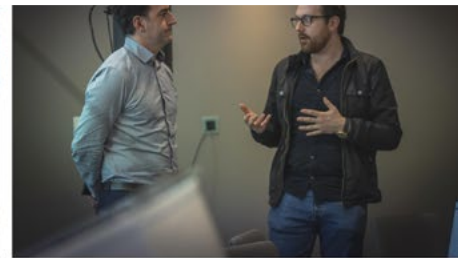epaResearch

Transboundary Adaptation Learning Exchange: Policy and Practice

Authors: Denise McCullagh, Anna Beswick, Stephen Jones, Jane McCullough and Jeremy Gault.

Tal X
Transboundary
Adaptation
Learning Exchange

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.

Advocacy: Working with others to advocate for a clean, productive and well protected environment and for sustainable environmental practices.

Our Responsibilities Include:

Licensing

> Large-scale industrial, waste and petrol storage activities;
> Urban waste water discharges;
> The contained use and controlled release of Genetically Modified Organisms;
> Sources of ionising radiation;
> Greenhouse gas emissions from industry and aviation through the EU Emissions Trading Scheme.

National Environmental Enforcement

> Audit and inspection of EPA licensed facilities;
> Drive the implementation of best practice in regulated activities and facilities;
> Oversee local authority responsibilities for environmental protection;
> Regulate the quality of public drinking water and enforce urban waste water discharge authorisations;
> Assess and report on public and private drinking water quality;
> Coordinate a network of public service organisations to support action against environmental crime;
> Prosecute those who flout environmental law and damage the environment.

Waste Management and Chemicals in the Environment

> Implement and enforce waste regulations including national enforcement issues;
> Prepare and publish national waste statistics and the National Hazardous Waste Management Plan;
> Develop and implement the National Waste Prevention Programme;
> Implement and report on legislation on the control of chemicals in the environment.

Water Management

> Engage with national and regional governance and operational structures to implement the Water Framework Directive;
> Monitor, assess and report on the quality of rivers, lakes, transitional and coastal waters, bathing waters and groundwaters, and measurement of water levels and river flows.

Climate Science & Climate Change

> Publish Ireland's greenhouse gas emission inventories and projections;

> Provide the Secretariat to the Climate Change Advisory Council and support to the National Dialogue on Climate Action;
> Support National, EU and UN Climate Science and Policy development activities.

Environmental Monitoring & Assessment

> Design and implement national environmental monitoring systems: technology, data management, analysis and forecasting;
> Produce the State of Ireland's Environment and Indicator Reports;
> Monitor air quality and implement the EU Clean Air for Europe Directive, the Convention on Long Range Transboundary Air Pollution, and the National Emissions Ceiling Directive;
> Oversee the implementation of the Environmental Noise Directive;
> Assess the impact of proposed plans and programmes on the Irish environment.

Environmental Research and Development

> Coordinate and fund national environmental research activity to identify pressures, inform policy and provide solutions;
> Collaborate with national and EU environmental research activity.

Radiological Protection

> Monitoring radiation levels and assess public exposure to ionising radiation and electromagnetic fields;
> Assist in developing national plans for emergencies arising from nuclear accidents;
> Monitor developments abroad relating to nuclear installations and radiological safety;
> Provide, or oversee the provision of, specialist radiation protection services.

Guidance, Awareness Raising, and Accessible Information

> Provide independent evidence-based reporting, advice and guidance to Government, industry and the public on environmental and radiological protection topics;
> Promote the link between health and wellbeing, the economy and a clean environment;
> Promote environmental awareness including supporting behaviours for resource efficiency and climate transition;
> Promote radon testing in homes and workplaces and encourage remediation where necessary.

Partnership and Networking

> Work with international and national agencies, regional and local authorities, non-governmental organisations, representative bodies and government departments to deliver environmental and radiological protection, research coordination and science-based decision making.

Management and Structure of the EPA

The EPA is managed by a full time Board, consisting of a Director General and five Directors. The work is carried out across five Offices:

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.

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Identifying pressures

Even if global greenhouse emissions stopped today, society is locked into some degree of climate change, making adaptation essential. TALX looked at climate adaptation from both a top-down and a bottom-up perspective and identified a number of challenges across Britain and Ireland. Foremost among these is the need for resources to implement action. Currently, resources at all levels are insufficient for the aims and ambitions outlined in policy and legislation. Funding needs to move beyond short-term policy cycles to implement long-term, self-sustaining adaptation initiatives, which in turn can enable local empowerment and capacity building. Siloed working and a lack of collaboration and partnership within government and between public bodies, the private sector and communities, is a major obstacle to successful adaptation. A lack of communication between stakeholders has led to duplication of actions and missed opportunities for adaptation to be integrated into various initiatives. The pressures of climate change require society-wide ownership of adaptation. However, for this to happen, all voices need to be represented in decision-making throughout the adaptation process.

Informing policy

One of the main components of the TALX research was the assessment of national level climate adaptation policies across the five jurisdictions of Ireland and the UK, to identify if climate adaptation was acknowledged and provided for. National policies drive climate change adaptation in each country. However, in many areas, particularly regarding the provision of resources to support adaptation goals, policy is failing to enable these ambitions. To support policymakers, TALX has developed five policy briefs that outline key areas where policy is enabling adaptation action, and where it must improve. Recommendations for establishing and building on positive adaptation actions are provided within each brief.

Developing solutions

The co-development of a place-based climate adaptation partnership framework and the establishment of a transboundary community of practice were the other key components of the TALX project. A wide range of stakeholders, including practitioners, policymakers and academics, were brought together to share their insights and to create a practical framework to guide those at all levels in progressing place-based adaptation partnerships. Co-creation and inclusion were integral to the research, both to avoid maladaptation and to enable transformational change. The transboundary network established through the project has allowed for learnings to be shared and created a safe space for discussions on how best to progress climate adaptation in all regions.

Transboundary Adaptation Learning Exchange: Policy and Practice

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EPA Research Report

Authors:

Denise McCullagh, Anna Beswick, Stephen Jones, Jane McCullough and Jeremy Gault

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Executive Summary

The need for transformational climate adaptation that moves beyond the business-as-usual approach currently employed by a large majority of governments is becoming increasingly evident as the environmental, social and economic benefits of early and proactive adaptation are observed. The Transboundary Adaptation Learning Exchange (TALX) project combines an analysis of top-down and bottom-up approaches to adaptation development in order to support this transformational change.

Using international best practice as a guideline, an assessment of the national climate adaptation policies of the five jurisdictions of Ireland and the UK were completed and the barriers to and enabling conditions for adaptation in each of the jurisdictions identified. Policy and governance and resource are two key areas where all jurisdictions are failing to support the implementation of successful adaptation approaches. There is a lack of the coordination and collaboration between the different national, regional and local entities involved that are necessary for adaptation action, something that is further compounded by a substantial deficiency in resource to support adaptation action at all levels. Moving away from siloed working and developing partnerships with other stakeholders, individuals and organisations can allow stakeholders to enjoy economic co-benefits through economies of scale and reducing duplication of effort.

Using an innovative co-creation approach, the TALX project built a network of actors working in the field of adaptation, consisting of policymakers, practitioners and academics from across Ireland, the UK and the world, and co-developed a place-based climate adaptation partnership framework. The framework highlights the four key capabilities of leadership, evidence, partnership and resource, and offers a roadmap of practical actions to develop these capabilities and the overall adaptive capacity within partnerships.

The framework draws on learnings from existing examples of adaptation partnerships of different scales in Ireland and the UK and was trialled in two areas in Ireland and Northern Ireland in order to validate the research. This report further highlights the benefits of creating a learning network; the need for partnership working in different areas; and how the application of the framework and the use of neutral facilitators has supported the initiation of place-based adaptation partnerships in both Ireland and Northern Ireland.

As a result of this study a number of recommendations have been made that will help drive successful transformational adaptation and build resilience at all levels across Ireland and the UK.

1   Introduction

1.1   The Need for Transboundary and Transformational Adaptation

Climate change cannot be tackled through mitigation alone; however, the concept of adaptation, while having gained traction in recent years, is still not familiar across multiple sectors and levels of governance in Ireland and the UK or is seen simply as a failure of mitigation. The reality is that significant climate impacts are now unavoidable and that even net zero targets themselves will depend on successful adaptation for delivery.

The Intergovernmental Panel on Climate Change (IPCC) defines adaptation to climate change as "the process of adjustment to actual or expected climate and its effects, in order to moderate harm or exploit beneficial opportunities. In some natural systems, human intervention may facilitate adjustment to expected climate and its effects" (IPCC, 2019).

As society faces ever more frequent and severe impacts of climate change, implementing adaptation (or adaptation measures) in a way that is equitable and fair for all members of our society will require a systemic change in the way we operate. This smarter, systemic and timely adaptation requires all concerned to think outside the common regional and national boundaries to address interdependent and cascading risk through consideration of infrastructure, supply chains, geopolitical tensions and psychological pressures, among other factors (PwC, 2013; Prytz *et al*., 2018; Smith *et al*., 2018; Benzie *et al*., 2019; Challinor & Benton, 2021; Peter *et al*., 2021). To manage this, all relevant parties need to start considering the concept of adaptation on a broader scale while simultaneously implementing localised actions that will have the most benefits for those stakeholders most vulnerable to climatic impacts.

1.2   Project Objectives

Climate adaptation needs to translate into practice, at appropriate scales for implementation. This research will contribute to national policy efforts connecting decision-making in Ireland and the UK with contemporary "on-the-ground" development, thus supporting the harmonisation of policies and actions.

The aim of the Transboundary Adaptation Learning Exchange (TALX) project was to establish an innovative, collaborative and learning network to develop transferable skills and enabling solutions for adaptation while exploring best practice. The TALX project team identified three main objectives to achieve this aim:

1. identifying and assessing good practice criteria for enabling adaptation planning and identifying implementation pathways at national levels, including challenges and differences in adaptation policy development;

2. assessing key dimensions required for delivering effective adaptation implementation and developing a framework that can be applied in Ireland and the UK to support this delivery;

3. establishing a collaborative and shared learning environment to accelerate progress towards adaptation and allow for the monitoring and evaluation of the adaptation partnership framework in different national contexts.

By using the process of co-creation and adopting a stakeholder-led approach on a transboundary basis, the TALX project established a collaborative learning network to develop transferable skills and enable solutions for adaptation while exploring good practice in terms of the structures and processes that empower national, sectoral and local decision-makers to address climate adaptation in their regions.

1.3   Report Outline

Following on from this introduction, Chapter 2 outlines what defines good adaptation and good adaptation policy, the research methodology used for the assessment of the national climate adaptation policies of Ireland and the UK, and the outcomes of these assessments. Full details of the assessments are tabulated in Appendix 1. Chapter 3 summarises the need for partnership working and the methodology used to co-develop a framework to

support climate adaptation partnerships in building and progressing their capacity to implement adaptation actions. Chapter 4 explores place-based adaptation partnerships in practice, with detailed examples of case studies from across Ireland and the UK, and how adaptation partnerships could work on the island of Ireland. It includes details of the approach of pilot regions in Ireland and Northern Ireland to implementing the partnership framework co-developed by the project team. This chapter also highlights some of the key lessons learned and the key steps for progressing partnership working in these regions. Chapter 6 draws out the main conclusions and recommendations for building on the work conducted in this research project.

2 National Climate Adaptation Policy

Over the past decade, climate adaptation planning has emerged as a new focus of climate policies as it becomes increasingly evident that the impacts of climate change cannot be halted by mitigation alone (Moss *et al*., 2013; Preston *et al*., 2015). Policy is a broad concept that incorporates a number of facets (Torjman & Caledon Institute of Social Policy, 2005). It recognises that "adaptation planning and implementation are dynamic iterative learning processes" (Mimura *et al*., 2014) and appreciates the complementary role of adaptation strategies, plans and actions, based on the latest science, at different levels (national, subnational and local) (Mimura *et al*., 2014; European Commission, 2021). Not all policies are created equal, however; therefore the project created an assessment framework to evaluate the national adaptation strategies of Ireland, Northern Ireland, Scotland, England and Wales. This sought to determine how the national policies in the UK and Ireland are supporting "on-the-ground" adaptation, how they are preparing for the current and future impacts of climate change, and how, or if, high-level governance is driving this process.

2.1 What is Good Adaptation and How Can Policy Support This?

Good climate adaptation is effective, efficient and just (Conway *et al*., 2019). Adaptation measures should address and mitigate risk while preparing and protecting everyone from climate impacts, but particularly the most vulnerable in our society (EU Adaptation Strategy[1]), with the least amount of wasted resource. In this report, adaptation policy is interpreted as strategic, national guidance and/or legislation pertaining to how sectors and geographies should adapt to current and future climate change. Policy that enables this approach is considered successful, as evidenced in the recent work by Patel & Gebreyes (2020).

National governments often have considerable influence over the policy agenda due to their control of budgets and financing. National activity may relate to risk assessments, creating the evidence base to support action at lower levels, policy frameworks that influence decisions at subnational levels, coordination of the necessary legal frameworks, requesting specific sectoral action, and providing resources to other levels of government to undertake these actions (Berrang-Ford *et al*., 2011; Mimura *et al*., 2014). National climate adaptation policy should not just set out guidelines and offer information on how we can adapt, it should also provide the impetus for action towards climate adaptation, with regions with a national mandate or higher level government funding or pressure more likely to have an adaptation plan in place (Dilling *et al*., 2017; Reckien *et al*., 2018).

2.2 A Longitudinal Look at Climate Adaptation Policy in Ireland and the UK

In Ireland and the UK, the need for and advantage of early proactive adaptation has been highlighted by the recent worsening impacts of climate change, exposing the existing adaptation deficit and demonstrating the clear benefits of planned adaptation from an economic, social and environmental perspective. The impacts of climate change are projected to continue and intensify in the decades ahead. Taking proactive action to increase resilience by adopting progressive adaptation policy can unlock multiple benefits (e.g. long-term cost savings, efficiency of effort, shared cost burdens for implementation).

However, adaptation is not a new concept, and plans and initiatives have been in place in some areas for a number of years. The policy landscape in Ireland and the UK has undergone many changes over the years, creating the current enabling conditions for adaptation, and is discussed below.

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1 https://climate.ec.europa.eu/eu-action/adaptation-climate-change/eu-adaptation-strategy_en (accessed 6 June 2023).

2.2.1   Ireland

Ireland may have been perceived as being slow to start work on climate adaptation compared with the UK, but, after the Kyoto Protocol came into force (2005), a report was commissioned to determine the state of knowledge on climate change and expected impacts on Ireland (Desmond *et al*., 2009). This directly fed into the subsequent National Climate Change Adaptation Framework (2013). The passing of the 2015 Climate Action and Low Carbon Development Act was seen as a real turning point, signifying substantial government commitment and leading to subsequent investment. As an outcome of the 2015 Act, the development of the statutory National Adaptation Framework in 2018 saw a move towards a more practical and inclusive climate adaptation approach with clear goals and obligations. In recent years, Irish climate change policy has seen a move towards planning-based action that employs multiple styles of adaptation, something which the 2021 amendment to the Climate Action and Low Carbon Development Act also strengthened. Ireland has made continuous progress in improving climate adaptation policy (Figure 2.1), with not only a top-down drive for change but also a growing bottom-up movement that refuses to accept lip service or half measures with regard to climate action. A new National Adaptation Framework will be developed in 2023.

While there has been a shift towards addressing climate issues sooner rather than later, in particular the upcoming introduction of Ireland's Common Agricultural Policy Strategic Plan 2023–2027, which will seek to underpin the sustainable development of the farming and food sectors – areas of most concern with regard to climate change (CCAC, 2022) – there is still a lot of work to be done in Irish climate adaptation. The focus of climate action in Ireland in recent years has still been heavily centred on mitigation rather than adaptation, and some key adaptation actions have not been progressed in a way that addresses the urgency of the situation (e.g. the establishment of the coastal change management group, which first met in September 2020 and has yet to provide formal outputs to the public), as outlined by the most recent Climate Change Advisory Council report (CCAC, 2022).

