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epa Research

Addressing the Political-Economic Barriers to Climate Adaptation in Ireland

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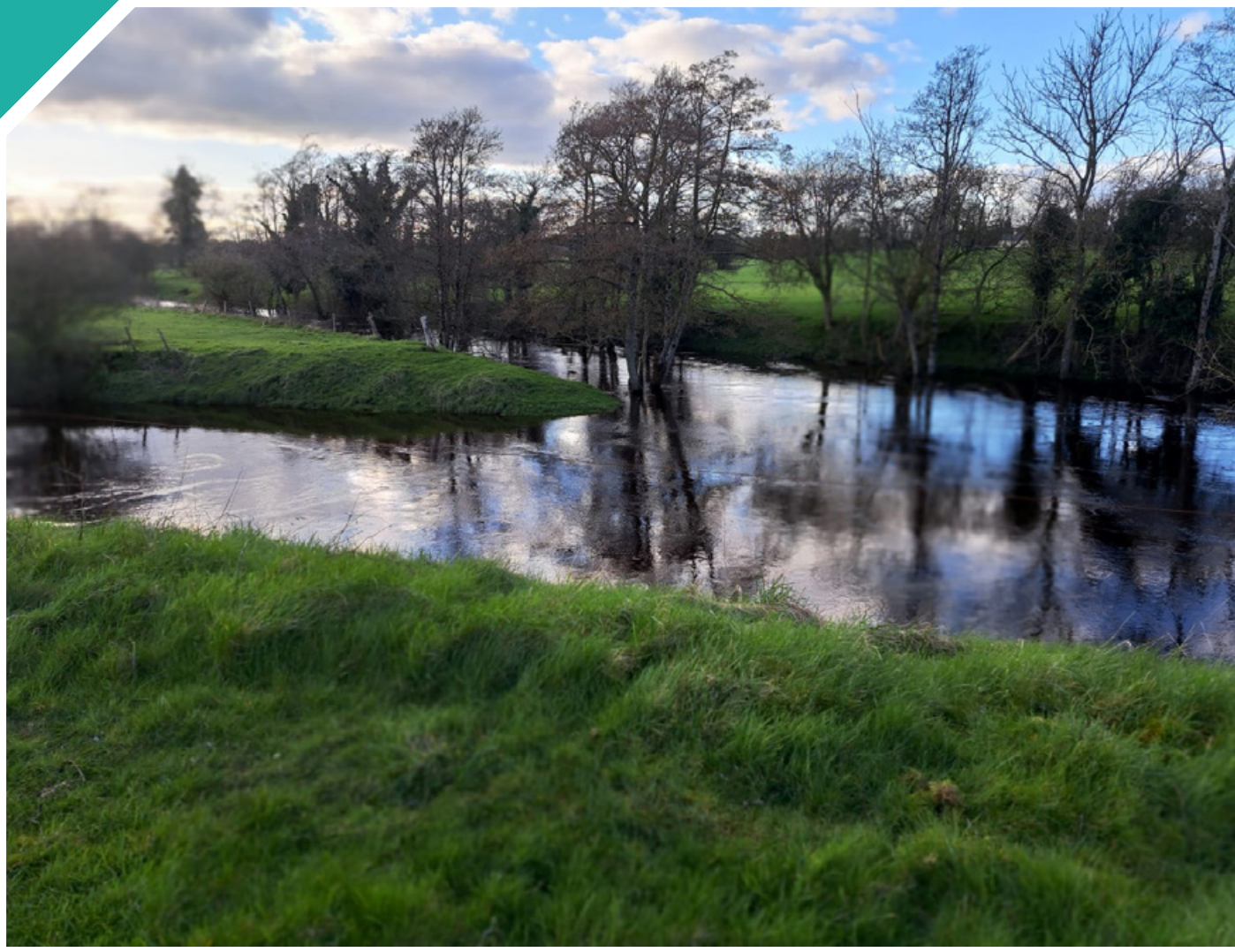

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Rialtas na hÉireann
Government of Ireland

Environmental Protection Agency

The EPA is responsible for protecting and improving the environment as a valuable asset for the people of Ireland. We are committed to protecting people and the environment from the harmful effects of radiation and pollution.

The work of the EPA can be divided into three main areas:

Regulation: Implementing regulation and environmental compliance systems to deliver good environmental outcomes and target those who don't comply.

Knowledge: Providing high quality, targeted and timely environmental data, information and assessment to inform decision making.

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1. Office of Environmental Sustainability
2. Office of Environmental Enforcement
3. Office of Evidence and Assessment
4. Office of Radiation Protection and Environmental Monitoring
5. Office of Communications and Corporate Services

The EPA is assisted by advisory committees who meet regularly to discuss issues of concern and provide advice to the Board.

Addressing the Political–Economic Barriers to Climate Adaptation in Ireland

Authors: Alice Brawley-Chesworth, Darren Clarke and Danny Marks

Lead organisation: Dublin City University

Identifying pressures

This research examined why climate adaptation in Ireland is not keeping pace with ongoing environmental change. Historically, Ireland's climate policies have prioritised reducing emissions over adapting to unavoidable climate impacts. With climate-related costs in Ireland projected to reach billions of euros annually by 2050, the study aimed to assess how current governance structures support or hinder adaptation. Using a political economy approach, it sought to uncover the interests, incentives and institutional factors that shape adaptation decisions across three key sectors: agriculture, flood risk management, and water quality and water services infrastructure. The research combined a literature review, document analysis, interviews and a stakeholder workshop to identify barriers preventing timely and effective adaptation. The goal was to provide evidence to inform more robust policy frameworks, ensuring that Ireland's climate adaptation efforts keep pace with emerging challenges and protect the country's economy, society and environment in the long term. Thus, this research is important for both the government and the general public. The research was innovative, as it was the first to explore Ireland's adaptation barriers through a political economy framework.

Informing policy

The study found that, while Ireland's National Adaptation Framework sets a strategic direction, political, economic and social factors hinder actual progress. Common barriers include (i) a perceived lack of urgency, where climate change is not seen as an immediate threat or one that requires widespread change; (ii) adaptation unsuccessfully competing with more immediate short-term political and economic priorities; and (iii) centralised governance and siloed thinking. In the agriculture sector, prioritising climate mitigation over adaptation, unclear goals, weak trust in advice, and powerful interest groups limit effective adaptation. In the flood risk management sector, slow progress is attributed to a lack of a sense of urgency, public disagreements on solutions, unclear division of responsibilities between agencies, and rigid funding criteria. In the water sector, a perceived abundance of water, unclear metrics that need landscape-scale implementation, prioritisation of current water challenges, and fragmented policies impede adaptation. These findings indicate that shifting underlying institutional and societal conditions is essential. This research further highlights the need for stronger leadership, consistent policies and greater stakeholder involvement, ultimately enabling Ireland's adaptation efforts to better align with the scale and urgency of climate impacts.

Developing solutions

The research provides a road map for policymakers, sector leaders and communities to strengthen adaptation efforts. Establishing high-level political support and appointing dedicated leadership can encourage long-term thinking. Initiating a national conversation – using participatory processes like citizens' assemblies – can build shared understanding and consensus on issues such as sustainable food systems and integrated landscape management for better adaptation. Pilot projects, such as experimental catchments for nature-based solutions, can demonstrate practical approaches that support adaptation across multiple sectors. Increasing local-level resources, training staff and fostering cross-sector collaboration will also help embed adaptation within governance structures. Sector-specific recommendations include giving farmers clear adaptation goals (agriculture), engaging communities in co-designing flood risk solutions (flood risk management), and raising public awareness about water resources and aligning related policies to deliver progress in water infrastructure (water quality and water services infrastructure). Over time, these measures can shift priorities and incentives, ensuring that adaptation actions become core elements of Ireland's policy landscape. Ongoing evaluation and further research will help refine and improve strategies, assisting Ireland in responding more effectively to climate challenges and ensuring long-term resilience.

EPA RESEARCH PROGRAMME 2021–2030

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EPA Research Report

Prepared for the Environmental Protection Agency

by

Dublin City University

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This report is based on research carried out/data from October 2023 to May 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's climate is experiencing significant changes, including higher temperatures, increased rainfall, rising sea levels and ocean acidification. These changes are already impacting our economy, society and environment. The costs of climate adaptation in Ireland are projected to be substantial, reaching billions of euros annually by 2050. Despite the pressing need for adaptation, national efforts have historically focused more on mitigation. Ireland's first and second statutory National Adaptation Frameworks were published in 2018 and 2024, respectively, to guide local authorities and key sectors in assessing climate risks and implementing resilience-building actions.

The Climate Change Advisory Council has consistently highlighted inadequacies in the implementation of some sectoral adaptation plans. The council's reviews from 2021 to 2023 reveal varying levels of adaptation progress in different sectors. The flood risk management sector has shown good progress, while the water quality and water services infrastructure sector and the agriculture sector have made moderate to limited overall progress.

A political economy approach has been identified as a useful way to examine embedded interests, incentives and institutions that enable or frustrate change, including for climate adaptation. Using a political economy approach to understand adaptation in Ireland, this study (i) evaluates whether current governance structures support or constrain adaptation efforts; (ii) examines adaptation barriers and outcomes from a political economy perspective in the agriculture, flood risk management, and water quality and water services infrastructure sectors; and (iii) identifies interventions to improve adaptation implementation by addressing political–economic barriers. The findings draw on a detailed literature review, document analysis, 50 semi-structured interviews and an in-person workshop with 23 stakeholders from the three focus sectors. Specifically, the interviews and workshop provided insights into the barriers these sectors face and helped identify the underlying political, economic and social mechanisms driving these barriers. Key findings include the following:

Overall Barriers

- **Lack of urgency and impacts.** Many stakeholders do not perceive climate change as an immediate threat or one that will necessitate widespread change, leading to complacency in implementing necessary adaptation measures.
- **Competing priorities.** Climate adaptation often competes with more immediate political and economic concerns, reducing its prioritisation.
- **Centralised governance and siloed thinking.** Over-centralisation and lack of cross-sectoral collaboration hinder effective adaptation planning and implementation.

