GREEN GROWTH

Third Northern Ireland Climate Change Adaptation Programme (NICCAP3)

Consultation Annex I: Draft NICCAP3

Department of Agriculture, Environment and Rural Affairs
www.daera-ni.gov.uk

An Roinn Talmhaíochta, Comhshaoil agus Gnóthaí Tuaithe

Depairtment o' Fairmin, Environment an' Kintra Matthers

“Working towards a climate resilient Northern Ireland”

Contents

Executive Foreword

Climate change is one of the defining generational issues of our time. In recent years, we have seen the increasing impacts of climate change on a global scale, but we have also experienced firsthand the impacts of climate change locally here in Northern Ireland. From widespread flooding in the North-West in 2017 to more recent flooding events in areas such as Downpatrick and Newry in 2023. We have also seen back-to-back storm events resulting in power outages and damage to IT infrastructure along with record temperatures broken, and significant wildfire events.

The risks identified in the latest UK Climate Change Risk Assessment do not just sit with a single Department to address, but impact upon and cut across the remits of multiple Departments. As such, if we are to successfully address the challenge of climate change, collaboration and partnership working both across Departments and with key stakeholders across wider society is vital. Our Programme for Government 2024 - 2027[1] recognises the cross-cutting nature of the impacts of climate change, such as increased flooding and extreme heat events, and confirms our commitment to providing an effective collaborative response.

While there has been much focus placed on climate mitigation measures concerned with reducing our greenhouse gas emissions, as we work towards achieving Net Zero, we recognise that we must not lose sight of the fact that reducing our emissions is only half of the climate change challenge. Even when emissions are reduced to net zero, we will still have locked in impacts of climate change as a result of historic emissions which we must continue to adapt to and prepare for.

We are committed to a holistic approach when addressing the impacts of climate change by ensuring that there continues to be investment and attention given to climate adaptation measures, whilst we simultaneously continue to progress measures to reduce our emissions. It is critical that we protect our economy, communities and environment from the impacts of climate change that cannot be avoided through emissions reduction measures alone.

Tackling climate change requires a whole society and economy approach. We also recognise the important role our Councils, non-government organisations, businesses, industry and academia play in creating climate resilience.

This Programme sets out our framework and vision for a future where Northern Ireland is well-adapted and resilient to the impacts of climate change and recognises the economic, social, health and environmental benefits that this will bring. We recognise that creating a Northern Ireland that is well adapted and resilient to the impacts of climate change is an ongoing journey which cannot be fully addressed through a single 5-year programme. Only with ongoing investment, and continued collaboration and partnership working can we ensure that through successive adaptation programmes we create a climate resilient Northern Ireland.

[1] https://www.northernireland.gov.uk/PfG

Executive Summary

Climate Adaptation

Climate Change is widely accepted as the one of the greatest inter-generational issues of our time. As a result of human activities, global temperatures are rising and driving the increased frequency and severity of extreme weather events ranging from storms and flooding to heatwaves and drought. These changes impact on all sectors and bring challenges to all levels of society. In Northern Ireland, we are seeing these increased, more frequent and extreme weather events causing damage, against a backdrop of hotter, drier summers, and warmer, wetter winters.

The challenge of climate change must be tackled on two fronts. It is imperative that we act to limit increases to global temperatures through the reduction of global greenhouse gas emissions and the achievement of net zero. This is **Climate Change Mitigation** and is a challenge that requires collaborative effort across the globe where each nation plays its part.

The second key aspect of the climate challenge is that of **Climate Change Adaptation**, which recognises that historic emissions have already locked in climate impacts that we must now take action to adapt to so that our environment, society and economy are robust and resilient. We must however recognise that some actions will have both climate change mitigation and climate change adaptation benefits. For example, peatland restoration and afforestation both bring carbon sequestration benefits and flood alleviation benefits through increased water storage during periods of heavy rainfall and increasing the runoff lag time. Similarly, a diverse energy supply system with a mixture of renewable energy sources will both decarbonise our energy sector whilst also providing supply resilience during periods of low wind speed or reduced water flow.

Adaptation is a Legislative Requirement

This is the third Northern Ireland Climate Change Adaptation Programme (NICCAP3) which has been developed as required by section 60 of the Climate Change Act 2008. It provides NI Executive Departments response to the climate risks which have been identified in the UK's third Climate Change Risk Assessment (CCRA3) and which fall within the devolved area of responsibility. It recognises the important role partnership working and collaboration plays in building a climate resilient Northern Ireland and as such also includes details of actions from Councils, Non-Government Organisations, Academia and other key stakeholders.

We recognise that climate change is a rapidly developing policy area and in acknowledgement of this, NICCAP3 will undergo a mid-programme review to coincide with the Climate Change Committee's (CCC) obligation under section 48 of the Climate Change Act (Northern Ireland) 2022 (the 2022 Act) to provide an assessment of the progress made towards implementing the objectives, proposals and polices within the Programme. This will ensure NICCAP3 is a dynamic programme which is able to react to, and take account of, the latest policy and budgetary positions.

To conduct their assessment of NICCAP3, the CCC will use their new adaptation monitoring framework which contextualises a well-adapted UK around the following 13 thematic areas:

- **Nature:** Terrestrial (including on farmland), freshwater and marine habitats.
- **Working lands and seas:** Agriculture, forestry and fisheries.

- **Food security:** Domestic and imported food supply chains, as well as vulnerability of society to climate-related food disruption.
- **Water supply**: Public water system which supplies households and businesses.
- **Energy**: Key energy systems, the electricity system (transmission, distribution, and generation), gas networks and novel sources of energy supply (such as hydrogen) as they develop.
- **Telecoms & ICT**: Communications and ICT infrastructure, including data centres, networks and other critical national infrastructure.
- **Transport**: Road networks (both the national strategic road network and local roads), railways, ports and airports.
- **Towns and cities**: The built environment at a settlement scale, covering flooding, coastal erosion and overheating risks.
- **Buildings**: Individual buildings and their occupants, covering overheating and flooding.
- **Health**: Public health, including mortality and morbidity, as well as climate-sensitive vector-borne diseases and health care delivery.
- **Community preparedness and response**: Preparedness of communities for climate impacts, including the ability to protect cultural heritage, and their ability to effectively respond when climate and weather-related disruptions occur.
- **Business**: Businesses and their function as a commercial entity, including risks to supply chains (both domestic and international), sites and assets, access to capital and productivity impacts.
- **Finance**: Financial system, so that systemic risks from climate change are minimised and it can effectively support the economy in investing in necessary adaptation actions.

Our Approach to developing NICCAP3

NICCAP3 has been structured around these 13 thematic areas to align with the CCC's monitoring framework and provide a direct read across to the assessment they will provide under the 2022 Act. The structure of NICCAP3 is as follows:

Part 1

An introduction to Climate Adaptation in Northern Ireland covering the shared aspect of this responsibility, the legislative basis for adaptation action and the rationale for the structure of NICCAP3.

Parts 2-6

These provide a description of the climate challenge in terms of the 13 thematic areas, grouped into 5 key areas of action – Natural Capital; Food Security; Infrastructure Services; People and the Built Environment; Disruption to Businesses and Supply Chains.

Part 7

This part provides details on how NICCAP3 will be monitored and contains an assessment of the progress made through the previous NICCAP.

Annex I

This is the Climate Change Adaptation Delivery Plan (ADP) and sets out details of the actions proposed in response to the risk areas in the CCRA3 which fall within the devolved Northern Ireland Executive area of responsibility. It is composed of two parts, the first displaying risk maps for the 13 thematic areas, using reference numbers to show which actions respond to the risks within a thematic area. The second part of Annex I contains the reference list of all actions put forward from the NI Executive and also from local government, academia, environmental non-government organisations (NGOs) and other key stakeholders.

Annex II

This is a list of the acronyms and abbreviations used throughout the document listed alphabetically for ease of reference.

Case Studies

A number of the chapters contain case studies highlighting current or completed projects which contribute to building climate resilience in Northern Ireland. These have been gathered from across Government Departments and external stakeholders.

Part 1: Introduction

The science behind climate change.

The Earth's climate is changing, and we are already seeing its profound and far-reaching impacts here in Northern Ireland and across the globe. Rising global temperatures are driving more frequent and severe weather events such as storms, flooding, droughts heatwaves and extreme wildfires all of which can impact on all aspects of life and society.

The changes we are seeing are the result of human activities. In its 2023 synthesis report produced as part of the sixth assessment cycle, the United Nations Intergovernmental Panel on Climate Change (IPCC)[2] placed the human emissions of greenhouse gases as the principal driver of the global surface temperature increase of 1.1°C from pre-industrial levels. This has driven rapid and widespread changes to the Earth's atmosphere, oceans and biosphere which has already led to significant losses and damages to both human society and the natural world.

While it is crucial that work is done to mitigate against further global temperature increases by reducing our emissions to achieve net zero by 2050, we must also work to reduce our vulnerability to the impacts we are already experiencing. It is paramount that we build resilience for the impacts of climate change which are inevitable due to past and present emissions while mitigation efforts, to reduce emissions, are underway.

What is climate adaptation?

Climate adaptation is focused on addressing the risks from climate impacts, both current and projected, whilst also recognising that there may be opportunities that a changing climate may bring e.g. ability for new varieties of crops to grow in Northern Ireland.

Ensuring effective climate adaptation, including action to ensure that our current infrastructure is fit for purpose, and to also build resilience to the future projected impacts of climate change, is dependent on collaboration across government, business and societies and if done effectively society, ecosystems and economies can be safeguarded against the worst impacts of climate change.

[2] https://www.ipcc.ch/report/ar6/syr/

Chapter 1: Collaborative Working & Shared Ownership – a vision for a well-adapted and climate resilient Northern Ireland

Figure 1-1: NI Executive's Draft Green Growth Strategy

The climate challenge is one that faces not just government departments, but public bodies such as Councils and environmental Non-Government Organisations (eNGOs), the private sector and wider society as a whole. It is widely accepted as one of the most important generational issues of our time.

While government may lead the way in areas such as setting policy, it is only by recognising the extent of this challenge and by working in partnership together across departments, society and even borders, will we be able to fully address and adapt to the changing climate we will all experience.

To capture this message and bring it to the forefront of the third Northern Ireland Climate Change Adaptation Programme (NICCAP3), the Department of Agriculture, Environment and Rural Affairs (DAERA) undertook a co-design process with a range of key stakeholders to develop the following vision for a well-adapted and climate resilient Northern Ireland:

Our NICCAP3 Vision

By working with partners across all aspects of Northern Ireland's environment, economy and communities we will take action to build upon and strengthen our resilience to our changing climate as we work towards creating a Northern Ireland which is well adapted and resilient to both our current and projected future impacts of climate change to protect our environment, economy and communities for both our current and future generations.