2.2.2   UK

Due to the devolved nature of the political structure of the UK, some aspects of climate change adaptation rest in the hands of the administrative jurisdictions (Northern Ireland, Scotland, England and Wales),
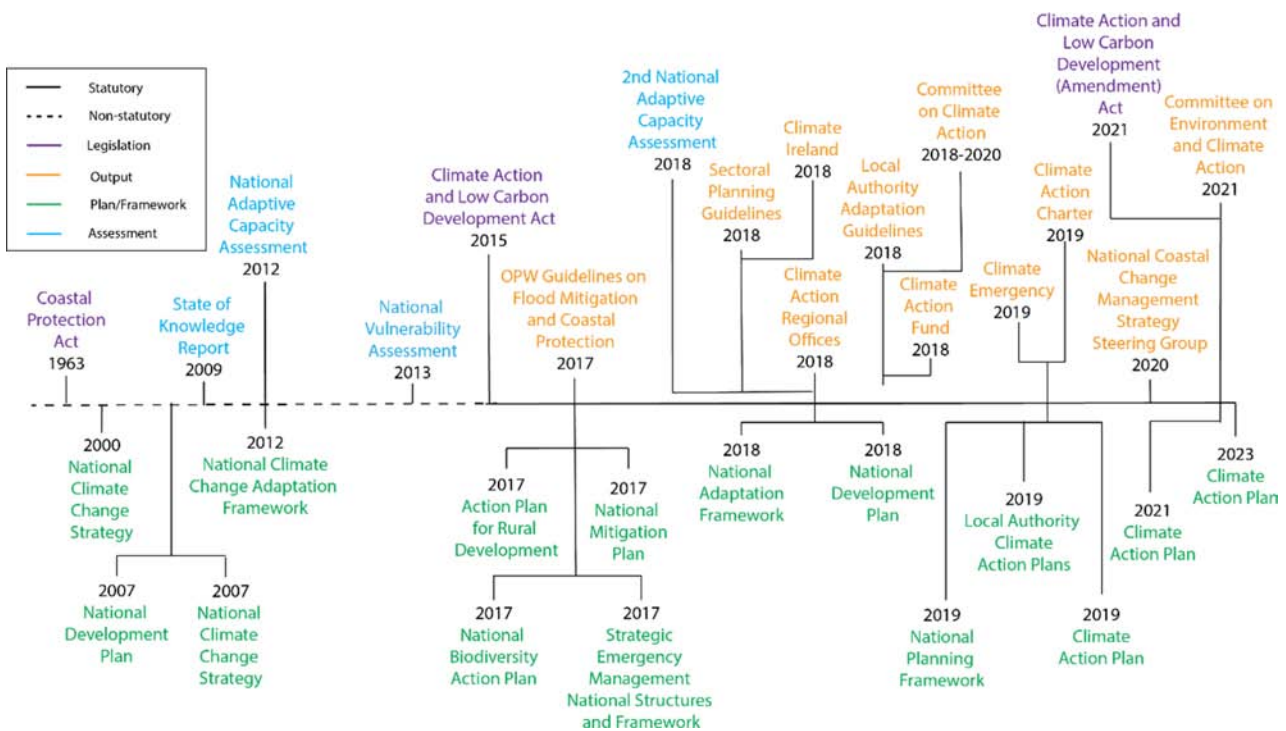
Figure 2.1. Climate policy evolution in Ireland.

which are responsible for the implementation of adaptation action in their regions. Some of the jurisdictions, however, have chosen to use UK climate legislation and policies to guide their own strategy development, noting that UK legislation on climate mitigation is mandatory for all jurisdictions.

Following the Kyoto Protocol, which brought climate change into the spotlight internationally, the UK Climate Change Act was passed in 2008 (Figure 2.2). It provided a legal mandate for the government to set out policies to adapt to climate change and set emission reduction targets, and it set an international precedent. Under the Act:

- A Climate Change Risk Assessment must be published every 5 years.
- A National Adaptation Programme (NAP) must address the priority risks identified.
- Reports by public service organisations must be made to the government regarding adaptation activity and building on issues identified in the NAP (however, this has been voluntary since 2016).
- An independent adaptation sub-committee (ASC) of the Climate Change Committee must be created.

The Act also mandated the creation of the Climate Change Committee (CCC), an independent statutory body to advise the UK and devolved governments on climate mitigation and adaptation progress.

Northern Ireland

Compared with other jurisdictions in the UK, Northern Ireland has been much slower in its efforts to address the issue of climate adaptation (Figure 2.3). The first policy commitment to adaptation in Northern Ireland was the Climate Change Adaptation Programme, created in 2014. This document, however, was perceived as lacking in ability to measure the progress of climate adaptation and the associated work required. In 2022 the Climate Change Act (Northern Ireland) was passed, establishing a much stronger directive on climate adaptation, including climate action and sectoral plans, the Northern Ireland Climate Commissioner and the Just Transition Commission. Until that point, climate adaptation in Northern Ireland had limited coordination from either a top-down or bottom-up perspective; however, this is something that could change given the increased mandate for climate action.

Scotland

Following the implementation of the UK Climate Change Act 2008, the Scottish Government passed the Climate Change (Scotland) Act in 2009 (Figure 2.4). This Act had more ambitious carbon reduction targets than the UK Climate Change Act and includes additional provisions for climate adaptation. The Climate Change (Scotland) Act requires the Scottish Government to address the risks set out in
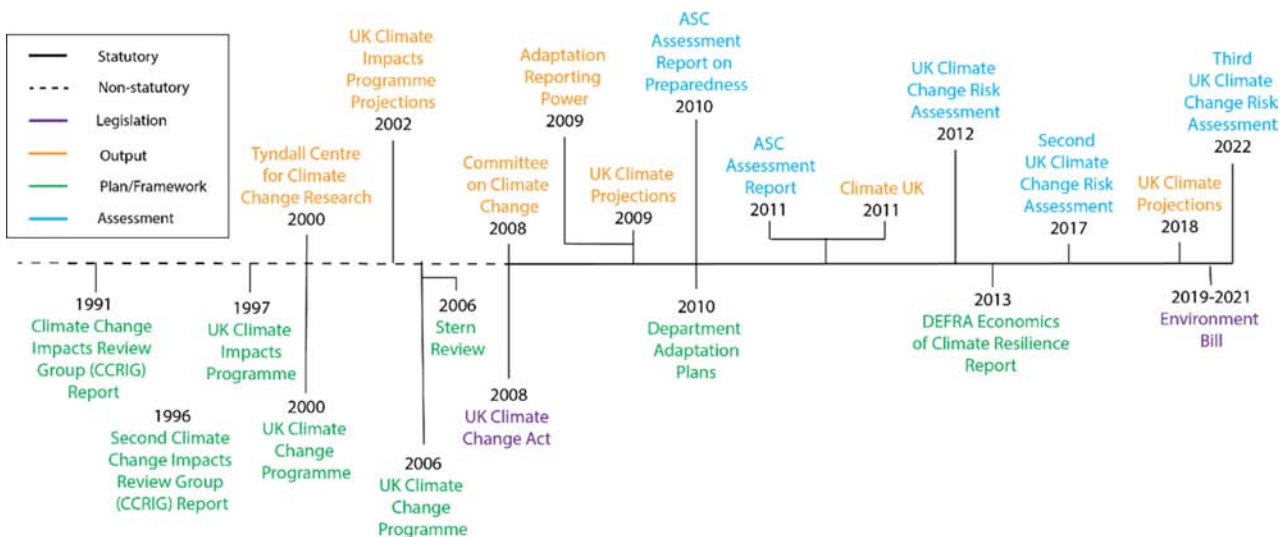
Figure 2.2. Policy evolution in the UK.
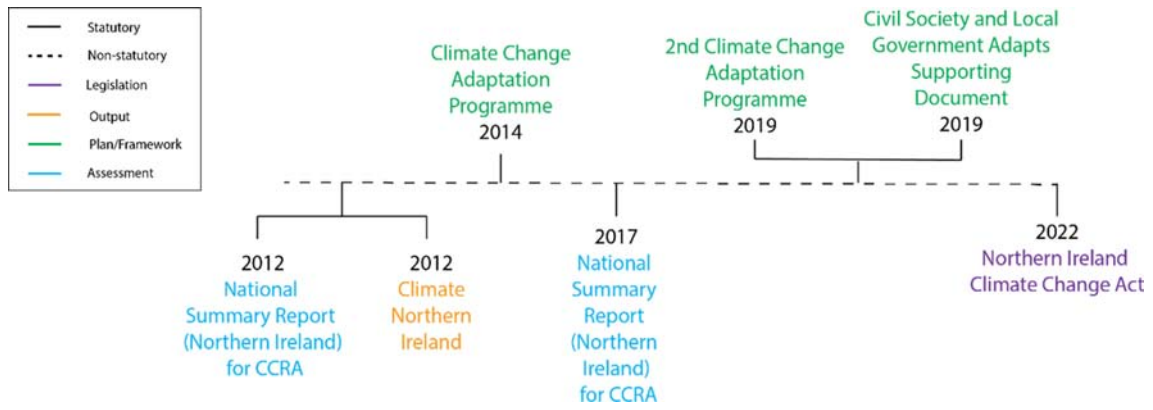
Figure 2.3. Policy evolution in Northern Ireland.

the UK Climate Change Risk Assessment and develop a statutory climate change adaptation programme. It also requires annual progress reporting to the Scottish Parliament and a biannual independent assessment of progress by the CCC, and includes a public bodies climate change duty. The Scottish Government published a non-statutory Climate Change Adaptation Framework in 2009 structured around sector action plans. This framework laid the foundations for the first statutory Scottish Climate Change Adaptation Programme (SCCAP), which was introduced in 2014. The first SCCAP focused on promoting awareness and gathering evidence and research. The second SCCAP was published in 2019 and aimed to progress an outcome-focused approach that supported cross-cutting policy and the promotion of collaboration between sectors, weaving climate adaptation into Scottish Government policy development. Scottish climate adaptation has moved well beyond the legal requirements set out by both the UK Climate Change Act 2008 and the Climate Change (Scotland) Act 2009. Scottish adaptation policy has moved from a learning-led, bottom-up approach towards an outcomes-based approach. However, recent assessments (Dooks, 2022) have shown that progress has stalled and that across many sectors there has been no development in the delivery of adaptation or effective monitoring and evaluation of measures.
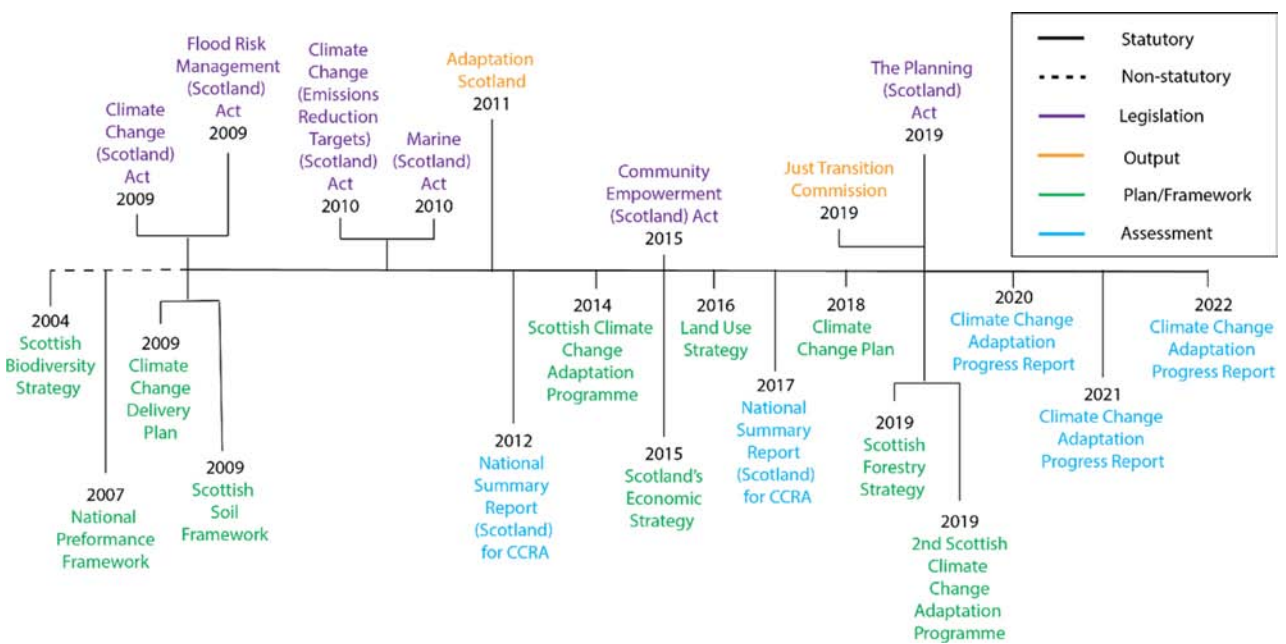
Figure 2.4. Policy evolution in Scotland.

England

Unlike the devolved administrations, England does not have separate, specific adaptation policy. Much of the key adaptation policy in England is derived directly from UK policy, as it deals with reserved matters. This section concentrates only on policy that solely or primarily applies to England and reserved matters.

After the passing of the UK Climate Change Act in 2008, the UK Government quickly established departmental adaptation plans and various support services to help the country adapt to the changing climate (Figure 2.5). This was an excellent effort to provide support and guidance across all levels of government, providing for stakeholder dialogue and cooperation (e.g. National Indicator 188, Climate Ready Support Service, Local Adaptation Advisory Plan, Climate Local). Many of these plans and support services could be established quickly and effectively due to the already existing network of climate actors that had been operating under the existing UK Climate Impacts Programme (UKCIP). The creation of the NAP in 2013 was an important start towards climate adaptation, involving input from multiple stakeholders, including non-governmental organisations (NGOs), local community groups, local councils, civil society and the private sector; however, many of the objectives were broad and not easily measured, with no set time frames or actors responsible and no set actions to achieve them (CCC, 2017). Most of England's early policy was already planning based and learning led due to the successful local grassroots climate change initiatives that already existed. Research and projects conducted by the Environment

Agency on flooding impacts had already begun as a result of the Flood and Water Management Act (2010) and local councils were already aware of the hazards associated with it, making the acceptance of policy to do with certain aspects of climate change much easier.

The second NAP (NAP2) published in 2018, however, failed to address almost half of the climate change risks identified and attempted to repurpose older actions instead of setting new targets in line with the current climate risks. NAP2 has failed to plan for even the most conservative climate projections and falls well short of the expected adaptation standards of a leader in climate action. This is not the only evidence of England's deprioritisation of climate change. Drastic funding cuts to local governments forced climate initiatives to take a back seat and led to the transfer of UKCIP responsibilities to an already under-resourced Environment Agency's climate-ready service, which was subsequently closed down, without a replacement, in 2016. The Adapting to Climate Change Team was cut from 38 officials to 6 in 2013, and there was a 21% spending cut on adaptation action in English councils between 2010/11 and 2018/19. This has been compounded by a relaxation of climate reporting requirements by the Adaptation Reporting Power from mandatory to voluntary.

The bottom-up initiatives that were in place in England supported excellent initial widespread stakeholder engagement, but in recent years the lack of top-down support, breakdown of bottom-up initiatives and failure of the government to meet climate change obligations has seen progress stall.
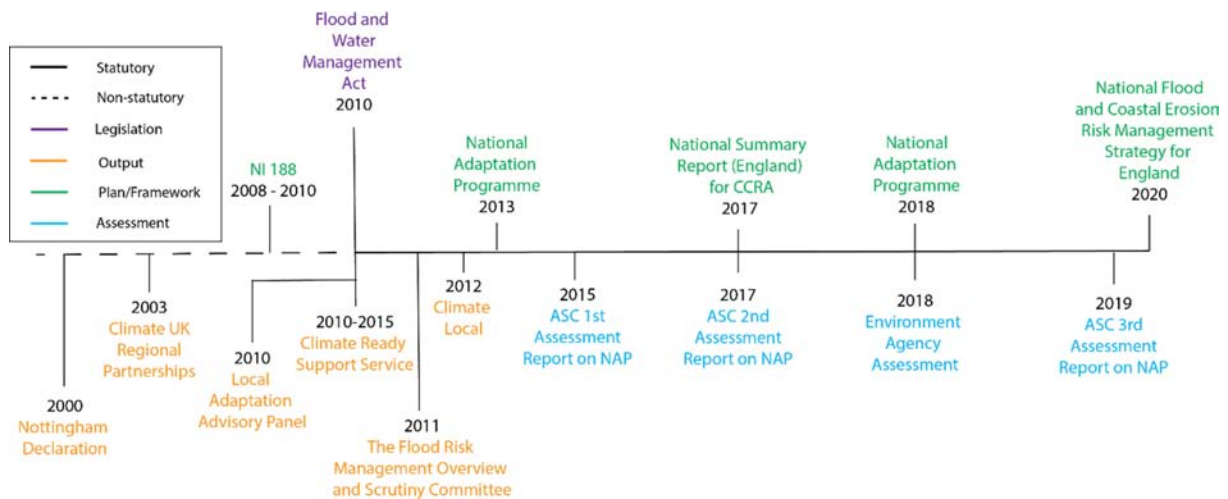
Figure 2.5. Policy evolution in England.

Wales

The Welsh Government brought sustainability into its policies in the form of sustainable development schemes, but the Adaptation Delivery Plan 2010 was the first official attempt to specifically insert climate adaptation into policy (Figure 2.6). A national conversation, "The Wales We Want", was initiated in 2014 in order to improve the government's understanding of what the public felt were key factors to address in creating a sustainable Wales. The public identified climate change as the main issue facing future generations. The information gathered from this national conversation, perceived to be an exemplar for stakeholder engagement (Messham & Sheard, 2020), was used to inform the Well-being of Future Generations (WFG) (Wales) Act, which was passed in 2015.