Sector-specific Barriers

- **Agriculture:** farmers prioritise mitigation over adaptation, lack trust in conflicting advice, face powerful lobbying groups that challenge change, and have unclear goals and options for adaptation.
- **Flood risk management:** a lack of a sense of urgency, public disagreements on preferred solutions, questions of scale and financial inflexibility delay implementation.
- **Water quality and water services infrastructure:** public perception of water abundance, a need to change practices across the landscape, fragmented water governance, prioritisation of pre-existing activities, and unclear goals and metrics impede progress.

Overall Recommendations

- **Provide consistent leadership for long-term thinking.** Politicians should show high-level political support and appoint a commissioner for long-term thinking.
- **Establish a national conversation on food systems and landscape management.** Use participatory processes like citizens' assemblies to

discuss sustainable landscape changes with the public.
- **Designate an experimental catchment.** Test and demonstrate landscape-scale implementation of nature-based solutions.
- **Increase resources for climate adaptation, especially at the local level.** Enhance local authorities' long-term capabilities and provide further specific training and development for sectoral staff.

Sector-specific Recommendations

- **Agriculture:** provide clear adaptation goals and options for farmers.
- **Flood risk management:** establish public conversations and co-create flood risk solutions.
- **Water quality and water services infrastructure:** increase public engagement on water issues and align water-related laws and policies.

The report underscores the need for integrated, cross-sectoral actions and consistent political support to overcome these barriers. Addressing these challenges requires a shift in governance structures, prioritisation of long-term sustainability over short-term economic gains, and fostering collaboration across many sectors and levels of government.

1 Introduction

1.1 Research Background

Ireland's climate is changing in line with international trends, with extreme weather events, along with sea level rise and coastal erosion, highlighting an adaptation deficit nationally (Murphy *et al*., 2024). These changes are already impacting Ireland's economy, society and environment, with a 2013 Environmental Protection Agency (EPA) study estimating that adaptation costs range from €80–800 million annually (EPA, 2013). Moreover, the cost to the Irish economy of climate change is anticipated to be billions of euros per year by 2050 (Murphy *et al*., 2024). Adaptation is therefore needed.

Adaptation as a policy issue is a relatively recent strategy in Ireland. Until 2012, national efforts to deal with climate change centred primarily on mitigation practices (GOI, 2018). However, Ireland's first and second statutory National Adaptation Frameworks (NAFs) were published in 2018 and 2024, respectively (GOI, 2018, 2024a). The NAF was established to ensure that local authorities (LAs), regions and key sectors assess climate change risks and vulnerabilities, implement actions to build resilience to climate change, and ensure adaptation considerations are mainstreamed into all local, regional and national policymaking.

1.2 Sectoral Climate Adaptation Barriers

Despite the NAF's commitments, the Climate Change Advisory Council's (CCAC's) annual reviews from 2021 through to 2023 have repeatedly concluded that, of the 12 sectoral adaptation plans developed under the NAF, adaptation is still not adequately addressed in national, sectoral or local policies and initiatives (CCAC, 2021, 2022, 2023). Specifically, while progress was evident, in 2023 the CCAC noted that "There is limited evidence of the levels of urgency necessary in implementing concrete adaptation actions and delivering impacts" (CCAC, 2023, p. 19). Furthermore, the 2023 annual review added that "The performance of sectors in the implementation of sectoral adaptation plans is mixed. Although all sectors provided feedback on the implementation of their plans, there are clear deviations in terms of the standard of the action plans contained within the sectoral adaptation plans" (CCAC, 2023, p. 19). In particular, the CCAC found that agencies had inadequate resources and needed to better understand vulnerabilities and risks, develop key performance indicators and timelines, and better consider distributional impacts (CCAC, 2023).

Levels of progress differ between sectors and from year to year, according to the CCAC's analyses. For instance, as can be seen in Figure 1.1, the flood risk management sector consistently achieved good progress from 2021 through to 2023, while the water quality and water services infrastructure sector achieved good progress in 2021 and moderate progress in 2022 and 2023. The agriculture sector, however, achieved moderate or limited progress across the 3 years. The current pace of adaptation planning and delivery is, therefore, not commensurate with the rate at which climate change is currently impacting and will continue to impact Ireland, nor is it aligned to commitments contained in national adaptation policy and legislation. The Climate Action and Low Carbon Development (Amendment) Act 2021 states that it is focused on "pursuing the transition to a climate resilient, biodiversity rich and climate neutral economy by no later than the end of the year 2050 and to thereby promote climate justice, and just transition" (GOI, 2021). The flood risk management, water quality and water services infrastructure, and agriculture sectors represent different levels of adaptation success, as demonstrated in Figure 1.1. There is therefore significant merit in examining these sectors to identify reasons for different levels of adaptation progress. This could provide essential insights for these sectors and for adaptation planning across other sectors, thereby improving national adaptation outcomes.

1.3 Political Economy

Political economy is defined by Tanner and Allouche (2011, p. 2) as "the processes by which ideas, power and resources are conceptualised, negotiated and implemented by different groups at different scales".

	Flood Risk Management			Water Quality and Water Services Infrastructure			Agriculture, Forestry and Seafood		
	2021	2022 (progress since 2021)	2023 (progress since 2022)	2021	2022 (progress since 2021)	2023 (progress since 2022)	2021	2022 (progress since 2021)	2023 (progress since 2022)
Risk, prioritisation and adaptive capacity	Advanced	Good	Advanced	Good	Moderate	Limited	Moderate	Moderate	Moderate
Resourcing and mainstreaming	Advanced	Good	Good	Good	Limited	Moderate	Moderate	Limited	Good
Governance, coordination and cross-cutting issues	Good	Moderate	Good	Moderate	Moderate	Moderate	Good	Limited	Moderate
Trend	N/A	N/A	↔	N/A	N/A	↔	N/A	N/A	↑
Overall	Good	Good	Good	Good	Moderate	Moderate	Moderate	Limited	Moderate

Figure 1.1. Summary of flood risk management, water quality and water services infrastructure, and agriculture sectoral plans from CCAC reports (CCAC, 2021, 2022, 2023). N/A, not applicable.

Several scholars have looked at Ireland's political economy over the years and found that Irish governance is highly centralised, with local government having very limited functions and powers (Breathnach *et al*., 2021; Ó Broin and Waters, 2007). Even in areas where LAs have significant responsibilities, the central government controls resources and policies, leaving local governments with little leverage over the government departments and agencies from which they need cooperation to meet their goals (Breathnach *et al*., 2021; MacCarthaigh, 2020). Also highlighted in the literature is the prioritisation of foreign direct investment, a strategy that was celebrated during the "Celtic Tiger" era of the 1990s until 2007, but has received mixed reviews since (Bohle and Regan, 2021; Kitchin *et al*., 2012). This focus on attracting multinationals has continued even after the financial crash in the mid-2000s; scholars attribute this to large business and economic interest groups having easier access to politicians than other types of interest groups, and there being little discussion of alternatives in the public sphere (Bohle and Regan, 2021; Murphy, 2023). This is not attributed to corruption; it is because the basic neoliberal model of growth has not been questioned by any major party in Ireland (Bohle and Regan, 2021; Fahy, 2020; Murphy, 2023). This focus on growth prioritises economic considerations over risk reduction associated with climate adaptation.

1.4 Political Economy of Adaptation

This study examines adaptation barriers in Ireland from a political economy perspective. Previous studies have highlighted barriers to adaptation as a major challenge to implementing adaptation strategies in an Irish context, but this has been sector specific, e.g. flood risk management (Clarke and Murphy, 2019, 2023; Clarke *et al*., 2016; Jeffers, 2013, 2022). However, there is a need to better understand how national and subnational adaptation processes connect with higher organisational scales of governance and interact across sectors (Desmond, 2018). Political economy analysis of adaptation efforts can reveal "underlying interests, incentives and institutions that enable or frustrate change" (Department for International Development, 2009), and thereby help identify barriers to adaptation and opportunities for further effective adaptation policy development and implementation. Political economy studies can also help identify opportunities for policy

reform and ways to address the underlying drivers behind these identified barriers.

A political economy approach has been used to examine climate change adaptation as a collective-action problem that requires a high degree of technical information and a large number of players, some of whom will lose resources and power from certain policies. Therefore, adapting to climate change depends not merely on physical, human and capital factors, but also on the institutional structures of the country (Doner, 2009). Thus, a sector's capacity to adapt to climate change is determined not only by its level of resources and technology, but also by social, economic and political variables, such as governance structures and ideas (Jones, 2011). Studies have shown that, from a political economy perspective, ideas and ideologies shape policy outcomes (Tanner and Allouche, 2011). Scholars have noted an "implementation gap" in Ireland where climate-related laws and policies are sufficient or even progressive, but implementation is half-hearted and slow (Fahy, 2020). FitzGerald *et al*. (2019) point out that slow implementation can be an indicator of a weak commitment to a policy or of competing or contradictory policies driving action in different directions. This is potentially the case for Ireland, where any policy or law that contradicts the economic growth model and challenges the status quo would run into difficulty at the implementation phase. In fact, in the sectoral adaptation plans and other documents outlining implementation priorities, reference is frequently made to needing to do this in the context of the economy or sectoral growth. For example, the 2022 draft update of the River Basin Management Plan for Ireland says that "managing our natural assets cannot be at the cost of accommodating development growth and the needs of expanding populations" (GOI, 2022a, p. 23). Similarly, one of the objectives for the agriculture sector is to "support the sector and foster sustainable growth ..." (GOI, 2019a, p. 27). This makes it very difficult to implement actions that may be necessary for climate adaptation but have the potential to restrict economic or sectoral growth in any way.

1.5 Research Objectives

The objectives of this study are to:

- evaluate whether current adaptation governance structures support or constrain national, subnational and sectoral adaptation efforts;
- examine adaptation barriers and outcomes from a political economy perspective in the flood risk management, water quality and water services infrastructure, and agriculture sectors;
- identify interventions for improved adaptation implementation within these three sectors that address underlying political–economic barriers and could be applicable to interventions in other sectors and to the overall governance of adaptation in Ireland.

1.6 Methodology

This research was conducted over a 1-year period between July 2023 and June 2024, and consisted of a detailed literature review, document analysis, semi-structured interviews and a workshop with stakeholders from the following three sectors: flood risk management, agriculture, and water quality and water services infrastructure. It should be noted that for the water quality and water services infrastructure sector, the authors mostly interviewed people responsible for water quality, with fewer interviewees responsible for water services infrastructure available. Consequently, most of the findings and recommendations for this sector relate to that specific component. Qualitative research methods were used because, as Maxwell (1994) explains, qualitative methods are good for understanding processes and causal explanations within particular contexts. The research focused on finding out why adaptation is or is not occurring, relying on the perceptions of study participants, which are better revealed through qualitative methods (Creswell, 2008).