NI Executive Departments have recognised the need for this collaborative approach between Departments and key stakeholders for some time now. The 'New Decade, New Approach deal' (NDNA), which was published in January 2020 and the Executive's Programme for Government 2024-2027 'Our Plan: Doing What Matters Most'[3] both recognised the importance of addressing climate change and the risks that it brings to our communities, businesses and environment from impacts such as increased flooding during severe weather events and extreme heat events.

The Executive's Green Growth Strategy (figure 1-1) recognises the need to tackle and mitigate these impacts whilst also taking the opportunities to change and grow the economy and improve people's quality of life through green jobs and a clean environment.

For over a decade now, to assist with information exchange on climate adaptation between Departments a Cross Departmental Adaptation Group has been in place. Following on from the publication of the NDNA, and the development of the draft Green Growth Strategy, a Green Growth Strategic Oversight Group, which comprises senior official representation from all Departments, which is chaired by the Department of Agriculture, Environment and Rural Affairs (DAERA) Permanent Secretary, was established to provide a forum for discussion and senior level oversight across all Departments on the progression of climate action.

In recognition of the need for collaboration and joined up working between Departments, work is progressing to establish an Inter-Ministerial Group with a specific focus on climate change.

To support Departments in the delivery of action and engagement with key stakeholders, in 2008 the Climate Northern Ireland Project (Climate NI) was established, under contract, by the then Department of the Environment (DoE) to help fulfil its obligations to address climate change impacts following a recommendation from the 2007 DOE/Sniffer report, "Preparing for a Changing Climate in Northern Ireland"[4].

Figure 1-2 : Climate NI Logo (Climate NI)

Climate NI is currently funded by DAERA and is delivered by Northern Ireland Environment Link (NIEL) under contract with a key focus on ensuring collaboration between Government departments and key stakeholder partners through an intersectoral network and a series of working groups which are devoted to increasing understanding of climate change impacts and risks within Northern Ireland and promoting adaptation and the mitigation actions necessary to address these. Climate NI provides a vital link between the voluntary and community sectors, private business sectors, academics and local and central government.

The Climate NI project is governed by a Steering Group composed of organisations from a wide range of sectors including central and local government, the business sector, environmental organisations and academia. Its aims are to share best practice, increase the understanding of the impacts of climate change in Northern

[3] https://www.northernireland.gov.uk/PfG

[4] https://www.ukcip.org.uk/wp-content/PDFs/Preparing_CC_NI.pdf

Ireland, to share knowledge, promote action and provide independent advice and support to the sectors with which it engages.

Supported by the steering group, Climate NI works with Local Government in NI to provide training and support to councils to reduce their greenhouse gas emissions and improve their resilience to the impacts of climate change. In 2019, Climate NI established the Local Government Climate Action Network (LGCAN) to develop a cohesive and collaborative regional approach to climate action within local government and to act as a dedicated forum for cross-council support and training on climate adaptation and wider climate action. This work is supported by Climate NI's *NI Adapts Planning Toolkit*[5] (Figure 1-3), which aims to support organisations to undertake a methodological approach to adaptation planning with the overall aim of enabling NI to build resilience to the current and projected negative impacts of climate change. With this toolkit and the network of contacts the LGCAN provides, councils can work together to share best practice, and with external agencies to develop a strategic regional approach to climate action.

Figure 1-3: NI Adapts logo (Climate NI)

NICCAP2 saw the first contributions from local government to a climate adaptation program in the UK. With NICCAP3 we have again (through Climate NI) collaborated with local governments, civil society, academia, eNGOs and the private business sector to create a programme which recognises the important work and contributions to climate adaptation that the whole of society can make.

To further increase the collaborative approach to climate adaptation within NI, and to focus a response to recommendations from the Climate Change Committee's (CCC) 2022 review on adaptation progress in NI[6], a Policy and Research Panel was set up through Climate NI. This panel brings together academics, government and industry to identify, investigate and address data gaps in adaptation progress indicators. Its work will feed into the monitoring and evaluation of NICCAP3, discussed in more detail in Part 7.

As well as working together to address climate change across Northern Ireland, a number of Departments collaborate on a UK and island wide basis through participation and membership of groups such as the Climate Adaptation Research and Innovation Board (CARIB), Climate Change Risk Assessment working groups, the British Irish Council work streams, research centres and the North South Ministerial Council.

CARIB is a UK wide group, which is attended by the DAERA Chief Scientific Advisor, which brings together senior representatives from government departments, non-departmental public bodies and non-ministerial departments to support effective climate adaptation across the UK through the development of a Climate Adaptation Research and Innovation Framework[7].

[5] https://www.niadapts.org.uk/
[6] https://www.theccc.org.uk/publication/adapting-to-climate-change-progress-in-northern-ireland/
[7] https://www.gov.uk/government/groups/climate-adaptation-research-and-innovation-board

Case Study 1: Co-Centre for Climate + Biodiversity + Water

Co-Centre for Climate + Biodiversity + Water Co-Directors (L-R): Professor Ed Hawkins (University of Reading), Professor Yvonne Buckley (Trinity College Dublin), Professor Mark Emmerson (Queen's University Belfast) (Right).

The Co-Centre for Climate + Biodiversity + Water is a cross-jurisdictional programme of research for innovation and policy in the areas of climate, biodiversity and water. Its purpose is to carry out research in Northern Ireland, the Republic of Ireland and Great Britain to support fair transitions to Net Zero while also addressing the interlinked issues of reversing biodiversity loss and restoring water quality for a sustainable economy.

The cross-jurisdictional approach recognises that these challenges know no borders, must be addressed at the international scale and allows for better integration of disciplines and institutions to maximise research impacts.

The programme is funded for six years by Science Foundation Ireland, the Department of Agriculture, Environment & Rural Affairs (DAERA) and UK Research & Innovation (UKRI); and is also supported via UK's International Science Partnerships Fund and the Irish Government's Shared Island initiative.

The programmes total budget is €41.3M over 6 years including co-funding from 29 industry partners (€9.25M) with a cross-jurisdictional PhD programme being supported through an additional €1 million donation by the Sunflower Charitable Foundation through Community Foundation Ireland.

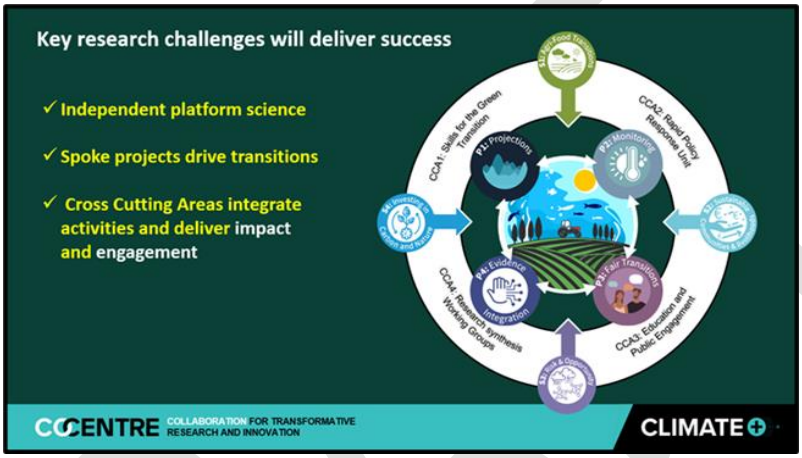
The programme has over 60 Principal and Funded Investigators from 14 academic partners across the two islands and intends to recruit over 80 post-doctoral researchers and 25 PhD students.

The Co-Centre Projects will generate research outputs through over 50 projects of fundamental research (Platforms) or more applied industry led research designed to provide answers industry urgently needs to innovate new products and services (Spokes).

Platforms	**Spoke**
Projections – Model-based projections of future climate, biodiversity and water scenarios	**Sustainable Agri-Food Transitions** - Achieving a sustainable transition to net zero emissions from agriculture and food systems
Monitoring – Development of a monitoring framework	**Sustainable Communities & Livelihoods** – including achieving a just transition in rural communities

Enabling Just Transitions - Transition to a low carbon future that is socially inclusive and equitable	**Risk & Opportunities** – Addressing threats to supply chains, physical infrastructure, natural capital, and communities, including health and livelihoods
Evidence Discovery and Integration – including the application of Artificial Intelligence to the collation and synthesis of evidence	**Investing in Carbon & Nature** - Investing in nature-based solutions such as peatlands, forests, saltmarshes, and agricultural grasslands and soils

The research projects are supported by a series of cross cutting activities. Notably these include a Policy Response Centre to allow commissioning of policy ready evidence needs that arise during the lifetime of the project and an Education and Public Engagement campaign.



Example Projects

Spoke 3 - Risk & Opportunities Targeted Projects

This spoke will explore climate, biodiversity and water-related risks, improving our understanding of their present-day drivers and their future evolution, including what can be done to mitigate their impacts. Nature-based solutions will be augmented using digital monitoring, data assimilation, and viewing tools that highlight locations where natural features provide protection from coastal storm surge flooding or erosion risk. Properties of these features will be upscaled, enhanced or translocated as part of regional adaptation strategies and solutions.

Example Spoke 3 Objective

Construct 'adaptation pathways' to support iterative decision-making processes and develop evidence-based recommendations for policies promoting sustainable communities and livelihoods.

Example Spoke 3 Projects

- Nature-based solutions for coastal adaptation
- Understanding hydrological extremes to support water resources planning and adaptation

For further information please contact:

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Business Development Manager
Co-Centre for Climate + Biodiversity + Water
Queen's University Belfast

Chapter 2: Climate Change Risk Assessment

Legal background

Climate Change Act 2008

Figure 1-4: The Climate Change Act 2008

In November of 2008, the Climate Change Act 2008[8] (the 2008 Act) was passed into law. This Act was seen as a landmark piece of legislation at the time, representing the world's first legally binding framework to tackle climate change. The 2008 Act (Figure 1-4) contains a range of policy directions including UK emissions targets, UK carbon budgets and carbon trading schemes.

The 2008 Act also established the Climate Change Committee (CCC) as an independent, statutory body, which formally launched in December 2008, to advise the UK Government and Devolved Governments on matters relating to climate change. To support the work of the Committee an Adaptation Committee, with a remit to provide specific advice about climate adaptation and the steps which government should be taking to build resilience to the impacts of climate change, was also established.

