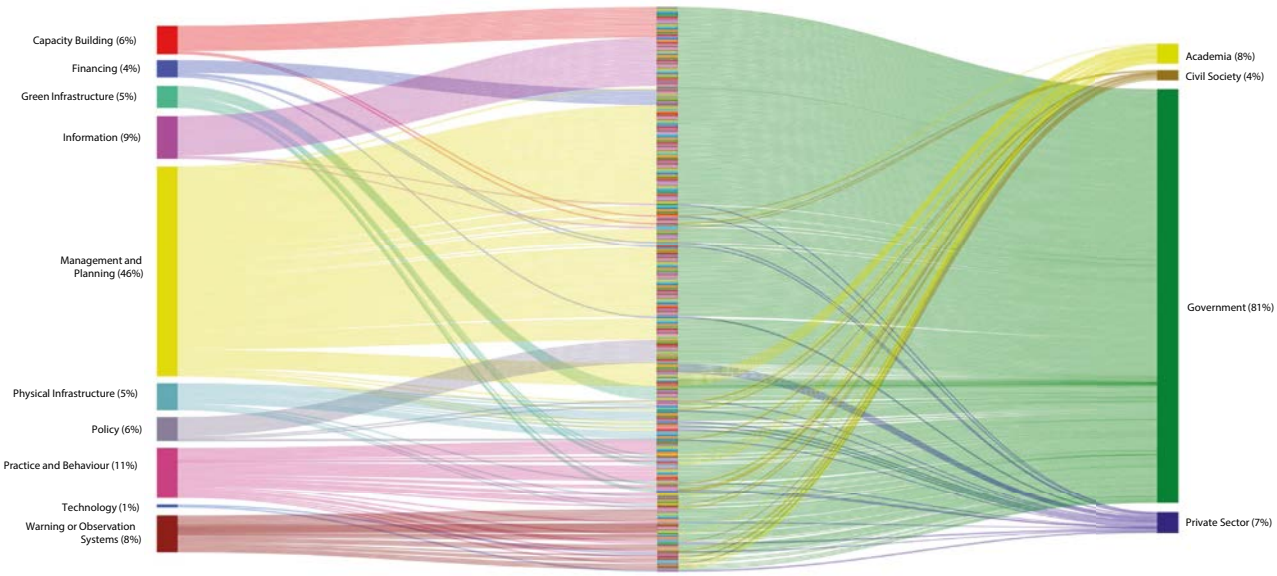

Figure 2.4. National/sectoral adaptation actions by typology in the NAF and associated linkages with academic, civil society, government and private sector actors.

society, key linkages emerge around the role of citizen science in "Warning or Observing Systems" for monitoring, through "Capacity Building" via outreach and education, and via "Financing" through the Local Authority Climate Action Fund.

It is important to note that NAF18 and subsequent SAPs mark the first iteration of adaptation planning nationally. The distribution of typologies and the predominance of resilience actions that aim to prepare for, adapt to and recover from specific climate risks without fundamentally changing underlying systems largely reflects the framing of resilience in NAF18, with a typically centralised governance structure and with sectors driving implementation, either horizontally through building relationships with other government sectors or vertically through support of local authorities. Like NAF18, actions are focused on the integration of adaptation into the existing business of government, and building the evidence base for climate action through collecting data and conducting research to drive adaptation efforts. As is evident from the dominance of the "Management and Planning" typology, adaptation and resilience are heavily grounded in assessments of future climate change impacts. Given the unevenness of such assessments across sectors, many actions seek to

address this barrier by quantifying future impacts. Public engagement or social resilience is rarely noted. While some actions highlight public awareness (e.g. raising awareness on climate risks and adaptation needs in communities), there is limited focus on empowering vulnerable communities – those most impacted by climate change. Financing of adaptation is facilitated through the development of the Local Authority Climate Action Fund, administered by local authorities and through which communities can apply for project funding on climate action (both for mitigation and adaptation). It is important to recognise that such competitive approaches to funding may bias access to community organisations that have the capacity to develop successful bids, at the expense of those that do not. Elsewhere, financing actions typically involve quantifying costs through cost–benefit analysis or seeking funds to continue existing monitoring activities. Actions across all typologies are aimed at understanding current and future exposure, and the monitoring and maintenance of existing systems and the status quo.

2.3.2 Adaptation within local authority climate action plans

A similar analysis was conducted at the local authority scale. LACAPs for all 31 local authorities in Ireland were adopted in 2024. These plans were developed during the transition from NAF18 to NAF24. Within LACAPs, climate actions are tagged as relating to mitigation or adaptation, or as being of benefit for both adaptation and mitigation. They are further organised into five areas of relevance to local authorities ("Governance and Leadership", "Natural Environment", "Built Environment and Transport", "Communities" and "Sustainability and Resource Management"). Figure 2.5 shows the distribution of LACAP actions across these areas. Those focused on adaptation make up the smallest proportion of actions (14%) and are most numerous in the areas of Natural Environment, Built Environment and Transport, and Communities. Fewer adaptation actions are tagged in Governance and Leadership and in Sustainability and Resource Management.

Actions listed in all LACAPs were collated and organised into adaptation typologies and associated with an RRT category as above. During collation, 60 (15%) actions tagged as adaptation were deemed to be focused on mitigation and removed from the analysis. We did not assess if any mitigation actions were similarly incorrectly tagged, nor did we parse those tagged as adaptation and mitigation. This could form the focus of future work. In total, our analysis is based on 348 adaptation actions from across all LACAPs, and represents a good sample of approaches for local-scale adaptation and resilience.

Table 2.5 shows the distribution of LACAP adaptation actions across areas, adaptation typologies and RRT

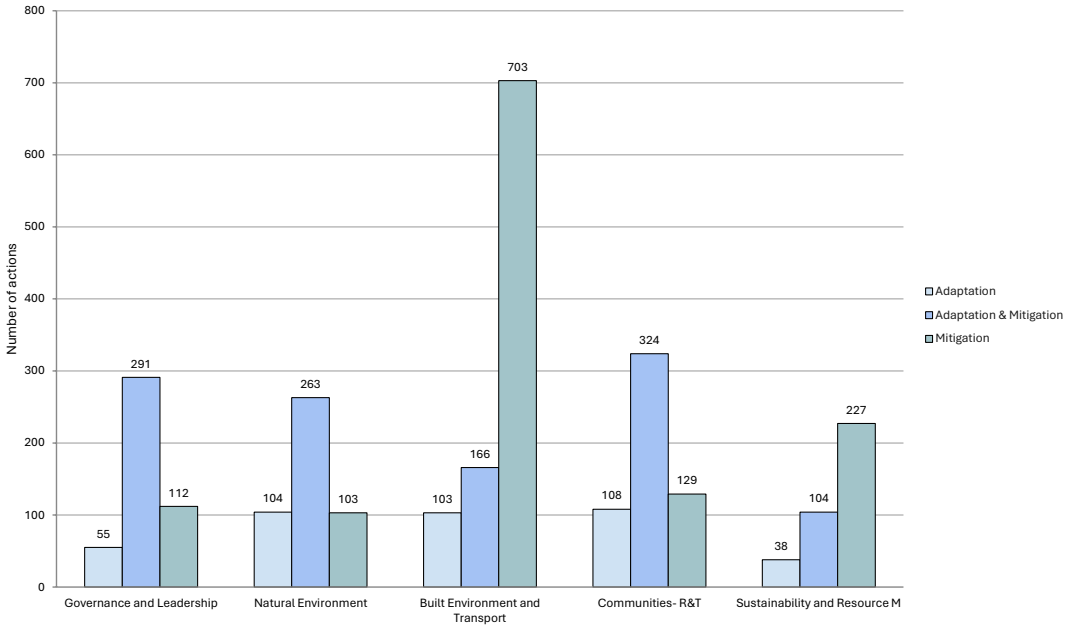

Figure 2.5. Distribution of actions tagged as adaptation, mitigation or both adaptation and mitigation in LACAPs (before removal of incorrect tags in adaptation). M, management; R&T, resilience and transition.

Table 2.5. Distribution of adaptation actions across LACAPs by area, adaptation typology and RRT category

Area/typology	Resilience	Resistance	Transformative	Total
Built Environment and Transport	70	8	12	90
Financing		3		3
Green Infrastructure	3		4	7
Information			1	1
Management and Planning	46	4	7	57
Physical Infrastructure	15	1		16
Policy	2			2
Warning or Observing Systems	4			4
Communities – Resilience and Transition	75	2	18	95
Capacity Building	7		2	9
Financing	3			3
Green Infrastructure	2		2	4
Information	2			2
Management and Planning	48		9	57
Physical Infrastructure	4		1	5
Policy	2			2
Practice or Behaviour	2		2	4
Warning or Observing Systems	5	2	2	9
Governance and Leadership	23		16	39
Management and Planning	18		16	34
Physical Infrastructure	1			1
Policy	1			1
Warning or Observing Systems	3			3
Natural Environment	61	5	37	103
Capacity Building	1		1	2
Green Infrastructure	11		12	23
Information	1			1
Management and Planning	36	4	21	61
Physical Infrastructure	2			2
Policy	4	1	1	6
Practice or Behaviour			2	2
Warning or Observing Systems	6			6
Sustainability and Resource Management	15	1	5	21
Capacity Building	3			3
Green Infrastructure			2	2
Information	1		1	2
Management and Planning	5	1	2	8
Physical Infrastructure	3			3
Technology	2			2
Warning or Observing Systems	1			1
Total	244	16	88	348

See the text for definitions of RRT.

categories. On the whole, while resilience-based actions predominate (70% of actions categorised), a considerably greater proportion (25%) of actions can be categorised as potentially transformative than was seen in the national/sectoral analysis above. Based on our judgement, these can be considered to embrace systemic changes, long-term thinking and innovation in order to address the structural causes of vulnerability while aligning with broader sustainability objectives. These actions tend to introduce novel approaches (particularly the integration of nature-based approaches), develop and maintain networks of actors, work towards the systemic integration of climate risks and resilience into long-term planning, and develop demonstration and innovation exemplars to support experimentation, innovation, learning and scaling up. Example actions considered transformative, along with associated reasoning, are provided in Table 2.6.

Across the areas of climate action adopted by LACAPs, the most predominant adaptation typology is "Management and Planning", indicating ongoing work around mainstreaming climate resilience and revising emergency response plans to account for changing climate risks. Unlike the national/sectoral analysis above, rather than being dominated by needs for further studies, these actions are dominated by integrating adaptation and climate action into workflows and governance structures. The next most frequent typology is "Green Infrastructure", recognising a commitment across local authorities to nature-based approaches, particularly for flood risk management, but also recognising multiple benefits for mitigation and sustainable resource management.