A detailed literature review and document analysis focused on political economy studies internationally and in Ireland, climate adaptation research across multiple sectors, including the three selected sectors, and barriers to climate adaptation worldwide. This scoping review of the literature was subsequently used to inform the primary data collection.

Fifty approximately 1-hour interviews were conducted with people working across adaptation in Ireland. Approximately one-quarter of interviews were with people from each of the three sectors and the remaining one-quarter of interviews were with people who are not specific to a sector, but instead have expertise in overall adaptation action and policies in Ireland. Interviews were conducted online using Zoom or in person between October 2023 and

Table 1.1. Interviewees' primary sector and employment[a]

	Employment			
Sector	**Government department, agency or LA**	**Private**	**Non-profit**	**Total**
Agriculture	9	3	3	15
Flood risk management	6	1	2	9
Water quality and water services infrastructure	12	1	1	14
Other	8	0	4	12
Total	35	5	10	50

[a]Some interviewees could be classified under more than one sector. For this table, the primary sector worked in was used. For example, if someone worked for an organisation helping farmers change management practices for water quality, flood control, biodiversity and farm resilience, they were considered to be in the agriculture sector.

Table 1.2. Categories of barriers used in the study

Barrier	Description
Belief formation	Stories about what is happening in society and what is important
Organisational inertia	When organisations keep doing what they are used to doing and what they already know how to do
Boundary control	Tightly controlling what an organisation works on or funds
Enclosure and exclusion	Only certain people's expertise and experience are considered; also, certain groups capture resources
Frame polarisation	Each side's version of reality gets farther from the other side's over time
Veto player	When someone can block action by withdrawing support or resources
Lost in translation	Messages are interpreted and altered as they are passed to each new person or group
Conflict infection	Past animosity, sometimes in relation to a different topic, impacting today's interactions

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February 2024, with one interviewee submitting written answers. Interviewees worked at various levels of government, in the private sector as consultants working on flood management, water or agriculture, or in the non-profit sector (see Table 1.1). Of these, six interviewees indicated that they were farmers in addition to having other employment. The researchers contacted multiple full-time farmers but received no response.

All interviews were transcribed and analysed using NVivo software. This allowed for thematic coding of key themes from interviews by one researcher. A review of the thematic coding of each interview was subsequently undertaken by a second researcher to identify missing themes and improve validity of the findings. Quotes included in this report have been corrected for grammar. Following the interviews, a workshop was held in March 2024 to review and validate the initial findings. The workshop included 23 participants, some of whom had been interviewed and others who had not, but were similar in terms of their sectoral and professional employment. Notes were taken by the research team during the workshop and were used to corroborate the draft interview findings.

In their analysis the authors sought to dig deeper rather than simply naming the barriers identified by study participants; they looked for the underlying political, economic and social mechanisms that are driving these barriers, in line with the purpose of this research, to examine adaptation barriers from a political economy perspective. Several frameworks exist for classifying barriers to adaptation actions, including those proposed by Moser and Ekstrom (2010) and Sovacool *et al*. (2015). For this analysis, the authors found the framework outlined by Ishtiaque *et al*. (2021) to be the most useful. The categories of barriers are shown in Table 1.2.

2 Overall Barriers

2.1 Background

The barriers uncovered in this study include those specific to individual sectors and those that apply to all sectors. The sector-specific barriers are outlined in Chapters 3–5. Overall barriers are presented in section 2.2. In addition, a subsection on barriers to implementation of nature-based solutions is presented in section 2.3. Nature-based solutions are recommended in the Climate Action Plan, the CCAC's 2023 annual review, Ireland's Climate Change Assessment and the 2024 NAF as a means for overcoming multiple challenges in an integrated way, including in all three sectors examined in this study (CCAC, 2023; GOI, 2022b, 2024a; Murphy *et al*., 2024). This research found that barriers to implementing nature-based solutions are different to barriers to implementing more traditional built infrastructure solutions; therefore, they are highlighted in a subsection of the overall barriers (section 2.3).

2.2 Overall Barriers

2.2.1 B1: downplaying the urgency and extent of necessary changes (organisational inertia; belief formation)

The overarching barriers to climate adaptation that influence all other barriers are beliefs and attitudes about how climate change will impact Ireland. While climate change denial is rare, impacts are often seen as either a future problem or a problem that will not impact Ireland very severely, and there is no widespread agreement on what specific solutions should be implemented (O'Mahony *et al*., 2024). Even people experiencing adverse events like flooding or loss of crops do not connect them directly to climate change, or they think that they will not get much worse than at present. Among those tasked with implementing climate adaptation actions, there is no sense of urgency or realisation of the scale of necessary changes. As interviewee 3 (government) said, "Some people just hope climate change will change nothing, so they won't have to change anything". From a political economy standpoint, this means that people in all three sectors are trying to operate within the current growth-oriented economic and political paradigms. As interviewee 31 (non-profit) said, "There's the political ideological view that you could actually just farm this out to the market, the transition will happen naturally within the space of the market". As part of this, many study participants mentioned that Ireland has an implementation gap. The laws and policies are frequently adequate and even progressive, but enforcement is low, resourcing is insufficient and the civil and public service resists making the changes. Organisations have not come to terms with the game-changing nature of the climate crisis. Another participant commented on existing powerful interests:

> When something is established it's very hard to change it without there being a loser, and the loser is invariably going to protest. And the scientific evidence might not get as much priority in those situations over the existing interest.
>
> Interviewee 18 (government)

However, many study participants felt that, for the most part, there is little opposition to climate adaptation in Ireland; rather, there is just comfort with the status quo. When asked who was opposing action, participants said "nobody", "I don't really know" or gave vague answers such as "the powerful". As interviewee 36 (government) said, "Ultimately, the status quo is what we'd all settle for ... there's some nasties out there, but generally the reality is that you want to keep things the same, or what's predictable", while interviewee 41 (government) added, "I'm not aware of any nefarious calculation of someone who's selling the status quo, that's benefiting. It's just always that pressure from inertia". This view persists despite recent experiences nationally with flooding, unusually persistent rain and record-breaking monthly global temperatures.

2.2.2 B2: competing priorities (belief formation)

From a political perspective, while the public believes that climate is important and should be highly

prioritised (O'Mahony *et al*., 2024), there are always other priorities that feel more urgent and politically salient. Elected officials pay more attention to things seen as urgent day-to-day worries of the public, such as housing, energy costs and healthcare. Interviewee 28 (non-profit) said, "Climate change is not the only thing happening. There are other pressures people are facing and the priority given to climate change waxes and wanes over time". Even within climate action, mitigation is seen as more important and more urgent: "We need mitigation, obviously. I would prioritise mitigation and reducing our emissions" (interviewee 19; non-profit). Climate adaptation does not compete with other issues that feel more urgent to many people, and, as a result, to politicians and policymakers.

2.2.3 B3: over-centralisation and siloed thinking (enclosure and exclusion)

Adaptation is widely considered to be a localised problem. In Ireland this can be a challenge, since governance is highly centralised compared with other European countries (Ó Broin and Waters, 2007). While some study participants perceived advantages of centralisation, such as the ability to prioritise flood risk management actions on a national scale, there was also an overall recognition that local solutions, local resources and local support were often lacking in Ireland because of its governance structures. For example, when discussing water quality one study participant said:

> It's the national context that's driving the policies and the regulations. The local authorities should be doing a lot of the inspections and they're not ... [it's not] a lack of will; it's a lack of resources and a lack of knowledge.
>
> Interviewee 19 (non-profit)

In addition, even at the national level, sectors have, so far, been trying to plan and implement climate adaptations separately in their own siloes:

> One of the key barriers to adaptation in Ireland is [that] we have this siloed approach, even at a national scale, where we have sectoral adaptation plans. They're very much separated into flood risk management, water, and agriculture – all have their own adaptation plans.
>
> Interviewee 28 (non-profit)

This over-centralisation and siloed thinking were highlighted by interviewees as barriers to adaptation in all three sectors.

2.3 Barriers to Nature-based Solutions

2.3.1 B4: organisational silos (enclosure and exclusion; veto player)

One of the most valuable characteristics of nature-based solutions is their multiple benefits. However, this is also one of the biggest barriers to their implementation. Each organisation can spend money on their specific responsibilities only. This inability to fully fund multi-benefit projects occurs even within organisations because budgets are earmarked for specific activities. For example, at the LA level, there is a reluctance to fund nature-based solutions using money for transport even when it would be used to manage rainwater run-off from streets:

> Local authorities are responsible for the storm water drainage network … [but] the roads engineers will tell you we don't have the money to upgrade drainage. All the money we have has to go to road maintenance.
>
> Interviewee 14 (government)

Another element of this is that organisations need a positive cost–benefit ratio for their specific element, e.g. flood risk management or water quality improvement. Quantified benefits are not always available, and interviewees pointed out that sometimes the cost–benefit may not be positive for flooding or water quality benefits when calculated in isolation, even if the overall project's benefits, when including things like biodiversity enhancement, for example, outweigh its total costs.

2.3.2 B5: overemphasis on certainty (organisational inertia; belief formation)

A related barrier is that the Office of Public Works (OPW), which is responsible for flood risk management, has more resources than agencies in other sectors. Most people working in flood risk management think that there is an objectively right way to reduce flood risk, i.e. engineered structures designed to protect buildings. The engineering mindset is common among those working on flood risk management and includes a belief that structural flood measures are the only realistic way to achieve certainty in preventing flooding. There are many reasons why engineers working in this sector believe that nature-based solutions will not work. As one interviewee said, "Ultimately, the only way to defend against a significant storm event [is] to build flood defences" (interviewee 5; government).