The WFG Act (2015), like the Scottish Climate Act (2009), went above and beyond the UK Climate Act (2008) and placed a duty upon 44 public bodies to work towards sustainable development by making decisions that work towards all of the goals identified, establishing Wales as one of the few nations worldwide that has incorporated sustainable development into its legislation. The WFG Act has strengthened Welsh legislation on climate adaptation, especially through the requirement for annual reporting to the government.

In 2019, Wales declared a national climate emergency, the first country in the world to officially do so,

suggesting that the government was prioritising decarbonisation and the need for climate resilience and adaptation. However, no ground-breaking new policies have been introduced and little or no change on climate action has been seen following the declaration. The climate adaptation plan Prosperity for All: A Climate Conscious Wales, released in 2019, is heavily focused on learning approaches, with few quantifiable targets or time frames and little indication of resources that will be committed, although it does clearly designate agencies responsible for delivery.

2.3 Methodology for Selecting Assessment Criteria

Good climate adaptation policy is defined by the authors as the creation and implementation of flexible and dynamic policies that are set within the broader social, economic and cultural environment and allow for sustainable development in a way that is socially just, addresses existing inequalities and does not cause further inequality.

Barriers are defined as constraints and involve anything that makes it challenging for national or local governments to plan and implement adaptation (IPCC, 2007; Moser & Ekstrom, 2010; Biesbroek *et al*., 2013; Klein *et al*., 2017). These barriers can serve as limits to adaptation, restricting the type of adaptation actions and the extent to which they can be implemented, noting that their influence will vary depending on context and actor. The list of potential barriers could
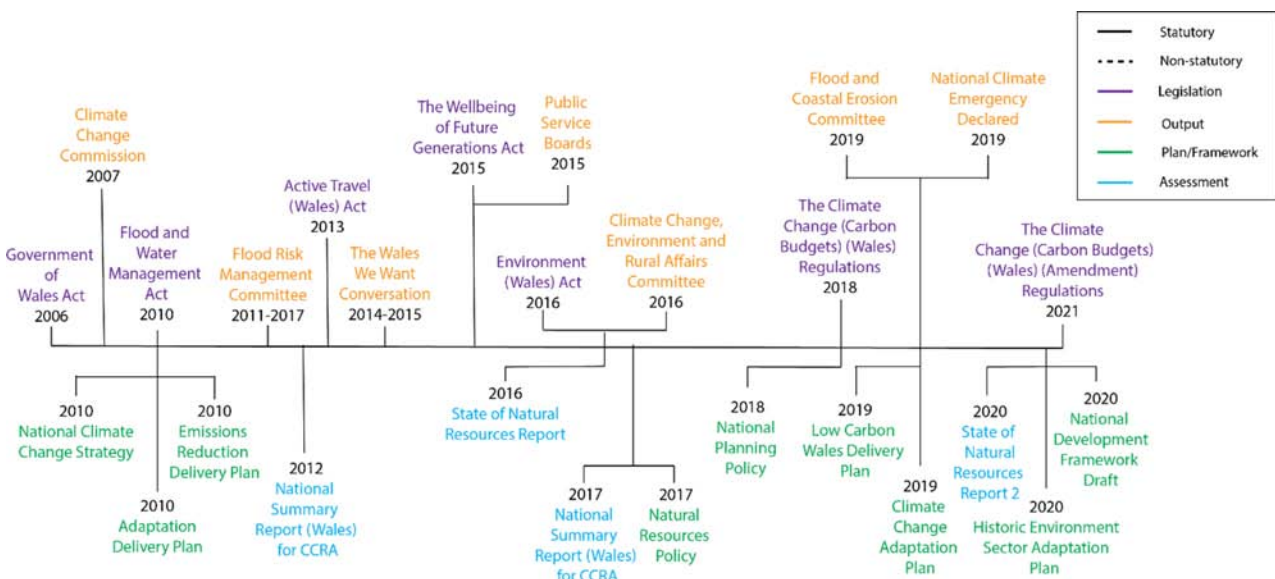
Figure 2.6. Policy evolution in Wales.

be endless; however, the components of the biggest barriers to climate adaptation can also be the biggest enablers if employed correctly. For example, in Figure 2.7, under "Resource", a lack of information and data can be a barrier, whereas the availability of and access to relevant information and data (through climate adaptation platforms, e.g. Climate Ireland) can be a key enabler.

Five key themes (stakeholder engagement, policy and governance, resource, decision-making and mainstreaming – in blue boxes in Figure 2.7) are found throughout the literature that can either support or hinder climate adaptation (Moser & Dilling, 2007; Moser & Ekstrom, 2010; Berrang-Ford *et al*., 2011; Busch, 2011; Bulkeley *et al*., 2012; Pruneau *et al*., 2012; Termeer *et al*., 2012; Biesbroek *et al*., 2013; Oberlack & Eisenack, 2014; Reckien *et al*., 2018; Gawith *et al*., 2020; Berrang-Ford *et al*., 2021). Under these key themes the TALX project identified 33 essential criteria to create the project's national climate adaptation policy assessment framework.

2.3.1   *Stakeholder engagement*

Without appropriate stakeholder engagement, promotion of a narrow view of adaptation options and their implementation is likely, perpetuating inequality within a country and/or region, as not all voices may be represented or heard. By working in partnership and developing policies that have input from a diverse range of stakeholders (e.g. from public authorities, NGOs, business), actions can be geared towards

equality, realising multiple benefits, addressing compromises and potentially leading to more effective implementation.

2.3.2   *Policy and governance*

Policy and governance is made up of the three sub-themes outlined below.

National policy

Lack of a clear national agenda or incentives on adaptation can result in limited action or inactivity, and ineffective or conflicting actions that reduce the potential for synergistic and complementary action. At the national scale, policy development can provide the structure, guidance and impetus to enable climate action, with high-level guidance providing a starting point and becoming more outcome- and action-orientated over time.

Leadership and the coordination of roles and responsibilities

Leadership is required for effective climate adaptation development, and lack of leadership support from senior managers and elected officials can restrict or stall adaptation progress. When institutional governance and decision-making structures are inappropriate or ineffective, this can restrict adaptation policy development and implementation (Berrang-Ford *et al*., 2014; Araos *et al*., 2016). Coordination
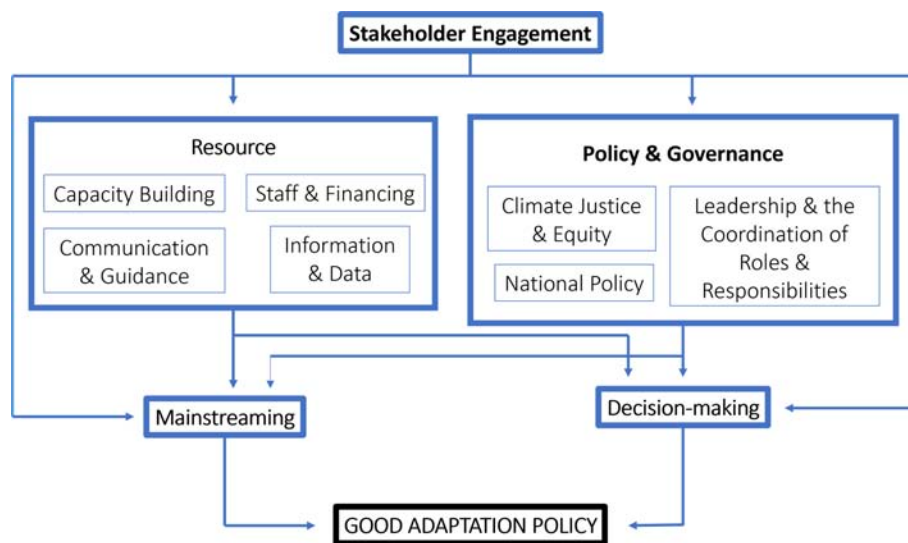
Figure 2.7. The themes that can prove both barriers to and enablers of climate adaptation.

between multi-level institutions is important and can be detrimental to outcomes if not present (Corfee-Morlot *et al*., 2009; Measham *et al*., 2011). Although work occurs at different levels, there is an important need to ensure collaboration, alignment and coordination between formal government and private stakeholders (Tompkins & Eakin, 2012). Governance needs to involve multiple actors (public, private and third sector) across sectors and scales (national, regional, local) and transparent processes towards climate adaptation, fully communicating the effects of various adaptation options in both the near and the long term and providing as much detail as possible.

Climate justice and equity

On a global scale, those least responsible for climate change will suffer the most from its impacts, with many who are already disadvantaged more likely to experience and be susceptible to climate impacts (Neumann *et al*., 2015; Makonnen & Hoekstra, 2016; Bathiany *et al*., 2018), while also having less ability to cope and to recover (Dell *et al*., 2014; Islam & Winkel, 2017). Disadvantaged groups are also affected by systemic inequalities in power, meaning that they are excluded from decision-making that could affect their ability to increase resilience and adapt to climate impacts. Adaptation policy could also potentially contribute to widening existing inequalities if policy further benefits those who are already most advantaged without also benefiting those who are disadvantaged. Climate justice represents one of the crucial challenges facing adaptation policies. By ensuring diverse stakeholder involvement and a dedicated effort from policymakers to factor social justice into policy and investment decisions, climate adaptation measures can be targeted to benefit those who are most disadvantaged and ensure that inequality is not perpetuated.

2.3.3 Resource

Resource is made up of the four sub-themes outlined below.

Staff and financing

Economic and financial restrictions can limit adaptation progress. Oberlack & Eisenack (2014) argue that

barriers may restrict adaptation in a number of ways, including by restricting means of adaptation, influencing the use of available means, increasing cost, reducing incentives for adaptation and increasing incentives for maladaptation. Economic barriers arise as a result of factors including limited availability of and access to finance, lack of ability to assess and make the economic case for adaptation and not valuing the social benefits of adaptation. There is also a lack of understanding of the means of balancing funding and financing adaptation actions within policy. In addition to financial resources, other resources required for adaptation include human resources and physical and material resources. There is also a longitudinal issue whereby staff and financing are provided but only on a short-term basis and in line with specific government initiatives or projects, leading to a serious failure to retain skills in the public sector. By including sustained access to appropriate resourcing in terms of finance, information and staff trained in adaptation policy at a national level, effective climate adaptation can be further supported.

Capacity building

Actors' characteristics and capabilities can act as a barrier to adaptation. Actors' confidence and abilities, such as communication and facilitation skills, greatly determine the extent to which they are able to progress adaptation in their organisation and secure appropriate resources (Adger *et al*., 2009). To instigate systemic adaptation, there is also a need for multiple organisational capacity building and securing resources across organisations, not just within organisations. A lack of funding or temporary funding can increase staff turnover, meaning that capacity building is reset to near zero periodically and that climate adaptation is not always part of the skillset of those working on projects and initiatives, something that can be detrimental to the outcomes (Power *et al*., 2018). There can often be an "adaptive capacity" gap between the perception that people are able and need to adapt and actually taking adaptive action to the level needed, leading to an "adaptation deficit" (Berrang-Ford *et al*., 2011; Lesnikowski *et al*., 2015; Gawith *et al*., 2020). Adaptation policy can promote the education, empowerment and engagement of all stakeholders across every level to address this.

Information and data

A thorough scientific evidence and knowledge base has been identified as a prerequisite for designing and implementing effective adaptation measures; however, access to well-supported and informed adaptation data and evidence is inconsistent across sectors and regions, and in terms of hazards (e.g. the UK and Ireland have a less robust evidence base on heat stresses than on flooding). By identifying where there is a lack of knowledge and evidence, clear research and innovation priorities can be set and addressed through adaptation policy.

Communication and guidance

The way in which climate change data are presented and communicated to decision-makers and policymakers can influence judgements about future climate scenarios and therefore adaptation decision-making (Daron *et al*., 2015). It is vital that presentation of data is tailored to the audience and that learnings from cognitive and psychological sciences can be used to improve accessibility (Harold *et al*., 2016). To enable this, adaptation policy can promote the use of platforms that make information available to a wide and diverse audience through open databases, knowledge brokers, policy entrepreneurs, bridging organisations, actions to support the co-production of knowledge between science and practice, and actions that build trust and social cohesion in communities (Tribbia & Moser, 2008; Cinner *et al*., 2018). The Knowledge Exchange between Climate Adaptation Platforms (KE4CAP) project provides a forum for adaptation platform developers and operators to come together to compare and learn from their different approaches and is an excellent example of how knowledge exchange and collaboration can be facilitated and cross-cutting issues addressed, enabling these platforms to increase their reach and effectiveness for their users (Street *et al*., 2021).

2.3.4 Decision-making

Planning for climate change and the creation of adaptation policy requires the comparison of different decision options (Pidgeon & Fischhoff, 2011). However, uncertainty can limit the ability or comfort of decision-makers in planning and implementing adaptation actions.

Adaptation decisions regarding future climate and its impacts must be made urgently, and appropriate consideration of uncertainties as part of the knowledge base can actually enhance the robustness of adaptation decisions. The use of a "living" policy when creating an adaptation plan will also be integral to overcoming uncertainty, as new information and the monitoring and reviews of adaptation can always be fed back and incorporated into the policy to constantly evolve and improve it.

2.3.5 Mainstreaming

Climate change may exacerbate pre-existing stresses (e.g. gender inequality, health (mental and physical), pollution, urban development, biodiversity loss, supply chain disruption), and there is a need to consider these linkages within plans and strategies. Climate adaptation needs to be systematically integrated into all decision-making processes, and how adaptation fits into growth and development, considering both short- and long-term benefits, must be analysed. This may be explored through understanding linkages between adaptation, development and disaster risk management, and identifying co-benefits among societal goals (Mimura *et al*., 2014) across different sectors.

Competing policy agendas can limit adaptation or lead to maladaptation. To avoid adaptation policies that are a detriment to other sectors/areas, adaptation needs to be sustainable, with collaboration between different sectors. By mainstreaming climate adaptation concerns into a wide range of policies, across sectors, the effectiveness of adaptation action can be maximised (OECD, 2009).

2.4 Assessment of Adaptation Policy in Ireland and the UK

2.4.1 Initial assessment by the project team

To assess the effectiveness of national climate adaptation policy in each of the five jurisdictions of Ireland and the UK, the proposed framework (Table 2.1) poses the overarching question "Did the climate adaptation policy provide mechanisms to overcome the barriers as discussed above?" and assesses each of the themes using a number of criteria and according to the performance of the

Table 2.1. Final assessment results after Delphi survey (May 2022)

Factor	Sub-factor	Code	Criterion	I	E	N	W	S
Stakeholder engagement	Stakeholder engagement	S1	Representative stakeholder involvement throughout the entire climate adaptation process, from the creation of adaptation policy to the implementation and evaluation of adaptation plans	orange	orange	orange	orange	orange
		S2	A dedicated process in place to facilitate inclusive stakeholder involvement in the preparation of adaptation policies	blue	orange	orange	blue	orange
Policy and governance	National policy	P1	A central administration body officially in charge of adaptation policymaking	blue	orange	blue	blue	blue
		P2	A national climate adaptation policy	blue	blue	blue	blue	blue
		P3	Country-level legislation in place to underpin adaptation policy (including frameworks and strategies)	blue	blue	red	blue	blue
		P4	Independent monitoring and evaluation of national policy	blue	blue	red	blue	orange
	Leadership and coordination of roles and responsibilities	P5	Horizontal (cross-sectoral) coordination mechanisms exist within the governance system, with division of responsibilities and SMART objectives and the alignment of policies	orange	orange	orange	blue	orange
		P6	Vertical (multi-level) coordination mechanisms exist within the governance system, enabling all levels of administration from local to national to influence policymaking	orange	orange	orange	orange	orange
		P7	Creation of spaces for leaders of climate adaptation to emerge across scales	orange	orange	orange	orange	orange
		P8	Climate adaptation is scalable, able to be tailored to different levels	orange	orange	red	orange	orange
		P9	Transparent climate finance with regard to adaptation initiatives	blue	orange	red	orange	red
		P10	Transboundary cooperation (either existing or planned) to work together to address common challenges with other countries	blue	blue	blue	blue	blue
	Climate justice and equity	P11	Domestic justice and equity issues (economic, social, environmental and cultural) relevant to each country are recognised in national-level climate change policy and implementation (e.g. through decision-making)	orange	orange	red	orange	blue
		P12	Processes are in place to allow actions to reduce any identified differences and/or ensure the benefits of interventions accrue to the most vulnerable	orange	orange	red	orange	orange
		P13	Climate adaptation policy development, implementation and review is fully transparent	blue	blue	red	orange	orange
Resource	Staff and financing	R1	Appropriate financing (enough to cover the cost of policy actions) is being applied to climate adaptation to achieve policy goals at all levels of governance	red	red	red	red	red
		R2	Accessible long-term and self-sustaining resources are available to support policy goals of increasing climate resilience (i.e. funding, infrastructure, human resources)	orange	orange	orange	orange	orange
	Capacity building and understanding the capability of decision-makers and action takers	R3	Policy supports education, empowerment and engagement of stakeholders at all levels of decision-making and action taking in relation to adaptation	blue	orange	orange	orange	orange
		R4	Mechanisms exist to recruit and train practitioners with the specific skills required to undertake complex climate adaptation	orange	orange	orange	orange	orange
	Information and data	R5	The policy supports advances in scientific research to improve understanding and inform decision-making	blue	blue	orange	orange	orange
		R6	Guidance on how to employ climate adaptation information is provided at sub-national levels	blue	orange	orange	orange	orange