The least frequent typologies are "Technology", "Financing", "Practice or Behaviour" and "Information". Such a small number of actions in the "Financing" typology are a concern in terms of the sustainability of actions. Actions on "Practice or Behaviour" are limited to the areas of Communities and Natural Environment. These relate to integration of potentially marginalised voices in decision-making, promotion of community involvement in development and implementation of nature-based approaches, and working to realise more sustainable practice in agricultural activities such as fertiliser application. Numerous local authorities are also committing to tracking climate change impacts using technology and citizen science to assist in developing local risk profiles, and in time to inform adaptation outcomes. Integration of actions across scales is also frequently noted through actions to support implementation of SAPs in water, flooding and biodiversity in particular. Finally, it should be noted that the small number of actions tagged under sustainability and resource management is offset by the commitment to nature-based approaches and actions in other areas.

Table 2.6. Examples of actions across areas and typologies identified as potentially transformative in LACAPs

Area	Typology	Transformative action	Reasoning
Natural Environment	Green Infrastructure	Promote the integrated planning, design and delivery of green infrastructure (including urban greening) through appropriate provisions in planning policies, development standards, infrastructural, public realm and community projects	Integrates green infrastructure planning into systemic land use and urban development strategies
Governance and Leadership	Management and Planning	Ensure climate change is included in the risk register	Systematically integrates climate risks into decision-making processes at all levels
		Work with communities to pursue regenerative/ sustainable tourism initiatives in coastal areas	Promotes sustainable economic growth and working with communities, while protecting coastal environments
Natural Environment	Physical Infrastructure	Identify sites where flood defence features can be removed or relocated to increase flood capacity of rivers and estuaries	Implements innovative approaches to improve flood management and ecological restoration
Communities	Practice or Behaviour	Develop cultural, social, recreational and environmental initiatives to promote integration of different cultural communities into implementation of climate action initiatives	Fosters inclusivity and collaboration in climate action efforts

For each adaptation action, we mapped linkages in implementation to actors (Figure 2.6). Like the national/sectoral analysis, the vast majority of actions are undertaken within government, either within or between local authorities, or between local authorities and national government departments/ agencies responsible for a particular sector (e.g. the Office of Public Works for flood risk management). Despite an increase in absolute terms in the number of actions directly involving civil society relative to the national/sectoral plans, linkages remain limited, being mostly evident in the "Capacity Building", "Green Infrastructure" and "Practice or Behaviour" typologies. Actions that include linkages and engagement beyond government were disproportionately associated with transformative potential. If a climate-resilient Ireland is to realise transformative opportunities, then the further engagement of civil society in adaptation planning and implementation will be necessary at all scales.

It is worth noting that many of the actions tagged as both adaptation and mitigation in the LACAPs are associated with engagement and dissemination around broad themes of climate action. It would be worthwhile reflecting on how the importance of adaptation can be magnified in those engagements. Given the predominance of mitigation actions overall in the LACAPs, there is a risk that engagement will also be dominated by mitigation. The absence of linkages with academia and the private sector is also notable. This might be explained by the role of climate action regional offices in engaging with academia to translate science to action, and the predominance of private sector actors in mitigation rather than adaptation. These are aspects that might be further reflected on in further iterations of the LACAPs.

While the majority of actions in LACAPs are focused on the resilience of current systems, there is evidence for the integration of potentially transformative actions, particularly those that attempt to systematically integrate climate resilience into long-term planning, and the engagement and integration of communities and potentially marginalised voices. Many actions prioritise risk identification and reduction through monitoring (e.g. flood risk mapping, early warning systems), infrastructure maintenance and emergency response planning. This supports preparedness for near-term climate hazards, a fundamental component of resilience. A significant number of actions incorporate nature-based approaches, such as sustainable urban drainage systems, green infrastructure and coastal defence measures using natural processes. These approaches not only reduce vulnerability but also offer co-benefits like biodiversity protection and ecosystem enhancement. Actions are tailored to the specific risks and contexts of different local authorities, including urban heat islands, coastal erosion and flood-prone areas. Innovation is evident in the use of technology and apps like the Weather

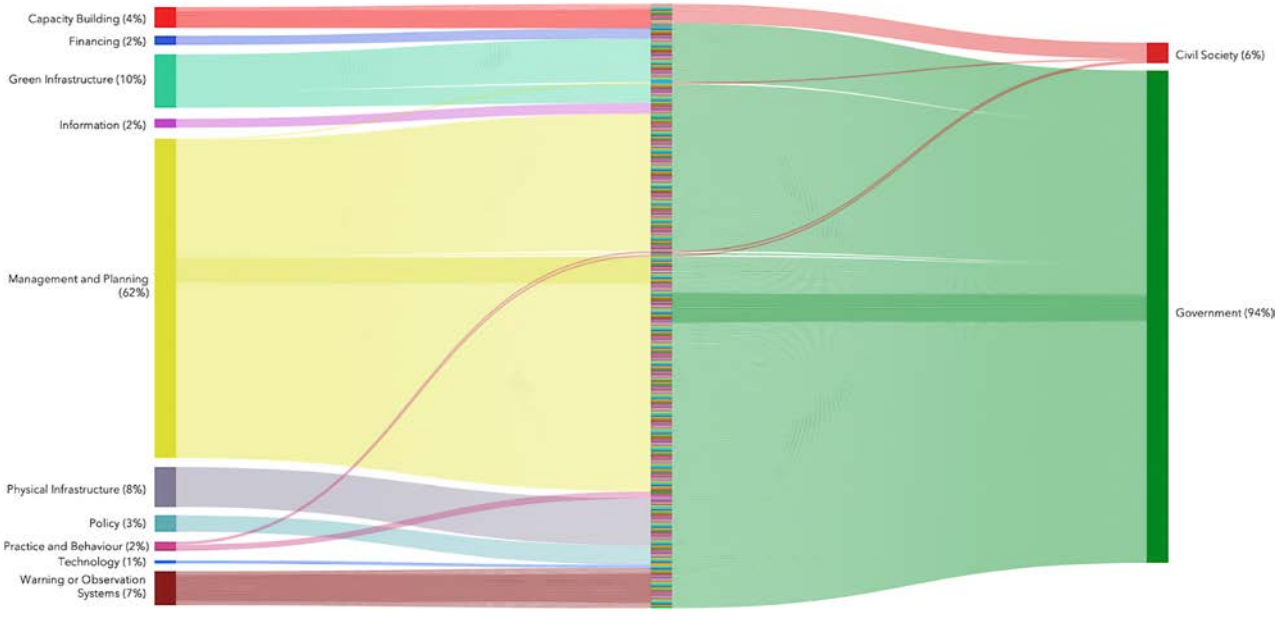

Figure 2.6. LACAP adaptation actions by typology and associated linkages with actors (academic, civil society, government and private sector actors).

Impact Register in collecting real-time data to inform adaptive responses. However, the sensitivity of these approaches to power outages and communication network failures, as evident through the impact of Storm Éowyn, should be assessed. Potentially transformative actions are typically associated with partnerships between local authorities, government agencies and communities. Additional collaborations with the private sector and academia could further support such initiatives.

Aspects that might be improved or where gaps emerge include increasing the number of initiatives that tackle underlying vulnerabilities, such as socio-economic inequalities or governance structures, which can impede effective adaptation. Even in the distribution of community funding through the Local Authority Climate Action Fund, attention needs to be given to ensuring that resources reach vulnerable communities who may not have the capacity to apply for and win competitive funding. Without doing so, climate action funding may actually reinforce existing vulnerabilities.

There is also evidence for the uneven integration of some sectors in LACAP actions. While some sectors, such as water management and flood risk, receive substantial attention, others, like public health, agriculture and energy, appear to be underrepresented. This uneven focus may leave critical systems vulnerable to climate impacts at the local level. Despite commendable progress, further structured engagement with communities, particularly vulnerable groups, is required. Without meaningful involvement, resilience measures risk being misaligned with local needs and capacities. Several actions depend on funding or require further assessment to proceed. A lack of resources, skilled personnel or clear implementation pathways could hinder the operationalisation of resilience measures.

2.4 Conclusions

This chapter describes the comprehensive mapping of adaptation actions at the national and local scales and attempts to bridge the gap between policy and practice. Our analysis is based on a compilation of more than 600 adaptation actions (292 national/sectoral adaptation actions and 348 local-level adaptation actions), thus providing one of the most detailed assessments to date of how resilience is operationalised in Irish policy. Unlike many adaptation assessments that focus on either national policies or local implementation, this study compares national adaptation plans/SAPs with LACAPs. The study not only examines adaptation actions and typologies but also classifies them into the RRT framework. This provides a novel perspective on whether adaptation actions are specifically targeted at maintaining the status quo or contribute to long-term systemic change. The following key conclusions are drawn from our analysis:

- **How resilience is framed matters.** While definitions of resilience remained the same in NAF24 as in NAF18, the broader framing of resilience shifted from a focus on stability and incremental change (in NAF18) to a broader, more transformative approach, emphasising governance, equity and proactive adaptation (in NAF24). These differences influence how resilience is operationalised and the actions that emerge across national and local plans. This is evident in actions identified in SAPs and LACAPs. Within the SAPs developed from NAF18, resilience actions primarily focus on management, planning and risk assessments, reinforcing existing systems rather than transforming them. However, at the local level (LACAPs), a greater proportion of adaptation actions are potentially transformative, integrating nature-based solutions and community engagement.
- **Consistency in resilience definitions is crucial for effective policy execution.** The existence of multiple definitions of resilience across different policy documents (NAF18, NAF24, NCCRA), in addition to the proliferation of different definitions in SAPs and LACAPs, risks creating confusion, the misalignment of adaptation actions and conflicting implementation strategies. A more harmonised and integrated definition is necessary for effective policy execution.
- **Government actors dominate implementation.** Government agencies are by far the most prominent actors in adaptation planning and implementation, with limited engagement from civil society, academia and the private sector. Expanding participation beyond government could improve innovation, legitimacy and community buy-in for adaptation efforts. While LACAPs incorporate community participation more than national-level plans, engagement remains

limited. Empowering marginalised and vulnerable communities in adaptation decision-making is essential to achieving climate resilience that is socially just and effective.

- **Adaptation actions are dominated by management and planning.** The dominance of management and planning actions in both national and local adaptation plans highlights a strong emphasis on climate risk assessments and policy integration, and attempts to mainstream adaptation into existing governance structures. At the national level, these actions primarily focus on data collection, monitoring and institutional coordination. At the local level, while planning also dominates, there is greater incorporation of green infrastructure, community engagement and nature-based solutions, showing a shift towards more place-based and potentially transformative adaptation. However, across both scales, hard infrastructure, financing and people-focused actions remain limited, indicating that, while resilience planning is progressing, concrete implementation and systemic transformation are still underdeveloped. Strengthening financial mechanisms, fostering more community-driven adaptation and expanding nature-based approaches will be critical to enhancing long-term resilience.
- **Financing for adaptation remains limited.** Limited financial commitments to adaptation pose a challenge to building long-term resilience at all scales. While an important addition to the funding landscape, the Local Authority Climate Action Fund is a competitive funding mechanism that without careful oversight may unintentionally exclude vulnerable communities who lack the capacity to apply, potentially reinforcing existing inequalities.
- **Cross-sectoral integration and long-term vision are needed.** While sectors like water management and flood risk receive substantial attention, others such as public health, energy and agriculture are underrepresented in adaptation planning and the actions evaluated, pointing to the lack of clear mandates for local authorities to integrate actions across sectors. Many actions at the local scale involved updating emergency response policies and processes. While important, such actions emphasise a reactive approach to dealing with climate extremes. More integrated, long-term and cross-sectoral strategies are needed to ensure systemic resilience to climate change.