Climate Change Committee

Figure 1-5: Climate Change Committee Logo

The key function of the CCC regarding climate adaptation is under section 57 of the 2008 Act whereby it must provide advice to UK Government on the preparation of a Climate Change Risk Assessment (CCRA), to be laid by the UK Government in the UK Parliament every 5 years under section 56 of the 2008 Act. In fulfilling this requirement, the CCC publish an independent assessment of Climate Risk to the UK on a 5 yearly cycle. This assessment is known as the Climate Change Risk Assessment Independent Assessment (CCRA-IA). This independent assessment and the associated National Summary reports (Figure 1-6) are available at the UK Climate Risk website[9] which also contains a range of other useful resources.

Figure 1-6: CCRA3 Summary Technical Report for Northern Ireland

The National Summary for Northern Ireland[10] report, which accompanied the CCRA-IA, describes the impacts we are already experiencing in Northern Ireland through

[8] https://www.legislation.gov.uk/ukpga/2008/27/contents
[9] https://www.ukclimaterisk.org/
[10] https://www.ukclimaterisk.org/publications/summary-for-northern-ireland-ccra3-ia/

impacts such as increases to temperature, rainfall, weather extremes and sea level rise which are summarised in Figure 1-7 below. The national summary report utilises the Met Office-produced UK Climate Change Projections data from 2018 (UKCP18)[11] to describe the further climatic changes we can expect.

Variable	Change in Northern Ireland
Average annual temperature	Increase of 0.7°C from mid-1970s to mid-2010s
Annual mean rainfall	Increase of 6.4% from mid-1970s to mid-2010s
Weather extremes	UK-wide increase in extreme heat events Little evidence yet on changes in extreme rainfall
Sea level rise	UK-wide increase of ~1.4mm per year since 1901 (16cm to date)

Figure 1-7: Observed impacts of Climate Change in Northern Ireland from UKCP18

We are now in the third iteration of this statutory cycle, with the most recent CCRA3-IA published by the CCC in June 2021[12]. The CCRA3-IA was developed at a UK wide level and informed the development of CCRA3, which was laid in Parliament in January 2022[13] (Figure 1-8) and which agreed with the findings of the CCRA3-IA.

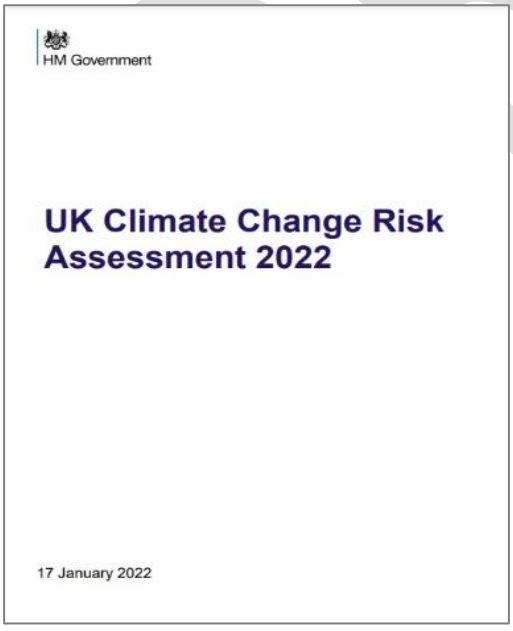


Figure 1-8: Third UK Climate Change Risk Assessment

The CCRA3-IA considered 61 specific risks and opportunities which were assigned an urgency score (Figure 1-9) ranging from 'More action needed' to 'Watching brief' across 5 broad themes covering the Natural Environment and assets; Infrastructure; Health, Communities and the Built Environment; Business and Industry; and International Dimensions.

In considering the 61 risks and opportunities for Northern Ireland, the CCRA3-IA scoring assessment identified:

- 31 requiring more action;
- 19 requiring further investigation;
- 5 sustain current action; and
- 6 watching brief.

This represented a significant increase in risk ratings level from CCRA2-IA.

[11] https://www.metoffice.gov.uk/research/approach/collaboration/ukcp

[12] https://www.ukclimaterisk.org/publications/technical-report-ccra3-ia/

[13] https://assets.publishing.service.gov.uk/media/61e54d8f8fa8f505985ef3c7/climate-change-risk-assessment-2022.pdf

Category	Description
More action needed	New, stronger or different Government action, whether policies, implementation activities or enabling environment for adaptation – over and above those already planned – are beneficial in the next five years to reduce climate risks or take advantage of opportunities. This will include different responses according to the nature of the risks and the type of adaptation: Addressing current and near-term risks or opportunities with low and no-regret options (implementing activities or building capacity). Integrating climate change in near-term decisions with a long life-time or lock-in. Early adaptation for decisions with long lead-times or where early planning is needed as part of adaptive management.
Further investigation	On the basis of available information, it is not known if more action is needed or not. More evidence is urgently needed to fill significant gaps or reduce the uncertainty in the current level of understanding in order to assess the need for additional action. *Note the category of 'Research Priority' in CCRA2 has been replaced with 'Further investigation' in CCRA3. This is because of some confusion following CCRA2 that 'research priority' only denoted that more research was needed, when in fact the urgency is to establish the extent to which further adaptation is required.*
Sustain current action	Current or planned levels of activity are appropriate, but continued implementation of these policies or plans is needed to ensure that the risk or opportunity continues to be managed in the future.
Watching brief	The evidence in these areas should be kept under review, with continuous monitoring of risk levels and adaptation activity (or the potential for opportunities and adaptation) so that further action can be taken if necessary.

Figure 1-9: CCRA3-IA Urgency Scores Guide (Source: CCC)

The UKCP18, produced by the Met Office, also sets out the latest projected changes in climate for Northern Ireland (Figure 1-10). The UKCP18 analysis highlights that:

- Temperatures are projected to rise producing both warmer summers and winters, with summer months expected to see the greatest increase. Coupled with changes to rainfall depending on the season, this will lead to hotter, drier summers with an increase in extreme heat events.
- We will also see warmer, wetter winters, but this will not exclude extreme cold events such as severe snowstorms and cold snaps such as the "Beast from the East"[14] in early 2018 which saw temperatures of -11 °C and caused widespread disruption due to ice and snow.
- Sea level is expected to rise by between approximately 23-30cm and 40-65cm by 2050 and 2080 respectively compared to a 1981-2000 baseline. This will bring an increase in the likelihood of flooding and erosion of coastal communities and habitats, impacting upon people, coastal infrastructure and biodiversity.

	2050s RCP2.6 (50th Percentile)	**2050s RCP8.5 (50th Percentile)**	**2080s RCP2.6 (50th Percentile)**	**2080s RCP8.5 (50th Percentile)**
Annual Temperature	+1.0 °C	+1.4 °C	+2.1 °C	+4.6 °C
Summer Rainfall	-12%	-12%	-10%	-22%
Winter Rainfall	6%	9%	10%	21%
Sea level rise (Belfast)*	+23cm	+30cm	+40cm	+65cm

*Figure 1-10: UKCP18 Climate Projections for Northern Ireland. *Sea level rise taken at the 95th Percentile*

[14] 2012_12_MOBlog | Met Office UA – Page 5

Chapter 3: Northern Ireland's third Climate Change Adaptation Programme

The Climate Change Act 2008

The 2008 Act requires that governments from across the UK respond to the climate risks identified in the latest CCRA laid in Parliament. The Scottish Government separately have specific requirements to develop an adaptation programme in response to the latest CCRA under the Climate Change (Scotland) Act 2009.

Specifically, for Northern Ireland, Section 60 of the 2008 Act requires Northern Ireland departments to produce and lay before the Northern Ireland Assembly, programmes of adaptation to climate change which address the risks identified in the most recent Climate Change Risk Assessment laid under Section 56.

As the lead department for cross-cutting climate change legislation and to ensure a co-ordinated approach, which recognises that climate risks may cut across multiple sectors, DAERA has assumed the role of leading on the development of Northern Ireland's Adaptation Programmes to ensure that the requirements of Section 60 are met. In this role DAERA coordinates the input of policies and proposals from across Government departments in response to the CCRA risks into a single Northern Ireland Climate Change Adaptation Programme (NICCAP).

Development of NICCAP3.

This is the third programme which builds upon progress made through the two previous NICCAPs, setting out the policies and proposals from both within government and from across wider society through the inclusion of actions from local councils, eNGOs, academia and the private sector.

In NICCAP3, we recognise a new statutory requirement placed on the Climate Change Committee (CCC) through the Climate Change Act (Northern Ireland) 2022[15] (the 2022 Act) which received Royal Assent in June 2022.

Section 48 of the 2022 Act requires that the CCC provide an assessment of future NICCAPs within 3 years of being laid in the Assembly and so in anticipation of this, and to assist the CCC in delivering this function, we have developed NICCAP3 to align with the adaptation monitoring framework the CCC have developed and to take account of the key priorities, for NICCAP3, identified by the CCC in their independent assessment of NICCAP2[16] as discussed later in this chapter.

The CCC Adaptation Monitoring Framework[17] sets out 13 thematic areas for climate risk and adaptation and allows for the climate risks and opportunities identified in the CCRA to be contextualised within and across the 13 themes. Further details on the monitoring framework and how it will be used can be found in Chapter 17.

The CCC have grouped these 13 themes into 5 key areas which will be impacted by our changing climate. For each of these key areas, DAERA has undergone a co-design process with a range of key stakeholders to develop overarching strategic objectives designed to focus the intent of adaptation in each area. A summary of these objectives, key areas and themes can be found in Figure 1-11. A more detailed discussion on each key area and its themes is contained in the relevant chapter for each, where summaries of the risks and opportunities for each theme can also be found.

To assist with future monitoring of NICCAP3 we have also developed the Adaptation Delivery

[15] https://www.legislation.gov.uk/nia/2022/31/contents/enacted

[16] https://www.theccc.org.uk/publication/adapting-to-climate-change-progress-in-northern-ireland/

[17] https://www.theccc.org.uk/publication/ccc-adaptation-monitoring-framework/#introduction

Plan (ADP), contained in Annex I, to align to the thematic areas and have mapped the actions in the ADP to the relevant CCRA3 risks. However, we recognise that there are a number of actions which do not naturally sit in a specific thematic area, due to their strategic nature, and to reflect this we have included a section to capture these actions which provide significant benefits for adaptation action delivery. All of the actions within the Delivery Plan are either of an ongoing nature or will be commenced within the lifetime of this Adaptation Programme.