Flood risk managers at the national and the local level believe that too many nature-based facilities would be needed over a large catchment area and would not work once the land is saturated, that nature-based facilities are too hard to maintain and are unproven in Ireland, and that it is too difficult to get landowners on board. This is often expressed as nature-based solutions not providing enough certainty:

> The problem with that is, it doesn't give the level of certainty that citizens and insurance companies would like … . All these mini little beaver dams all over the catchments, tens of thousands of them, they might work, they might help, but there's no guarantee.
>
> Interviewee 4 (government)

This belief is also common among the residents in areas at risk of flooding. Many have been repeatedly told that only structural flood barriers will protect them, and that insurance companies will insure only properties that are protected by hard infrastructure such as flood walls and flood embankments. This persists despite examples of structural flood control failure and inadequacy, and examples from abroad of the successful implementation of nature-based solutions for flood risk reduction (see, for example, Fox-Rogers *et al*. (2016) and Short *et al*. (2019)).

2.3.3 B6: dependence on changes on agricultural land (veto player)

Scholars have written previously about the perceptions of historical and continuing conflicts between agricultural and environmental interests in Ireland (see, for example, Best and Hochstrasser (2022)). For example, there are ongoing conflicts over whether agricultural run-off is the primary cause of water quality degradation and whether improvement requires a reduction in livestock numbers. These conflicts are a barrier to the implementation of nature-based solutions because they slow adaptation action on agricultural land, which constitutes 67% of the Irish landscape (Attorp, 2022). These conflicts were highlighted in the interviews to help explain why farmers do not trust those advocating for adaptation actions that are geared towards environmental improvements. As one interviewee said, "[There is] a lot of fear around changing to adapt to the climate situation. People feel attacked" (interviewee 21; government). This concern has not necessarily arisen because of actions specific to climate adaptation, but because increasingly polarised views hinder action, as highlighted by one study participant:

> The perception among farmers is that [environmentalists] want them to stop farming ... . And some of our politicians defending nitrates derogations on very dodgy ground [in order] to be popular in their area. You get the whole gamut from one end to the other … . It can be kind of polar opposites at times.
>
> Interviewee 26 (government)

Because farmers feel that they are being unfairly blamed for the environmental problems in Ireland, they also feel they are being unfairly burdened with the changes needed to fix them. This can result in a deflection of attention to other sectors and a reluctance to take action. One participant said that when farmers are asked to make changes to improve water quality, "You get a lot of whataboutery at the moment, you know: [farmers saying] 'well, what about wastewater, and the state'" (interviewee 32; government).

Interviewees from environmental and public infrastructure organisations acknowledged that farmers have been poorly treated and that agriculture's impacts

on the environment are the result of historical and current government growth-oriented policy incentives. For example, the intensification of dairy farming in the past decade is a direct result of government programmes designed to increase exports. Farmers now feel blamed for doing what they were encouraged to do, which makes them sceptical that the current incentive structures for water quality, forestry and biodiversity improvements will be honoured in the long run.

2.3.4 B7: belief that Ireland is unique (belief formation)

Several of the study participants stated that solutions piloted in other countries could not be applied to their locale because Ireland is unique in its climate, regulations and cultural practices. Other participants disagreed with the substance of that argument, but agreed that it is a barrier to importation of solutions from elsewhere. This was particularly true for nature-based solutions:

> [There's] a generally conservative approach within our state agencies. They're afraid to act on evidence coming from other countries. They kind of want proof that it works in an Irish context before they put the necessary measures in place.
>
> Interviewee 19 (non-profit)

Nature-based solutions have been proven effective elsewhere; however, for adaptation people need proof that they will work in Ireland before they are willing to include them in projects, and so implementation is delayed.

3 Agriculture Sector Barriers

3.1 Background

Despite agriculture being considered one of the most vulnerable sectors when it comes to climate change, adaptation is not at the top of the agenda for farmers worldwide. This is at least partly due to early messages that agriculture is highly adaptable and the costs would be low (Burton and Lim, 2005). Weather variability has always impacted agriculture, and farmers are constantly adapting and changing things like crop selection and diversity, and the timing of planting (Dolšak and Prakash, 2018). Many farmers have made adjustments to their activities as they respond to changes in the weather, but these are unlikely to be enough in the long term (Vermeulen *et al*., 2018). Vermeulen *et al*. (2018) explored the potential for transformative change in agriculture, and concluded that few of the current adaptation activities are transformative and that changes in mental models and how farmers envisage the future are needed to spur such transformations.

The situation is similar in Ireland. Until quite recently, Ireland was a mostly agricultural society, with cattle having a special cultural significance, with practices originating thousands of years ago (Attorp, 2022). This, combined with the continuing importance of agriculture to the economy, the unpredictability inherent in farming and the prioritisation of food security, means the agriculture sector has been treated differently from other sectors in law and policy in Ireland and most of Europe (Attorp, 2022). Although farmers were incentivised, until very recently, to intensify production, most farms in Ireland are still small, with income inequality in agriculture among the highest in the country (Mercier *et al*., 2020; NESC, 2023). In 2021, the agriculture sector received a "moderate" score from the CCAC's review, and in 2022 it received a "limited progress" score, as shown in Figure 1.1 (CCAC, 2021, 2022). However, it rebounded in 2023 with a "moderate" score, and even achieved "good" in resourcing and mainstreaming, indicating an upwards trend (CCAC, 2023). While mainstreaming adaptation into new policies was highlighted, the CCAC also noted that "the success of these frameworks in delivering concrete adaptation actions will depend on their effective and sustained implementation" (CCAC, 2023, p. 16).

3.2 Barriers

3.2.1 B8: competing priorities (belief formation; organisational inertia)

The primary focus of climate-related work in agriculture is on mitigation. The narrative among farmers is that they can prioritise only one thing because of limited time and resources, and mitigation is currently being both regulated and incentivised. As one interviewee said:

> A lot of the discourse has been around greenhouse gas emissions from agricultural land use change from a mitigation perspective. And I'm not sure that's the case for adaptation, and its importance to agriculture hasn't really come onto the agenda as it needs to.
>
> Interviewee 28 (non-profit)

Part of the reason for this is a related narrative that climate change is a future problem that may not be very disruptive to agriculture in Ireland. This is supported by statements made by politicians and the Department of Agriculture, Food and the Marine that climate change will bring opportunities for farmers. Because farming has always been adaptive to local conditions, changes in prices, disease and weather events, there is a belief that adaptation to climate change can be accomplished in a reactive way through small incremental adjustments as the need arises. Larger transformative actions are not part of the conversation. As interviewee 10 (private) said, "As a farmer you react to every season the way it comes at you. So, what's climate change? It's just another change to the seasons".

Although farmers are more aware of how the climate is already changing, they have not necessarily connected

the changes they are seeing on their farms with a need to make fundamental changes to their practices or take proactive adaptation actions. This is despite the fodder crises of recent years, including 2023–2024, due to ground saturation from rainfall over the winter and spring. For the same reason, farmers have also been facing a "crisis" in planting crops and getting livestock access to grass (Boland, 2024). Even with increased rainfall and frequent ground saturation, the proposed solution is short-term government funding rather than long-term fundamental changes that would make farming more sustainable.

There are other competing priorities unrelated to climate change for Irish farmers. For most farmers in Ireland, finances are a higher priority because they have very low farming income, with interviewees indicating that many do not have enough resources, in terms of either time or money, to make changes to their farms. As participant 42 (non-profit) said, "we've got a viability issue with a lot of our farms, the vast majority of farms aren't viable without public money". This is confirmed by studies showing the financial precarity of farming for most Irish farmers (NESC, 2023).

3.2.2 B9: farmers do not trust the advice they are being given (conflict infection)

Some interviewees suggested that farmers resent being told that they are the problem, which may contribute to their resistance to changing their practices. Despite scientific evidence showing that the agriculture sector is Ireland's greatest contributor to climate change, water pollution and biodiversity loss, there is a general feeling among farmers that they are unfairly blamed. They feel that the Irish way of farming, especially the extensive farms, is sustainable, and that Irish grass-based beef and dairy farms are more sustainable than those in other countries. This disconnect between the experiences of farmers and the recommendations of the scientific community is leading to increasing polarisation, in line with experiences in other parts of Europe (McGee, 2024).

In addition, in recent decades farmers have been incentivised to intensify production. For years they were told by government and advisory bodies that intensification was necessary; however, those same agencies are now telling them the opposite: that Irish farming is too intensive and is causing environmental harm. This has led to resentment and mistrust of politicians and scientists. As one interviewee said about changing incentives for farmers, "There's so much change and so much uncertainty that farmers are going, 'look, just leave me alone, I'm fed up. You're constantly changing the messaging'" (interviewee 38; non-profit). An important element of this is that many farmers took out loans to implement previous advice and have yet to finish paying off these:

> I think that those farmers invested a lot in expanding, they did exactly what they were told to do: they were told by politicians, they were told by the media, they were told by Teagasc … and now they're being told that that was all wrong.
>
> Interviewee 42 (non-profit)

This reversal of advice and shift in incentives has bred mistrust and resentment. Farmers are now less willing to listen to "outsiders", dismissing their advice as coming from city dwellers who know nothing about farming. Interviewees said that farmers are sick of being told to change practices, which has led to an entrenchment of current farming methods and an unwillingness to change.

3.2.3 B10: the power of the agricultural lobby (veto player)

The agricultural lobby is perceived to be very powerful in Ireland. The lobbying organisations are generally believed to have achieved regulatory capture. For example, interviewees believed agricultural lobbyists, including those from Ireland, were responsible for watering down the European Union (EU) Nature Restoration Law:

> The original iteration of that piece of legislation called for widespread land use restoration of natural areas … and you had the agricultural lobby up against the nature lobby arguing how they weren't going to give an inch.
>
> Interviewee 13 (government)

An example given by some participants of how lobbying harms adaptation is the agricultural lobby's advocacy for delaying new regulations and reducing

inspections and enforcement of environmental laws. Interviewee 23 (government) said about the lobbyists, "it's somewhat huge industry pressure to maintain the short-term economic benefit, which is enormous … the short-term benefit is outweighing the long-term pain". Delaying enforcement prevents achievement of environmental outcomes, which then triggers another round of regulations, such as the reduction in the nitrates derogation. Participants stated that this ongoing uncertainty about future regulations causes farmers to delay implementing any changes on their farms. For example:

> [You're asking them to add slurry storage while] at the same time to reduce the stocking rate, and so they don't know how many [cows] they will have to reduce in the coming years. So why would they add [slurry] storage now if they don't need it anymore in 5 years?
>
> Interviewee 3 (government)

This regulatory uncertainty makes farmers less likely to make changes, even if doing so would increase their own resilience.