There are a number of limitations to highlight. For our analysis of LACAPs, we focused on actions tagged as adaptation. Due to time constraints within the bounds of a 1-year project, we did not explore actions tagged as both adaptation and mitigation. It may be that there is greater engagement with public actors and communities within this stream of actions. Further research should investigate this. Our analysis is based on the categorisation of actions listed in policy documents, rather than an assessment of how effectively these actions have been implemented or whether desired outcomes have been realised. It is too soon to evaluate these outcomes from LACAPs, which were adopted in 2024. However, future assessment of outcomes may be challenging given that key indicators for actions at the national and local scales tend to be missing or more focused on implementation (number of people trained, meetings held, etc.) rather than any indicators on outcomes. This is a key concern for future work evaluating the outcomes of resilience actions. While the study acknowledges the underrepresentation of civil society and private sector actors, it does not deeply explore why these stakeholders are not more engaged in adaptation planning or how they could be integrated more effectively. Similarly, the above policy analysis does not include stakeholder interviews to assess the issues in more detail, which is the focus of the next chapter.

3 Operationalising Resilience in the Water Sector

3.1 Introduction

This chapter reports results from in-depth interviews with practitioners and policymakers within the water sector to explore the meaning of resilience and the challenges for operationalisation. We focus on the water sector because of its cross-sectoral importance for national- and local-scale resilience. Water is fundamental to sustaining ecosystems, human wellbeing and economic development. Climate change is intensifying pressures on water resources, exacerbating risks such as droughts, flooding and declining water quality. Given Ireland's reliance on a well-functioning water system for ecology, agriculture, industry and public health, developing resilience in this sector is critical.

Fourteen online interviews were conducted and recorded with stakeholders and practitioners (Figure 3.1) involved with climate change adaptation in the water sector from state, semi-state, private and non-governmental organisations (NGOs). Participant selection followed a purposive snowball sampling with interviewees across the sector involved in water resource management, water quality and ecosystems, flood risk management, public health and adaptation more broadly. While this approach allowed coverage of key sectors, findings would be strengthened by additional interviews. However, this was not possible in the context of project resources. Interviews were semi-structured around three research questions that focused on (1) what resilience means to the interviewees in the context of their work, (2) the key challenges encountered in operationalising resilience, and (3) what transformation would look like in the water sector from the interviewees' perspectives. Results from question 3 are reported in Chapter 4. Interviews lasted between 30 and 70 minutes and were transcribed and anonymised on completion.

The analysis began by thoroughly reviewing all transcripts before undertaking inductive coding using MAXQDA software. Inductive coding (Barlow, 1974) is a data-driven approach where codes are generated directly from the data rather than pre-existing theoretical frameworks or hypotheses. This allows for a more exploratory and open-ended analysis, making it suitable for uncovering patterns and themes that emerge from participants' responses. In MAXQDA, text segments were highlighted and assigned codes that reflected emerging themes or concepts. These initial codes were then refined and grouped into broader themes as patterns became more apparent. An iterative process of coding and recoding was employed to ensure that the final themes remained grounded in the data and accurately represented the participants' perspectives. We employed functionality in MAXQDA to plot relationships and connections between different codes and themes. For interpreting the code maps presented throughout this chapter, each node represents a code, with the size of the node representing the frequency of code occurrence across interviews. Node colours indicate themes of related codes. The connections or lines between nodes show relationships or co-occurrences between codes, while the position of the node on the map indicates how central or peripheral the code is to the dataset we collected. The final themes that emerged from our analysis are presented below, focusing first on the

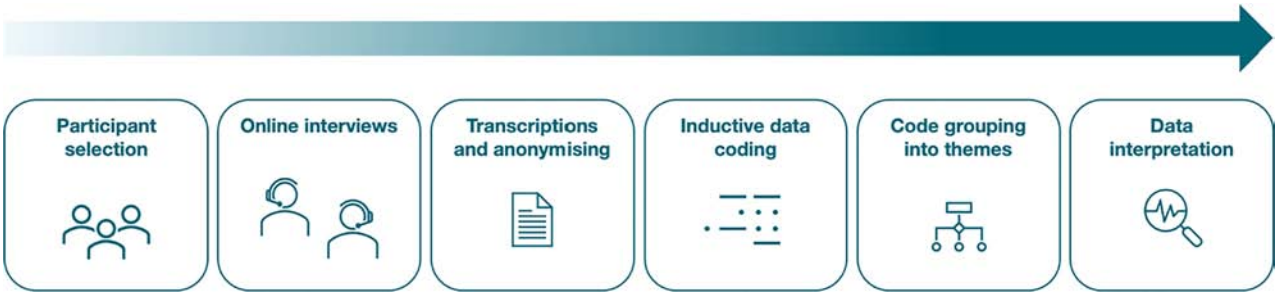

Figure 3.1. Steps involved in the collection and analysis of the interview data underpinning this chapter.

meaning of resilience and second on challenges in operationalising resilience.

3.2 The Meaning of Resilience

Interview responses on the meaning of resilience (question 1) were coded to represent the primary focus of resilience conveyed by respondents. As indicated by Figure 3.2, multiple and sometimes competing perspectives on resilience were identified across interviews. A common and central theme was the uncertainty associated with the meaning of resilience. One government official noted "… that is probably the single hardest question I have encountered in my two and half years working in this area". Numerous respondents described resilience as being focused on a holistic approach founded in the concept of sustainability. As indicated by one respondent, this approach to building resilience aims to balance human and environmental needs:

> A resilient system would be one where we can provide to society what it needs, where we can manage usage in smart ways and where we leave enough water of sufficient quality for ecosystems to thrive …, it's about guaranteeing supply and also ensuring that we do not impoverish nature at the same time.

For others, such an all-encompassing approach made it difficult to attach meaning to and operationalise resilience from a policy perspective, with this view clearly illustrated by the following quote:

> [I]t would be nice to have a vision of what it [resilience] is, but the vision has to encompass all the sectors and all of the local authorities and everything else ..., it's so high level as to be lovely and nice and aspirational but not very meaningful and we have discussed that internally here you know, how could we address that and we haven't. I don't think we have come across or come to a conclusion on how best to express it.

For some interviewees, this uncertainty has resulted in a default positioning of resilience as maintaining the status quo:

> I guess it [resilience] means at a basic level that we are no worse off …, and this is at an absolute minimum, we are no worse off in any given area due to climate change than we were last year.

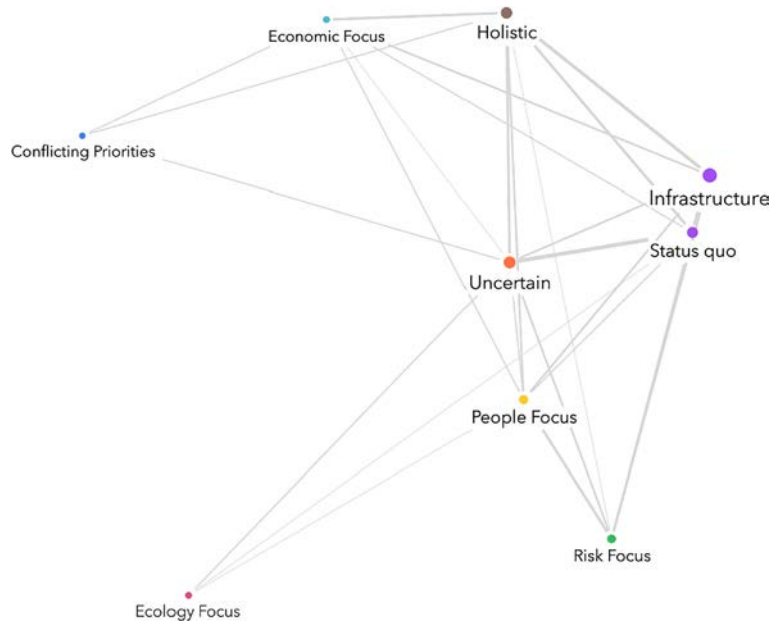

Figure 3.2. Code map derived through inductive coding of interview responses in conversations on the meaning of resilience. See section 3.1 for guidance on how to interpret this map.

> [Resilience is] very much along the lines of being able to still be functional due to a change, in this case climate change, … to still be effectively operational to an acceptable degree and that's kind of how I'd see it.

Closely associated with resilience being considered the status quo was the interpretation of resilience as being primarily focused on infrastructure. This is most readily conveyed as changing design standards and levels of service as objectives that can be targeted and acted on, in the context of either flood defences or water supply infrastructure:

> [W]e have an objective to ensure secure and resilient supply. So we have set out a standard of a 1- in 50-year-level of service to apply for the future.

Aspects of social resilience, connections between water and health, and just resilience were noted, and were typically associated as parts of an emerging or challenging area or as an add-on to resilience being considered the status quo to ensure that vulnerable groups were not left behind, or with how resilience might be translated to local communities:

> It's a growing area … it's probably evolving more so in language than anything else at the moment … But our role is trying to break that down into what it actually means for communities on the ground.

> I suppose, it's that, you know, … we will be able to continue to function at least closely as we are ... while also incorporating that kind of just resilience piece as well, that vulnerable groups aren't left behind.

For others, social resilience was closely aligned with existing approaches to water-related risk management and emergency responses, with differential responsibilities at the national and local levels of government, feeding through to the responsibilities of the individual:

> [W]e call preparedness, preparedness and resilience and so this is now stepping down from kind of that national concept of resilience against flood risk to a more localised resilience. We are working with the National Directorate for Fire and Emergency Management for example to develop guidance on preparation of flood event emergency planning for the local authorities. That then informs individual resilience which is about being prepared for a flood.

Less common but still important perspectives on resilience were associated with the economy, especially in terms of water resources:

> So any future economic growth if we are looking at businesses coming in, if we don't have enough water, then there's going to be some serious concerns there.

Interestingly, this economic framing of resilience revealed linkages with very different perspectives on resilience, including the holistic, social, infrastructure and status quo framings. Linkages with holistic framings tended to emphasise the balancing of human and environmental needs, while linkages with a social framing tended to focus on livelihoods and not leaving marginalised groups behind. Linkages with infrastructure and status quo framings tended to emphasise the role of the former in enabling economic growth. The most isolated framing of resilience was associated with an ecological focus. A key perspective here was the lack of resources for resilience, and how declining water quality and freshwater habitats associated with the status quo and infrastructure were causing problems for ecological resilience:

> [W]e are looking at habitat restoration, river restoration and building resilience, but that's very new and it's not fully resourced yet.