Key Area	Objective	Thematic Areas
Natural Capital	We will use nature-based solutions where possible and encourage sustainable practices across the land and water use sectors to build ecologically healthy, well-connected habitats which support increased species abundance and diversity, and improved soil and water quality, which in turn create a climate resilient environment rich in the ecosystem services so important for human wellbeing, and sustainable agricultural, forestry, fisheries, and aquaculture sectors which are so important to the Northern Ireland economy.	Nature Working Land & Seas
Food Security	We will work with local industry stakeholders and producers to strengthen the resilience, sustainability and prosperity of our local agri-food and fisheries sectors in the creation of a sustainable food system that protects and enhances our natural environment, as well as supporting the sectors to invest in systems to assess climate risks and vulnerabilities and plan adaptation throughout their supply chains to ensure we continue to supply safe and sustainable food both at home and abroad.	Food Security
Infrastructure Services	Recognising the degree which infrastructure services rely upon each other to function effectively, we will collaborate across public sector organisations to identify vulnerabilities, manage these interdependencies and support the integration of climate adaptation into business operating models to ensure adaptation is delivered effectively and efficiently to ensure system level reliability, security and resilience across our infrastructure services and networks.	Water Energy Telecoms & ICT Transport
People and the Built Environment	Recognising how dependent we are upon our built environment and the ability it has to shape and support our health and wellbeing; we will engage with community groups and organisations to increase community understanding of localised climate impacts, and their impact upon their health. By empowering communities to understand their risks and develop innovative solutions making use of local knowledge and resources, we will build upon their shared experiences to target and address the climate risks specific to them to improve their climate resilience.	Towns & Cities Buildings Health Community
Disruption to Business and Supply Chains	We will support businesses to understand and embed climate adaptation into their strategies and practices, to identify climate risks and to make the most of existing and emerging opportunities. Through encouraging cost-effective early action to strengthen operating models to the risks and impacts of Northern Ireland's changing climate, we will ensure our supply chains have the resilience needed to support our rich network of businesses for our climate today, and tomorrow.	Business Finance

Figure 1-11: Summary of NICCAP3 Key Areas, Objectives, and Thematic Area

Climate Change Committee assessment of NICCAP2

As outlined earlier in this chapter in developing this Adaptation Programme, whilst structuring it to align to the CCC's adaptation monitoring framework, we have also sought to ensure that we have taken account of the priorities for NICCAP3 identified by the CCC in their independent assessment of NICCAP2.

Ahead of the new legal requirement under section 48 of the 2022 Act commencing, DAERA sought the views and agreement from other Departments to take a proactive approach and commission the CCC to undertake an independent assessment of NICCAP2 in 2022. On 20 April 2023, the CCC published 'Adapting to Climate Change – Progress in Northern Ireland[18]'report.

This independent assessment provided a useful means of gauging the expert opinion of the CCC at an earlier stage and allowed us to consider their recommendations alongside the CCRA3, in the development of this Programme.

Climate Change Committee's key recommendations for NICCAP3

The CCC's assessment of NICCAP2 outlined their views on the following key priorities for this Programme as being:

i) **A refined vision.**
NICCAP3 must build on NICCAP2's vision for a well-adapted Northern Ireland. The next programme should link NICCAP actions to climate change objectives. More specific and quantitative targets also need to be established as top-level goals for the programme, linked to identified key performance indicators.

ii) **Increased scope.**
NICCAP3 should cover the full range of sectors and policy areas which require adaptation, including outcomes, actions and indicators for the energy sector; water supply; telecommunications and ICT; health; buildings; and finance, as well as interdependencies between sectors, which largely fall outside the scope of NICCAP2. These sectors need to be included in the programme to address all the risks identified under the third Climate Change Risk Assessment.

iii) **Engagement through the development process.**
NICCAP3 is an opportunity to raise awareness and understanding of climate risks across Northern Ireland Government, but departmental policy leads find it challenging to embed adaptation into their areas. NICCAP3 should build on the work of civil society and local government to deliver effective adaptation.

iv) **Strengthened monitoring and evaluation**.
Monitoring and evaluation need to be strengthened and expanded to assess the effectiveness of adaptation actions. The assessment found it was not possible to evaluate 29 out of 45 outcomes due to data gaps.

Building upon NICCAP2 to go further

Departments, in developing policies and proposals for inclusion in NICCAP3 in response to the CCRA3, have also taken account of the views of the CCC from their assessment of NICCAP2. In particular, in relation to the key priorities as outlined above:

i) NICCAP3 contains a new refined vision and objectives which have been co-designed with a range of stakeholders.

ii) We have worked to ensure that the scope of NICCAP3 brings in all areas under devolved policy with those risk areas which are reserved policy matters (i.e. ICT, international)

[18] https://www.theccc.org.uk/publication/adapting-to-climate-change-progress-in-northern-ireland/

being dealt with at a UK level through the UK's third National Adaptation Programme (NAP3).

iii) In the development of the NICCAP3 we have went beyond the legal requirement of the Climate Change Act 2008 and again incorporated delivery actions from key delivery partners including Councils, Academia, NGOs and private sector businesses in recognition of the important role they can play in creating climate resilience. Within Government we are continuing to work to embed climate resilience into other high-level strategies where appropriate including the Programme for Government, Climate Action Plan, and the Environmental Improvement Plan. This is in addition to developing and rolling out training across the NI Civil Service to improve upon climate change awareness and empower civil servants to make positive impacts through their professional and personal lives.

iv) In developing NICCAP3, as detailed in chapter 17, we have sought to develop a suite of indicators to support monitoring and evaluation in partnership with a range of key stakeholders with specific sectoral expertise.

In developing this Adaptation Programme, we have sought to build upon the progress made under NICCAP2 whilst recognising and accepting that we must go further. Since NICCAP2 was laid in the Assembly in 2019 we have seen local flooding events such as those which occurred in Newry and Downpatrick in 2023, significant wildfires in the Mourne's in April 2021, damage to buildings during storm events such as the damage to the Titanic Visitor Centre roof in April 2024 during Storm Kathleen, record temperatures broken in July 2021 and a series of severe weather events resulting in damage to property and infrastructure.

It is clear from the CCC assessment detailed further in Chapter 18, and these recent climate related events, that NICCAP3 must go further. Whilst there are several actions which will roll over from NICCAP2, given their ongoing nature, we have sought to expand upon and strengthen the responses received from across government and wider society. We have worked towards the goal of ensuring that all risk areas, which are in the devolved areas of responsibility, have actions related to them incorporated. However, some areas still require further attention, and work is ongoing through a range of forums to engage with the appropriate bodies and to support them in bringing forward adaptation actions.

Furthermore, we recognise the dynamic nature of climate change and its impacts, and as outlined in chapter 17 we will be undertaking a comprehensive mid-programme review of the programme which will allow additional actions to be added in and therefore ensures that NICCAP3 adopts a dynamic and more agile approach to meet the challenges climate change brings.

Furthering the delivery of the Sustainable Development Goals

Section 60(2) of the 2008 Act requires that the objectives, proposals and policies within our adaptation programme must contribute towards sustainable development.

The 2030 Agenda for Sustainable Development[19], adopted by all United Nations Member States in 2015, provides a shared blueprint for peace and prosperity for people and the planet, now and into the future. At its heart are the 17 Sustainable Development Goals[20] (SDGs), which are an urgent call for action by all countries, developed and developing, in a global partnership. They recognise that ending poverty and other deprivations must go hand-in-hand with strategies that improve health and education, reduce inequality, and promote economic

[19] https://sdgs.un.org/2030agenda

[20] THE 17 GOALS | Sustainable Development (un.org)

growth – all while tackling climate change and working to preserve our oceans and forests.

Figure 1-12: UN Sustainable Development Goals

It is widely recognised that delivery of climate action can drive forward delivery across multiple SDGs. In his briefing to the UN General Assembly on 6 February 2023[21] António Guterres, the United Nations Secretary General, stated "Climate Action is the 21st century's greatest opportunity to drive forward all the Sustainable Development Goals".

The SDGs include guidelines and targets that UN member states are expected to adopt to frame their agendas and political policies until 2030.

Goal 13 'Climate Action' (SDG 13) specifically sets the following targets relating to climate adaptation:

- strengthen resilience and adaptive capacity to climate-related hazards and natural disasters;
- integrate climate change measures into policies and planning;
- build knowledge and capacity to meet climate change;
- implement the UN Framework Convention on climate change; and
- promote mechanisms for raising capacity for planning and management.

The objectives, policies and proposals within this Adaptation Programme will, in varying ways, contribute towards the furthering of SDG 13 as well as across a number of other SDGs.

[21] Secretary-General's briefing to the General Assembly on Priorities for 2023 [scroll down for bilingual, as-delivered; all-English and all-French versions] | United Nations Secretary-General