Most farmers are operating at either a loss or on a very small profit margin, surviving through off-farm employment. As one study participant noted in reference to larger, more intensive farms:

> Their stocking rates are so high that nothing can go wrong because they produce exactly the amount of feed to feed their … cows. And in adaptation it's a problem, because if something goes wrong the whole system collapses because you … didn't have a margin of error.
>
> Interviewee 8 (government)

This is also the case for smaller and less intensive farmers:

> Am I comfortable that I'd get through if I had two bad years in a row? Because you're not going to invest in anything if you don't know if you're going to be still in business in a year or two.
>
> Interviewee 38 (non-profit)

Individual farmers do not have the resources necessary to make changes on their farms, even though the industry as a whole realises significant profits. However, interviewees indicated that the agricultural lobby is not advocating for and is, in some cases, resisting policies that would shift profits within the sector to the benefit of small farmers.

3.2.4 B11: unclear goals and options (lost in translation)

Current adaptation goals are too vague for farmers to take action. When asked about adaptation to climate change, most study participants from the agriculture sector talked about actions that would help with water quality, flooding or biodiversity adaptation, rather than adaptation of agriculture. This is perhaps reflective of the view within the sector that agricultural adaptation is perceived by farmers as supporting cross-sectoral adaptation efforts rather than the agriculture sector's or individual farmers' need to adapt to climatic risks at farm level, e.g. through changing land use practices to respond to farm-level flooding or drought. In addition, participants discussed the changes to farming needed for mitigation, even when the conversation was steered back to adaptation. One reason for this is that farmers do not have a clear vision in their minds of what adaptation of the farming system for long-term sustainability would involve: "So it's going to be more of those extreme events, like the rainfall we had yesterday. How do you adapt for that in a farming scenario? I'm not really sure what you can do" (interviewee 3; government). Similarly to the water sector (see Chapter 5), the goal of "resilience" is not concrete enough to drive action. For farmers, it is also very important to have local examples of actions:

> And the key bit there is that the more localised they can be, the more buy-in there is from the local community … a lot of what we have at the moment is top-down, one size fits all, which, by the time it hits the ground, is one size fits nothing.
>
> Interviewee 23 (government)

Therefore, any solution that is not specifically tailored to farmers' circumstances is considered not to be applicable or not worth the risk of changing current practices.

4 Flood Risk Management Sector Barriers

4.1 Background

Flooding has long been recognised as an important issue in Ireland. Prior to preparation of the first sectoral adaptation plans in 2018, the OPW had a long history of planning for flooding using engineering-based structural flood control measures. In addition, the EU Floods Directive directs Member States to use a catchment approach to flood management and encourages them to move from purely structural flood relief solutions to adopting a more holistic approach to flood risk management (Clarke and Murphy, 2019; GOI, 2019b; O'Neill, 2018). Ireland has implemented the EU Floods Directive through preparation of the Catchment Flood Risk Assessment and Management Programme and Flood Risk Management Plans. According to the 2019 *Flood Risk Management Climate Change Sectoral Adaptation Plan* (GOI, 2019b), 118 flood relief schemes and 35 flood relief projects were already identified prior to preparation of the sectoral adaptation plan in 2018.

The flood risk management sector was held up by interviewees as more successful than other sectors. It has consistently earned one of the highest scores in the annual CCAC reviews, scoring "good" each year, and earning an "advanced" rating for work in risk, prioritisation and adaptive capacity in 2023 (CCAC, 2021, 2022, 2023). In addition, the OPW has been planning for climate change for longer than the other sectors:

> [The OPW] started doing these assessments 20 plus years ago. So to be honest it's quite self-driven … [they're] dealing with flood risk, [which is] an obvious impact that a lot of people think of when you think about the impact of climate change.
>
> Interviewee 2 (government)

Study participants expressed that the OPW is more effective because it has a clearer mission and goals than other sectors. OPW staff know what is being planned for within a range of reasonable uncertainty, and that effective, if not ideal, solutions exist.

4.2 Barriers

4.2.1 B12: lack of urgency (organisational inertia; belief formation)

Several interviewees suggested that the risk of floods from climate change is perceived as a future problem, including among the general public:

> It's very hard to get people to pay for things in the future, and that's across everything like health insurance, pensions – people don't pay today for things that they're not going to see a benefit of until a long time in the future.
>
> Interviewee 17 (government)

Several interviewees noted that, while they consider climate change a current challenge, they were frustrated by the broader public perception that it is a future problem. This apathy may lead to a failure by the public to demand more long-term flood planning for climate change. One interviewee with responsibility for managing flood risks noted:

> We don't have the money. We shouldn't be spending billions a year in 2024 building massive infrastructure for something that's not going to happen for 70 years – so I think we need a plan to go from where we are to what we expect in 2100.
>
> Interviewee 4 (government)

This suggests that even those responsible for flood risk management are, at present, cautious of developing and implementing flood adaptation measures that will future-proof against climate change. This lack of urgency among the public and those responsible for flood risks persists despite many communities nationally experiencing major flooding in recent years and evidence suggesting that flood risks will increase in the future.

4.2.2 B13: no agreement on preferred solutions (belief formation; organisational inertia)

Flood control projects are often delayed due to objections from the public and planning delays. Some interviewees thought members of the public expect and prefer hard engineering flood defences, at least partially for insurance reasons. Community acceptance of non-structural flood solutions is not widespread, perhaps because people have been presented with only engineering solutions in the past and the experts have told them that they are the only effective solutions. Non-structural flood solutions are often unpopular or misunderstood, requiring visible success and sustained engagement to gain support. For example, one participant talked about objections to a non-structural solution in their community:

> And the playground was built in such a way that it can flood ... so we get to use that as a recreation facility 360 days a year, and … as a flood storage location for 5 days of the year. And in my opinion that's a win–win situation. But to many members of the public that's an utter disgrace [because] I can't use it 5 days a year.
>
> Interviewee 4 (government)

Some residents will object to any non-structural solutions. In some ways, it is a "chicken and egg" problem, where people need to see a successful non-structural solution before they will support it.

However, structural flood control solutions are also frequently opposed, as one participant said:

> There's issues around social acceptability … people don't want their views obstructed. People have valid environmental concerns, because these are major engineering projects, and they do have an environmental impact.
>
> Interviewee 17 (government)

At the root of this is a larger societal problem where towns and houses have been built in areas that are prone to flooding. Interviewees highlighted that the historical relationship to the land in Ireland means that there is a reluctance to impose any restrictions on land use. These legacy and continuing land use issues, and disagreements about the best ways to manage flooding, cause long delays in project implementation.

4.2.3 B14: questions of scale (boundary control)

While having a national flood management agency was mostly seen as beneficial, some interviewees raised the problem of flood planning at a national scale. Some felt that LAs are more in touch with local communities than national government, and they could put together more community-focused schemes. While LAs can apply to the OPW's Minor Flood Relief Scheme for funding for projects up to €750,000 in value, they are often reluctant to take on a project because they need to follow a different approval system (they have authority under the Planning and Development Act rather than the Arterial Drainage Act), and they would take on the liability if they built the scheme. Moreover, the OPW's funding covers planning, design and construction, leaving the LAs with maintenance responsibilities but no budget for them. As one interviewee said:

> The OPW is the flooding authority for the country, but it would argue the local authority is responsible for maintaining infrastructure and keeping it free of water ... . So I do think there is ambiguity there that is hampering the responses.
>
> Interviewee 4 (government)

These questions of liability, funding and what level of government is best positioned to plan, build and maintain flood risk management projects are barriers to adaptation action.

4.2.4 B15: financial inflexibility (boundary control)

While the CCAC scorecard demonstrates that the flood risk management sector is the most advanced nationally, the singular remit of the OPW to focus on flooding is seen as restrictive because of its inability to fully consider and engage with other community priorities. If an LA wants to have a multipurpose project with co-benefits, the OPW can fund only the flood portion, making it difficult for such projects to move forward under the current constrained LA funding

structure. As interviewee 14 (government) said, "All the other types of benefits like natural capital, social benefits, all of those things ... they don't feature in the benefit–cost ratio at the minute". Similarly, speaking about taking other sectors' interests into consideration, interviewee 17 (government) said, "they are considered through the multicriteria analysis. … but the cost–benefit analysis, as it currently stands, just considers the flood damages versus the costs". The OPW is trying to bring these considerations into their analyses, but, to date, this has been uneven. There was also a suggestion that the Department of Public Expenditure, National Development Plan Delivery and Reform's infrastructure guidelines would need to be changed before the OPW could integrate these considerations into its assessment criteria for flood projects.

5 Water Sector Barriers

5.1 Background

The water sector includes both water quality, defined as "the biological, chemical and physical status of raw water in the environment", and water services infrastructure, which refers to "the integrity and performance of above and below ground infrastructure assets relevant to water and wastewater service provision" (GOI, 2019c, p. 5). Like other sectors in Ireland, the water sector's law and policy are multilayered, with EU directives and national, regional and local elements. In addition, in Ireland urban and rural water are managed differently. There are many ongoing pressures on the water sector that intersect with adaptation planning, including a rising population and intensification of agriculture. Climate change brings in "chronic, long-term variations to existing climate conditions, and acute changes to the severity and frequency of extreme events" (GOI, 2019c, p. 12).

Governance in the water sector is complex and has been subject to reforms and reorganisations, with the most recent occurring in 2016 with the adoption of the second cycle of the River Basin Management Plans. At that time, the government added the Water Policy Advisory Committee to coordinate departmental actions, An Fóram Uisce as an advisory body for water-related organisations and sectors, and the Local Authority Waters Programme (LAWPRO) to assist LAs and coordinate local knowledge and technical expertise for implementation (O'Riordan *et al*., 2022). This sector earned a "good" status in the 2021 CCAC review but scored "moderate" in the subsequent 2 years (CCAC, 2021, 2022, 2023). In 2023, the risk, prioritisation and adaptive capacity sub-rating was "limited". Therefore, while overall progress stayed steady between 2022 and 2023, when looking at all 3 years of the scoring it appears that progress has either stalled or started to decline.