> There is the big challenge that you know the EPA has published lots of evidence to show that a significant proportion of our water resources and waterbodies are not a good status so they are not where they need to be and, if we are talking about making them resilient and protecting them into the future, the first thing we have to do is get them to good quality now before we can protect them, I mean they have to be improved significantly

> first so, you know, we're not starting from an ideal point either.

A key finding from the interviews was how wide the range of meanings associated with resilience is and how these different interpretations of resilience, depending on the context and positionality of the practitioner, can result in conflicting priorities in terms of implementation:

> [I]t means different things … depending on what part of the sector you are coming from. But climate change will impact each one of those.

A private consultant who works across the sector highlighted:

> [Resilience] depends on the client, depends on the ask, that prioritisation is slightly different depending on the client essentially.

The implications of these different meanings and priorities for operationalising resilience are unpacked further in the next section.

3.3 Challenges in Operationalising Resilience

A second key objective of the interviews was to explore challenges encountered in operationalising resilience (question 2). Figure 3.3 maps codes and their interrelationships in response to this question. Five core themes emerged, differentiated by colour codes in Figure 3.3. The largest theme comprises issues best characterised as "planning and capacity" challenges and incorporates issues such as planning, collaboration, funding, guidance, human resources and uncertainty. Codes within this theme are all highly interrelated. The other thematic areas are integrating a "people focus", "power of implementation", "political buy-in" and "conflicting priorities". Power of implementation and political buy-in are considered

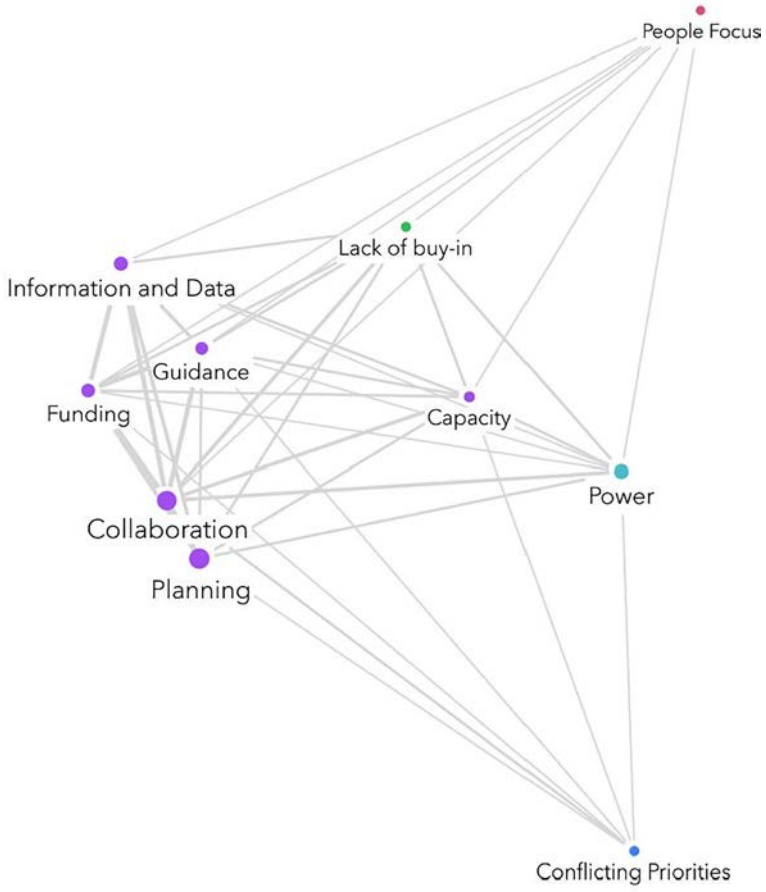

Figure 3.3. Code map derived through inductive coding of interview responses in conversations on the challenges of operationalising resilience. See section 3.1 for guidance on how to interpret this map.

together for simplicity. The codes constituting these themes are also highly interlinked with each other and with "planning and capacity". The following paragraphs unpick some further detail around these thematic clusters.

3.3.1 Planning and capacity

Planning is a central node in Figure 3.3, as reflected by its size and connectivity with other challenges. A key issue to emerge in relation to resilience planning more broadly is the lack of sequential publication and thus integration of the NAF and NCCRA, and subsequent SAPs and LACAPs. Respondents highlighted that these are currently "out of order", which results in a lack of coherence that impedes collaboration and integration of "joined-up thinking" across the national, sectoral and local levels. One respondent put this as follows:

> [W]e have a NAF[24] coming out when we don't have a national risk assessment. The LACAPs are coming out to be published in March [2024] or thereabouts again, not informed by either of those things and the new iteration of SAPs [2025] coming out after that, so the order is all wrong.

Another key challenge that emerges from a planning perspective is the uncertainty and lack of clear objectives in terms of what resilience means and what we are planning for. For instance, one respondent noted the complexities of future emissions scenarios, highlighting:

> [W]hat as a society are we planning for, you know, if we take it that we have to conduct all of our long-term planning on the basis that we could have futures, like everything from RCP [representative concentration pathway] 2.6 to 8.5, if we don't have a target in place which we don't really generally, it does cause paralysis, resilience has to either be timebound using a certain RCP or something like that.

Interviewees highlighted an alternative approach being taken in the UK that they felt was making planning easier and could potentially remove some of the barriers faced in Ireland:

> In the UK, they are putting adaptation plans in place that will ensure that they are resilient to a 2-degree global temperature increase by 2050 and that's very simple and you can plan for that, and it mightn't be perfect but everyone is on the same page; you're using the same metrics, you can plan.

The water sector's connection with other sectors complicates resilience efforts, as impacts on one sector can cascade across others. Some interviewees highlighted that guidance is needed on how co-benefits for climate, biodiversity and health from nature-based approaches can be realised and how actions that can address challenges from multiple perspectives can be identified:

> There is a lack of clarity around ensuring that we achieve co-benefits or how nature-based solutions should be valued and brought into the process. Biodiversity has been closely linked to water for a long time but now we have got much strengthening of those links between flooding and health and water and everything else and people are just struggling with this being an everything problem I think to an extent.

For others, more guidance on the meaning and implementation of and planning for resilience is needed:

> So there are a few things in place there at the moment. But … I think what's missing comes in the form of guidance, breaking down interpretations, what it looks like, what do we mean and whether these things need to be brought forward as individual programmes, with a bespoke funding mechanism behind them. Or whether it can be left up to local authorities to deliver on an ad hoc basis playing into a bigger picture. But that is missing at the moment and that is impacting the ability to talk about resilience or the ability to be effective at resilience in the water sector.

Interviewees highlighted that their ability to think about planning on longer-term horizons was limited, as they were stuck in a reactive mode as a result of human and financial resources being stretched. At the national level, a respondent responsible for water resource planning highlighted this in the context of most work at present being focused on getting current systems up to standard after years of underinvestment:

> [A] lot of time we are in the reactive space and it will take us a long time before we are actually in that proactive space.

At the local level, an interviewee also highlighted the challenges of being in this reactive space rather than being able to proactively plan across scales in an integrated way. Speaking about water quality issues as an example, this interviewee highlighted:

> [L]ocal authorities have to make decisions around everything that their services cover. On the water quality side of things, it means that they sit in this very reactive space. So, when things go wrong, they do what they need to do to respond to that. Because there is no integrated planning, it's not coherent and so it becomes very ad hoc.

At the national level, another interviewee spoke about how being reactive and the lack of long-term, integrated planning across sectors are amplifying vulnerability:

> [W]e need investment, we need planning, we need cross-jurisdictional [sectors and scales] planning, we need long-term planning … If we have a major drought of the proportions of 2018 or even longer and harsher, we will find things failing, you know, we are great as a species at having a disaster hit and then going oh God we should have done something about this, we are less good at foreseeing the disaster that will happen and being resilient to it occurring.

Others highlighted that there are now layers of compliance issues across multiple national regulations and EU directives that makes understanding and integrating requirements difficult. They conveyed a sense of frustration about the complexity and challenge of the task faced:

> We have created I suppose, in the environmental space because it's so technical, we have created an absolute labyrinth of legislation and technical standards and stuff like that, that no one person fully understands.

Interviewees highlighted the importance of integrating climate change into this legislative landscape as being critical to success, including via the EU Water Framework Directive, the EU Floods Directive and the EU Habitats Directive. All of these directives, as well as numerous pieces of national legislation and compliance requirements, dominate staff time in the water sector. One interviewee viewed the Water Framework Directive as an important vehicle for operationalising resilience to climate change:

> Now, river basin management planning is a complex process anyway but, I think, for us to see adaptation written far more robustly into the river basin management plan would be the main step in operationalising this and just to make sure it's as forward looking as possible.

Working across national and local scales was also seen as a challenge. As is evident from Figure 3.3, both planning and collaboration are closely linked. Coherent planning that involves both horizontal coordination, at the sectoral level and between local authorities, and vertical coordination, between government, sectors and local authorities, was seen as crucial. One interviewee highlighted challenges faced in relation to the vertical integration of planning:

> With central government divisions … that is where the initial challenge starts, because you are dealing with different individuals across different divisions and it might not make sense to local government that the central government has organised itself in certain ways. And that adds a level of complexity and probably frustration to it. Sometimes the outcomes are good in that you get a good person or you get a good division and it will come back down the line having

> been informed from the local level. And then sometimes/often you are not getting that coherency.

All interviewees noted the importance of collaboration, but many highlighted that collaboration needs to be better incentivised, funded and integrated into current ways of working:

> We need to work collaboratively but we also need to have the resources to work collaboratively, and sectoral funding does not allow for that. So, for me, they are the fundamental points and just to keep really driving home the message that it has to be joined up thinking across everything and if we start operating in isolation, this is not going to end well.

Human capacity is highly integrated with numerous themes, especially with the challenges of planning and collaboration. Capacity challenges are faced from numerous directions. The high turnover of staff with whom people have developed effective collaborations was seen as a particular challenge:

> I have been in this place for over 10 years now I think, actually 12 years probably, and I am noticing the turnover of people in departments, so you have to start from scratch almost with people. That is just wearing and exhausting.

Others highlighted the temporary nature of contracts and the importance of permanent staff in embedding capacity:

> I think all organisations involved need to ensure that there is sufficient permanent staffing involved to communicate this, to talk to people, to teach people and that the experience is maintained and grown and that it is not transient or temporary you know.

One interviewee noted the multiple demands on individuals and challenges related to frustration and demotivation:

> So, what I would say is that across departments and across local authorities is that where you have people who are enthusiastic [about climate change resilience], you get great progress. But not everybody is enthusiastic and for different reasons. Sometimes it's a lack of expertise, sometimes it's other competing priorities or whatever or lack of budgets.