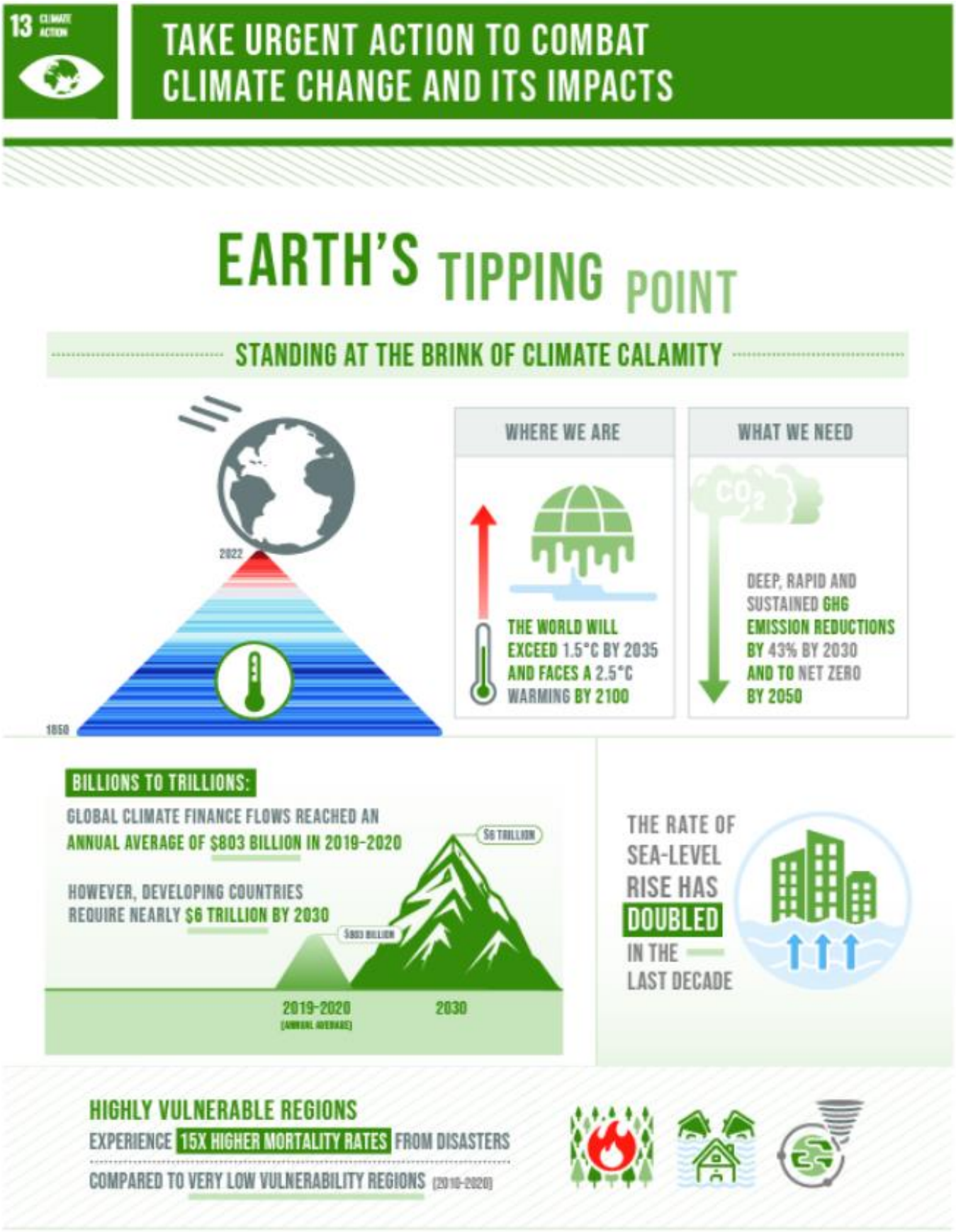


Figure 1-13: The Sustainable Development Goals Report 2023

Case Study 2: Climate Northern Ireland - Enabling collaborative climate adaptation in Northern Ireland

The Climate NI Steering Group hosted the UK Climate Change Committee in May 2024 (Climate NI)

Climate Northern Ireland (Climate NI) is a cross-sectoral network devoted to understanding and enabling adaptation and mitigation actions in NI that can address the climate emergency. The programme is funded under contract by the Department of Agriculture, Environment and Rural Affairs (DAERA), and works in partnership with a wide range of actors and organisations from academia, local and central government, and both the private and NGO sectors. Climate NI has been active in its current form since 2012, and the current iteration of the programme runs from 2023-2026 with an option to extend to 2028. The Climate NI programme aims to:

1. Support development and implementation of climate policy by enabling the exchange of expertise and advice between Government Departments, public bodies, and civil society;
2. Engage the research community to help define and address evidence needs for climate policy and action;
3. Increase co-ordination and awareness on climate change through partnership and clear communication; and,
4. Enable delivery of climate action in NI by addressing barriers and building capacity at local, regional and national levels.

One of the primary mechanisms for achieving these aims are the networks and partnerships that Climate NI has established across the various sectors listed above. At its core is the Climate NI Steering Group; comprised of some 20+ member organisations and broken down into key sectoral areas, each guided by a 'Sector Lead'. Other groups convened and facilitated by Climate NI include the Local Government Climate Action Network (LGCAN) and the Climate NI Policy and Research Panel. Other groups are created, expanded and finished throughout the programme, as guided by the Steering Group and the needs of partners.

Climate NI Steering Group Structure (Climate NI)

Climate NI has leveraged these networks and their internal resources to support the development of adaptation policy, including gathering evidence for the Climate Change Risk Assessments (CCRA) and the Northern Ireland Climate Change Adaptation Programmes (NICCAP). For this third NICCAP, Climate NI engaged stakeholders across civil society and local government, collecting 65+ submissions for adaptation actions across NI, and 11 strategic actions endorsed by the Society of Local Authority Chief Executives and Senior Managers (SOLACE) and the Northern Ireland Local Government Association (NILGA). Climate NI has supported ten of eleven councils to begin developing their own adaptation plans through the LGCAN, using their bespoke NI Adapts Planning Toolkit. Four of eleven Councils have now completed a plan.

Climate NI supports various sectors through the development of tools and resources. For example, Climate NI developed a Business Resilience Guide as a first step to help small and medium sized (SME) businesses understand the impacts of a changing climate and how to voluntarily report climate-related risks, increasing understanding of climate risks with a range of business sizes and sectors. This work was supported through collaboration with other members from the Climate NI Steering Group (Business in the Community, Marsh and Invest NI), with the guide published on the 'NIBusinessInfo' website[22].

Climate NI utilises a range of media to produce and disseminate climate-related news and information. This includes the creation and circulation of a monthly newsletter, a dedicated website hosting a calendar of local climate events and conferences and climate news stories, in addition to an expanding presence across all major social media platforms.

Climate NI will continue to expand its support to a range of audiences throughout the current work programme. This work includes, providing support to Public Bodies required to report on climate adaptation and mitigation through a peer support network; raising awareness of climate change through training; and increasing collaboration between government, practitioners and academia through the Climate NI Policy and Research Panel.

To find out more about Climate NI, see here: climatenorthernireland.org.uk/

[22] https://www.nibusinessinfo.co.uk/content/climate-related-financial-disclosure-reporting-tcfd

Part 2: Natural Capital

Image 2-1: Photo by Larry Ferreria on Upsplash

Objective

We will use nature-based solutions where possible and encourage sustainable practices across the land and water use sectors to build ecologically healthy, well-connected habitats which support increased species abundance and diversity, and improved soil and water quality, which in turn create a climate resilient environment, rich in the ecosystem services so important for human wellbeing and sustainable agricultural, forestry, fisheries, and aquaculture sectors which are so important to the Northern Ireland economy.

Northern Ireland is a country rich in natural capital. Through its idyllic coastlines, carbon rich peatlands, forestry, expansive mountain ranges, and tapestry of farmland covering all terrains. Our natural capital provides value and ecosystem services to the lives of everyone who lives, works, or visits here.

Our natural capital plays a critical role in Northern Ireland as it supports our rich diversity of wildlife and provides the ecosystems we rely on for the water we drink, fresh air we breathe, the food we eat, the captivating scenery all around us, and the agricultural industries that help to support our local economy.

Our Adaptation Objective for Natural Capital recognises the vital role that nature can play in creating an environment, society and economy that is resilient to both the current and projected future impacts of climate change. We understand the role that all the farming sectors have to play in ensuring our natural environment can continue to support the rich diversity of species which underpins the productivity of their sectors. By working with those sectors and supporting them to adapt their methods to ones which place an emphasis on sustainability, we will ensure that the natural capital which brings so many benefits to all of us is protected and enhanced in the face of a changing climate for future generations.

The risks to Natural Capital from climate change have been distilled into two thematic areas, covered in the following chapters:

- Chapter 4 - Nature, and
- Chapter 5 - Working Land and Seas.

Case Study 3: The CANN Project - Saving peatlands and wetlands through the Collaborative Action for the Natura Network (CANN)

Coir Log pools – Lough Atona, Cuilcagh Mountain Park, Co Fermanagh (Photo credit - Simon Gray)

The CANN project was a cross-border environment project which ran from 2017-2022 with an over-arching aim to improve the condition of protected habitats and to support priority species found within Northern Ireland, the Border Region of Ireland and Scotland.

The project which secured over €9.4m of EU Interreg funding consisted of a consortium of 11 partners including researchers, scientists, local authorities, environmental Non-Government Organisations and charities from Ireland, Northern Ireland and Scotland. The consortium was led by Newry, Mourne & Down District Council.

The project took forward action to improve the condition of 25,000 hectares of internationally important wildlife sites across the jurisdictions. Within Northern Ireland the project took forward practical conservation actions to protect and restore blanket and raised bogs such as those at Cuilcagh Mountain in County Fermanagh, Garry Bog in County Antrim, Peatlands Park in County Armagh, and Moneygal in County Tyrone to improve their condition.

Peatlands cover about 18% of Northern Ireland, more than double the area under trees, and store huge amounts of carbon as well as providing clean drinking water sources and storing water to alleviate the potential for flooding.

Actions undertaken on these sites included the removal and control of invasive species such as Rhododendron, enhanced grazing management in upland areas, fencing, drain blocking and wildfire management as well as nest protection for threatened species such as the hen harrier.

Other deliverables of the CANN project included the production of 26 Conservation Action Plans for a range of sites across the jurisdictions which are designated as Special Areas of Conservation (SACs) which accumulatively accounted for over 25,000 hectares of land.

Direct conservation actions identified in these plans were carried out on 3,605 hectares of these SACs, all with an aim to protect the habitats and species found at these sites towards achieving favourable conservation status to benefit both biodiversity, carbon storage capabilities and resilience to climate change.

The CANN Project was possible through the collaboration of a wide range of stakeholders. Supported by the European Union's INTERREG VA Programme, managed by the Special EU Programmes Body, match funding was provided by the Department of Housing, Local Government and Heritage (DHLGH) in Ireland, by the Department of Agriculture, Environment and Rural Affairs (DAERA) in Northern Ireland, and by NatureScot in Scotland. The other project partners were Argyll & the Isles Coast & Countryside Trust, Agri-Food and Biosciences Institute (AFBI), Armagh, Banbridge & Craigavon Borough Council, East Border Region, Golden Eagle Trust, the Institute of Technology Sligo, Monaghan County Council, Scottish Natural Heritage, Ulster University and Ulster Wildlife.

For further information on the CANN project and its work please visit https://www.newrymournedown.org/the-cann-project

Chapter 4: Nature

The natural environment is the bedrock for all life in Northern Ireland. It encompasses the terrestrial, freshwater, marine and coastal habitats that provide the living spaces for the rich flora and fauna that do so much for every one of us. Whether it is to ensure we have clean air and water, or to facilitate better connections with the natural world around us through access to the countryside, the importance of ensuring the stability and connectivity of these habitats and the species they support, in the face of our changing climate, cannot be overstated.

Over time wildlife has adapted to its local environmental conditions, and this has created ecosystems that have established themselves in accordance with the stability of their environment. While a degree of tolerance is associated with ecosystems and the species they support, they begin to deteriorate in condition and abundance when put under sustained pressure which pushes the limits of their resilience. Considerable evidence shows that sustained pressure is being applied as we see climatic conditions steadily change in Northern Ireland. We are already experiencing hotter, drier summers where intense wildfires have ravaged large areas of habitat such as in April 2021 when the largest gorse fire Northern Ireland has ever seen damaged approximately 720 acres of habitat in the Mournes.