Table 2.1. Continued

Factor	Sub-factor	Code	Criterion	I	E	N	W	S
	Communication and guidance	R7	Communication and engagement strategies are included in the policy that use multiple platforms to reach diverse stakeholders	amber	amber	amber	amber	amber
		R8	Recognition within the policy that climate change is an international issue and that adaptation strategies must look beyond national boundaries (i.e. the policy ensures that the international aspect of adaptation is considered at decision-making levels)	amber	amber	amber	amber	blue
		R9	Learning and support networks are available to enable all decision-makers to produce and implement appropriate climate adaptation policies	blue	amber	amber	amber	amber
Decision-making	Decision-making	D1	Priority adaptation options are identified, prioritised and selected based on robust, equitable and transparent methods (e.g. using decision support tools)	amber	amber	red	amber	red
		D2	An evaluation process is in place to assess the effectiveness of actions taken across all aspects of climate adaptation (i.e. from stakeholder engagement to mainstreaming)	amber	amber	amber	amber	amber
		D3	The policy recognises that adaptation is an iterative and flexible process that accounts for new information/experience	amber	amber	amber	amber	amber
Mainstreaming	Mainstreaming	M1	Consideration of climate change adaptation has been included in the national frameworks for environmental impact assessments and DRR	amber	amber	amber	amber	amber
		M2	Key policies recognise the need for adaptation action in future growth and development as a result of the impacts of climate change	blue	red	amber	blue	amber
		M3	National policy instruments promote adaptation at sectoral level, in line with national priorities	blue	amber	amber	amber	blue
		M4	Adaptation is mainstreamed in insurance or alternative policy instruments to provide incentives for investments in risk prevention	amber	amber	amber	amber	amber
		M5	Climate mitigation and adaptation are being investigated in tandem	amber	amber	red	amber	amber
		M6	Adaptation actions are sustainable (i.e. meet environmental, societal and cultural needs) for their intended lifetime	amber	amber	amber	amber	amber

I, Ireland; E, England; N, Northern Ireland; W, Wales; S, Scotland. Red indicates not acknowledged in policy; amber indicates acknowledged in policy but no resources provided; blue indicates acknowledged in policy and resources provided.

DRR, disaster risk reduction; SMART, specific, measurable, achievable, relevant and time-bound.

policy in overcoming these barriers. Performance is illustrated through a colour rating system:

- red – the barrier is not acknowledged in the climate policy;
- amber – the barrier is acknowledged as needing to be overcome but no resources are provided to do so;
- blue – the barrier is acknowledged as needing to be overcome and (some) resources are designated in order for this to happen.

An initial assessment was carried out by the project team for each of the five jurisdictions and a detailed justification was provided for the rating of each criterion (Appendix 2). To ensure that this assessment was as robust as possible, a modified Delphi methodology was then employed by the research team.

2.4.2 Modified Delphi method

To validate the findings and address the gap that can exist between academic and practitioner knowledge and the perspectives different stakeholders have of adaptation measures (Ochoa-Gaona *et al*., 2010; O'Neill *et al*., 2011; Revez *et al*., 2022), the research

team employed a modified Delphi method. The Delphi method is a widely used "method for structuring a group communication process so that the process is effective in allowing a group of individuals as a whole to deal with a complex problem" (Linstone & Turoff, 1975) that is particularly useful in complex and multi-faceted contexts (Masse *et al*., 2014; Ribeiro and Quintanilla, 2015). This technique is used to help a panel of experts, in an anonymous and iterative discussion, using two or more survey rounds, to reach consensus (Richey *et al*., 1985; Oliver, 2002; Makkonen *et al*., 2016) and bring together a range of perspectives into a unified viewpoint. The staged and structured process of feedback and dialogue enabled through these rounds encourages respondents to reflect on their initial perspective, learn from others and reconsider their own stance (Hsu & Sandford, 2007).

The way in which the Delphi process is applied is constantly evolving (Linstone & Turoff, 2011; Melander, 2018), with adaptations made in order to suit the needs of the issue being addressed and enable knowledge exchange and participatory decision-making (Crabbe *et al*., 2010; Hasson & Keeney, 2011; Swor & Canter, 2011). One of these modifications to the Delphi method is the hybrid application of quantitative and qualitative methods (Rowe & Wright, 2011) that allow for a more holistic view of extraordinarily complex issues or "wicked problems", such as those posed by climate adaptation.

The Delphi survey in this research was modified in that the first round did not begin with "open" questions. Instead, the framework was developed from international best practice, and an initial assessment

was provided by the project team. All rounds then allowed for the expert panels to modify these assessments and to create or revise justifications.

Several steps (Figure 2.8) were taken to prepare the initial assessment framework, select participants for the survey and analyse the responses over various rounds, before the final results of the national climate adaptation policy assessment were compiled. Due to the strong agreement among the panel members across a majority of the criteria, the Delphi process was concluded after round 2 as it was determined that consensus had been reached (where possible) and that further rounds would not achieve unity in specific criteria that were particularly contentious.

2.4.3   *Final assessment following the Delphi survey*

Based on the assessments, key similar areas across the five jurisdictions were identified, with all factors showing at least some level of agreement between jurisdictions. There were also some key differences, with factors identified as red (not acknowledged in policy), amber (acknowledged in policy but no resources provided to address them) and blue (acknowledged in policy and resources provided to address them) for the same criteria across the jurisdictions (Table 2.1).

While there were no significant changes between rounds for the majority of criteria, any that did experience rating changes were downgraded to either not being acknowledged in policy or being acknowledged in policy but not provided for, with
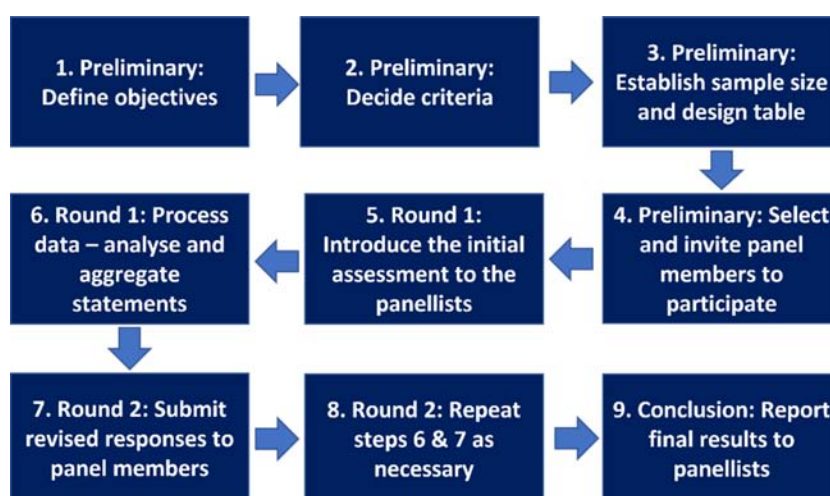
Figure 2.8. Policy assessment and Delphi survey methodology steps.

the exception of one, which was upgraded to being acknowledged in policy but not provided for (Appendix 1). However, even when there was agreement among Delphi panellists from different jurisdictions, many panellists added further information for clarity and context in the justifications for each of the ratings (Appendix 3).

Overall, there are significant similarities in the assessments of the different jurisdictions. Although some differ around individual criteria, there is a general feeling that, while policy in general acknowledges the importance of different adaptation aspects, it does not provide for this in practice. Public policies often fail to realise their stated intentions, with research showing that policy goals regularly remain on paper because of the barriers that exist to implementing them (Hupe, 2011). The analysis of the national adaptation policy assessments showed that there are common barriers across all of the UK and Ireland, the most significant of which is a lack of resources and an absence of the decision-making necessary to realise stated national policy ambitions. Between the different jurisdictions, more criteria are rated blue in Ireland and Wales than in the other regions, while the highest number of criteria rated amber are found in England and Scotland and the highest number of criteria rated red are found in Northern Ireland. This directly corresponds to the presence of climate legislation in these regions. Northern Ireland has only recently introduced climate legislation (2022). At the time of the assessment it had no formal legislation in place, and this appears to have had a knock-on effect on criteria being acknowledged in policy. With regard to the assessment ratings for the other regions, the length of time that legislation has been in place appears to be inversely proportional to the effectiveness of current adaptation policy. Both England and Scotland have had climate legislation in place for well over a decade; however, the current rating of their national-level climate adaptation policy suggests a reduction in effort and ambition and a much lower level of support for the implementation of actions. The opposite is observed in Ireland and Wales, both of which saw the implementation of climate legislation in 2015 (in Ireland there were also significant amendments to the 2015 Act in 2021), and where, based on the assessment ratings, there is more impetus for climate action and more support in place for implementation at a national level.

The assessments highlight the importance of top-down drivers to ensure key elements of adaptation at all levels. The TALX project has successfully developed a baseline that countries can use to assess their current status with respect to essential adaptation criteria and thus support government in enabling climate adaptation within their respective jurisdictions.

2.5 Key Messages for Policymakers

Good adaptation policies have the power to provide transformational adaptation by altering the social and political dynamics that have produced various levels of vulnerability in society. In order to address the increasingly complex and numerous questions from across diverse policy sectors and scales ranging from local to global, a high level of coordination is necessary (Klein *et al*., 2017). It is essential that climate adaptation policy in Ireland and the UK begins to enable this coordination among the various actors and sectors involved, using the key themes that have been demonstrated to support and enable adaptation.

2.5.1 Stakeholder engagement

Representative stakeholder engagement is a fundamental feature of robust adaptation planning and practice, especially for tough decisions that require local buy-in. Without proper engagement, climate adaptation policy can promote a narrow view (representative of only a small subset of the population) of the impacts and opportunities of climate change and the risks perpetuating inequality. Across the five jurisdictions, some structures, such as public consultations, national conversations and citizens' assemblies that incorporate elements of climate adaptation (as seen in Ireland and Wales), exist to support this work, but none currently enables the breadth and depth of engagement required, although Ireland has made substantial headway in this area in recent months through engagement with public participation networks, the general public and groups led by the Department of the Environment, Climate and Communications to inform the upcoming Climate Action Plan (2023).

2.5.2 Policy and governance

Within policy and governance, a clear national agenda and strong leadership can bring authorities together

and drive forward action. This coordination between multi-level organisations and actors is important and can be highly detrimental to outcomes if not present (Corfee-Morlot *et al*., 2009; Measham *et al*., 2011), whether in the case of the public, private or third sector (Tompkins & Eakin, 2012). All TALX partner countries have the ambition to improve climate adaptation, with national climate adaptation policies, underpinned by legislation (in the case of Northern Ireland this has been put in place since the Delphi panel ended), and a monitoring and evaluation framework already in place. Governance structures, however, often promote siloed working, and a lack of resources for cross-sector and multi-level collaboration means that issues of justice and equity are not being adequately addressed, if at all. Næss *et al*. (2005) highlight that a lack of clear or shared responsibilities can lead to competition for resources or policy influence. This in turn can lead to inefficient or unsuccessful adaptation action and a widening gap in climate justice in different regions. This is highlighted in Northern Ireland, where a lack of climate legislation meant that climate justice and equity issues were not acknowledged in adaptation policy documents.

Across Ireland and the UK, a lack of adequate resources for implementation has also hindered the emergence of climate adaptation leaders and this has impacted practice at the local scale, which requires stakeholder input and support, as well as strong leadership, to be successful (Gupta *et al*., 2010). All five jurisdictions, however, have acknowledged and provided for (at least at some level) wider transboundary cooperation to address climate impacts, particularly for infrastructure that crosses national boundaries such as energy and transport networks.

2.5.3   *Resource*

Across the resource theme, there was almost unanimous agreement among all jurisdictions that there was a lack of proper provision for staff and financing, capacity building, information and data gathering and communication and guidance. The exception was a very limited number of policies (in Ireland, England and Scotland) that do provide for initiatives to gather and communicate new evidence to support the need for adaptation action.

Foremost among these components is the scale of the staff resources and financing required, which has not

been acknowledged in policy in any jurisdiction and is one of the factors on which panellists unanimously agreed with respect to their Delphi ratings (round 2).

A thorough scientific evidence and knowledge base and the ability to communicate the evidence is a prerequisite for effective adaptation action. While some jurisdictions are providing for new scientific research, this is usually in the form of short-term, stand-alone projects that rarely incorporate local knowledge. None of the TALX jurisdictions has a designated pipeline of research with associated sustainable, long-term funding that provides continuity for effective adaptation action. Access to evidence-based information and local or indigenous knowledge and the ability to discern what is relevant and important is seen as a key aspect of successful adaptation (Lonsdale *et al*., 2010; Street *et al*., 2021). Without this it is much more difficult to discern research gaps and set clear priorities. The way this evidence is presented to decision-makers and policymakers can influence judgements about future climate scenarios and therefore influence adaptation decision-making (Daron *et al*., 2015). Therefore, it is vital to tailor the presentation of evidence to the audience and provide appropriate communication and engagement strategies and learning and support networks.

2.5.4   *Decision-making*

Successful adaptation at all levels is underpinned by good decision-making. The skills, resources and guidance needed to assess and decide on adaptation options in an equitable manner are currently not provided for in any national-level policy in Ireland or the UK, however. This has a knock-on effect and sets the standard for sub-national policy as well, increasing the likelihood of inequity and maladaptation across all jurisdictions. The assessment found that in some jurisdictions (Scotland and Northern Ireland) essential elements of decision-making are not acknowledged in policy and that uncertainty is limiting the ability or comfort of decision-makers in planning and implementing adaptation actions in all jurisdictions. Many decision-makers at both national and local levels have concerns over taking action that may not be appropriate or cost-effective and often have overly optimistic perceptions of the technology and political buy-in that future generations will have available to deal with climate change

(Björnberg & Hansson, 2011). However, as is seen in the increasing severity and frequency of climate impacts across Ireland and the UK, this "wait and see" approach to decision-making is no longer viable and is likely to cost more in time, resources and funding in the long run (Björnberg & Hansson, 2011; Stern, 2015; Brisbois, 2022).

2.5.5 Mainstreaming

Policy acknowledges that adaptation should become part of "business as usual" and that linkages within strategies must be considered, but there is still a large adaptation gap across all jurisdictions, with adaptation not recognised in key growth and development policies in England and not investigated in tandem with mitigation in Northern Ireland. The lack of provision to ensure that climate adaptation is considered in key national frameworks and in insurance instruments means that there are a major gaps both in how adaptation is perceived by society and in the current implementation of sustainable adaptation initiatives across Ireland and the UK. While some jurisdictions (Scotland and Ireland) are providing resources to promote sectoral adaptation in line with national priorities, this is not progressing in all sectors and is not enough to mainstream adaptation into the consciousness of stakeholders when making routine decisions. For this to happen, there needs to be sustained government prioritisation of climate adaptation, which is not evident in the national policy assessments in any jurisdiction.

3   Co-developing an Adaptation Partnership Framework

To support change on the scale necessary for transformational adaptation, it is essential that top-down approaches be used alongside bottom-up approaches. Climate adaptation is often an intrinsically local issue, and local government and community action is of particular importance, with municipalities playing a major role in adaptation implementation (Corfee-Morlot *et al*., 2009; Rosenzweig & Solecki, 2010).

3.1   Enhancing Climate Adaptation Across Scales

Climate change is an existential threat that society currently faces, and it will substantially alter the natural environment. As institutions and human systems are embedded within the natural environment, they need to adapt to any alterations to this environment (Busch, 2011). Many organisations face barriers to implementing adaptation measures. The transition to a net zero, climate-ready future will require transformational change in which the root causes of climate risks are addressed and opportunities for system change are realised. To tackle adaptation barriers and work towards transformation, stakeholders need to be able to define their capabilities and know where they should target their efforts.

A capability maturity model is a framework that allows the evaluation and improvement of certain dimensions of a partnership or organisation by providing an increasingly coordinated way of operating (Proença & Borbinha, 2016). It can provide the basis for a practical, systematic and easy-to-use development tool for stakeholders who are integrating the practices of climate adaptation. This is done by identifying key capabilities that must be progressed (levelled up) over time in order to achieve adaptation visions and goals. The previous level provides a foundation of practices and attributes on which subsequent maturity levels can be built. A capability is defined as a combination of observable and measurable knowledge, skills, abilities and attributes that enhance success (Thomas, 2019).