Another interviewee highlighted that lack of resourcing and financing was stifling the ability of staff to engage in the long-term planning and integration of the wider dimensions of resilience:

> [I]t is the same people … now I do think it's specifically down to resources, that are trying to think of every action and thinking of climate and thinking about biodiversity in that. They are so stretched. So I can see, having engaged with them a lot over the last 2 years now, that they are seriously under-resourced. And so I think that does make it more difficult to look at that alignment and to be thinking of, you know, the next steps. They are just having to think of here and now.

For some interviewees, the sheer volume of information and the pace of developments from academia can feel overwhelming and can result in decision-making paralysis. The interviewees highlighted the importance of learning by doing, rather than seeking a perfect response:

> I think as well as that, we're creating such a huge amount of knowledge in the academic space and I think we can be a little bit paralysed then and maybe too worried about not doing the right thing if the information changes, so I think there has to be learning by doing, we have to be willing to make some mistakes along the way in order to learn those lessons and I think we shouldn't be afraid of letting the perfect be the enemy of the good.

3.3.2 Conflicting priorities

Conflicting priorities emerged as a key challenge for operationalising resilience for different practitioners, especially in terms of water quality and ecosystems, where the operational management of infrastructure

was seen as a key challenge for the resilience of freshwater ecosystems. Legacy strategies such as arterial drainage, which was instigated as a means of improving agricultural productivity and flood risk management in the 1940s, was seen as an impediment to ecosystem health and in realising the co-benefits of nature-based approaches and mitigation. One interviewee, speaking about arterial drainage schemes, noted the unequal distribution of the costs and benefits of maintaining the schemes:

> Maintaining them [arterial drainage schemes] provides a great benefit for the farmers because that was why the schemes went in in the first place, to improve land for agricultural production, but it does have environmental impacts and, where it goes through organic soils, it could be leading to carbon emissions, so, if we were to cease the drainage, rewet the organic soils, we could cut down on the emissions from the drained peatlands.

Another interviewee noted that, in their experience, the fact that the central government Department of Housing, Local Government and Heritage is responsible for water management means that tackling water-related issues is not prioritised, given the many other ongoing housing challenges facing Ireland. The interviewee suggested that it would be more efficient, from a governance perspective, to allocate responsibility for water, at a national level, to the Department of Climate, Energy and the Environment:

> I think that there's some improvements that could be made from a governance point of view that would help the process, certainly. It's difficult because we are all separated in different departments. In particular, that water is in one and environment and climate is in another, that I think is a huge challenge. And then water being in the Department of Housing when we are in a housing crisis, means water just isn't that much of a priority. Until it runs out; then it will be a priority!

Prioritising risk and impacts outside the water sector was seen as a significant challenge in resilience planning, particularly when dealing with cascading risks and especially in relation to electricity and water resources. For instance, one interviewee noted how the prioritisation of flooding by EirGrid as its key climate change risk seemed to demote the importance and impact of windstorms on the electricity grid. This interviewee also highlighted the different and nuanced risks faced in the transmission and distribution of electricity, and the differences in responsibilities for parts of an integrated system. This was seen as problematic, as loss of electricity has the potential to affect water resource provision, with treatment plants and pumps relying on electricity, a cascading risk became evident on a national scale following Storm Éowyn in January 2025:

> EirGrid have come out and said they considered the most serious threat to the power network to be from flooding … it seems to me that wind is more the issue perhaps than the flooding issue. I think we are all aware that thousands of houses that get knocked out of power aside from water infrastructure and so on and it's always invariably because power lines have been hit by trees or blown down.

3.3.3 Power and political buy-in

Lack of power and political buy-in were seen as important challenges linked with conflicting priorities, collaboration and lack of funding, in particular. Rather than being compulsory, the engagement of sectors with adaptation and resilience planning is done on a voluntary and negotiated basis. If a sector or associated responsibility is named in the NAF, it becomes necessary to implement that commitment, since the NAF is a government policy document. However, inclusion of sectors in the NAF is decided on a negotiated basis with individual government departments, rather than through buy-in from government and the cabinet as a national priority. This reveals a critical misalignment between the national climate objective of realising a climate-resilient Ireland and the political buy-in to realising that objective. The Department of the Environment, Climate and Communications (DECC) (now the Department of Climate, Energy and the Environment) was seen as doing the best it could to develop the NAF within the constraints of existing resources, but it was associated with soft power rather than any real power of implementation. Ultimately, the role of this department

is to negotiate the inclusion of key sectors in and agree on the NAF, with no power of compulsion, oversight or implementation:

> The development and implementation of the NAF falls under the remit of DECC, and the Department of the Taoiseach doesn't have a direct role. However, while the legislation requires key sectors in the NAF to develop SAPs, some sectors were not included in the 2018 NAF. DECC can marshal arguments to persuade new sectors of the need and benefits of developing a SAP, but it has no statutory powers to compel sectors where they do not wish to be required by the NAF to produce SAPs.

The process by which departments are engaged with inclusion in the NAF was also highlighted:

> A memorandum for government is prepared, to present a policy document like the NAF to government, seeking approval. Ahead of submission to government, it must be circulated to all ministers to ensure that there is consensus on the approach. Where any minister has an issue with the policy document or memorandum, they can make observations and the sponsoring department seeks to agree a way forward. Without this agreement in place, it is not normally possible to submit the matter to government. It is the role of officials to find a pathway that is acceptable to all. For example, the Department of Finance views adaptation policy as something to be mainstreamed into other sectors or as falling under the remit of bodies including the Central Bank and is not required under the NAF to prepare a SAP.

Where a department does not engage with adaptation planning, this can result in challenges in operationalising resilience across scales and for the work of other sectors that are progressing with developing and implementing plans to realise resilience. This results in an ad hoc approach, the emergence of conflicting priorities and challenges with regard to capacity and funding, which represent significant barriers to the operationalisation of resilience across sectors and could result in cascading risks. In particular, the lack of a SAP being developed by the Department of Finance suggests that responsibility for resilience is being pushed from government to the private sector (Central Bank) and individuals (via insurance), or it is being left to departments and local authorities to realise resilience with existing budgets. It is therefore not surprising that, despite recognition of the importance of a people-centred approach to ensuring resilience in NAF24, an approach to ensuring resilience that maintains the status quo dominates our varied assessments. The challenges of securing political buy-in are summarised in the following quote, with important sectors commencing adaptation planning and scoping during the second iteration of SAPs:

> Two important sectors were identified as missing from the 2018 NAF: tourism and built environment/planning. Following discussions between officials, it was agreed that a new SAP would be developed for the tourism sector and the sector would be included in the NAF24. DHLGH [Department of Housing, Local Government and Heritage], on the other hand, noted the complexities of the planning and buildings policy areas and, following discussions at official level, agreed to undertake a scoping report on the potential for a SAP. The NAF24 includes this as an action.

3.3.4 People focus

As highlighted in Chapter 2, there is limited public engagement at the national level via the SAPs. Public engagement and people-focused policy have been enhanced, but are still limited, at the local levels, with implementation of resilience largely being led from the top down. This is despite recognition within NAF24 of the importance of just resilience and the integration of community needs and the needs of those impacted by climate change in adaptation decision-making. Even interviewees who mentioned there being a people focus in resilience planning indicated that this tended to be included at the end of the decision-making process or through engagement for information transfer, behaviour change or education. This lack of a people focus or engagement seems to stem from

established processes that might not be fit for purpose and a lack of resources and capacity. As noted by one interviewee:

> The community piece is being done, I think in as much as it can with the resources that it has. But, I think, overall, to operationalise resilience, ... all organisations involved need to ensure that there is sufficient permanent staffing involved to communicate this, to talk to people, to teach people, and that the experience is maintained and grown.

Engagement of the public in the development of the NAF and SAPs is typically done via mandatory consultation periods whereby any member of the public can comment on draft plans and policies. These approaches have not been successful in engaging the public, despite best efforts. For example, an interviewee commented:

> So, decision-making, consensus is the wrong word, but it's definitely a very interactive system of making sure that we are not, or at least we are doing our best to make sure we are not, missing anybody in this. Now we are on the last stage of that in terms of the decision-making process where we are at public consultation and now that's finishing next Monday and, so far, we have only had three responses.

Pressured timelines, resources and capacity constraints within similarly stretched NGOs representing local interest groups has been problematic for gaining more meaningful public engagement in these processes. Speaking about attempts to garner input from a major NGO in the area, one interviewee noted:

> [W]e specifically sent it to them last time around and they didn't respond … under their umbrella, they have at least two or three related organisations. I would have thought somebody would kind of put something in, you know. So, we can only ask and ... try to get people involved as best you can.

The same interviewee commented about timelines and capacity:

> We are on a very tight timeline in terms of what we have to do, so not everything that people say can be reflected, but we do our best to do what we can … we were put under quite a bit of pressure … I suppose when the climate action plan was being formulated for 2020 to have an ambitious timeline for this. Ambitious is one thing, but there is a lot of work involved so trying to get everybody's ideas together in a coherent way and make sure they are all reflected and so on within a tight timeline is difficult.

An interviewee recognised the importance of increasing the focus on people, but also highlighted that the current emphasis is on physical infrastructure and the lack of funding for collaboratively working with people in a way that addresses underlying vulnerabilities:

> [T]he receptor in all of this are humans, it's people, it's children, it's old people, it's all of that and, as long as people keep thinking of receptors as just being a building or a water thing [infrastructure] or something over there, that's away from people, then I think ... it [adaptation] can be just done as a theoretical exercise but there are real people impacted by these things and I think that in the end of it like what I notice again is there is no collaborative working [with communities], there is no funding for collaborative working, the funding is for sectoral working silos, in pillars.

Others highlighted that it can be difficult to adopt a more people-centred and vulnerability-led approach when people are referred to as "customers" or "consumers", and regulatory oversight does not include such an approach. In the context of Uisce Éireann, it was noted that:

> [T]hey report to Com Reg [Commission for the Regulation of Utilities] rather than to, you know, and in reality that's only just about their consumer relationship with people, but they

have a sort of duty-of-care relationship that is not properly acknowledged and not properly resourced yet.