Image 2-2: Mourne Mountain gorse fire (BBC)

This wildfire also impacted upon and killed large numbers of animals including the common lizard and ground nesting birds, and left large areas of charred and burnt grassland, heather, and sphagnum mosses uninhabitable.[23]

Severe weather events, which are becoming more frequent, are resulting in major flood events and storms. These can have significant impacts on intertidal coastal and riverine habitats as vast quantities of water and wind drive the erosion of river channels and sand dune systems resulting in the redistribution of sediment.

Flooding events can also have negative impacts on water quality as the input of domestic, agricultural and industrial pollution to rivers and lakes can be increased through run off from land as well as the sheer volume of water exceeding the capacity of our wastewater management systems ability to cope during severe weather events.

As increasing global temperatures bring external pressures to ecosystems species respond in a variety of ways. Heat stress force those which can adapt, to do so by moving into new territories or habitats which in turn increases the pressures they are experiencing due to the changing climate. This has already changed the migration patterns of birds with differences in species composition and numbers being observed in the UK each year. The British Trust for Ornithology (BTO) estimates the numbers of wild birds in the British Isles to have fallen by 73 million since 1970 with figures from Defra showing a change in abundance of 130 species to be 86% over the same time period.[24] Changes in rainfall equally has critical impacts on our flora and fauna as differences in rainfall at key stages throughout the year results in varying

[23] https://www.nationaltrust.org.uk/visit/northern-ireland/the-mournes/our-work-to-recover-from-the-fires-in-the-mournes

[24] https://www.bbc.co.uk/news/science-environment-66858850

growth of crops and grass for silage as well as flowering rates of wildflowers which our pollinators rely on. The protection and increased resilience of these natural habitats is crucial in supporting our wildlife in adapting to the unavoidable impacts of climate change.

Image 2-3: Garron Plateau peatland bog (DAERA)

It is also important to highlight the important role Nature Based Solutions such as afforestation, blue carbon habitats and peatland restoration can have for both climate mitigation (sequestering carbon) and climate adaptation (resilience). All of these habitat types can both store vast quantities of carbon as well as providing climate adaptation benefits. Afforestation and peatlands through the storage of water can increase rainfall lag time to alleviate flooding. Afforestation can also help to protect our freshwater habitats through buffer strips along watercourses to trap and prevent sediment from entering them in runoff following heavy rainfall. Blue carbon habitats represent a vital natural tool which plays an important role in the Earth's carbon cycle. They are capable of sequestering carbon at rates up to 4 times that of terrestrial forests[25] while also helping to protect coastal habitats and infrastructure from storm events and erosion.

Image 2-4: Blue green algae at Lough Neagh (Google Earth)

Finally, in Northern Ireland in recent years we have seen the significant impact of blue green algae on a number of our aquatic rivers, lakes and coastal locations. Most notability Lough Neagh. Climate change is resulting in increasing water temperatures which creates both opportunities for new invasive species to arrive and survive here but it also presents an increased risk of the occurrence of blue green algae blooms.

[25] https://www.thebluecarboninitiative.org/about-blue-carbon

Case Study 4: Soil Nutrient Health Scheme

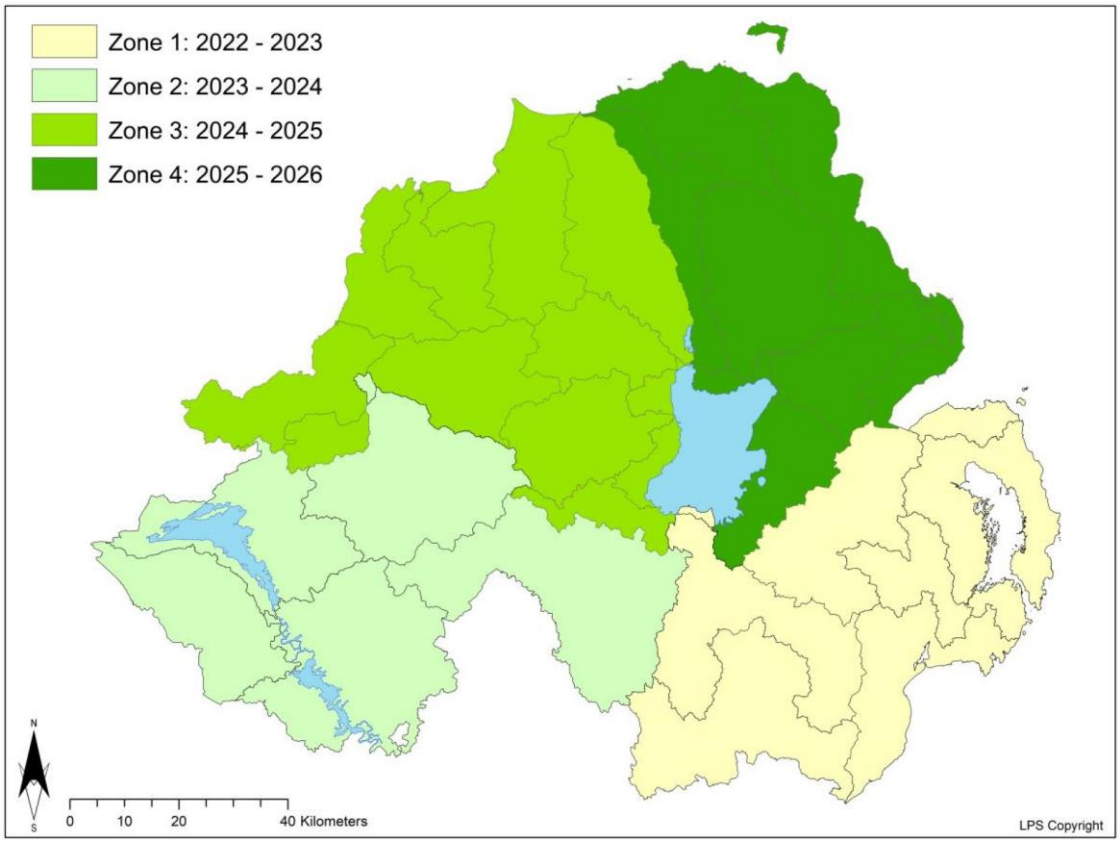
The Soil Nutrient Health Scheme (SNHS) is a comprehensive regional soil sampling and analysis programme that provides Northern Ireland's (NI) farmers with data that can help optimise crop nutrient applications, assess on-farm carbon stocks and build farm resilience. The £37.6m Scheme, which runs from 2022-26, is funded by the Department of Agriculture, Environment and Rural Affairs (DAERA) and managed by the Agri-Food and Biosciences Institute (AFBI)[26].

The SNHS is available to every eligible farm business in NI and has the potential to sample approximately 640,000 fields. It provides participating farmers with:

1. Detailed, individualised information on the nutrient status of their soils.
2. LiDAR (Light Detection and Ranging) derived runoff risk maps for nutrient loss to waterbodies for each field sampled.
3. Farm specific estimates of carbon stored in the soil and as above ground biomass.
4. Training (provided by the CAFRE: College of Agriculture Food and Rural Enterprise) on the interpretation of soil nutrient reports, generation of farm nutrient plans and the important role of farm carbon.

The SNHS's scale and complexity necessitates rolling it out over four zones, with the final Zone due to complete in 2026. Maximising participation is key to the Scheme's success and the response has been very positive with approximately 90% of farm businesses joining in each of the three zones opened to date.

[26] https://www.afbini.gov.uk/articles/soil-nutrient-health-scheme



Soil Nutrient Health Scheme Zonal Map (Base map services are provided by Land and Property Services ©Crown Copyright)

The involvement of stakeholders from design, through development and finally the roll out of the SNHS is key to its success. Stakeholders include farming, government, environmental, contractors and scientific bodies.

The Scheme is supported by a comprehensive programme of underpinning research led by AFBI and with partners at both Ulster and Leeds Universities. The research is looking in depth at areas including soil phosphorus testing on basaltic soils, understanding relationships between nutrient excess and water quality, soil and above ground biomass carbon stocks and farmer behavioural impacts following receipt of Scheme data.

With CAFRE providing the training associated with the scheme, empowering farmers with individualised SNHS data helps them tailor nutrient application to crop need, improve nutrient use efficiency and reduce the risk of excess loss to waterbodies. This helps increase the return on inputs, builds resilience and improves the environmental sustainability of farm businesses. Survey research carried out by Leeds University during pre-Scheme pilots (2017-2019) evidenced that providing farmers with detailed, individualised soil analysis data led to more informed decision making and positive behavioural change[27]. This survey work continues in the full SNHS rollout.

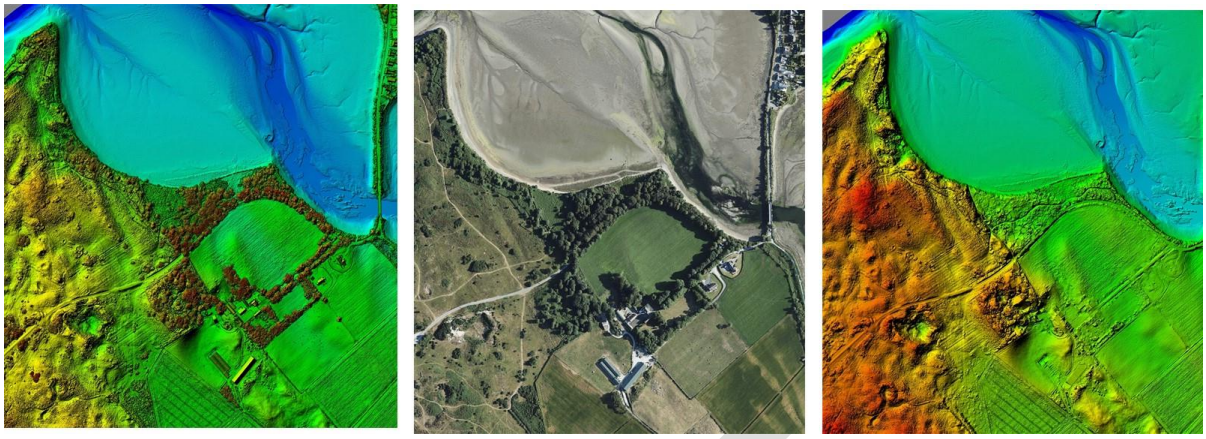
When complete, the SNHS will establish independent, verifiable NI datasets of baseline soil nutrients, farm carbon estimates and LiDAR derived runoff risk, and above ground biomass mapping. These baseline datasets will help shape evidence-based policy making and enable change to be assessed as NI agriculture and the wider economy transitions and adapts to a lower carbon future.