5.2 Barriers

5.2.1 B16: perceptions of water being clean and plentiful (belief formation)

Several participants thought that the Irish public's beliefs about water are also barriers to improving water resilience, specifically the belief that Ireland is water-rich, clean and green. According to several of the interviewees, the public, especially in the cities, have lost a connection to the rivers, and often do not know the source of their water; as one participant said:

> No one believes we've got a problem with water quantity for a start, or that we will. It's very hard in a country that receives so much rainfall … that water quantity can be seen as a problem. Yet it is already a problem. But it's not taken seriously.
>
> Interviewee 23 (government)

The public also do not understand the connections between climate change and the increasing probabilities of water shortages, according to several study participants. Most people believe that there is plenty of water despite the eastern part of the country being subject to water shortages, as is demonstrated by the planned transfer of water from the Shannon River basin to the greater Dublin metropolitan area (Antwi *et al*., 2022).

One issue that was brought up by participants is that for most people water is "free" in the sense that they do not directly pay for what they use. People have little incentive to conserve water and have no regular contact with their water provider, especially in urban areas. The lack of direct communications between the main water provider Uisce Éireann and its customers was also brought up as a factor adding to the disconnection between Irish people and their water supply, as highlighted by one participant:

> I think people take it for granted, especially because we don't pay for it. We turn on the tap, and there it is – free [sic]. So they don't know how that water is produced. When they flush the toilet, they don't really understand where it goes.
>
> Interviewee 16 (government)

While several interviewees recommended switching to a pay-for-service model, with Uisce Éireann charging

residents directly for water supply and wastewater treatment, this is unlikely to happen given the lingering resentment around the establishment of Uisce Éireann and its association with externally imposed austerity measures (Antwi *et al*., 2023; Brennan, 2019; Hearne, 2015).

Interviewees said that many people in Ireland have a reasonably good understanding of water quality challenges, having seen media stories about the EPA's water quality assessments and EU actions criticising slow progress on water quality improvement; however, it is not one of their top priorities, and they do not connect the water quality issues with health and biodiversity. Many people see Ireland's environment as essentially healthy, and so the current water quality issues are viewed as peripheral and a "nice to have", rather than a necessity for a thriving, healthy country. This narrative was evident from several participants, as interviewee 41 (government) said, "Water quality is something that people feel, 'it'd be lovely if our rivers were full of salmon. It's a pity they're not. But oh, well, that's progress'". This lack of prioritisation of water quantity and quality improvements translates into low salience of related measures in the political sphere. This was evident in the interviews:

> So that minister is worried about housing currently. And that makes it difficult to put water on the agenda in that space because … that minister needs to be dealing with what the public want, which is more affordable housing.
>
> Interviewee 15 (government)

Because of this lack of public attention, politicians are not prioritising water issues, and public sector employees do not prioritise them unless they are an essential part of their job. This leads to the deprioritisation of climate adaptation actions in the water sector.

5.2.2 B17: changes needed on agricultural lands (frame polarisation; conflict infection; veto player)

As discussed earlier in the context of nature-based solutions (section 2.3), agriculture is the main land use in Ireland, with 67% of the landscape being agricultural (Attorp, 2022). Therefore, progress on water quality problems will not be possible without changing agricultural practices. While urban wastewater and surface water discharges are important contributors to water quality issues, EPA data show that agricultural practices and land use are the largest contributors to water quality issues nationally (EPA, 2023). The delays to making changes on farmland, discussed in sections 2.3.3 and 3.2, impact the ability of the water sector to adapt to a changing climate. As interviewee 18 (government) said, "water quality very much depend[s] on agricultural policies". If farmers do not take action, then water adaptation will not be successful.

5.2.3 B18: fragmentation (enclosure and exclusion; boundary control)

Water management is highly fragmented in Ireland. The study participants who worked in the water sector did not feel that they could clearly explain who is responsible for different aspects of water overall; they could explain only their own organisation's role and the role of those they work with closely. Even then, there were some contradictory explanations given by different participants. There is a national utility, i.e. Uisce Éireann, but it handles only drinking water supply and sewage collection/treatment, and not in all areas of the country, as some rural areas operate their own systems. There are also multiple oversight and collaboration bodies, some of which are responsible for facilitating collaboration between the various water management bodies in Ireland, such as An Fóram Uisce and LAWPRO, mentioned in section 5.1. Fragmentation itself is not necessarily a barrier to action if the various organisations all work together well. This was not the situation according to the study participants, however. As one interviewee said:

> Who's responsible for a river? Who manages it? Who deals with the infrastructure that's on the sides of it? Those responsibilities are really fragmented at the moment … that's one of the big stumbling blocks and difficulties we have in Ireland.
>
> Interviewee 11 (government)

According to study participants, each organisation is primarily looking narrowly at their own interests when they plan projects and schemes and perform cost–benefit calculations, although this is improving, with more collaboration now than in the recent past. An element of this is a growing recognition that water quality cannot be improved in isolation from other

landscape-scale sectors. Organisations are not yet set up to work holistically on biodiversity, flooding, agricultural land use, urban drainage and water quality in an integrated way to enhance long-term success in increasing resiliency and implementing climate adaptation. As one interviewee said:

> Let's not talk about only water in one place, and talk about only climate in another place, and talk about only biodiversity in another place. We need to start joining the dots a bit, because it's often co-benefits for all of them.
>
> Interviewee 15 (government)

However, while many participants acknowledged that governance of the water sector is complex, there was also a feeling that further significant changes now may do more harm than good. In some cases, continuing cycles of reorganisation and reform can delay action and stifle innovation (MacCarthaigh, 2020). While study participants noted that the multiple departments and agencies involved, as well as confusion about responsibilities and authorities, was a barrier to action in the water sector, the study findings also highlight that recent changes have been made to water governance, such as the establishment of LAWPRO. These changes, it was suggested, need to be given time to work before more adjustments are made. As one participant said:

> I think we have the tools ... I think it's just how we're applying it ... . And you could throw everything out and start again. But I don't think that would solve it.
>
> Interviewee 13 (government)

Some interviewees felt that reorganisation would delay action by causing those working in the sector to have to start over again, forming new relationships and new plans. Therefore, they believe that pre-existing plans and structures are sufficient and that those working in adaptation now need to move ahead with implementation without being delayed by another cycle of planning.

5.2.4 B19: prioritising current water challenges (organisational inertia)

The general consensus is that adaptation is not prioritised in the water sector. The current issues with water quality and infrastructure are top priorities. There is also agreement that the actions being taken to improve the current situation are the same actions that would need to be taken for climate adaptation. For example, the planned transfer of water from the Shannon River basin to the greater Dublin area will help with both current water shortages and climate change, as will demand management and leakage reduction programmes (Antwi *et al*., 2022). In addition, as was stated by one workshop participant, improving water quality "is an adaptation", and so current efforts to improve water quality should be included in assessing the success of water adaptation. Another participant noted, "The problems now are so huge that they're focused a little bit more on what the problems are now. I don't think they connect the dots that we need to be doing this adaptation piece too" (interviewee 11; government). This is related to inherent inertia in organisations; change is hard, and getting water sector organisations to change their focus is difficult, particularly when the current goals have not yet been met. Adding climate adaptation to this mix, when not specifically resisted, is difficult because of this inertia. For example, one participant said:

> We have huge leakage rates, like 38% of our treated drinking water goes back to the ground … we have issues around wastewater, we have issues around land … we have issues with water quality, and pollutants are going in the wrong direction. There's so many things you'd want to fix, just nothing to do with climate change, just as we currently are today.
>
> Interviewee 15 (government)

This becomes especially difficult when climate action is not fully integrated into the laws and regulations that drive action in the water sector, but, rather, is required on top of them.

5.2.5 B20: unclear goals and metrics (lost in translation)

A barrier to climate action in the water sector is the lack of a common understanding of what future climate should be planned for, what the specific metrics of success would look like and how actions would be prioritised. The work of Climate Ireland to collect relevant climate predictions into a centralised

database and agree what future climatic conditions Ireland should plan for, as well as the publication of the National Climate Change Risk Assessment, due in 2025, will help with the first of these issues, but how the other two issues can be resolved is still unclear. The sectoral adaptation plan has a list of actions, but interviewees felt they were too numerous and unprioritised to drive action. As one interviewee noted, a barrier is "A lack of specific baseline information about targeting adaptation measures where they're needed" (interviewee 27; non-profit). There is a feeling that mitigation has clear metrics and goals, but adaptation is more nebulous, with no clear definition of success.

6 Recommendations

This chapter includes recommendations for overcoming the overall and sectoral barriers to climate adaptation in Ireland. There are few sector-specific recommendations because there are many common and related barriers to action among the three sectors studied, and because one of the main barriers is the siloed organisational approach currently being taken. The study participants expressed that joined-up and cross-sectoral actions are essential to achieve Ireland's climate adaptation goals. The recommendations reflect this.

6.1 Overall Recommendations

In this section, some overall recommendations are outlined that apply to all three sectors. Most of these recommendations can probably be applied more broadly to sectors beyond the three examined in this study, and could be considered in updates to future sectoral adaptation plans to improve outcomes. In particular, implementation of the recommendations aimed at increasing the use of nature-based solutions would also help improve biodiversity and public health, as well as improving adaptation outcomes for other sectors.

6.1.1 R1: government should provide consistent leadership for long-term thinking

The Irish public believe that politicians should be doing more to promote climate action (O'Mahony *et al*., 2024). A clear message is needed from the highest levels of government that the welfare of people and tackling the climate crisis are more important than short-term economic growth. Political leadership is especially important in promoting sectoral adaptation actions, as civil servants and public employees have limited time and resources. Without political leadership and attention, additional financial resources will not spur action. Long-term leadership is needed for developing expertise among public sector employees and increasing capacity among contractors. More specific recommendations in this area are as follows:

- Show consistent high-level political leadership for climate adaptation actions. Adaptation actions require long-term attention, which will happen only if there is ongoing support from political leadership. Farmers may be reluctant to take actions if there is not consistent and clear support from the government, as others have also noted (see Irwin *et al*. (2023) and Robbins *et al*. (2020)).
- Appoint a commissioner to promote long-term thinking and prioritise the needs of future generations in all government decisions. This could be modelled after the Future Generations Commissioner for Wales, created by the Well-being of Future Generations (Wales) Act 2015. The commissioner would be responsible for acting as a guardian for future generations, and monitoring and assessing the actions of government bodies. Future revisions of the NAF could take into account these recommendations. The commissioner should be supported with financial and other resources and should collaborate with LAs to determine the adaptation priorities within their jurisdictions (Nesom and MacKillop, 2021). Based on lessons learned from Wales, careful consideration is needed as to whether the commissioner should have an advisory role or take on more of a regulatory role (Davies, 2016).
- Hold training and all-sector facilitated workshops on creating a vision of the future of Ireland, including cross-sectoral adaptation pathways, defined as "pre-determining strategies to switch land uses or investments to be triggered at critical thresholds of change in environmental or social systems" (Barnett, 2022, p. 1109). This is consistent with the "pathways planning approach" in the 2024 NAF (GOI, 2024a). Collaborate with the new Just Transition Commission to ensure that the training is consistent with best practices in justice and fairness.