3.4 Conclusions

This chapter reports results from in-depth interviews with 14 respondents from across the water sector to explore the meaning of resilience and challenges experienced in operationalising resilience. Key findings are synthesised below:

- **Resilience is a multidimensional and context-dependent concept.** There is no single definition of resilience currently in operation across the water sector. The policymakers and practitioners with whom we engaged all approach resilience differently. The dominant interpretation focuses on infrastructure and maintenance of the status quo. This is in alignment with findings from our policy analysis in Chapter 2 from across all sectors. Social and ecological resilience are, more often than not, of secondary importance. This focus on ensuring continuity rather than addressing root vulnerabilities or enabling systemic change limits the ability to respond effectively to emerging climate risks.
- **Challenges in operationalising resilience are systemic and multi-scalar.** Fragmented and sometimes misaligned governance, a reliance on reactive rather than long-term planning, and capacity constraints across all levels are major systemic challenges. The sequencing of adaptation planning, from the NAF to LACAPs, is misaligned. Without coherence and feedback opportunities, resilience planning remains ad hoc and fragmented, affecting the ability to prioritise, collaborate and allocate resources efficiently. High staff turnover, reliance on short-term contracts and insufficient expertise within public institutions impede long-term resilience planning. A lack of sustained investment in adaptation further exacerbates the challenge, leading to reactive rather than strategic responses to climate risks.
- **Political buy-in and funding constraints limit progress.** Resilience efforts lack strong political backing, leading to inconsistent commitment across government departments. Lack of meaningful political buy-in at the highest levels of government is characterised by fragmented sectoral commitment to adaptation planning and funding, a lack of statutory obligations and a lack of clear accountability mechanisms in delivering actions, assessing outcomes and conflicting priorities. This limits long-term resilience efforts and results in a misalignment between reality and the national climate objective of achieving a climate-resilient Ireland by 2050.
- **Public and community engagement remain limited and reactive.** While policy documents such as NAF24 recognise the importance of just resilience and community involvement, there is little evidence of meaningful co-creation with the public. Engagement is often top down and limited to consultation on completed plans rather than via participatory decision-making. This restricts opportunities for building locally appropriate, inclusive and sustainable resilience measures. Such processes are time-consuming for practitioners and the public and may be further hampered by capacity and resource constraints.

4 What Would Transformation Look Like From a Practitioner Perspective?

4.1 Introduction

This chapter continues with the results from our interviews with practitioners to examine responses to the question of what, from their perspective, transformation in the water sector in the context of resilience should look like. While transformation is often characterised as being a large-scale system change, in reality transformative actions are those that address underlying barriers and open opportunities to do better at adaptation and addressing perceived limitations and challenges. Given our work with practitioners, we place their assessment of what might be characterised as transformative change in context. Figure 4.1 shows the code map for responses to this question, with four key themes emerging. These include themes related to “management and planning” (purple), addressing “cascading risks” (red), taking a more “catchment-focused approach” (blue) to resilience planning and “impact shocks” (cyan) associated with climate change that may transform adaptation and resilience planning. These themes are unpacked in the sections that follow.

4.2 Management and Planning

This theme comprises codes related to funding, planning, a people focus, political leadership and a common vision or consensus on the meaning and aims of resilience. These codes are highly interlinked. People and consensus/vision are central codes, indicating their criticality in addressing transformative needs. Planning, political leadership and funding are closely linked to these, indicating the important influencing role they play in enabling a people focus and common vision. In particular, political leadership and consensus/vision are closely connected, suggesting the important role of leadership in informing

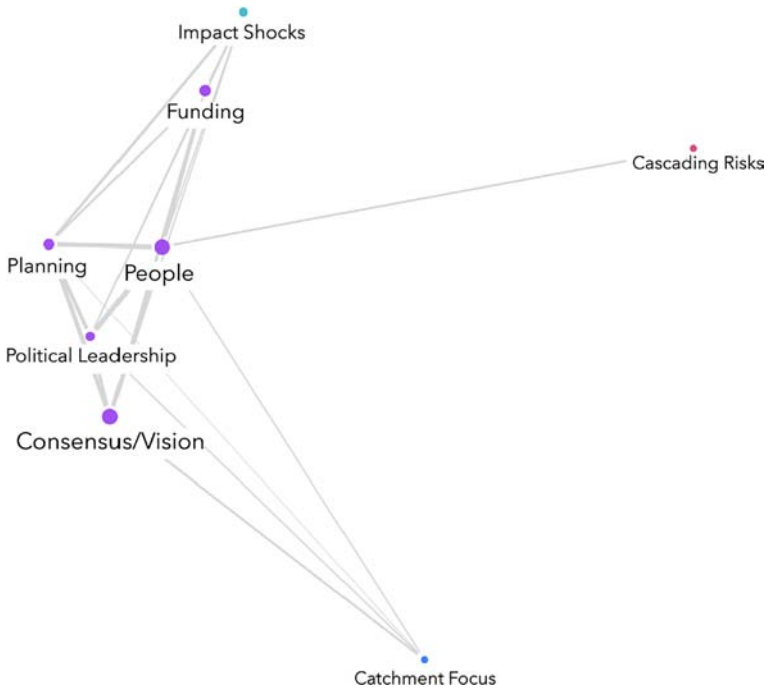

Figure 4.1. Code map derived through inductive coding of interview responses in conversations on what transformation would look like in the water sector from the interviewees’ perspective. See section 3.1 for guidance on how to interpret this map.

a consistent vision. The importance of establishing consensus is illustrated by the following quote:

> So, I think getting a kind of clear picture that all agencies are signed up to and that everyone is in agreement with; if we can get that basis correct, then it's a lot more simple for people to look at, so okay now the challenge for us is to meet that target. It's making sure that we are working to a target that we all agree with, that we all think is achievable and that we have the means to meet as a society. And they are high-level questions and challenges that I think, if we can get that transformation right, then I think all of the respective players in the water sector can execute that vision. I think the biggest challenge is getting that consensus at the high level right.

This view of a need for a coherent vision was widely shared among interviewees. Some went further to highlight that water considerations need to be more centrally integrated with climate change considerations at the highest levels, with this being key to policy coherence and understanding, and trade-offs and conflicting priorities:

> So policy coherence is just that; it's thrown around a lot. But water needs to be at the centre of climate discussions because it's completely central …, water has to be up there at the very top of the discussion. So I think that policy coherence and looking at that need for alignment of policies and looking at the trade-offs, just let's start being transparent.

Another interviewee highlighted the transformative potential and importance of shared values in an overarching consensus or vision of resilience, in particular highlighting the importance of integrating human needs, ecology and economy, rather than all efforts going into one aspect:

> I think transformation would be accepting that there's human and economic needs in terms of water … but balancing that with a functioning ecosystem – that's where we want to be, to kind of take those three strands and have a happy medium. It's not where all the energy goes to one …

The importance of shared values and thinking systemically rather than looking through the lens of competing priorities, namely addressing other social and economic challenges, was also highlighted:

> So, I think in terms of transformative change, we have to ensure the value of these resources [water] is increased. We also have to, I think, look honestly at the limitations of people's ability to prioritise this when they have more pressing, immediate concerns like housing, food and jobs. So, I think then you are into actual systemic changes that we achieve some of this transformation through system changes, where we ensure that environmental laws are adhered to.

Expanding participatory decision-making processes to integrate public and stakeholder input into adaptation implementation, in addition to adaptation planning, was seen as an essential part of transformation. Closely linked to the idea of consensus based on shared values was greater engagement with and from the public. The importance of engaging the public was seen as critical right across the water sector. From a flood risk perspective, this was seen as crucial for exploring different ways and combinations of measures that could be feasible for resilience in high-risk locations:

> The way we plan flood management strategies needs to perhaps change; we need more capacity to get the community engaged right at the outset and clearly say what the expectations could be, so if you want to be protected it will need something of this type of scale and, if that's not going to happen, these are the other ways you can manage your resilience risk.

From a water quality perspective, the Local Authorities Waters Programme (LAWPRO) is widely seen as a leader in implementing and sustaining real engagement and working with a wide range of

stakeholders, but it needs further support and to be scaled up:

> [W]e would work with a lot of community groups who communicate their concerns about the complications [of water quality] that they have. And LAWPRO is a really great answer to it, but it really needs more funding if it's going to actually have some meaningful results.

Some interviewees highlighted that getting buy-in from private landowners for implementing and maintaining nature-based approaches was a key challenge for the implementation of catchment-based measures. The development of a process or system for supporting this type of engagement and working together with private landowners was seen as being necessary for realising transformative change:

> There's the need to develop and have the proper process and system for getting measures on private land. It needs to be supported and funded and the benefits made far clearer as to why you need to do something on their land to slow the flow down before it gets to rivers.

For others, linking water to health in all policies and public health was seen as important for both establishing values around water and building resilience in the health sector:

> From the bottom up … there needs to be that link made between climate change and water availability, water quality, public health. Transformation is about becoming healthy in all policies, collaboration, funding for collaboration.

The planning system was seen as crucial to realising transformation, especially the need for planning to take account of future climate risks rather than only present-day risks, on topics ranging from zoning of land through to accessibility and transport networks crucial to emergency response and economic logistics:

> We need proper land use and development plans that use climate change risks rather than just present-day risks. So, numerous areas of land around the country zoned for residential for example may not be at risk now but we know will be in the future so how is that going to be managed … we need to make sure that our key access roads, transport networks are not going to be flooded. So, there is a whole load of things that need to be there.

Another interviewee highlighted the links to political leadership and the important roles that developers can play in realising transformative change:

> Development plans can no longer be purely developer led; it will have to be evidence and risk led, so they have to make decisions based on the evidence and then you use your developers, utility companies to then work, innovate to do the best way of developing an area for improving the community, improving resilience whilst still being able to sort of earn their profit or work through things. So, it's going to need that change from above, rather than them being swayed by the developers to do the cheapest, easiest thing; it's going to need to change to be this is what we have to do, we have to do it differently, now we need your help to recommend the most sustainable way of doing it, so there is the expertise there.

A shift towards more compact development was also noted by one interviewee as being important, particularly given the issues of infrastructure resilience and the number of water supplies that need to be developed and maintained for more dispersive development:

> I mean, to move from 500 independent supplies down to 320 is significant. I think one of the things to facilitate that would be the development of towns, industries, so that they are having regard to water usage, but then they are also more compact development.

In addition, a move away from past water management policies, in particular the Arterial Drainage Act and the maintenance of drainage schemes, which were viewed as making resilience across the water sector

more difficult to achieve, was seen as potentially transformative:

> The Arterial Drainage Act, it's a big barrier to adapting rivers to future conditions, so these schemes were designed to drain land based on conditions in the 1800s, early 1900s, which is different to what it is now. So, they are going to need to change; we can't just keep maintaining them as they are.

Political leadership was seen by many interviewees as being key to realising transformation and a resilient Ireland, not just in establishing a shared vision but in driving the implementation of change in planning, funding and resources, and in increasing the importance of adaptation and resilience alongside mitigation and a reduction in greenhouse gas emissions:

> The agenda needs to come into the higher level of government, the core ministers, the top three … at the moment, climate action is there in terms of reducing greenhouse gas emissions but the adaptation side perhaps is sort of hidden in the EPA and other departments; it's not really at the core of the government.

The importance of political leadership from government was highlighted by one interviewee, particularly from a planning perspective. They highlighted the transformative potential of all sectors engaging in adaptation planning so that gaps can be closed and plans made more coherent:

> I think it's got to be all part of national planning and you look at the housing sector in Ireland: where is the adaptation plan? There is none; they are not even in the National Adaptation Framework. How can you have a sector that is exempt from adaptation? … [H]ow can finance not be included, how can housing not be included? I know the water sector is in there [NAF] but they're not there for housing and they are giving planning permissions to pay people to build wells … it's not even just giving planning permission, it's actually knowing what's going on at the moment; it is not joined-up, there is no joined-up thinking.