In order to support local action to adapt to climate change, the TALX project co-developed a place-based adaptation partnership framework, based on the format of a capability maturity model, with practitioners from Ireland, Northern Ireland, Scotland, England and Wales. This framework includes recommended actions to progress core capabilities at three different maturity stages (initiate, develop, advance) following input from participants.

3.2   The Need for Place-based Adaptation and Partnership Working

"Place" is a dynamic, multi-faceted concept that exists across scales, encompassing a spatial area that combines human, biophysical, social and economic systems, and is given meaning by the people who have an attachment to it and the environment that shapes it (Stedman and Ingalls, 2014; Pulver *et al*., 2018; Gislason *et al*., 2021). Therefore, place-based adaptation is cross-sectoral and multi-level, focused on a geographical area and engaging with all the different elements within it (both built and natural). By aligning national agendas and local priorities, a more holistic vision of adaptation can be developed, benefiting a greater majority of stakeholders within the place and lessening the level of inequity that may arise from adverse climate impacts (Groulx *et al*., 2014; Khan *et al*., 2018; Conway *et al*., 2019; RTPI, 2021).

In the context of the TALX project, a place-based scale is defined as an administrative region that has established governance structures, decision-making processes and democratic participation, and the influence and ability to administer and deliver policy and finance instruments. Examples of this scale include the Dublin Metropolitan Climate Action Regional Office (CARO) (encompassing four local authorities), the Pembrokeshire Coastal Forum, covering all of the Pembrokeshire coastline, and the Maharees Conservation Association, covering the 5-km-long natural Maharees tombolo in the west of Ireland.

One of the main benefits of focusing on place-based adaptation is that people are much more likely to participate and remain involved in adaptation actions when they feel a connection to the location.

3.3 Co-developing a Climate Adaptation Partnership Framework

Co-development and co-production with stakeholders has been shown to be an agent of transformation (Moser, 2016). The involvement of citizens and practitioners can frame issues in ways that had not been previously considered (Fung, 2017), and this involvement is highly beneficial to the relevance of outputs and usability of knowledge and services (Vincent *et al.*, 2018). The co-development process can empower those involved and challenge existing knowledge systems (Lotz-Sisitka *et al.*, 2017). To begin the process of defining what key capabilities were necessary for progressing adaptation, the project team brought together a wide range of adaptation practitioners actively working in the field across the five jurisdictions of Ireland and the UK. This process allowed cross-sector and multi-level cooperation and collaboration and gave a voice to the communities and organisations actually involved in implementing adaptation practices, highlighting lived experience.

3.3.1 Building a transboundary network of knowledge and experience

Through participation in seven online workshops, over 80 organisations from across Ireland and the UK, along with international entities, were involved in the co-development of the climate adaptation partnership framework. These practitioners included representatives from public, private and third sector organisations and initiatives, and their insights and experience, together with the knowledge of the project team, informed and shaped the development of the partnership framework. The workshop series is shown in Figure 3.1 and the rationale, approach, structure and overview of the outcomes of workshops 1–7 are discussed in the sections below.

Perspectives workshop

The initial workshop, "Practitioner Perspectives on Well-adapting Places", was held to establish the key adaptation concepts of what a well-adapting place is and the activities and capabilities necessary to achieve it. This workshop comprised participants from 16 organisations across the five jurisdictions of Ireland and the UK (Appendix 4). The outputs of this workshop highlighted the themes that practitioners believed to be important for successful climate adaptation (Appendix 5) and prioritised them, with six capabilities deemed to be the most necessary to develop in order to progress. The original capabilities were named as: legislation and policy; leadership and ownership; research, knowledge and expertise; community education, engagement, involvement and empowerment; collaboration, cross-sectoral networks and partnerships; and sustained and secure funding and resource. These were renamed for ease as legislation, leadership, evidence, community, partnerships and resource. As legislation is considered at a national level and is outside the immediate control of many stakeholders considering adaptation action, it was excluded from the framework. The subsequent online workshops (2–6) were designed to delve deeper into the other five capabilities (identified above) and determine the attributes and actions that characterise

Figure 3.1. The workshop series used to co-develop the adaptation partnership framework.

them. The final workshop (7) considered the inter-dependencies between these capabilities.

Leadership workshop

To establish the key leadership qualities needed for effective place-based adaptation partnerships and the actions and activities necessary to develop this leadership, we held a workshop entitled "Adaptation Leadership for Well-adapting Places". Participants from 20 organisations from Ireland, the UK and internationally (Appendix 4) detailed their own experiences and the challenges of leadership at various stages of adaptation. The workshop highlighted that transformational change requires a shift away from traditional power structures towards empowered and inclusive networks of leaders. Strategic vision was also a vital requirement.

Evidence workshop

The third workshop, "Adaptation Evidence for Well-adapting Places", aimed to establish the key types of evidence needed in place-based adaptation partnerships and the actions and activities necessary to develop the evidence base and support decision-making in relation to adaptation. Participants from 18 organisations across Ireland and the UK (Appendix 4) provided a range of insights from their own work. The challenges of building and maintaining a robust evidence base that is relevant to decision-makers, in particular the need for a range of types of relevant and usable evidence at different scales, was discussed. Participants highlighted that local knowledge should be valued and included alongside more formal datasets. Inclusive and participatory processes that build trust can help partnerships begin to identify the root causes of climate risks and opportunities for addressing them. Effective communication of evidence was also viewed as essential for building support for action.

Community workshop

The fourth workshop, "The Role of Communities in Developing Place-based Adaptation", explored the need for engagement with communities and the role they play in place-based adaptation partnerships. Participants discussed the actions and activities

necessary to develop community leadership. Participants from 23 organisations across Ireland, the UK and internationally (Appendix 4) provided a range of insights from their own experience. The workshop highlighted the value of locally led adaptation action that is developed based on an understanding of the values, culture and heritage of places. Participants also explored how to involve under-represented groups and consider stakeholder emotions in any action. Participants discussed the importance of recognising that communities are facing trauma and loss linked to climate impacts and/or are dealing with climate impacts alongside a wide range of social, economic and environmental stressors.

Partnership workshop

The fifth workshop, "The Role of Partnership in Developing Place-based Adaptation", was convened to explore how effective partnership working develops over time. Participants explored how partnership working is integral to unlocking opportunities for transformational change and identified actions and activities necessary to develop this. Participants from 17 organisations across Ireland and the UK (Appendix 4) provided a range of insights from their own experience of partnership working. The workshop highlighted that partnerships are essential for larger and longer-term adaptation initiatives, especially when implementing, sustaining and updating adaptation action. It explored actions that groups can take to identify whether a partnership is needed and actions that can help established partnerships develop a change process and opportunities for system change.

Resource workshop

The sixth workshop, "The Role of Resource in Developing Place-based Adaptation", explored how funding and finance, human resources, assets and communication can be developed by place-based adaptation partnerships. Participants from 14 organisations across Ireland and the UK (Appendix 4) provided a range of insights and understanding from their own work. The workshop highlighted that mapping the resource that is already available within a partnership can help motivate action but that blended finance and expertise is critical for larger scale adaptation initiatives to remain sustainable.

Interdependencies workshop

The final (seventh) workshop, "Interdependencies for an Effective Capability Maturity Model", drew together all of the previous workshop material to allow a first draft of the adaptation partnership framework to be developed. The capabilities of partnership and community were found to have significant overlap, and community was subsumed into the partnership capability, although communities were acknowledged as essential stakeholders across all capabilities. Participants from 42 organisations across Ireland and the UK (Appendix 4) helped validate the framework content.

3.3.2 Framework of actions

Following the workshops, actions to progress partnership working were seen to fall into one of three stages of progress: initiate, develop and advance. The resulting TALX climate adaptation partnership framework uses four core capabilities – leadership, evidence, partnership and resource – to progress adaptation action at each stage. Within each of the four capabilities there are three separate aspects (A–C), all of which must be developed at each stage in order to progress the capability as a whole (Table 3.1). The key aspects of each capability are:

- Leadership – A: vision; B: influence; C: empowerment.

Table 3.1. Actions for each aspect of each capability at each maturity stage

Capability	Maturity stage		
	Initiate	**Develop**	**Advance**
Leadership	Action 1A: Create a vision for the future	Action 2A: Use the vision to motivate positive transformation	Action 3A: Expand inclusive and representative adaptation
	Action 1B: Use opportunities for change and policy and legislation to support action	Action 2B: Build support for action	Action 3B: Learn from setbacks to strengthen leadership
	Action 1C: Inspire and empower communities	Action 2C: Create opportunities for leaders to emerge and grow	Action 3C: Work with and inspire others to achieve wider transformation
Evidence	Action 1A: Survey existing evidence	Action 2A: Co-develop and strengthen evidence to inform adaptation planning and action	Action 3A: Use the right tools to bring the evidence base to life
	Action 1B: Co-develop shared evidence	Action 2B: Co-develop the framework for risk assessment and implement it	Action 3B: Ensure that the evidence base is accessible and up to date
	Action 1C: Set in place monitoring, evaluation and learning	Action 2C: Plan development, tracking and sharing of evidence	Action 3C: Map the evidence and processes within the system to keep it dynamic and responsive
Partnership	Action 1A: Build relationships	Action 2A: Put in place strong supporting structures	Action 3A: Strengthen the partnership
	Action 1B: Make the case for change	Action 2B: Commit to system change and transformation	Action 2B: Focus on delivery
	Action 1A: Focus on locally led adaptation	Action 2C: Develop locally led adaptation actions and projects	Action 3C: Reflect, evaluate and learn
Resource	Action 1A: Recognise existing members' capacity and capability	Action 2A: Create coordinator position to support work planning and implementation	Action 3A: Commit resources to continual skills development of partnership staff and members
	Action 1B: Map existing funding sources and opportunities	Action 2B: Build capacity to understand funding and finance options	Action 3B: Capitalise on assets to further develop the partnership
	Action 1C: Develop fair and equal resourcing approaches	Action 2C: Identify and secure revenue streams and agree mechanisms for resource allocation and prioritisation	Action 3C: Achieve long-term funding and finance and ensure fair distribution of resources

- Evidence – A: co-developing and maintaining the evidence base; B: communicating and understanding the evidence; C: monitoring, evaluating and learning.
- Partnership – A: create a healthy culture; B: build strong governance and supporting structures; C: collaborate.
- Resource – A: people; B: assets and communications; C: funding and financing.

The actions provided within the framework are designed to provide a practical roadmap for adaptation action; however, they are not intended to be prescriptive; rather they are intended to be used as a guideline and adapted by partnerships to support their own priorities and goals.

3.3.3 *Choosing our champions*

To help make this information as user friendly and interactive as possible, the TALX team worked closely with a graphic artist to create champions that were representative of each capability (Figure 3.2). These champions take us on a journey as each capability develops, showing how the capability changes as places progress from the beginning of their adaptation partnerships to becoming more mature. The TALX team chose champions that participants could identify with; these are people from Ireland and the UK who embody the capability they represent, as detailed in the illustration.

Leadership

Grace O'Malley (Gráinne Ní Mháille; *c*.1530–1603) was the fearless leader of the Ó Mháille dynasty in the west of Ireland. She was a political pragmatist and tactician who challenged the turbulent politics of the 16th century. She was a skilful leader, negotiator and guardian of place, and that is why she was chosen as the leadership champion.

Evidence

Annie Scott Dill Maunder (1868–1947) made significant contributions, against the odds, to various scientific fields, many of which formed the basis of modern-day understanding, while also working tirelessly to increase public engagement and outreach, particularly among women. She drove change through the gathering and sharing of knowledge and information, and that is why she was chosen as the evidence champion.

Partnership

Patrick Geddes (1854–1932) was a Scottish biologist, socialist and innovative civic planner who pioneered the concept of community engagement before designing or implementing any planning strategies. He was highly collaborative and forward-thinking, overcoming opposition to drive change, and that is why he was chosen as the partnership champion.

Figure 3.2. The champions that represent each capability. Image credit: Becky Hackett (ThinkVisual).

Resource

Tessa Tennant (1959–2018) was an advocate for sustainable investment and a pioneer of the responsible investment industry. She was a visionary who dedicated herself to advancing green finance and changing perceptions of it. She was highly resourceful and determined, overcoming obstacles to drive and promote transformational change, and that is why she was chosen as the resource champion.

3.3.4   *Tools to progress place-based adaptation partnerships*

Within the framework there is a wide selection of tools and resources to help partnerships complete the actions outlined. These draw on existing knowledge from work on climate adaptation in Ireland, the UK and internationally. They include links to various adaptation plans and strategies, projects where actions have been developed, national guidance on climate action, and interactive tools and programmes to develop a wide range of skills.

As well as tools developed externally, the TALX project also created a number of question sets[2] to allow partnerships to reflect on their position on their adaptation journey and to evaluate, learn and set intentions for the future. For those stakeholders exploring whether they wish to create an adaptation partnership, a freely available pre-partnership survey[3] was produced to help them assess whether this is something they need and what areas they will need to develop if they wish to progress. An infographic of the framework has also been created in order to support the dissemination of information to a variety of audiences (Appendix 7).

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2   https://talx2020.github.io/tools_and_case_studies.html (accessed 9 May 2023).

3   https://talx2020.github.io/tools_and_case_studies.html (accessed 9 May 2023).

4 Place-based Adaptation Partnerships in Practice

Actors are much more likely to engage with and support climate-friendly behaviour if they have an attachment to the place (Groshong *et al.*, 2020); therefore, place-based adaptation partnerships are an excellent way to engage stakeholders in adaptation action. But how do these partnerships work in practice? What are their key strengths? And what are the challenges of establishing and maintaining these partnerships?

4.1 Learnings from Existing Exemplar Adaptation Partnerships

The research project identified a number of existing place-based adaptation partnerships[4] of different scales in Ireland and the UK in order to provide case studies of what good partnerships look like. Ranging from highly localised to city and region wide, these partnerships exemplify the potential of place-based adaptation partnerships for cross-cutting adaptation action that can change attitudes to climate action and behaviours. Below are examples of these partnerships and how they have used the core capabilities outlined in the adaptation partnership framework to progress adaptation.

4.1.1 Maharees Conservation Group Ltd

The Maharees Conservation Association CLG partnership is an excellent example of what a community-based partnership can do and how small initiatives can have a wider impact on progressing adaptation.

- Leadership – a locally led partnership that empowers the community to take ownership of adaptation action in its locality. Its success has also allowed it to share knowledge and insights with other coastal communities, influencing wider change at a regional level.
- Evidence – focused on outreach activities and developed shared content, including a coastal management plan, with the Maharees community local councils, national agencies and regional universities.
- Partnership – established under the principle that "anyone who cared about the Maharees" could be a member, ensuring that a diverse range of stakeholders and perspectives were included in the partnership from the beginning.
- Resource – brought together a wide range of community members to address climate impacts and implement practical solutions.

4.1.2 Connswater Community Greenway

Connswater Community Greenway is an urban greenspace regeneration project in east Belfast transforming underused and inaccessible spaces into a community asset, while also providing a flood alleviation scheme for the area.

- Leadership – social empowerment and infrastructure improvement driven by the local community were at the core of the project from the beginning, and its success has enabled the EastSide Greenways Concept Plan, which aims to develop a partnership to scope the potential for other green spaces in the wider east Belfast region.
- Evidence – used a range of data sources to create a health impact assessment and promote the need for community spaces in east Belfast, then used localised flooding events to link the community greenway and flood alleviation into a single project.
- Partnership – delivered through a complex consortium led by EastSide Partnership and including Belfast City Council, government departments and private sector representatives, with the needs of a neglected local community at its heart. It takes a holistic and deep engagement approach, and open communication informs all processes in this partnership.

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4 https://talx2020.github.io/tools_and_case_studies.html (accessed 9 May 2023).

- Resource – used a window of opportunity to obtain significant funding and bring local council partners on board to support the management of finance and the long-term maintenance of the greenway.

4.1.3   Highland Adapts

The Highland Adapts partnership initiative was formed with shared power and collective action at the heart of its approach.

- Leadership – the founders committed early on to distributive power, recognising that diverse partners should be involved in Highland Adapts and that the leadership and decision-making should not be restricted to the partners who were able to provide finance.
- Evidence – the approach to developing risk and opportunity assessments is to value formal data and evidence alongside lived experience from community members.
- Partnership – brings communities, businesses, land managers and the public sector together to facilitate transformational action towards a prosperous, climate-ready Highlands by creating space for partners to hear and understand different perspectives.
- Resource – the partnership has developed a charter to help raise awareness of climate change and its impacts and to build momentum in communities and organisations to work towards transformational change.