Some of the study findings reflected a lack of imagination and integrated cross-sectoral vision for an adapted future. This recommendation is therefore designed to overcome this and produce not only clearer goals, but also pathways to achieve this vision based on a range of potential future conditions.

6.1.2 R2: establish a national conversation on food systems and landscape management

Many studies, including this one, have found that the current agri-food system is not supporting environmental quality or the livelihoods of the majority of farmers (Harrahill *et al*., 2023), and is a major barrier to successfully adapting to climate change in multiple sectors. This has prompted repeated calls for a re-examination of a system that, according to Dekker and Torney (2021, p. viii), focuses "more on the economic growth of the agri-food sector than on addressing growing income disparities at farm level, or their social and environmental impacts".

On-farm changes will be necessary to achieve adaptation goals for many of the sectors, but that will not be enough. The agri-food system needs to change. However, the fact that any changes to the system must address multiple, and often competing or even contradictory, societal priorities means that solutions are not obvious or simple (Thompson *et al*., 2020). Achieving a sustainable landscape will mean rethinking the export-oriented agri-food system and how we use our land. This work should build on previous efforts, such as the National Land Use Review from 2023, but with a greater focus on public participation, values and a just transition. Fortunately, Ireland has a tradition of successfully tackling these types of problems through the use of citizens' assemblies, a deliberative process where a representative sample of the population is brought together to learn, discuss and decide on policy recommendations for political issues affecting their lives. Past assemblies in Ireland have had widespread support among the general public (Bächtiger *et al*., 2018; Giraudet *et al*., 2022). The previous Citizens' Assembly on Biodiversity Loss included some recommendations for agriculture. However, the goal of that assembly focused on reversing biodiversity loss, and therefore it did not consider the wider off-farm food system or fully explore the financial, climate and other pressures on farmers and food systems (The Citizens' Assembly, 2023). While citizens' assemblies have been criticised as being unrepresentative of public opinion and lacking accountability, they can be good for revealing when public opinion differs from existing policy (Lafont, 2017), and have been recommended for proposing ideas for balancing competing demands of producers, distributors and consumers in the food system (Thompson *et al*., 2020).

This recommendation is for the establishment of a well-designed citizens' assembly, or similar participatory and deliberative process, designed to:

- incorporate and reflect a wide range of diverse voices and give more power to underrepresented groups, like small farmers (engaging with the Just Transition Commission can help achieve this);
- explore issues beyond just food production, processing and distribution in isolation;
- discuss what landscape-scale changes are needed to achieve multiple aims, such as climate, health, water, flood management and biodiversity goals, in a fair and just way that compensates farmers for their full contributions to society.

While systemic and transformative food system changes would reduce, or even eliminate, the need for farm subsidies, for climate adaptation and broader environmental commitments to be achieved farmers will need to be incentivised appropriately. As part of the state's role in improving agricultural sustainability, it has identified a need to integrate tools to encourage uptake of natural capital accounting in agriculture, which could provide payment for ecosystem services (PES), e.g. for improved water, soil, climate and biodiversity outcomes. PES incentives pay farmers to maintain ecosystem services, such as protecting habitats, sequestering carbon, alleviating flooding and improving water quality. PES aims to be results based, i.e. rather than paying for specific management actions, PES rewards outcomes. At present, a version of PES is being implemented through the Agri-Climate Rural Environment Scheme (ACRES) nationally as part of the state's €1.5 billion investment under the EU's Common Agricultural Policy 2023–2027. The scheme aims to support up to 50,000 farm families nationally. While the current ACRES is results based, one of the difficulties in assessing and rewarding environmental performance is that the results scoring system is entirely qualitative. Currently, scores at a farm level are based on advisory field assessments, with a qualitative score determining the ACRES payment (GOI, 2024b). As such, they are based on observable proxies rather than quantitative changes in ecosystem services. A more integrated PES approach that accurately quantifies the benefits of ecosystem services at a farm level would greatly assist national adaptation efforts. This would not only reflect the true ecosystem services provided by landowners, but

would also support cross-sectoral adaptation and other environmental outcomes (see also section 6.1.3).

6.1.3 R3: establish an experimental catchment for landscape-scale implementation of new ideas

Nature-based solutions for improving water quality, biodiversity, protection of pollinators for agriculture and flood risk management are most effective when planned at a larger scale, such as catchment or sub-catchment scale. This is a challenge because it means that multiple jurisdictions and landowners need to be involved (Nelson *et al*., 2020). Challenges highlighted in section 2.3 include the desire for certainty and a reluctance to rely on evidence from outside Ireland. Many people working in sectors requiring adaptation need proof that nature-based solutions work before they are willing to include them in projects. Implementation of such measures is therefore often delayed, limited or subject to modifications that evidence from implementation in other countries would suggest are unnecessary. Moreover, these beliefs are not currently being challenged by the political system to any great degree. These issues can be tackled through the designation of a catchment in Ireland where new ideas can be tried at scale. Small-scale experiments have shown that nature-based solutions can work in Ireland, but demonstration sites and a larger-scale trial are now necessary to convince departments, agencies, LAs and the public that they can work together on the landscape. The designation of an experimental catchment could allow for larger landscape-scale testing of innovative flood management strategies and case studies that could assist in making a stronger case for the inclusion of nature-based solutions in climate adaptation planning. This could provide practical insights, proof of concept and other data to inform broader implementation of novel flood protection measures. The following elements may greatly assist in this regard:

- At a practical level, the nature-based solutions PES approach we propose in section 6.1.2 could be trialled within a small catchment on multiple farms to quantify the impacts on adaptation and on its provision of broader ecosystem services. The SloWaters project aims to assess the benefits of nature-based solutions for water quality and quantity on agricultural land in Ireland, and is one of the first studies of its kind to do so nationally (SloWaters, 2024). However, there is an urgent need to quantitatively measure the multiple ecosystem services provided at a farm/catchment level, including water quality and quantity, but also biodiversity, soil organic matter improvements and carbon sequestration, among others. Trialling a quantitative results-based PES initiative at a catchment/multiple farm scale would be an important first step towards evaluating if and how such a model could be incorporated into future farm-level subsidy payments nationally.
- Inventiveness and experimentation require a willingness to try new things that might not work as intended (King and Anderson, 1995; Rogers, 2003). Individual projects within the larger effort should take an adaptive management approach, where they are monitored and adapted over time, rather than being seen as failing if they need reengineering to meet their goals. This should involve using the best science available, aiming for success, putting safeguards in place to reduce the risks of catastrophic failure, and being honest with the public that some adjustments will be necessary. This will allow for new ideas to be tried, with projects designed as experiments with opportunities for interdisciplinary learning built in.
- Landowners need to be compensated for use of their land for nature-based solutions. Whether land will be temporarily taken out of agricultural production, prevented from being developed or made less usable in other ways, landowners should not be expected to sacrifice for the public good, especially farmers, who feel they are constantly being told to change practices for the sake of others (see related recommendation in section 6.1.3).
- Communities in the catchment need to be involved in the planning and design of the proposed solutions. Delays currently occur because of the lack of overall agreement about what should be done. Participatory processes, included in the recommendations section of the 2024 Climate Action Plan, where solutions are co-created with communities, can overcome this endless cycle of objections (Jeffers, 2020; Nightingale *et al*., 2022).
- All levels of government, multiple sectors and civil society organisations must be involved in planning, design and implementation. Collaboration is needed to achieve goals that are

dependent on landscape-scale and integrated changes, such as improving water quality and biodiversity, and mitigation and adaptation activities for climate change, and is especially important for increasing the use of multi-benefit solutions (Collier and Bourke, 2020).
- To avoid the barrier of relying on strict sectoral cost–benefit analysis and withholding of funds, different funding mechanisms could be used. These could include financial incentives for collaboration, requiring partnerships to receive funds or providing funding to an umbrella organisation rather than to specific sectoral organisations.

6.1.4 R4: increase resources for climate adaptation, especially at the local level

As highlighted in section 2.2.3, centralisation is a barrier to progress on climate adaptation in Ireland. However, as explained in more detail for the water sector in section 5.2.3, reorganisation of the work to decentralise would cause unnecessary delay. Study participants generally felt that the current structures of government could work if LAs were given more administrative power and sufficiently resourced to fulfil their responsibilities. In particular, the current short-duration national funding contribution for LA climate staff, with those funds being phased down over time, disincentivises people to move into these positions and develop expertise in this area. In addition, there is a shortage of trained staff at all levels and within the private sector. Specific recommendations in this area are as follows:

- Provide additional long-term resources to LAs for climate adaptation. This could be accomplished in a variety of ways, including enhancing LAs' ability to generate funding locally, establishing an enhanced local climate adaptation fund, or increasing the amounts awarded to and enhancing the consistency of existing funding mechanisms for Climate Action Regional Offices and LA climate action teams. For instance, the Climate Action Charter, an agreement between the local government sector and central government, commits the sector to climate action. Any revisions to this charter or future climate policies should consider the long-term climate action resourcing needs of LAs, and account for additional responsibilities assigned to LAs through various national and local legislative and policy changes.
- Assess needs and provide additional specific training and development for staff in all sectors required to develop adaptation plans. Include justice and a just transition in the training.
- Provide incentives to develop adaptation expertise within consulting and construction firms to help fill the capacity gap in Ireland. This should start with a national needs assessment, and then prioritise the most important gaps.