4.3 Cascading Risks and a Catchment Focus

For some interviewees, addressing cascading risks across different sectors was seen as potentially transformational. However, as highlighted in Chapter 3, this was seen as contingent on increased funding to work more deeply with other sectors rather than superficial engagement. This interviewee notes the value of cross-sectoral thinking:

> [I]t is crucial to understand of the role that the cross-sectoral, the interactions, the cascading risks of the sector. And what will the sectors need from others and vice versa, what does water need, energy, for water treatment these types of things.

For some, this systemic thinking brings complexity that may be better tackled at the river catchment scale, rather than within local authority boundaries or at national scales. Developing resilience at the catchment scale was seen as beneficial for many of the management and planning issues above and highlighted in Chapter 3, especially for engaging with communities (e.g. the work of LAWPRO), integrated planning and development of coherent actions relative to local needs and place-based values. One interviewee highlighted:

> [W]e need to start looking [at resilience] at a catchment scale … and trying to plan at that scale. So because that's not the case for climate mitigation but it is the case for climate adaptation because the impacts that we'll see from climate change and particularly around water quality and water availability isn't going to be the same in Dublin as it is for Galway or Cork; they are going to be completely different. So we need to start looking at a catchment, seeing where the water is, the land use around it, the risks on the system.

Another interviewee reinforced the value of a catchment-based approach that has been used as part of water planning in the EU Floods Directive and Water Framework Directive:

> I think a necessity is looking at it [resilience] from a catchment scale. That's really

> important for actually figuring out what needs to happen on the ground to deal with both flooding and water availability …, it's not just a blanket thing for the whole of Ireland. We need to start looking at these extremes of drought and flooding in particular at catchment scale.

4.4 Impact Shocks

Some of our interviewees viewed extreme impacts of climate change (termed "impact shocks" by an interviewee) as potentially transformative, but not in a positive sense. The interviewees pointed out that, if changes in extremes beyond a certain level are realised, they may force systemic changes in adaptation planning and resilience. These comments reflect the perception that there is a limit to what current approaches can achieve in terms of adaptation. One interviewee highlighted:

> There is a certain degree of protection that can be provided for rising sea levels and increasing river levels, but there will come a point where it is unacceptable or not practical to carry on … and then it's a choice of either accept that increased risk and make communities a lot more resilient to flooding, which could be kind of retrofitting houses to make them flood resistant or resilient so moving all the power circuits so they're not down at ground level, maybe converting ground floors into flood-resilient materials ...

This quote highlights how resilience is seen as something that *individuals* are responsible for when approaches to risk management that are currently being undertaken prove to be ineffective or reach a limit. It also highlights the central role that cost–benefit analysis plays in decision-making through determining acceptable or practical interventions. For this interviewee, resilience is something to fall back on when current approaches fail. Transformation is seen as being a move away from publicly funded works towards increasing the roles of private citizens and building design or retrofitting in adaptation.

Another respondent highlighted that the occurrence of an extreme drought event more severe than those recently experienced would present serious issues for the water sector and, by extension, for the wider economy, environment and society. The following quote highlights that current approaches to resilience planning in the sector would not have been sufficient for dealing with events that happened in the past and nor are they sufficient for dealing with such events that could happen again in the future, even without climate change:

> We know from the past that there have been periods of drought, extended drought, far longer than we saw in 2018. It would be foolish in extreme to suggest that we wouldn't see that kind of drought again, a historical drought, a multiyear drought. If we see a multiyear drought, all bets are off as to the resilience of our supply.

Like the previous quote, this gives the sense that practitioners know that there are real limits to resilience planning at present that may not be fully understood. An extreme drought event is likely to provide an impact shock that could transform current approaches to resilience. Despite the quote highlighting that it would be "foolish in extreme" not to plan for more severe events, such planning does not seem to be part of current resilience planning. These potentially transformative impact shocks may be addressed through more proactive planning for future extremes rather than by placing an emphasis on reacting to recent events, addressing a historical lack of funding and investment in infrastructure, assessing the limitations of current approaches to risk management in some areas that place recent extremes (that may not be extreme in long-term historical or future climate change conditions) at the centre of resilience planning, and stress testing against more severe extremes.

Finally, tipping points in the climate system were also highlighted as potential impact shocks that could drive a negative transformation in resilience planning and the lack of thought given to these risks. Speaking in the context of the Atlantic Meridional Overturning Circulation (AMOC) system, one respondent highlighted:

> We are not even beginning to think about what would happen if AMOC shut down you know. And, if AMOC shuts down, you get a

> complete reorganisation of the atmospheric circulation in the North Atlantic sector, you get a complete change in seasonality of temperature and precipitation and even the form of precipitation might become more solid precipitation in winter than we are used to and we are not even resilient to present day climate. A climate shock of the size of AMOC collapse, which is not out of the question within our lifetimes, would be existential for the island of Ireland.

4.5 Conclusions

This chapter presents results from interviews with practitioners relating to the question of what, from their perspective, transformation in the water sector in the context of resilience should look like. Six conclusions are distilled below, reflecting the key themes highlighted by practitioners that, in their opinion, could transform the operationalisation of resilience:

- **Consensus, a shared vision and leadership for transformation should be developed.** Achieving a shared vision of resilience is crucial, and this requires political leadership and cross-sectoral coherence. Policy alignment is needed to integrate water resilience with climate adaptation at the highest levels. This would enable more cohesive, long-term decision-making rather than short-term reactive measures.
- **Embracing catchment-based and community-focused approaches to enhancing resilience is crucial.** Expanding participatory decision-making processes to integrate public and stakeholder input into adaptation implementation in addition to adaptation planning is an essential part of transformation. Planning at a catchment scale and tackling current administrative boundaries may allow for more effective adaptation. Community engagement, such as through LAWPRO, is vital but needs greater funding and support. Such an approach would allow for the development of place-based solutions that are tailored to local water challenges, while engaging communities at the outset would foster ownership and sustainable solutions.
- **Cascading risks must be understood and evaluated.** The water sector is deeply interconnected across all other systems. Addressing cascading risks requires integrated adaptation strategies rather than siloed sectoral approaches. Systematic oversight of cascading risks would enable co-benefits across multiple sectors and enhance resilience at all scales, from local to national. Systematic cross-sectoral adaptation assessments and collaborative implementation frameworks are needed to better address cascading risks.
- **Climate resilience should be more fully integrated into the planning system.** Land use and development planning should integrate future climate projections rather than relying on present-day risk assessments. Zoning, transport infrastructure and emergency response systems must be designed for long-term resilience. This would ensure that settlements, water systems and critical infrastructure are built with climate resilience at their core.
- **Legislative and policy barriers should be addressed.** Outdated policies, such as the Arterial Drainage Act, hinder resilience efforts in the water sector. Adaptation planning should be mandated across all sectors to ensure a coherent national strategy.
- **Impact shocks could drive unplanned transformations.** Extreme events, such as prolonged droughts or an AMOC collapse, could push resilience planning beyond its current limits. A greater emphasis on proactively planning for greater climate extremes is essential to avoid crisis-driven transformation.

5 Conclusion and Recommendations

5.1 Final Conclusions and Recommendations

The ORICA project has provided a broad examination of how resilience is understood, framed and implemented within Ireland's climate adaptation policies and planning processes. The study has assessed both national and local adaptation planning and engaged with key stakeholders in the water sector, identifying the barriers to and transformative potential and opportunities for improving resilience. Chapters 2–4 contain conclusions specific to the findings presented in each. Here, we summarise key findings from across the report.

The framing of resilience in the NAF is shifting towards a more transformative approach. The shift from a focus on stability in NAF18 to an emphasis on governance, equity and proactive adaptation in NAF24 is a positive development. However, many SAPs still prioritise incremental adjustments rather than transformative change. It is hoped that the revised framing of resilience in NAF24 will result in more transformative actions being included in the next iteration of sectoral plans. Stronger policy coherence and approaches for tracking the impacts and outcomes from actions are needed to ensure that resilience is operationalised effectively and should be taken on board in the next iteration of SAPs.

Clearer definitions, guidance and targets are needed to drive implementation. While resilience is a core principle in Irish climate policy, variability in definitions across different policy documents (NAF18, NAF24, NCCRA, SAPs, LACAPs) creates fragmentation. The absence of a clear understanding of resilience and guidance makes it difficult to achieve coherence among practitioners and results in conflicting priorities and ad hoc implementation. It also makes it difficult to track progress. Establishing national adaptation targets and structured guidelines for implementation would enhance consistency and effectiveness.

Local authorities are key drivers of resilience implementation. LACAPs demonstrate greater innovation and community-led adaptation than many sector-level plans, integrating nature-based solutions and participatory approaches. However, local authorities need sustained funding and capacity development in the area of adaptation to move beyond planning towards large-scale implementation.

The focus on management and planning must be matched by greater implementation efforts. Adaptation efforts to date have prioritised risk assessments, policy integration and planning, creating a strong foundation for action. However, the pace of implementation remains slow, with limited investment in infrastructure, technology and social adaptation measures. Moving forward, stronger monitoring frameworks and clearer adaptation targets will help translate plans into tangible (and relevant) actions.

Sustained and equitable financing mechanisms are needed to foster resilience. Current funding models, including the Local Authority Climate Action Fund, have improved financial access for local adaptation efforts. However, reliance on competitive funding mechanisms can exclude under-resourced communities and sectors. Establishing long-term, structured funding streams for adaptation that increase access and/or focus on vulnerable communities will be critical for scaling up and sustaining adaptation initiatives.

Stronger cross-sectoral coordination and better long-term planning are required. Adaptation planning often remains sector specific and reactive. Developing systematic cross-sectoral risk assessments and collaborative planning that bring together key decision-makers within and across sectors will enable co-benefits to be realised and resilience to cascading climate impacts to be improved. More integrated, long-term and cross-sectoral strategies are needed to ensure systemic resilience to climate change.

Greater political buy-in is essential. While climate resilience is recognised as a national priority in policy documents (e.g. the National Objective, Climate Action Plan and NAF), political commitment remains inconsistent across sectors and governance levels. The lack of mandatory adaptation planning

in key areas and insufficient coordination between government departments limit progress.

Address structural drivers of vulnerability. Many current approaches to resilience prioritise maintaining existing systems and infrastructure, which can overlook the structural drivers of vulnerability, such as poverty, housing insecurity and unequal access to resources. Adaptation actions that focus on protecting infrastructure or conducting technical risk assessments may unintentionally reinforce existing inequalities. Similarly, competitive funding mechanisms for community-focused climate action risk excluding under-resourced or marginalised communities, who may lack the capacity to submit competitive applications. By explicitly linking the operationalisation of resilience to equity-focused practices – such as community-led risk assessments, targeted support for vulnerable populations and participatory governance mechanisms – the operationalisation of resilience can better ensure that strategies do not reinforce existing inequalities but instead contribute to more just and inclusive climate adaptation outcomes, thereby avoiding maladaptive outcomes and supporting inclusive, transformative adaptation pathways.