[27] The role of experiential learning in the adoption of best land management practices https://www.sciencedirect.com/science/article/pii/S0264837721001204

The third Climate Change Risk Assessment climate risks associated with the Nature theme are detailed in the following table:

Risk number and Receptor	Nature of risk/opportunity		Urgency Score
N1. Terrestrial species and habitats	Changing climatic conditions and extreme events, including temperature change, water scarcity, wildfire, flooding, wind, and altered hydrology (including water scarcity, flooding and saline intrusion)	RISKS	More action needed
N2. Terrestrial species and habitats	Pests, pathogens and invasive species	RISKS	More action needed
N3. Terrestrial species and habitats	New species colonisations	OPPORTUNITIES	Further investigation
N4. Soils	Changing climatic conditions, including seasonal aridity and wetness	RISKS	More action needed
N5. Natural carbon stores, carbon sequestration and GHG emissions	Changing climatic conditions, including temperature change and water scarcity	RISKS & OPPORTUNITIES	More action needed
N8. Forestry	Pests, pathogens and invasive species	RISKS	More action needed
N11. Freshwater species and habitats	Changing climatic conditions and extreme events, including higher water temperatures, flooding, water scarcity and phenological shifts	RISKS	More action needed
N12. Freshwater species and habitats	Pests, pathogens and invasive species	RISKS	More action needed
N13. Freshwater species and habitats	New species colonisations	OPPORTUNITIES	Sustain current action
N14. Marine species, habitats and fisheries	Changing climatic conditions, including ocean acidification and higher water temperatures	RISKS	More action needed
N15. Marine species, habitats and fisheries	Changing climatic conditions	OPPORTUNITIES	Further investigation
N16. Marine species and habitats	Pests, pathogens and invasive species	RISKS	More action needed
N17. Coastal species and habitats	Coastal flooding, erosion and climate factors	RISKS & OPPORTUNITIES	More action needed
N18. Landscape character	Climate change	RISKS & OPPORTUNITIES	Further investigation
ID10. Risk multiplication to the UK	Interactions and cascades of named risks across systems and geographies	RISKS	More action needed

Case Study 5: Coastal Evidence Gathering in Northern Ireland



Images from the Topographic LiDAR and Orthophotography survey in 2021 (Dundrum Bay)

Northern Ireland's coastline is facing increasing pressure from the impacts of climate change; sea levels are rising, and more frequent and intense storms are impacting the coast. Given the cross-cutting nature of impacts this is creating at the coast, it is important that a collaborative approach is taken to develop solutions for climate resilience. The Northern Ireland Coastal Forum, established in 2015, has enabled collaboration by bringing together Government Departments, Local Authorities and the National Trust, to encourage a more strategic approach to coastal management. Early commitment was made by the Coastal Forum to address the shortfall of scientifically robust data on the Northern Ireland coastline and how it is changing.

As a member of the Coastal Forum, the Department of Agriculture, Environment and Rural Affairs' (DAERA) Marine & Fisheries Division has invested in the region of £2.2m on evidence gathering at the coast since 2021. After significant stakeholder engagement on the evidence requirements, DAERA commissioned projects to be undertaken by private companies, academia and other government departments. The evidence collected so far includes acquisition of high resolution topographic and bathymetric LiDAR (Light Detection and Ranging), orthophotography and satellite-derived bathymetry, as well as historical shoreline analysis from Ordnance Survey maps and aerial photography and coastal geological surveys of both the superficial and bedrock geology.

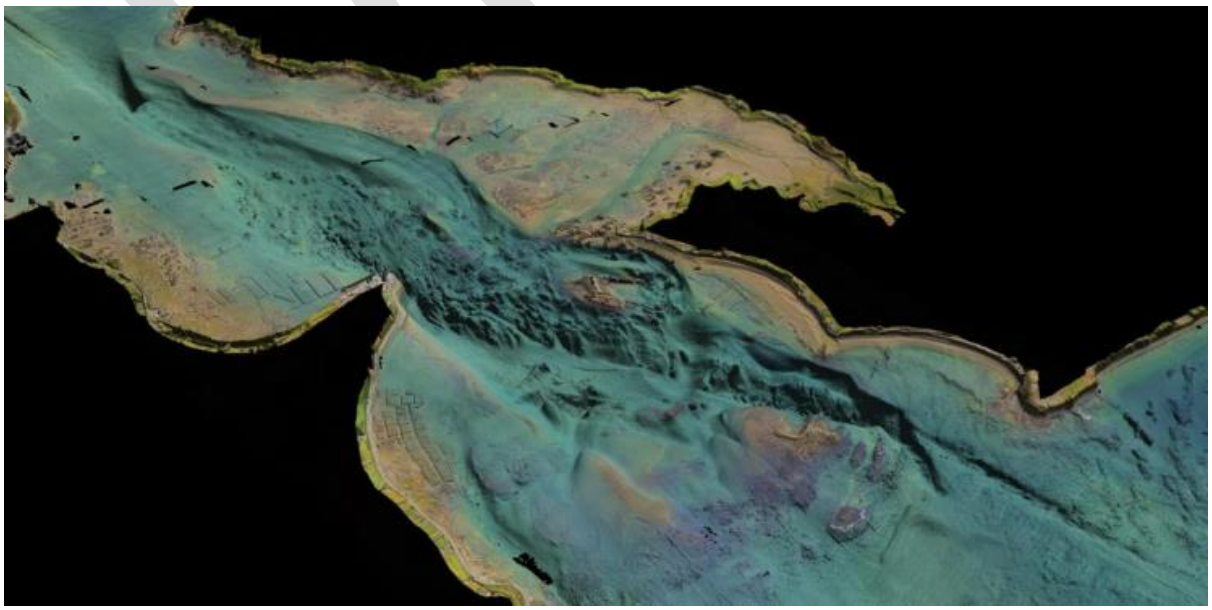


Image from the Bathymetric LiDAR survey in 2023 (Carlingford Lough)

All this evidence gathering has provided scientifically robust data on the coast. The historical data analysis provides a detailed understanding of the coast's position and geometry over annual to decadal time periods, providing a dynamic picture of how the coastline has changed since the start of the early 1800s. Meanwhile, the high-resolution LiDAR and orthophotography provides a detailed baseline of the coast and nearshore environments, that will allow future change to be analysed and quantified from an ongoing programme of repeat surveys.

All data collected is publicly available and free to all for use. To facilitate this, DAERA's Marine & Fisheries Division launched the Northern Ireland Coastal Observatory in October 2023. The Observatory was built using ArcGIS Experience Builder and it is hosted on ArcGIS Online, a platform which enables users to visualise and analyse the coastal datasets and their metadata in 2D and 3D formats on a Map Viewer, as well as via web services. A Coastal Information Tool provides a synopsis of all the evidence collected at 140 points around the coast, outlining how the coast has changed and how it's likely to do so in the future in light of climate change.

The Coastal Observatory provides a platform for stakeholders, accurately detailing how the Northern Ireland coast is changing. It enables a better understanding of the nature and scale of coastal change in Northern Ireland and empowers decision-makers with information that can be used to ensure more sustainable coastal management as we move forward in light of climate change. Work will continue on developing this platform, increasing functionality, expanding datasets and furthering analysis of evidence collected. As more evidence becomes available, Executive Departments and Local Authorities will be better informed to develop policies and plans which will build resilience and inform adaptation to the impacts of climate change on our coastal areas.

Chapter 5: Working Land and Seas

Image 2-5: Co. Antrim (Larry Ferreira, Unsplash)

This thematic area focuses on the importance of our terrestrial, fresh water and marine resources in providing stability to society through the crucial role they provide in the NI economy and also in providing the very food we eat. While the preceding Nature theme was concerned with how our natural capital provides the ecosystems essential to support our local biodiversity, the Working Lands and Seas theme is reflective of how Northern Ireland's natural capital contributes to the human ecosystem all of us rely on.

Whether it be fishing, aquaculture, horticulture, or agriculture, farming on land or at sea is a practice as old as civilization itself. For all this time, the climate has played a fundamental role in the seasonal nature of the sectors with yields and harvests being strengthened or suppressed as a result of fluctuations. Many of us will have heard of the El Niño weather phenomenon: a global climate phenomenon which results from variations in winds and sea surface temperatures over the southern Pacific Ocean. These events, when they occur, have dramatic consequences on the global climate through their distortion of normal weather patterns and are responsible for far reaching impacts such as bumper anchovy harvests off the Argentine coast and devastating droughts in Australia. Climate projections for Northern Ireland, in the decades ahead, highlight the potential of similarly dramatic impacts both on and off our shores as increased rainfall during winter months, contrasted with hotter drier summers puts further strains on the land and water resources we rely on if we do not take action to reduce our greenhouse emissions and limit global warming.

Image 2-6: Flooded field in Rathfriland (UFU)

We are already seeing wetter winters with increased rainfall and a greater number of wet

days overall. The impacts of this are felt across the farming and forestry sectors through impacts on tree growth and stability from waterlogged conditions limiting forestry drainage as well as preventing fields from being ploughed, planted or fertilised by machinery. This has already had significant impacts on yields in the UK affecting both livestock and crops.[28]

Image 2-7: Example of clinical presentation of bluetongue in sheep (Animal & Plant Health Agency)

Impacts of this increased rainfall, combined with storm events can be felt in the aquaculture sector too as greater runoff into coastal areas may result in higher sediment displacement and loading, causing stress or physical damage to fish and shellfish as well as aquaculture infrastructure. An increased frequency of storm events resulting in flooding could also result in the increased potential for discharge of pollutants which could also impact upon aquaculture health. This would be in addition to what is already being felt from an increase in sea level, and sea surface temperature, where invasive species are moving into our waters as well as the emergence of new and novel pathogens which may impact on fish stock, health, and viability[29].

An example of this in the farming sector is the Bluetongue Virus -BTV-3, which is a viral disease spread by insects and affects all ruminants, mainly sheep and cattle. This virus is spread by certain species of biting midges which have been able to move north from Europe into the UK due to increasing temperatures.

In contrast, to the impacts of wetter winters, our summers are expected to be hotter and drier, bringing with them increased frequencies of extended droughts similar to that seen in the summer of 2022 which coincided with the first issuing of a level 4 heat health alert in the UK since its introduction in 2004[30]. Prolonged periods of hot, dry weather conditions can have significant impacts on crop growth and in particular grass growth and supply on farms. In the first instance grass is scorched in the fields, removing it as a source of fresh feed for livestock, and also reduces what can be cut and stored for the winter. This can force winter feedstock to be used in the summer as a supplement and as it may not be able to be adequately replaced prior to the winter months it may result in further knock-on impacts to feedstock supply in the winter months.