4.1.4   Pembrokeshire Coastal Forum

Pembrokeshire Coastal Forum (PCF) is a community interest company that brings together a number of organisations, including elected officials, industry professionals, public bodies, local authorities and local communities, in Pembrokeshire to create innovative solutions to the local challenges posed by the changing climate.

- Leadership – the PCF vision for a sustainable future has been supported through the creation of a Marine Code[5] and Outdoor Charter[6] for Pembrokeshire, which provide best practice

guidelines and voluntary codes of practice for stakeholders in the community and wider area.

- Evidence – a number of methods to raise awareness and understanding of climate impacts and develop local climate action were created by the PCF and other partners. These include interactive games, action cards and other learning resources.
- Partnership – this is at the heart of the work that the PCF does, with an extensive network of cross-cutting contacts, building trust among different stakeholders and inspiring adaptation action along the Pembrokeshire coastline.
- Resource – a range of communication and dissemination tools are used to raise awareness of the partnership and the work it is doing. The Wales Mapping project[7] is a collaborative approach with multiple partners that uses geographical information system (GIS) software to display a range of data for multiple users with different needs in an interactive way.

4.1.5   Yorkshire and Humber Climate Commission

The Yorkshire and Humber Climate Commission is the largest of its kind in England and brings together the public, private and third sectors to support a just transformation and sustainable climate action.

- Leadership – an independent entity supported by councils across the region and developed with the support of national agencies, public bodies and academic institutions. The commission invites a wide range of perspectives and voices into discussions, promoting and strengthening just and inclusive action to ensure that no one is left out or left behind.
- Evidence – impact sessions are being delivered to collect knowledge from academic, governmental and grassroots viewpoints, exploring how best practice can be scaled up, connecting thinking across disciplines and generating advice to deliver the most promising solutions for stakeholders in the region.

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5   https://www.pembrokeshirecoastalforum.org.uk/projects/pembrokeshire-marine-code/ (accessed 9 May 2023).

6   https://www.pembrokeshirecoastalforum.org.uk/projects/pembrokeshire-outdoor-charter-group/ (accessed 9 May 2023).

7   https://www.walesactivitymapping.org.uk (accessed 9 May 2023).

- Partnership – a wide range of perspectives and voices are included in the commission, and these feed into the development of adaptation, including the recently developed climate action plan, which provides a framework of actions for the region and commission.
- Resource – organisations across the Yorkshire and Humber area have recognised the benefits of pooling resources at a regional level to encourage adaptation solutions that are tailored to the region. The commission retains its independence, and organisations accept that contributions in no way influence its work and that all decisions are for the benefit of the wider area.

4.1.6   *Climate Ready Clyde*

Climate Ready Clyde (CRC) is a major adaptation initiative widely regarded by practitioners as one of Europe's leading examples of place-based adaptation action. It works to ensure that the Glasgow City region is able to adapt to the challenges of the changing climate and that everyone benefits from this transformation.

- Leadership – the CRC vision was developed through a range of workshops to explore whether the Glasgow City region needed a climate adaptation partnership. It was endorsed by partners and used to communicate the need for joint action and the development of a business case for action. This vision was expanded to include a detailed Theory of Change,[8] which sets out a long-term vision for the region.
- Evidence – innovative and inclusive risk and opportunity assessments were developed for the Glasgow City region and the results were used to inform the development of the adaptation strategy and action plan that followed.
- Partnership – CRC is a collaborative partnership with over 40 organisations that has been widely recognised for its ambition to drive a truly transformational approach to adapting to climate change.
- Resource – funded by 14 member organisations, including eight local authorities, and supported

by the Scottish Government, CRC, under the guidance of the secretariat (based within Sniffer[9]), leads an ambitious programme of work on climate adaptation.

4.2   Assessing the Need for Partnership Working in Northern Ireland and Ireland

To assess the need and desire for partnership working in Ireland and Northern Ireland, the project team collaborated with Cathy Burns, Climate Programme Manager at Derry City and Strabane District Council (DCSDC), and Laura Dixon, Climate Action Officer for Mayo County Council. Using the tools developed as part of the climate adaptation partnership framework, the TALX project assessed where DCSDC and Mayo County Council were currently positioned on their adaptation journeys. In both cases the project pre-partnership survey was employed, as no formal partnership working existed.

4.2.1   *Derry City and Strabane District Council*

While there are no current formal arrangements for partnership working for adaptation at DCSDC, representatives from a number of organisations, including Northern Irish agencies and government departments, sporting clubs and the neighbouring Donegal County Council, have been involved in discussions regarding joint working on climate adaptation and a number of smaller informal adaptation initiatives are being led by the council and various agencies. On a national scale, an all-party climate emergency working group and a climate action multi-agency working group have been re-established following the COVID-19 pandemic.

DCSDC has a robust evidence base concerning the climate risks it is facing, with detailed flood maps, climate risk analysis (carried out as part of the council's adaptation planning process) and detailed risk and opportunity analysis for Derry city centre and Strabane town centre. There are, however, a very limited number of organisations in the community that

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8   http://climatereadyclyde.org.uk/theory-of-change/#:~:text=Climate%20Ready%20Clyde%20has%20developed,how%20they%20should%20be%20achieved (accessed 9 May 2023).

9   https://www.sniffer.org.uk (accessed 9 May 2023).

are supportive of adaptation partnership working, and, while the DCSDC climate programme manager is a funded, full-time position, this is an insufficient level of resource to tackle the scale of adaptation work that needs to be implemented.

The survey highlighted that the challenges to partnership working within the region include conflicting priorities between partners and a lack of co-development, provision of resource and ownership. However, benefits of partnership working were also clearly seen, including the opportunity to learn from others, connections between people and networks, and increased resource and support from central government, allowing for larger scale adaptation initiatives.

4.2.2   *Mayo County Council*

There are no current formal arrangements for partnership working for adaptation in Mayo, although the council has discussed the need for joint working to adapt to climate change internally. Mayo County Council employs flooding engineers and has a robust evidence base on flooding and access to the Office of Public Works (OPW) tool "floodinfo.ie", which details flood risks and management works on a national level. Aside from flooding, however, there is very little research on the risks that climate change presents (e.g. heat/drought), and so the region is unprepared for these risks. The support in communities across Mayo for partnership action to adapt to climate change tends to be area specific. Areas that have been severely affected by climate impacts in the past, such as Ballina and the surrounding area, have a high level of community and stakeholder support for partnership working. This also applies to locations involved in climate action, such as decarbonising zone communities (e.g. Mulranny) and communities involved in sand dune preservation initiatives (e.g. Bertra). The level of resources available to support partnership working has not been discussed by the council, so capacity is unknown at this point. The survey highlighted that the challenges to partnership working in the region include conflicting priorities between partners and a lack of co-development. However, benefits to partnership working were also clearly seen, including the opportunity to learn from others, connections between people and networks, and increased resources available for action.

4.3   Initiating Place-based Adaptation Partnerships in Northern Ireland and Ireland

Following the assessments and in collaboration with DCSDC and Mayo County Council, the project team explored where place-based adaptation partnerships might be most beneficial in the two areas. In Northern Ireland, it was decided that the priority should be to initiate discussions on place-based partnership working across the entirety of the DCSDC region, while in Mayo it was agreed that discussions on place-based partnership working would be best focused on a smaller region, and locations in Ballina and its surrounding region, in the north of County Mayo, were selected. These regions were chosen as they already represented existing spatial boundaries and therefore it was felt that organisations would be more likely to contribute, as adaptation action is often already within their remit or will have clear benefits in their area. In the case of DCSDC, this is an administrative district council boundary, while in Ballina and the surrounding areas the boundary is primarily represented by the River Moy catchment area, although nearby coastal areas prone to flooding were also invited to contribute.

Pilot workshops were held in Derry City and Ballina (Figure 4.1), where the project team facilitated informal discussions on partnership working for climate adaptation with a wide range of stakeholders, and a number of key messages and outcomes were identified.

4.3.1   *Derry city and Ballina workshops*

The main findings of the workshops in both Derry city and Ballina highlighted that there is a need and a desire for partnership working. Many organisations are already engaged in similar actions but are working separately, with little or no communication. To avoid duplication of effort and to increase efficiencies through sharing of information and resources, increased collaboration is needed in both regions.

Participants felt that, to achieve the level of large-scale adaptation action that is needed, a wide range of stakeholders must be involved and that creating shared agency through partnership working would allow for complex adaptation initiatives. This type of partnership working would have the added benefit
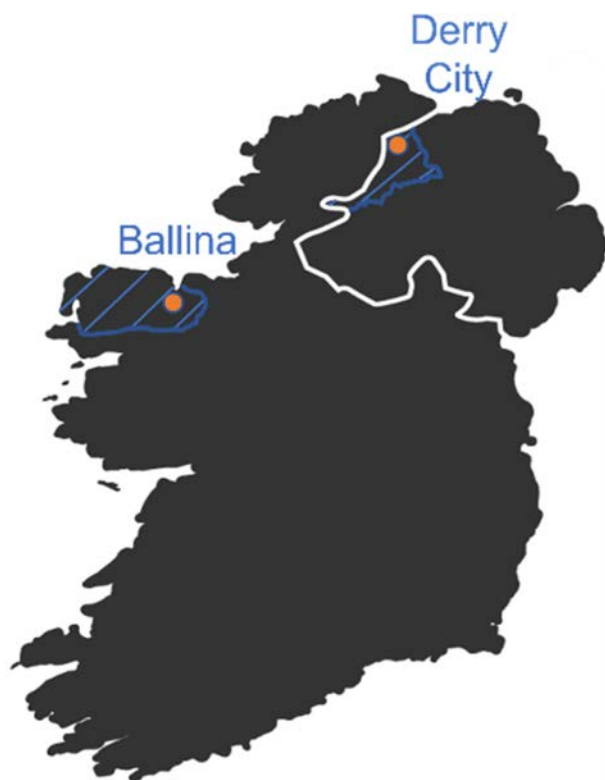
Figure 4.1. Location of the workshops (orange dots) and areas covered by the pilots (blue shading).

of widening perspectives and allowing a change in attitudes to enable innovative adaptation solutions.

In the Derry city workshop, participants agreed that inclusive decision-making and the disruption of existing power dynamics between the community and statutory agencies (where government agencies tend to hold most of the power) are crucial to achieving fair and just climate adaptation. However, the challenge of building the trust necessary for successful partnership working, especially between wider stakeholder groups with different priorities and capacities, was also highlighted.

Participants felt strongly that top-down support for partnership adaptation action is currently lacking, and that there needs to be increased education and awareness raising within organisations and promotion of the co-benefits of partnership working. The perception that mitigation is the primary goal of climate action is prevalent in many organisations and needs to be challenged, and the importance of considering mitigation and adaptation in tandem needs to be reinforced. However, participants indicated that the responsibility for climate adaptation should not be a "bolt-on" to existing roles that cover a wide remit.

Dedicated resources, for example climate action teams with expertise in adaptation, are needed to enable progress.

In the Ballina workshop, participants highlighted the need for defined roles and responsibilities and a high level of coordination and communication between partners. Accountability and transparency within partnerships and between stakeholders was seen as essential to success. However, participants noted that this may be easier for some partners than others, and conflicts might arise between the needs of the partnership and internal organisational policies, meaning that it is easier for some organisations to work on adaptation alone.

All participants, in both workshops, emphasised that social inclusion is essential in holistic and just climate adaptation and that this can be achieved only through the equal representation of all groups within a partnership, regardless of their ability to provide financial resources. Top-down and bottom-up approaches to adaptation must be used in tandem in order to ensure that adaptation action benefits everyone. While quick wins were recognised as important within partnership working and can be used to generate interest and buy-in, ensuring that wider meaningful adaptation actions are not sacrificed in order to secure these is crucial (e.g. by focusing too much on attractive areas of interest that have little long-term transformational benefits).

Partnership working and building trust and relationships with a wide range of stakeholders takes a great deal of time and effort but is necessary in order to change perspectives and attitudes, allowing for more transformational adaptation.

4.3.2   *Role of the project team in enabling progress*

The TALX team co-developed the pilot workshops alongside colleagues based at DCSDC and Mayo County Council and led on delivering the workshop content. The project team played an important role as neutral facilitators and trusted sources of expertise on place-based adaptation. The team created a safe space for local partners to learn from each other, explore current progress on adaptation and discuss the challenges and benefits of partnership working. This expert input and facilitation helped

partners make tangible progress towards partnership working that would not otherwise have been possible. Recommendations for further work in both regions were similar and are outlined below:

- **Adaptation leadership** – consider forming a small working group to scope out partnership working options and communicate back to a wider group of stakeholders. Consider the changing role of the council in this group, e.g. initial convening, administrative support, resource.
- **Shared priorities and evidence** – draw together details of existing adaptation work and discuss both quick wins across the four capabilities (including data sharing) and wider adaptation priorities for the region.

- **Current partnerships** – this includes mapping existing partnerships and networks that could have a role in supporting partnership working on adaptation. Consider whether a new partnership working mechanism is needed or if a remit for adaptation could be added to an existing mechanism.
- **Share resources** – identify the resources that are currently available to support partnership working and identify what would be needed to achieve the shared priorities that you have selected. This would need to be done in discussion with regional agencies to align any pilot with resource constraints.

5 Accelerating Place-based Adaptation

The TALX project final conference was held in Dublin in November 2022 and brought together 84 stakeholders from a number of sectors and organisations. The hybrid event provided an important opportunity to share learning from the TALX project, introduce the adaptation partnership framework and gather views on how progress with place-based adaptation can be accelerated.

The TALX project has established a space where those leading place-based adaptation across Ireland and the UK can learn and co-develop approaches to accelerating place-based adaptation. There was strong interest among the group in using the adaptation partnership framework. Participants were keen to see adaptation action research and demonstrator projects focused on applying the framework in practice and on sharing the results (Figure 5.1).

What should phase 2 of the TalX project focus on? (select up to 3)

Hands on action research to use the Adaptation Partnership Framework and support place based adaptation in different locations — 73%

Learning exchange network to support use of the framework and development of leadership, partnership, evidence and resource — 69%

Training focused on in depth aspects of each attribute - leadership, partnership, evidence and resource — 31%

Further development of the framework e.g. adding in other attributes and new tools and case studies — 12%

Work with established partnerships to evaluate progress, share learning and continually update the Framework — 31%

Phase 2 is not needed — 0%

Figure 5.1. Slido poll feedback from the final event on the viability of a second phase of the project.

6 Conclusions and Recommendations

6.1 Conclusions

Individual localities, regions and nations in the modern world are all highly interconnected. This interconnectivity exacerbates the risk of cascading climate impacts, which can have devastating effects on a wide range of scales, and highlights the importance of considering hybrid, community and transboundary governance to implement measures in response to these impacts (Kuyper *et al*., 2018; Benzie & Pearson, 2019). However, it also highlights the potential for conflicts, synergies and complementarities when adaptation actions are implemented. The research carried out in this study addressed the issue of adaptation from both a top-down national-level approach and a bottom-up local-level approach.

Initially, the project team considered how a change in political ambition is necessary for large-scale adaptation and how national governments can help drive this change. This research provided an understanding of where our policies and legislation are enabling change and where they are failing to do so, allowing decision-makers to build on successes and address areas of concern. Policy briefs have been provided to each of the five jurisdictions to aid this understanding.

Assessing the challenges and enabling conditions of each of the jurisdictions at a national level allowed the project team to conceptualise and better understand how this might impact regional- and local-level implementation. Subsequently, a place-based climate adaptation partnership framework was co-developed by a network of stakeholders across Ireland and the UK to enable those implementing adaptation and to inspire systemic change. This framework was designed to encourage and support practical actions that can be taken by a wide range of partnerships, from those only beginning to consider partnership working to those already advanced in their partnership. The framework highlights inclusivity and a change in the status quo power dynamics that currently underpin the way decisions are made to allow for sustainable, long-term adaptation actions that reduce inequalities propagated through climate impacts and avoid maladaptation.

6.2 Recommendations

The rate and scale at which we are seeing climate change impacts necessitates a move away from small-scale, incremental actions and a business-as-usual approach towards transformational change. As demonstrated during the COVID-19 pandemic, governments in Ireland and the UK have the ability to mobilise change on a systemic level and to inspire behavioural change that can lead to transformation. The threat that climate change presents is one of the most significant faced by our society and the response needs to be just as all-encompassing. The findings of the TALX project contribute to a growing body of research that highlights that working in partnership is essential at all levels to drive transformational change in the way society operates (Pelling *et al*., 2015; O'Brien *et al*., 2016; Few *et al*., 2017; Termeer *et al*., 2017; Warner *et al*., 2019; Berrang-Ford *et al*., 2021; Kuhl *et al*., 2021).