Public and community engagement need to be deepened and sustained. While community participation is improving at the local level, national-level adaptation remains largely government driven, with limited public involvement. Strengthening co-creation mechanisms through participatory planning and direct engagement with communities will help build locally relevant and socially just adaptation measures.

Climate resilience must be embedded into planning. Land use and development planning needs to better integrate long-term climate projections, rather than relying on present-day risk assessments. Ensuring that climate resilience is fully integrated into land use, zoning, transport and development planning will help prevent maladaptation and long-term vulnerabilities.

Without proactive planning, climate shocks could drive unplanned transformations. Sea level rise and extreme events, such as severe and prolonged droughts (that have already been seen in the historical record) or an AMOC collapse, could exceed current resilience planning limits. If proactive adaptation measures are not taken, future responses may be dictated by crisis-driven transformations rather than strategic, sustainable adaptation.

5.2 Final Reflection

Over the past 8 years, Ireland has made significant progress in embedding resilience into climate policy, particularly through evolving national frameworks, stronger local adaptation efforts and growing emphasis on just resilience principles. However, gaps in implementation, governance coordination, financing and target-setting remain major barriers. Moving forward, the focus must shift towards concrete implementation, long-term investment and integrated cross-sectoral strategies, to ensure a resilient and adaptive future. As Ireland's approach to ensuring climate resilience continues to mature, it must move beyond traditional approaches to risk management, towards more dynamic, forward-looking strategies that reflect the complexity of climate challenges. This requires a willingness to experiment, adapt and learn by doing – developing resilience, not as a fixed outcome, but as an evolving process shaped through practice and reflection and collaboration with communities and across sectors and scales. While this report has focused in detail on the water sector, similar approaches might be deployed to assess the understanding and operationalisation of resilience in other sectors.

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Abbreviations

AMOC	Atlantic Meridional Overturning Circulation
CAP24	Climate Action Plan 2024
DECC	Department of the Environment, Climate and Communications
LACAP	Local authority climate action plan
LAWPRO	Local Authorities Waters Programme
NAF	National Adaptation Framework
NCCRA	National Climate Change Risk Assessment
NGO	Non-governmental organisation
ORICA	Operationalising Resilience in Climate Action
RRT	Resilience, resistance and transformative
SAP	Sectoral adaptation plan
SES	Socio-ecological system

An Ghníomhaireacht Um Chaomhnú Comhshaoil

Tá an GCC freagrach as an gcomhshaol a chosaint agus a fheabhsú, mar shócmhainn luachmhar do mhuintir na hÉireann. Táimid tiomanta do dhaoine agus don chomhshaol a chosaint ar thionchar díobhálach na radaíochta agus an truaillithe.

Is féidir obair na Gníomhaireachta a roinnt ina trí phríomhréimse:

Rialáil: Rialáil agus córais chomhlíonta comhshaoil éifeachtacha a chur i bhfeidhm, chun dea-thorthaí comhshaoil a bhaint amach agus díriú orthu siúd nach mbíonn ag cloí leo.

Eolas: Sonraí, eolas agus measúnú ardchaighdeáin, spriocdhírithe agus tráthúil a chur ar fáil i leith an chomhshaoil chun bonn eolais a chur faoin gcinnteoireacht.

Abhcóideacht: Ag obair le daoine eile ar son timpeallachta glaine, táirgiúla agus dea-chosanta agus ar son cleachtas inbhuanaithe i dtaobh an chomhshaoil.

I measc ár gcuid freagrachtaí tá:

Ceadúnú

- Gníomhaíochtaí tionscail, dramhaíola agus stórála peitril ar scála mór;
- Sceitheadh fuíolluisce uirbigh;
- Úsáid shrianta agus scaoileadh rialaithe Orgánach Géinmhodhnaithe;
- Foinsí radaíochta ianúcháin;
- Astaíochtaí gás ceaptha teasa ó thionscal agus ón eitlíocht trí Scéim an AE um Thrádáil Astaíochtaí.

Forfheidhmiú Náisiúnta i leith Cúrsaí Comhshaoil

- Iniúchadh agus cigireacht ar shaoráidí a bhfuil ceadúnas acu ón GCC;
- Cur i bhfeidhm an dea-chleachtais a stiúradh i ngníomhaíochtaí agus i saoráidí rialáilte;
- Maoirseacht a dhéanamh ar fhreagrachtaí an údaráis áitiúil as cosaint an chomhshaoil;
- Caighdeán an uisce óil phoiblí a rialáil agus údaruithe um sceitheadh fuíolluisce uirbigh a fhorfheidhmiú
- Caighdeán an uisce óil phoiblí agus phríobháidigh a mheasúnú agus tuairisciú air;
- Comhordú a dhéanamh ar líonra d'eagraíochtaí seirbhíse poiblí chun tacú le gníomhú i gcoinne coireachta comhshaoil;
- An dlí a chur orthu siúd a bhriseann dlí an chomhshaoil agus a dhéanann dochar don chomhshaol.

Bainistíocht Dramhaíola agus Ceimiceáin sa Chomhshaol

- Rialacháin dramhaíola a chur i bhfeidhm agus a fhorfheidhmiú lena n-áirítear saincheisteanna forfheidhmithe náisiúnta;
- Staitisticí dramhaíola náisiúnta a ullmhú agus a fhoilsiú chomh maith leis an bPlean Náisiúnta um Bainistíocht Dramhaíola Guaisí;
- An Clár Náisiúnta um Chosc Dramhaíola a fhorbairt agus a chur i bhfeidhm;
- Reachtaíocht ar rialú ceimiceán sa timpeallacht a chur i bhfeidhm agus tuairisciú ar an reachtaíocht sin.

Bainistíocht Uisce

- Plé le struchtúir náisiúnta agus réigiúnacha rialachais agus oibriúcháin chun an Chreat-treoir Uisce a chur i bhfeidhm;
- Monatóireacht, measúnú agus tuairisciú a dhéanamh ar chaighdeán aibhneacha, lochanna, uiscí idirchreasa agus cósta, uiscí snámha agus screamhuisce chomh maith le tomhas ar leibhéil uisce agus sreabhadh abhann.

Eolaíocht Aeráide & Athrú Aeráide

- Fardail agus réamh-mheastacháin a fhoilsiú um astaíochtaí gás ceaptha teasa na hÉireann;
- Rúnaíocht a chur ar fáil don Chomhairle Chomhairleach ar Athrú Aeráide agus tacaíocht a thabhairt don Idirphlé Náisiúnta ar Ghníomhú ar son na hAeráide;
- Tacú le gníomhaíochtaí forbartha Náisiúnta, AE agus NA um Eolaíocht agus Beartas Aeráide.

Monatóireacht & Measúnú ar an gComhshaol

- Córais náisiúnta um monatóireacht an chomhshaoil a cheapadh agus a chur i bhfeidhm: teicneolaíocht, bainistíocht sonraí, anailís agus réamhaisnéisiú;
- Tuairiscí ar Staid Thimpeallacht na hÉireann agus ar Tháscairí a chur ar fáil;
- Monatóireacht a dhéanamh ar chaighdeán an aeir agus Treoir an AE i leith Aeir Ghlain don Eoraip a chur i bhfeidhm chomh maith leis an gCoinbhinsiún ar Aerthruailliú Fadraoin Trasteorann, agus an Treoir i leith na Teorann Náisiúnta Astaíochtaí;
- Maoirseacht a dhéanamh ar chur i bhfeidhm na Treorach i leith Torainn Timpeallachta;
- Measúnú a dhéanamh ar thionchar pleananna agus clár beartaithe ar chomhshaol na hÉireann.

Taighde agus Forbairt Comhshaoil

- Comhordú a dhéanamh ar ghníomhaíochtaí taighde comhshaoil agus iad a mhaoiniú chun brú a aithint, bonn eolais a chur faoin mbeartas agus réitigh a chur ar fáil;
- Comhoibriú le gníomhaíocht náisiúnta agus AE um thaighde comhshaoil.

Cosaint Raideolaíoch

- Monatóireacht a dhéanamh ar leibhéil radaíochta agus nochtadh an phobail do radaíocht ianúcháin agus do réimsí leictreamaighnéadacha a mheas;
- Cabhrú le pleananna náisiúnta a fhorbairt le haghaidh éigeandálaí ag eascairt as taismí núicléacha;
- Monatóireacht a dhéanamh ar fhorbairtí thar lear a bhaineann le saoráidí núicléacha agus leis an tsábháilteacht raideolaíochta;
- Sainseirbhísí um chosaint ar an radaíocht a sholáthar, nó maoirsiú a dhéanamh ar sholáthar na seirbhísí sin.

Treoir, Ardú Feasachta agus Faisnéis Inrochtana

- Tuairisciú, comhairle agus treoir neamhspleách, fianaise-bhunaithe a chur ar fáil don Rialtas, don tionscal agus don phobal ar ábhair maidir le cosaint comhshaoil agus raideolaíoch;
- An nasc idir sláinte agus folláine, an geilleagar agus timpeallacht ghlan a chur chun cinn;
- Feasacht comhshaoil a chur chun cinn lena n-áirítear tacú le hiompraíocht um éifeachtúlacht acmhainní agus aistriú aeráide;
- Tástáil radóin a chur chun cinn i dtithe agus in ionaid oibre agus feabhsúchán a mholadh áit is gá.

Comhpháirtíocht agus Líonrú

- Oibriú le gníomhaireachtaí idirnáisiúnta agus náisiúnta, údaráis réigiúnacha agus áitiúla, eagraíochtaí neamhrialtais, comhlachtaí ionadaíocha agus ranna rialtais chun cosaint chomhshaoil agus raideolaíoch a chur ar fáil, chomh maith le taighde, comhordú agus cinnteoireacht bunaithe ar an eolaíocht.

Bainistíocht agus struchtúr na Gníomhaireachta um Chaomhnú Comhshaoil

Tá an GCC á bainistiú ag Bord lánaimseartha, ar a bhfuil Ard-Stiúrthóir agus cúigear Stiúrthóir. Déantar an obair ar fud cúig cinn d'Oifigí:

1. An Oifig um Inbhunaitheacht i leith Cúrsaí Comhshaoil
2. An Oifig Forfheidhmithe i leith Cúrsaí Comhshaoil
3. An Oifig um Fhianaise agus Measúnú
4. An Oifig um Chosaint ar Radaíocht agus Monatóireacht Comhshaoil
5. An Oifig Cumarsáide agus Seirbhísí Corparáideacha

Tugann coistí comhairleacha cabhair don Ghníomhaireacht agus tagann siad le chéile go rialta le plé a dhéanamh ar ábhair imní agus le comhairle a chur ar an mBord.

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