6.2 Agriculture Sector Recommendations

6.2.1 R5: provide clear goals and a range of adaptation options for farmers

Farmers need tangible options and goals to take action to make their farms more resilient to climate change. Teagasc and others are currently working on identifying solutions. However, communicating the options and their costs and benefits to farmers has been challenging. One model a few interviewees highlighted is the marginal abatement cost curves developed by Teagasc for mitigation, where the costs of implementation and benefits of carbon reduction are both clearly shown for each option, making it easier for farmers to see which climate mitigation actions could work for them. While using marginal costs has its critics and may not be appropriate for adaptation (Ekins *et al.*, 2011), marginal abatement cost curves, owing to their simplicity and accessibility for farmers and farm advisors, can serve as a model for communicating the adaptation options, as suggested in the following recommendations:

- continue to develop tangible options that farmers can implement for climate adaptation;
- develop engaging materials to show farmers the costs and benefits of each action specific to their own circumstances.

To date, farmers have not yet fully understood that adaptation actions can help increase the sustainability of their own farming operations. This is starting to happen, but needs to be more widespread and clearly communicated. As noted in section 6.1.2, farm-level PES that is quantitative in nature could greatly improve adaptation uptake and outcomes.

6.3 Flood Risk Management Sector Recommendations

6.3.1 R6: establish public conversations and co-creation of flood risk solutions

Public participation is an essential element of flood risk management. Most planning processes require some sort of public participation, but that is not always enough, as the public does not necessarily see that regulatory requirements alone are sufficient (Clarke and Murphy, 2019). This is because there are multiple publics when it comes to how floods are experienced, with a large proportion of the public not directly impacted by a flood still having an interest in how changes are implemented in the community (Clarke and Murphy, 2023; Jeffers, 2022). Limiting participation to only those directly impacted can exclude important concerns and is, at least partially, responsible for the planning objections to flood projects. Rather than limiting objections, having a fully transparent public process can lead to better outcomes and a project that will be more widely accepted (Araos, 2023). Therefore, the following recommendations could greatly improve flood adaptation outcomes:

- Implement a robust and widely participatory process for public involvement in the planning, design and implementation of flood schemes led by trained public participation professionals. This must include both downstream and upstream and rural and urban communities within the catchment. Engage with the Just Transition Commission to help with planning.
- Acknowledge the importance of the public's emotional, aesthetic and other non-technical priorities that have prevented and delayed flood schemes in the recent past, for example in Clontarf and Cork (Clarke and Murphy, 2019, 2023; Clarke *et al*., 2016; Jeffers, 2019). To overcome the cycle of objections, these public considerations and concerns need to be given equal weight to engineering/economic considerations during the design and evaluation phases so that schemes are co-created with experts and the public in planning and design.

6.4 Water Sector Recommendations

6.4.1 R7: increase water communications and public engagement

With public water services in most towns and cities not being billed to private households, the usual avenue for regular communication between water service providers and the public does not exist. Recommendations in this area are as follows:

- The government should communicate with the public about water challenges and solutions on a proactive and frequent basis. This should include reminders about the importance of water and expected impacts of climate change on water quantity and quality.
- Embed water education into school curricula at all levels. This could be included in the climate education programme recommended by the 2023 National Youth Assembly on Climate.

6.4.2 R8: provide clear water sector goals and align water-related laws and policies

Clear goals and aligned policies are necessary for the water sector to prioritise action and to help the sector know when it has achieved success. This recommendation was summarised well by one study participant who said, "But ultimately I think it's setting our objectives and putting them, removing the misalignments of different policy mechanisms" (interviewee 36 (government)). Recommendations in this area are as follows :

- Provide clear and prioritised goals and outcomes for water sector adaptation.
- Align Ireland's laws and policies related to the Water Framework Directive, agricultural policy and planning so that water, air, soil, climate and biodiversity laws and policies are incentivising the same actions and aligned outcomes.

7 Conclusion

This research found multiple barriers to adaptation in the agriculture, flood risk management, and water quality and water services infrastructure sectors in Ireland. These are summarised in Table A1.1 in Appendix 1. Table A1.2, also in Appendix 1, provides a summary of the recommendations in this report and how these align with the barriers. It also provides suggestions for performance metrics and identifies organisations that could assume responsibility for ensuring the practical and timely uptake of these recommendations.

In all three sectors, the biggest barriers to implementing climate adaptation are the belief that climate change will not severely impact Ireland and the perception that adaptation has lower priority than economic growth. Specifically, the belief among many, including policymakers, that climate change is a future problem that will not severely impact Ireland supports a narrative that maintains the status quo as much as possible. This has resulted in a lack of urgency and limits adaptations to small-scale changes, making it easy to delay or prevent any actions perceived as potentially disruptive to the status quo. In addition, there are barriers related to competing priorities, centralisation and siloed thinking within departments and agencies, as well as challenges specific to implementing nature-based solutions and others unique to each of the sectors examined in this research.

These findings should perhaps come as no surprise, as they are consistent with other recent efforts examining Ireland's progress on landscape-scale environmental challenges (see, for example, Dekker and Torney (2021), Desmond (2018) and The Citizens' Assembly (2023)) and with barriers identified in other countries (Aguiar *et al*., 2018; Araos *et al*., 2016; Biesbroek *et al*., 2013). This level of agreement between researchers and citizens' deliberations indicates that we already know what needs to be done, but that there are challenges and barriers preventing implementation. For example, the first three recommendations from the Citizens' Assembly on Biodiversity Loss call for the state to provide political leadership, highlight inadequate funding, implementation and enforcement of existing regulations and policies, and emphasise that the state's ambition needs to be significantly increased. These points are all reflected in this report's findings and recommendations for climate adaptation.

The underlying reason why these points are not being addressed at present is both political and economic: the prioritisation of short-term economic and export growth over long-term environmental sustainability and human well-being (Jeffers, 2013; Kitchin *et al*., 2012; Morgan, 2020). Moreover, the failure to adapt also incurs higher long-term economic costs, including significant losses associated with extreme events, for the state, businesses and residents. Ireland is not unique in this regard, but continuing to delay needed adaptation across all sectors could have dire and increasingly severe consequences in the light of the climate emergency.

Momentum is now building in Ireland, with the CCAC recommending ringfenced adaptation funding, greater capacity for adaptation action throughout the government, and collaboration across sectors (CCAC, 2024). These are positive first steps, but they do not adequately address the reality that delaying action due to short-term economic considerations results in much worse long-term economic and societal impacts. The longer we delay action, the more vulnerable we will be, and the more difficult it will be to implement necessary actions in the future. Implementing the recommendations from this report, however, is likely to go a long way towards improving adaptation processes and outcomes nationally.

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Abbreviations

ACRES	Agri-Climate Rural Environment Scheme
CCAC	Climate Change Advisory Council
EPA	Environmental Protection Agency
EU	European Union
LA	Local authority
LAWPRO	Local Authority Waters Programme
NAF	National Adaptation Framework
OPW	Office of Public Works
PES	Payment for ecosystem services

Appendix 1 Summary of Barriers and Recommendations

Table A1.1. Summary of barriers and categories

Barrier	Category (from Table 1.2)
Overall barriers	
B1: Downplaying the urgency and extent of necessary changes	Organisational inertia; belief formation
B2: Competing priorities	Belief formation
B3: Over-centralisation and siloed thinking	Enclosure and exclusion
Overall/nature-based solution barriers	
B4: Organisational silos	Enclosure and exclusion; veto player
B5: Overemphasis on certainty	Organisational inertia; belief formation
B6: Dependence on changes on agricultural land	Veto player
B7: Belief that Ireland is unique	Belief formation
Agriculture sector barriers	
B8: Competing priorities	Belief formation; organisational inertia
B9: Farmers do not trust the advice they are being given	Conflict infection
B10: The power of the agricultural lobby	Veto player
B11: Unclear goals and options	Lost in translation
Flood risk management sector barriers	
B12: Lack of urgency	Organisational inertia; belief formation
B13: No agreement on preferred solutions	Belief formation; organisational inertia
B14: Questions of scale	Boundary control
B15: Financial inflexibility	Boundary control
Water sector barriers	
B16: Perceptions of water being clean and plentiful	Belief formation
B17: Changes needed on agricultural lands	Frame polarisation; conflict infection; veto player
B18: Fragmentation	Enclosure and exclusion; boundary control
B19: Prioritising current water challenges	Organisational inertia
B20: Unclear goals and metrics	Lost in translation

Table A1.2. Summary of recommendations

Recommendation	Barrier(s) addressed	Sub-recommendation	Entity responsible	Metric
R1: Government should provide consistent leadership for long-term thinking	B1, B2, B3, B4, B8, B12, B13, B16, B19	Show consistent high-level political support for climate adaptation actions	Department of the Taoiseach	Ongoing
		Appoint a commissioner for long-term thinking	Department of the Taoiseach	Position created
		Hold training and all-sector-facilitated workshops	DECC	Training and workshops held
R2: Establish a national conversation on food systems and landscape management	B3, B4, B6, B9, B10, B17, B18	All elements	DECC and DAFM	Summary report issued
R3: Establish an experimental catchment for landscape-scale implementation of new ideas	B3, B4, B5, B7, B12, B13, B14, B15, B18	All elements	DHLGH, DECC, DAFM and OPW	Catchment identified and proposal developed
R4: Increase resources for climate adaptation, especially at the local level	B1, B2, B6, B8, B17, B19	Provide additional resources to LAs for climate adaptation	Department of the Taoiseach	Ongoing
		Assess needs and provide training to staff and staff development in all sectors required to develop adaptation plans	DECC	Needs assessment complete; training held
		Provide incentives to develop adaptation expertise for consulting and construction firms	DECC	Incentive structures in place
R5: Provide clear goals and a range of adaptation options for farmers	B11	All elements	Teagasc	Initial report of goals; ongoing updates
R6: Establish public conversations and co-creation of flood risk solutions	B12, B13, B15	All elements	OPW and LAs	Ongoing – process conducted for each flood relief scheme/LA
R7: Increase water communications and public engagement	B16, B19	The government should communicate with the public on a proactive and frequent basis	DHLGH	Ongoing
		Embed water education into school curricula at all levels	Department of Education and DHLGH	Curricula developed
R8: Provide clear water sector goals and align water-related laws and policies	B18, B20	All elements	DHLGH and DECC	Review report issued

DAFM, Department of Agriculture, Food, and the Marine; DECC, Department of the Environment, Climate and Communications; DHLGH, Department of Housing, Local Government and Heritage.

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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