The following recommendations arise from the results of this study:

- The assessments of national climate adaptation policy should be used as a baseline for how to improve adaptation action at the national level. Using the policy briefs provided for each of the five jurisdictional areas of Ireland and the UK, decision-makers can begin to instigate improved support measures (including policy amendments, decision support services, tailored climate and system information facilities, or knowledge services) to address the adaptation implementation gap that is evident. The impact of ambitious goals and strong top-down support in driving action is obvious in the national assessments, and national and local government must work together to deliver this.
- Government and all stakeholders involved need to recognise the extent to which transformational change is required at a national level and investigate where levers of change can promote a political shift in the way we currently operate. Relatively few examples exist of this depth of action to date, partly due to a lack of coordination between national, regional and local actors,

and this is a significant opportunity for change. Governments must support the sustained prioritisation of climate adaptation.

- The climate adaptation partnership framework developed provides a basis for initiating partnership working at a sub-national level, something that is lacking across many areas in Ireland and the UK. This framework should be promoted within a range of organisations and government departments, particularly among those working in climate action (e.g. climate action officers and coordinators). To avoid duplication of effort and to harness existing community initiatives, it may be beneficial to use structures within existing spatial units.
- Further work on the use of the partnership framework and how it can support place-based adaptation in different locations is necessary to build on the initial research (as this is beyond the scope of the TALX project, which did not allow for prolonged hands-on action). In particular, the ability of external actors to facilitate discussions between a range of stakeholders, allowing a safe space for everyone to make their voices heard, is crucial to partnership working.
- Perpetuation of the learning exchange network that was established as part of the TALX project will build transboundary and transdisciplinary relationships between adaptation practitioners and establish trust between stakeholders, encouraging the exchange of information and resource and supporting stakeholder learning. The most appropriate existing state bodies should oversee the development of a forum through which this network can grow and strengthen. From information gathered from national climate adaptation policy assessments, the principal leads on adaptation policymaking for each jurisdiction are suggested as:
  - Ireland: Department of the Environment, Climate and Communications;
  - Northern Ireland: Department for Environment, Food and Rural Affairs;
  - Scotland: Scottish Government Environment and Climate Change Directorate;
  - England: Department for Environment, Food & Rural Affairs and the Environment Agency;

  - Wales: Welsh Government, Department of Environment, Energy and Rural Affairs, and Natural Resources Wales.

6.3 Contributions of the TALX Project

6.3.1 Identifying pressures

The TALX project looked at climate adaptation from both a top-down and a bottom-up perspective and identified a number of challenges for climate adaptation across Ireland and the UK. The main challenge is the need for resources to implement action. Currently, resources at all levels are insufficient for the aims and ambitions outlined in policy and legislation. Funding needs to move beyond short-term political and policy cycles to enable the implementation of long-term and self-sustaining adaptation initiatives, which in turn can enable local empowerment and capacity building.

The level of siloed working and lack of collaboration and partnership, both horizontally and vertically, within government and between public bodies, the private sector and communities is a major obstacle to successful adaptation. The lack of communication between actors has led to duplication of action and missed opportunities for adaptation to be integrated into various initiatives. The pressures of climate change require society to take ownership of adaptation action; however, for this to happen, all voices need to be represented and respected in decision-making, from the planning to the implementation of adaptation.

6.3.2 Informing policy

One of the main components of the TALX research was the assessment of national-level climate adaptation policies across the five jurisdictions of Ireland and the UK. National policies drive climate change adaptation in each country; however, the assessments highlighted that, in many areas, particularly regarding the provision of resources to support adaptation goals, policy is failing to enable national adaptation ambitions. To support policymakers the TALX team has developed five policy briefs (found on the TALX website)[10] that outline key areas where

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10 https://talx.ie/resource/ (accessed 9 May 2023).

policy is enabling adaptation action and where it must improve. Recommendations on how decision-makers and practitioners can establish and build on positive adaptation actions are provided within each brief.

6.3.3   *Developing solutions*

The co-development of the place-based climate adaptation partnership framework and the establishment of a community of practice were the other components of the TALX project. A wide range of stakeholders, from practitioners to policymakers and academics, were brought together to share their insights and experiences and create a practical framework that could guide those at all levels in developing place-based adaptation partnerships. Co-creation and inclusion were integral to the TALX research, both to avoid maladaptation and to enable transformational change. The transboundary network established through the project has allowed learnings to be shared and has created a safe space for discussions on how best to progress climate adaptation in all regions.

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Abbreviations

CARO	Climate Action Regional Office
CCC	Climate Change Committee
CRC	Climate Ready Clyde
DCSDC	Derry City and Strabane District Council
M&E	Monitoring and evaluation
NAP	National Adaptation Programme
PCF	Pembrokeshire Coastal Forum
SCCAP	Scottish Climate Change Adaptation Programme
TALX	Transboundary Adaptation Learning Exchange

Appendix 1 All Assessments of National Climate Adaptation Policy

Table A1.1. Initial assessment results before Delphi survey

Factor	Sub-factor	Code	Criterion	I	E	N	W	S
Stakeholder engagement	Stakeholder engagement	S1	Representative stakeholder involvement throughout the entire climate adaptation process, from the creation of adaptation policy to the implementation and evaluation of adaptation plans	orange	orange	orange	orange	orange
		S2	A dedicated process in place to facilitate inclusive stakeholder involvement in the preparation of adaptation policies	blue	blue	orange	blue	blue
Policy and governance	National policy	P1	A central administration body officially in charge of adaptation policymaking	blue	blue	blue	blue	blue
		P2	A national climate adaptation policy	blue	blue	blue	blue	blue
		P3	Country-level legislation in place to underpin adaptation policy (including frameworks and strategies)	blue	blue	red	blue	blue
		P4	Independent monitoring and evaluation of national policy	blue	blue	red	blue	blue
	Leadership and coordination of roles and responsibilities	P5	Horizontal (cross-sectoral) coordination mechanisms exist within the governance system, with division of responsibilities and SMART objectives and the alignment of policies	orange	orange	orange	blue	blue
		P6	Vertical (multi-level) coordination mechanisms exist within the governance system, enabling all levels of administration from local to national to influence policymaking	orange	orange	orange	orange	orange
		P7	Creation of spaces for leaders of climate adaptation to emerge across scales	orange	orange	orange	orange	orange
		P8	Climate adaptation is scalable, able to be tailored to different levels	orange	blue	orange	blue	orange
		P9	Transparent climate finance with regard to adaptation initiatives	blue	orange	orange	orange	red
		P10	Transboundary cooperation (either existing or planned) to work together to address common challenges with other countries	blue	blue	blue	blue	blue
	Climate justice and equity	P11	Domestic justice and equity issues (economic, social, environmental and cultural) relevant to each country are recognised in national-level climate change policy and implementation (e.g. through decision-making)	orange	orange	red	orange	orange
		P12	Processes are in place to allow actions to reduce any identified differences and/or ensure the benefits of interventions accrue to the most vulnerable	orange	orange	red	orange	orange
		P13	Climate adaptation policy development, implementation and review is fully transparent	blue	blue	red	orange	orange
Resource	Staff and financing	R1	Appropriate financing (enough to cover the cost of policy actions) is being applied to climate adaptation to achieve policy goals at all levels of governance	red	red	red	red	red
		R2	Accessible long-term and self-sustaining resources are available to support policy goals of increasing climate resilience (i.e. funding, infrastructure, human resources)	orange	orange	orange	orange	orange

Table A1.1. Continued

Factor	Sub-factor	Code	Criterion	I	E	N	W	S
	Capacity building and understanding the capability of decision-makers and action takers	R3	Policy supports education, empowerment and engagement of stakeholders at all levels of decision-making and action taking in relation to adaptation	blue	blue	amber	amber	amber
		R4	Mechanisms exist to recruit and train practitioners with the specific skills required to undertake complex climate adaptation	amber	amber	amber	amber	amber
	Information and data	R5	The policy supports advances in scientific research to improve understanding and inform decision-making	blue	blue	amber	blue	amber
		R6	Guidance on how to employ climate adaptation information is provided at sub-national levels	blue	blue	amber	amber	amber
	Communication and guidance	R7	Communication and engagement strategies are included in the policy that use multiple platforms to reach diverse stakeholders	blue	amber	amber	blue	amber
		R8	Recognition within the policy that climate change is an international issue and that adaptation strategies must look beyond national boundaries (i.e. the policy ensures the international aspect of adaptation is considered at decision-making levels)	amber	amber	amber	amber	blue
		R9	Learning and support networks are available to enable all decision-makers to produce and implement appropriate climate adaptation policies	blue	blue	amber	amber	amber
Decision-making	Decision-making	D1	Priority adaptation options are identified, prioritised and selected based on robust, equitable and transparent methods (e.g. using decision support tools)	amber	amber	amber	amber	amber
		D2	An evaluation process is in place to assess the effectiveness of actions taken across all aspects of climate adaptation (i.e. from stakeholder engagement to mainstreaming)	amber	amber	amber	amber	amber
		D3	The policy recognises that adaptation is an iterative and flexible process that accounts for new information/experience	amber	amber	amber	amber	amber
Mainstreaming	Mainstreaming	M1	Consideration of climate change adaptation has been included in the national frameworks for environmental impact assessments and DRR	amber	amber	red	amber	amber
		M2	Key policies recognise the need for adaptation action in future growth and development as a result of the impacts of climate change	blue	amber	amber	blue	amber
		M3	National policy instruments promote adaptation at sectoral level, in line with national priorities	blue	amber	amber	amber	blue
		M4	Adaptation is mainstreamed in insurance or alternative policy instruments to provide incentives for investments in risk prevention	amber	amber	amber	amber	amber
		M5	Climate mitigation and adaptation are being investigated in tandem	amber	amber	red	amber	amber
		M6	Adaptation actions are sustainable (i.e. meet environmental, societal and cultural needs) for their intended lifetime	amber	amber	amber	amber	amber

I, Ireland; E, England; N, Northern Ireland; W, Wales; S, Scotland. Red indicates not acknowledged in policy; amber indicates acknowledged in policy but no resources provided; blue indicates acknowledged in policy and resources provided.

DRR, disaster risk reduction; SMART, specific, measurable, achievable, relevant and time-bound.

Table A1.2. Round 1 assessment results after Delphi survey

Factor	Sub-factor	Code	Criterion	I	E	N	W	S
Stakeholder engagement	Stakeholder engagement	S1	Representative stakeholder involvement throughout the entire climate adaptation process, from the creation of adaptation policy to the implementation and evaluation of adaptation plans	orange	orange	orange	orange	orange
		S2	A dedicated process in place to facilitate inclusive stakeholder involvement in the preparation of adaptation policies	blue	orange	orange	blue	blue
Policy and governance	National policy	P1	A central administration body officially in charge of adaptation policymaking	blue	orange	blue	blue	blue
		P2	A national climate adaptation policy	blue	blue	blue	blue	blue
		P3	Country-level legislation in place to underpin adaptation policy (including frameworks and strategies)	blue	blue	red	blue	blue
		P4	Independent monitoring and evaluation of national policy	blue	blue	red	blue	blue
	Leadership and coordination of roles and responsibilities	P5	Horizontal (cross-sectoral) coordination mechanisms exist within the governance system, with division of responsibilities and SMART objectives and the alignment of policies	orange	orange	orange	blue	blue
		P6	Vertical (multi-level) coordination mechanisms exist within the governance system, enabling all levels of administration from local to national to influence policymaking	orange	orange	orange	orange	orange
		P7	Creation of spaces for leaders of climate adaptation to emerge across scales	orange	orange	orange	orange	orange
		P8	Climate adaptation is scalable, able to be tailored to different levels	orange	orange	orange	orange	orange
		P9	Transparent climate finance with regard to adaptation initiatives	blue	orange	red	orange	red
		P10	Transboundary cooperation (either existing or planned) to work together to address common challenges with other countries	blue	blue	blue	blue	blue
	Climate justice and equity	P11	Domestic justice and equity issues (economic, social, environmental and cultural) relevant to each country are recognised in national-level climate change policy and implementation (e.g. through decision-making)	orange	orange	red	orange	orange
		P12	Processes are in place to allow actions to reduce any identified differences and/or ensure the benefits of interventions accrue to the most vulnerable	orange	orange	red	orange	orange
		P13	Climate adaptation policy development, implementation and review is fully transparent	blue	blue	red	orange	orange
Resource	Staff and financing	R1	Appropriate financing (enough to cover the cost of policy actions) is being applied to climate adaptation to achieve policy goals at all levels of governance	red	red	red	red	red
		R2	Accessible long-term and self-sustaining resources are available to support policy goals of increasing climate resilience (i.e. funding, infrastructure, human resources)	orange	orange	orange	orange	orange
	Capacity building and understanding the capability of decision-makers and action takers	R3	Policy supports education, empowerment and engagement of stakeholders at all levels of decision-making and action taking in relation to adaptation	blue	orange	orange	orange	orange
		R4	Mechanisms exist to recruit and train practitioners with the specific skills required to undertake complex climate adaptation	orange	orange	orange	orange	orange
	Information and data	R5	The policy supports advances in scientific research to improve understanding and inform decision-making	blue	blue	orange	blue	orange
		R6	Guidance on how to employ climate adaptation information is provided at sub-national levels	blue	orange	orange	orange	orange

Table A1.2. Continued

Factor	Sub-factor	Code	Criterion	I	E	N	W	S
	Communication and guidance	R7	Communication and engagement strategies are included in the policy that use multiple platforms to reach diverse stakeholders	amber	amber	amber	blue	amber
		R8	Recognition within the policy that climate change is an international issue and that adaptation strategies must look beyond national boundaries (i.e. the policy ensures the international aspect of adaptation is considered at decision-making levels)	amber	amber	amber	amber	blue
		R9	Learning and support networks are available to enable all decision-makers to produce and implement appropriate climate adaptation policies	blue	blue	amber	amber	amber
Decision-making	Decision-making	D1	Priority adaptation options are identified, prioritised and selected based on robust, equitable and transparent methods (e.g. using decision support tools)	amber	amber	amber	amber	amber
		D2	An evaluation process is in place to assess the effectiveness of actions taken across all aspects of climate adaptation (i.e. from stakeholder engagement to mainstreaming)	amber	amber	amber	amber	amber
		D3	The policy recognises that adaptation is an iterative and flexible process that accounts for new information/experience	amber	amber	amber	amber	amber
Mainstreaming	Mainstreaming	M1	Consideration of climate change adaptation has been included in the national frameworks for environmental impact assessments and DRR	amber	amber	red	amber	amber
		M2	Key policies recognise the need for adaptation action in future growth and development as a result of the impacts of climate change	blue	red	amber	blue	amber
		M3	National policy instruments promote adaptation at sectoral level, in line with national priorities	blue	amber	amber	amber	blue
		M4	Adaptation is mainstreamed in insurance or alternative policy instruments to provide incentives for investments in risk prevention	amber	amber	amber	amber	amber
		M5	Climate mitigation and adaptation are being investigated in tandem	amber	amber	red	amber	amber
		M6	Adaptation actions are sustainable (i.e. meet environmental, societal and cultural needs) for their intended lifetime	amber	amber	amber	amber	amber

I, Ireland; E, England; N, Northern Ireland; W, Wales; S, Scotland. **Red indicates not acknowledged in policy; amber indicates acknowledged in policy but no resources provided; blue indicates acknowledged in policy and resources provided.**

DRR, disaster risk reduction; SMART, specific, measurable, achievable, relevant and time-bound.

Table A1.3. Final assessment results after Delphi survey

Factor	Sub-factor	Code	Criteria	I	E	N	W	S
Stakeholder engagement	Stakeholder engagement	S1	Representative stakeholder involvement throughout the entire climate adaptation process, from the creation of adaptation policy to the implementation and evaluation of adaptation plans	yellow	yellow	yellow	yellow	yellow
		S2	A dedicated process in place to facilitate inclusive stakeholder involvement in the preparation of adaptation policies	blue	yellow	yellow	blue	yellow
Policy and governance	National policy	P1	A central administration body officially in charge of adaptation policymaking	blue	yellow	blue	blue	blue
		P2	A national climate adaptation policy	blue	blue	yellow	blue	blue
		P3	Country-level legislation in place to underpin adaptation policy (including frameworks and strategies)	blue	blue	red	blue	blue
		P4	Independent monitoring and evaluation of national policy	blue	blue	red	blue	yellow
	Leadership and coordination of roles and responsibilities	P5	Horizontal (cross-sectoral) coordination mechanisms exist within the governance system, with division of responsibilities and SMART objectives and the alignment of policies	yellow	yellow	yellow	blue	yellow
		P6	Vertical (multi-level) coordination mechanisms exist within the governance system, enabling all levels of administration from local to national to influence policymaking	yellow	yellow	yellow	yellow	yellow
		P7	Creation of spaces for leaders of climate adaptation to emerge across scales	yellow	yellow	yellow	yellow	yellow
		P8	Climate adaptation is scalable, able to be tailored to different levels	yellow	yellow	red	yellow	yellow
		P9	Transparent climate finance with regards to adaptation initiatives	blue	yellow	red	yellow	red
		P10	Transboundary cooperation (either existing or planned) to work together to address common challenges with other countries	blue	blue	blue	blue	blue
	Climate justice and equity	P11	Domestic justice and equity issues (economic, social, environmental and cultural) relevant to each country are recognised in national-level climate change policy and implementation (e.g. through decision-making)	yellow	yellow	red	yellow	yellow
		P12	Processes are in place to allow actions to reduce any identified differences and/or ensure the benefits of interventions accrue to the most vulnerable	yellow	yellow	red	yellow	yellow
		P13	Climate adaptation policy development, implementation and review is fully transparent	blue	blue	red	yellow	yellow
Resource	Staff and financing	R1	Appropriate financing (enough to cover the cost of policy actions) is being applied to climate adaptation to achieve policy goals at all levels of governance	red	red	red	red	red
		R2	Accessible long-term and self-sustaining resources are available to support policy goals of increasing climate resilience (i.e. funding, infrastructure, human resources)	yellow	yellow	yellow	yellow	yellow
	Capacity building and understanding the capability of decision-makers and action takers	R3	Policy supports education, empowerment and engagement of stakeholders at all levels of decision-making and action taking in relation to adaptation	blue	yellow	yellow	yellow	yellow
		R4	Mechanisms exist to recruit and train practitioners with the specific skills required to undertake complex climate adaptation	yellow	yellow	yellow	yellow	yellow
	Information and data	R5	The policy supports advances in scientific research to improve understanding and inform decision-making	blue	blue	yellow	yellow	yellow
		R6	Guidance on how to employ climate adaptation information is provided at sub-national levels	blue	yellow	yellow	yellow	yellow

Table A1.3. Continued

Factor	Sub-factor	Code	Criteria	I	E	N	W	S
	Communication and guidance	R7	Communication and engagement strategies are included in the policy that use multiple platforms to reach diverse stakeholders	amber	amber	amber	amber	amber
		R8	Recognition within the policy that climate change is an international issue and that adaptation strategies must look beyond national boundaries (i.e. the policy ensures the international aspect of adaptation is considered at decision-making levels)	amber	amber	amber	amber	blue
		R9	Learning and support networks are available to enable all decision-makers in producing and implementing appropriate climate adaptation policies	blue	amber	amber	amber	amber
Decision-making	Decision-making	D1	Priority adaptation options are identified, prioritised and selected based on robust, equitable and transparent methods (e.g. using decision support tools)	amber	amber	red	amber	red
		D2	An evaluation process is in place to assess the effectiveness of actions taken across all aspects of climate adaptation (i.e. from stakeholder engagement to mainstreaming)	amber	amber	amber	amber	amber
		D3	The policy recognises that adaptation is an iterative and flexible process that accounts for new information/experience	amber	amber	amber	amber	amber
Mainstreaming	Mainstreaming	M1	Consideration of climate change adaptation been included in the national frameworks for environmental impact assessments and DRR	amber	amber	amber	amber	amber
		M2	Key policies recognise the need for adaptation action in future growth and development as a result of the impacts of climate change	blue	red	amber	blue	amber
		M3	National policy instruments promote adaptation at sectoral level, in line with national priorities	blue	amber	amber	amber	blue
		M4	Adaptation is mainstreamed in insurance or alternative policy instruments to provide incentives for investments in risk prevention	amber	amber	amber	amber	amber
		M5	Climate mitigation and adaptation are being investigated in tandem	amber	amber	red	amber	amber
		M6	Adaptation actions are sustainable (i.e. meet environmental, societal and cultural needs) for their intended lifetime	amber	amber	amber	amber	amber

I, Ireland; E, England; N, Northern Ireland; W, Wales; S, Scotland. Red indicates not acknowledged in policy; amber indicates acknowledged in policy but no resources provided; blue indicates acknowledged in policy and resources provided.

DRR, disaster risk reduction; SMART, specific, measurable, achievable, relevant and time-bound.

Appendix 2   Initial Criteria Justifications Provided for the Policy Assessments

Table A2.1. An example of the initial Delphi survey justification provided on the assessment rating for S1 (stakeholder engagement – criterion 1) for Ireland

Criterion: stakeholder engagement		
	Project team	
Assessment criterion	**Score**	**Justification**
Representative stakeholder involvement throughout the entire climate adaptation process, from the creation of adaptation policy to the implementation and evaluation of adaptation plans		The creation of the National Climate Change Adaptation Framework (2012) and the National Adaptation Framework (NAF) (2018) were both preceded by a stakeholder consultation process in 2009 and 2016, respectively. In the case of the NAF, written feedback from stakeholders was incorporated into the draft. The statutory adaptation plans for each sector are also subject to public consultation.
		At a sub-national level, many local council strategies involved stakeholder engagement in their creation and also in the post-implementation and monitoring/evaluation stage, with some strategies (e.g. Cork County Council) requiring progress reports on how actions have built new relationships with key stakeholders.
		The Government Task Force on Emergency Planning worked with key stakeholders from all relevant sectors to create and develop a Strategic Emergency Management National Structures and Framework for Ireland.
		The National Dialogue on Climate Action provides workshops where participants outline local climate issues and collaborate with facilitators on how to tackle these issues together. Recommendations from these stakeholders on adaptation implementation are then presented to relevant departments.
		However, while there is ample representative stakeholder engagement in the creation of most adaptation policy, the same is not true of the implementation and especially the evaluation of adaptation plans, and therefore this criterion is assessed as amber.

Table A2.2. An example of the initial Delphi survey justification provided on the assessment rating for D1 (decision-making – criterion 1) for Wales

Criterion: decision-making		
	Project team	
Assessment criterion	**Score**	**Justification**
Priority adaptation options are identified, prioritised and selected based on robust, equitable and transparent methods (e.g. using decision support tools)		The Well-Being of Future Generations Act (2015) has equality as a core principle; this means that all Public Service Boards must take it into account in any development, including climate adaptation planning.
		The National Adaptation Plan has prioritised research gaps as something that needs to be addressed in adaptation planning and has provided funds to carry this out.
		Certain areas have also identified the need to prevent maladaptation; for example, any measures taken to reduce air pollution should be able to mitigate climate change.
		Strategic environmental assessments assess environmental risk and promote sustainable development while providing an instrument through which Wales can implement climate change considerations into spatial and non-spatial plans and programmes.
		However, while just and transparent adaptation is recognised as necessary, less weight is given to the selection of priority adaptation options. The lack of resource for climate adaptation can mean that the best solutions are not always viable (this is especially true for nature-based solutions) and therefore not selected, which is why this criterion is rated amber.

Appendix 3   Changes in Criteria Justifications Following the Delphi Survey

Table A3.1. An example of the changes between the initial and final Delphi survey justifications (written in roman and italic text, respectively) provided on the assessment rating for P13 (policy and governance – criterion 13) for Scotland

Criterion: policy and governance		
	Project team	
Assessment criterion	**Score**	**Justification**
Climate adaptation policy development, implementation and review is fully transparent		Scottish adaptation policy takes an outcome-based approach, which they say encourages government to work across traditional boundaries and increases transparency and accountability. An annual progress report is published publicly. The 2021 report recognised that work is still ongoing to develop a monitoring framework for tracking progress towards the SCCAP2 outcomes. The government states that progress was delayed as a result of COVID-19. Due to the lack of a monitoring and evaluation (M&E) framework and results, the initial rating is amber.
Climate adaptation policy development, implementation and review is fully transparent		*Scottish adaptation policy takes an outcome-based approach, which they say encourages government to work across traditional boundaries and increases transparency and accountability. An annual progress report is published publicly. The 2021 report recognised that work is still ongoing to develop a monitoring framework for tracking progress towards the SCCAP2 outcomes. The government states that progress was delayed as a result of COVID-19. Due to the lack of an M&E framework and results, the rating provided is amber.*
		100% of Delphi respondents (who provided a rating) agreed with the amber rating for this criterion.
		A range of challenges was highlighted by survey participants, which restricted this factor from being rated green. For example, public bodies' climate change reporting still referring to SCCAP1 objectives (as opposed to SCCAP2 outcomes) means that it is difficult to assess adaptation policy implementation. In addition, existing SCCAP reporting is not joined up with public bodies' duties reporting. It was acknowledged that the SCCAP progress reports and the independent assessment of the SCCAP by the CCC provides a level of transparent review. The lack of a public-facing M&E framework justifies the amber rating.
		Given the outcomes-based approach that is less focused on inputs and outputs, it is important that an effective M&E framework is established. This will help to inform how well it is working, where it is not working and how it can be improved, as well as informing the next adaptation programme.

Table A3.2. An example of the changes between the initial and final Delphi survey justifications (written in roman and italic text, respectively) provided on the assessment rating for M6 (mainstreaming – criterion 6) for England

Criterion: mainstreaming		
	Project team	
Assessment criterion	**Score**	**Justification**
Adaptation actions are sustainable (i.e. meet environmental, societal and cultural needs) for their intended lifetime		Mainstreaming is recognised in policy as something that is necessary for sustainable climate adaptation; while adaptation actions outlined are a good mix of hard and soft, green and grey, there are no resources in place to ensure this across all sectors and levels of society. In order to determine whether adaptation actions are sustainable there needs to be agreement on what constitutes best practice in adaptation methods (nature-based vs artificial vs mixed). This differs in each situation and is something that is very difficult to judge, as actions need to have been implemented for long enough to be reviewed, which, with some exceptions, is not the case. This criterion is rated amber as, while policy acknowledges the need for sustainability, there are insufficient resources in place to accommodate this across all sectors and levels of society.
Adaptation actions are sustainable (i.e. meet environmental, societal and cultural needs) for their intended lifetime		*No rating provided – 0%; red – 17%; amber – 83%; green – 0%.* *Consensus was reached, with a majority (83%) of participants (who provided a rating) agreeing with the amber rating for this criterion.* *Mainstreaming is recognised in policy as something that is necessary for sustainable climate adaptation; while adaptation actions outlined are a good mix of hard and soft, green and grey, there are no resources in place to ensure this across all sectors and levels of society.* *At a sub-national level sustainable adaptation actions are not "on the radar" of many organisations, except perhaps the more cutting-edge, progressive ones.* *In order to determine whether adaptation actions are sustainable there needs to be agreement on what constitutes best practice in adaptation methods (nature-based vs artificial vs mixed). This differs in each situation and is something that is very difficult to judge, as actions need to have been implemented for long enough to be reviewed, which, with limited exceptions (e.g. the Thames Barrier), is not the case.* *This criterion is rated amber as, while policy acknowledges the need for sustainability, there are insufficient resources in place to accommodate this across all sectors and levels of society, and there is no long-term planning in place to address these sustainability issues.*

Table A3.3. Criteria assessment rating changes for each country by theme (%)

Country	Stakeholder engagement		Policy and governance		Resource		Decision-making		Mainstreaming		Total change
	R1	R2	R1	R2	R1	R2	R1	R2	R1	R2	Both rounds
Ireland	0	0	0	0	11	0	0	0	0	0	2.2
England	50	0	15	0	22	11	0	0	17	0	23
Northern Ireland	0	0	8	8	0	0	0	33	0	17	13.2
Wales	0	0	15	0	0	22	0	0	0	0	7.4
Scotland	0	50	0	15	0	0	0	33	0	0	19.6

Table A3.4. Average score for clarity and context and rating change between each round (with a maximum score of 5 representing a complete change in rating and a minimum score of zero representing total agreement with both the rating and full support of the justification for it)

	Stakeholder engagement		Policy and governance		Resource		Decision-making		Mainstreaming		Average score	
Country	R1	R2	R1	R2	R1	R2	R1	R2	R1	R2	R1	R2
Ireland	4	2.5	3.4	1.9	3	1.1	2	1	2.5	1	3	1.5
England	3	0.5	3	0.8	3.6	1.2	3.3	0	2.7	0.8	3.1	0.8
Northern Ireland	2.5	1	2.2	0.5	3	1	2.3	1.7	2.8	1.8	2.6	0.9
Wales	4	0.5	2.8	0.8	2.6	2.2	1.3	0	1.8	0.5	2.5	1.0
Scotland	4	2.5	3.8	1.9	4	1.3	3	2	4	0.8	3.8	1.6

Appendix 4   Participation in TALX Workshops

Table A4.1. Number of participants from each country at the TALX workshops

Workshop (WS)	Ireland	Northern Ireland	Scotland	England	Wales	International
Perspectives (WS1)	2	4	4	4	2	0
Leadership (WS2)	6	2	6	3	2	1
Evidence (WS3)	7	2	5	3	1	0
Community (WS4)	6	6	5	3	2	1
Partnership (WS5)	3	3	4	4	3	0
Resource (WS6)	4	2	2	4	2	0
Interdependencies (WS7)	15	8	9	6	4	0

Table A4.2. Names and affiliations of participants who attended TALX workshops and contributed to the development of the climate adaptation partnership framework

Name	Organisation
David Dodd	Dublin Metropolitan CARO
David Mellett	Atlantic Seaboard North CARO
Tara Murry	NESCAN (North East Climate Action Network)
Lesley Hinshelwood	South Lanarkshire Council
Clive Walmsley	Natural Resources Wales
Fen Turner	Natural Resources Wales
Alan Netherwood	Netherwood Sustainable Futures
Lorraine Hutt	Environment Agency
Robert Kay	ICF Climate Centre
Sabrina Dekker	Dublin City County Council
Breda Maher	Eastern and Midlands CARO
Margaret Desmond	Environmental Protection Agency
Kerrell Whalley	Wigan Council
Emma Whitham	Highland Adapts
Craig Love	Transport Scotland
Heather MacNaughton	Historic Environment Scotland
James Fitton	KPMG Sustainable Futures
Robyn Pender	Historic England
Anat Prag	Sniffer
Hannah Fluck	Historic England
David Charles	University of Strathclyde
Christine Baker	Fingal County Council
Larissa Naylor	Glasgow University
Emma Adair	Ards and North Down Borough Council
Alex Cameron-Smith	Pembrokeshire Coastal Forum
Naomi Clarke	Dundee City Council
Catherine Payne	Sniffer
Perla Mansour	Climate Northern Ireland
Catherine Pearce	Sniffer
Sean Maxwell	National Trust NI

Table A4.2. Continued

Name	Organisation
Simon Needle	Birmingham City Council
Pauline Power	University College Dublin
Zoe Clelland	RSPB Scotland
Liam Scott	Mayo County Council
Kate Lonsdale	University of Leeds
Kristen Guida	London Climate Change Partnership
Matt Ellis	Environment Agency
Cathy Burns	Derry City and Strabane District Council
John Barry	Queen's University Belfast
James Convery	Department of Agriculture, Environment and Rural Affairs
John Early	Department of Agriculture, Environment and Rural Affairs
Sean O'Leary	Environmental Protection Agency
Alan Dunney	Eastern and Midlands CARO
Darby Mullen	South Dublin County Council
Caroline Corrigan	Meath County Council
Ben Sears	Welsh Government
James Curran	Climate Ready Clyde
Kate Crowley	University of Edinburgh
Richard McLernon	Belfast City Council
Eugene Farrell	National University of Ireland Galway
Sarah Lindley	Manchester University
Andrew Thomas	Aberystwyth University
Thomas Gardiner	NI Water
David Harkin	Historic Environment Scotland
Hans Visser	Fingal County Council
Martha Farrell	Maharees Conservation Association
Marek Soanes	International Institute for Environment and Development
Eirini Gallou	University of Strathclyde
Eleanor Pratt	Sniffer
Cornell Hamxomphou	CEMVO Scotland
Laura Dixon	Mayo County Council
Alison Leslie	Aberdeen City Council
Nuala Flood	Queen's University Belfast
Tyrone Dunbar	Met Office
Keith Masson	Highlands Adapts
Amy Bell	Climate Northern Ireland

Appendix 5   Themes Identified by Practitioners as Necessary for Successful Climate Adaptation

Table A5.1. Outcomes of the initial workshop (Practitioner Perspectives on Well-adapting Places) – a summary of the themes identified as necessary for successful adaptation (prioritised themes indicated by an asterisk)

	Capability
1	Legislation and policy*
2	Leadership and ownership*
3	Visioning
4	Justice
5	Flexibility, practical action and delivery
6	Sustained and secure funding and resource*
7	Mainstreaming and holistic approach
8	Monitoring, evaluation for success and learning and accountability
9	Recognition of emotion
10	Research, knowledge and expertise*
11	Facilitation skills and the characteristics of conveners
12	Community education, engagement, involvement and empowerment*
13	Collaboration, cross-sectoral networks and partnerships*

Appendix 6   Infographic to Promote the Climate Adaptation Partnership Framework

Image credit: Becky Hackett (ThinkVisual) and Karen O'Callaghan (MaREI).

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, sriocdhírithe 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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