The CCC in its independent assessment of climate risk to the UK however also recognise that a changing climate may equally bring about opportunities for all sectors of farming through the changing conditions allowing for new species of fish, trees or crops which previously would not have been able to survive in our climate to grow and thrive. Early adaptation is essential to both protect against the negative impacts of climate change and to take full advantage of any opportunities which might emerge.

[28] https://www.theguardian.com/environment/2024/apr/10/uk-food-production-down-record-rainfall-farmers
[29] https://pure.uhi.ac.uk/en/publications/impacts-of-climate-change-on-aquaculture
[30] https://rmets.onlinelibrary.wiley.com/doi/10.1002/wea.4531

Case Study 6: Ballinderry Rivers Trust - Sustainable Drainage on Farms

Managing farmyard dirty water run-off is a significant environmental challenge that, if handled improperly, has detrimental effects on freshwater ecosystems, and in turn animal and human health. Extreme weather events like heavy rainfall and flooding (2023 being Northern Ireland's third wettest year on record), heightens the risk of slurry overflow, threatening food security as farmers become unable to maintain production while avoiding ecological harm and damages to their own operations. To address these concerns, the Ballinderry Rivers Trust, supported by the Department of Agriculture, Environment and Rural Affairs and the Water Innovation Network, implemented five test sites in the Lough Neagh catchment area between 2020-2022. These trials combined innovative trench drainage systems with nature-based solutions, including Russian comfrey and willow plants, to manage dirty water runoff by slowing, redirecting, and absorbing it before it reached local rivers.

Dam trench system visual inspection by Alan Keys from the Ballinderry Rivers Trust (Climate NI)

The drainage systems piloted have two key components. First, a diversionary structure, comprised of swales (open or pebbled trenches), is installed along field boundaries to slow and control water flow. The main open trenches are designed with "check dams" to prevent overflow in rainy seasons, and act as reservoirs during drier periods, while stoned swales and perforated pipes are added to further redirect and drain excess water when it reaches a certain level in the main swale. Sluice gates and slurry traps are included to further control overflow risks, ensuring that slurry remains contained even during extreme rainfalls.

Second, the system incorporates a planting scheme using Russian comfrey (*Symphytum x uplandicum*), a perennial plant with deep taproots that absorb and lock in nutrients, including carbon, that would otherwise be washed away in groundwater. The comfrey is planted alongside the swales and acts as a "mineral dam," preventing harmful nutrients from reaching watercourses. The variety used, Bocking 14, does not spread via seed, making it a non-invasive choice for this system. Willow strips are added as an extra safeguard to absorb any residual runoff. The comfrey also provides additional benefits, producing highly nutritious biomass for livestock feed and fertiliser.

The trials have shown encouraging results. In all but one location, where soil conditions were unsuitable, the systems effectively managed dirty water runoff. Water quality assessments in downstream areas confirmed substantial improvements. The combination of low-tech and nature-based solutions enables farmers to maintain food production without causing environmental harm. Furthermore, the Russian comfrey contributes to a more circular farming system by producing biomass that can be turned into liquid fertiliser or used as protein-rich silage, reducing reliance on ryegrass monocultures and imported feedstocks.

These drainage systems also benefit local biodiversity. The swales create small wetland habitats that function similarly to hedgerows, encouraging wildlife. Additionally, comfrey plants, being pollinator-friendly, support arable production. Despite the benefits, the systems are not universally applicable, as success depends on soil type and careful design to achieve appropriate gradients. Costs are also relatively low, with a recent system implementation priced around £7,000.

Freshwater biotic surveying (Climate NI)

Further evaluation is necessary to assess long-term performance, particularly in less favourable terrains. However, the trials have demonstrated that integrating trench drainage with nature-based solutions holds promise for making Northern Ireland's farms more resilient to extreme weather events and slurry overflows. With continued refinement and broader adoption, this approach could offer a sustainable, scalable solution to the challenge of nutrient and water management in agriculture.

The third Climate Change Risk Assessment climate risks associated with the Working Land & Seas theme are detailed in the following table:

Risk number and Receptor	Nature of risk/opportunity		Urgency Score
N4. Soils	Changing climatic conditions, including seasonal aridity and wetness	RISKS	More action needed
N5. Natural carbon stores, carbon sequestration and GHG emissions	Changing climatic conditions, including temperature change and water scarcity	RISKS & OPPORTUNITIES	More action needed
N6. Agricultural and forestry productivity	Extreme events and changing climatic conditions (including temperature change, water scarcity, wildfire, flooding, coastal erosion, wind and saline intrusion).	RISKS & OPPORTUNITIES	More action needed
N7. Agriculture	Pests, pathogens and invasive species	RISKS	More action needed
N8. Forestry	Pests, pathogens and invasive species	RISKS	More action needed
N9. Agricultural and forestry productivity	New/alternative species becoming suitable	OPPORTUNITIES	Further investigation
N10. Aquifers and agricultural land	Sea level rise, saltwater intrusion	RISKS	Watching Brief
N11. Freshwater species and habitats	Changing climatic conditions and extreme events, including higher water temperatures, flooding, water scarcity and phenological shifts	RISKS	More action needed
N12. Freshwater species and habitats	Pests, pathogens and invasive species	RISKS	More action needed
N13. Freshwater species and habitats	New species colonisations	OPPORTUNITIES	Sustain current action
N14. Marine species, habitats and fisheries	Changing climatic conditions, including ocean acidification and higher water temperatures	RISKS	More action needed
N15. Marine species, habitats and fisheries	Changing climatic conditions	OPPORTUNITIES	Further investigation
N16. Marine species and habitats	Pests, pathogens and invasive species	RISKS	More action needed
ID10. Risk multiplication to the UK	Interactions and cascades of named risks across systems and geographies	RISKS	More action needed

Part 3: Food Security

Image 3-1: Food supply (DAERA)

Objective

We will work with local industry stakeholders and producers to strengthen the resilience, sustainability and prosperity of our local agri-food and fisheries sectors in the creation of a sustainable food system that protects and enhances our natural environment, as well as supporting the sectors to invest in systems to assess climate risks and vulnerabilities and plan adaptation throughout their supply chains to ensure we continue to supply safe and sustainable food both at home and abroad.

While agriculture accounts for 75% of our land use in Northern Ireland[31], our relationship with the foods we eat is complex. As well as producing food for Northern Ireland, our agrifood and seafood sectors also contribute towards overall UK food production, as well as exporting food and produce to further afield such as to Europe. We however also rely on imported foods, produce and ingredients from other countries.

A variety of stakeholders work closely to ensure the smooth operation of this complex system, ranging from individual farmers, fishers, and traders to distribution network operators, to

[31] Statistical Review of Northern Ireland Agriculture 2013 https://library2.nics.gov.uk/pdf/dard/2014/EEUT.pdf

multinational supermarkets. Food security in Northern Ireland is dependent on the production of high-quality food by our primary producers and the smooth operation of the supply lines that ensure that both locally produced food, and that brought in from Great Britain, or further afield, can reach our shelves in the best, freshest condition with the minimum of waste.

Recent events have seen the UK's food security landscape change significantly, with pressures applied which have stretched and tested its resilience. The UK's departure from the EU, the war in Ukraine and the COVID-19 pandemic have brought aspects of our supply lines and food security areas into the forefront of our thoughts, highlighting both vulnerabilities in the multi-facet system as well as its resilience and flexibility.

While the impact of climate change on local food production and the food supply chain become better understood, it is clear there is more work to be done in preparing for the challenges ahead. Industry players must work together to diversify and strengthen local production and supply if we are to make the most of climate opportunities and mitigate the impacts of our changing climate.

Chapter 6: Food Security

The supply of varied, high-quality, fresh food is something we have grown to expect as a constant in our lives. So much so, that for much of our time we do not have to think about how our food comes to us or whether we will be able to choose from the rich selection of products we are accustomed to when we do our shopping. However, the systems and supply chains which provide this service are highly complex and multifaceted, dependent on a mix of local production and supply chains of varying length and complexity. Food Security is concerned with the protection of these systems and supply chains, and it is true that chains are only as strong as their weakest link. It has become clear from recent events that more work needs to be done to improve the resilience of these supply chains and so strengthen our food security.

Image 3-2: Vegetable selection (Hanna Long, Unsplash)

Our domestic production and productivity play an important role in Northern Ireland's food security and in the UK as a whole. Currently, the UK has a productive agricultural sector and agri-food industry that sees about 54% of the actual food on plates produced in the UK, this includes the majority of grains, meat, dairy and eggs[32]. The biggest medium to long term risk to this domestic production is from climate change with key impacts on soil degradation, drought, flooding and disease, with long term impacts from climate change likely to have negative consequences for the proportion of high-grade arable farmland available in the UK. We've already seen the impacts of some of these effects such as heavy rainfall and drought in the 2020 growing season which brought on a reduction of 40% of the wheat yield for that year[33]. With weather events like these predicted to increase in frequency and severity we can expect similar impacts to our domestic production in the years ahead. Increasing sea temperatures will also have consequences for fish stocks.

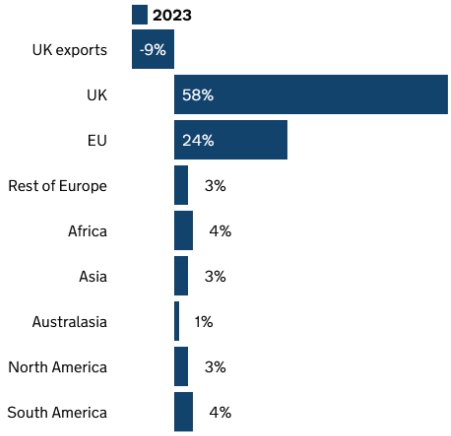


Figure 3-1: Origins of food consumed in UK, 2023 (Defra)

Food imports and exports play a significant role in our food supply. In 2023, 42% of the food on our plates in the UK was imported. Our producers also make use of export supply chains to ensure we can buy products we want while others are exported overseas for profit. Climate change is already impacting on the import and export of foods. Spain, a top producer of fruit and vegetables in the European Union has seen droughts of increasing severity, exacerbated by excessive heat with dramatic impact on its agricultural production. Tomatoes in particular are vulnerable to drought, and in 2023 drought

[32] United Kingdom Food Security Report 2021: Theme 2: UK Food Supply Sources

[33] https://assets.publishing.service.gov.uk/media/5fdcc2fad3bf7f3a30ec487f/structure-jun2020final-uk-22dec20.pdf

across Spain and Italy helped push the average tomato price up to a 50-year high[34].

In October 2024, areas of Spain suffered from severe flooding which was reported as damaging extensive areas of greenhouses, which are used for growing fruit and vegetables, in the Almeria area which threatens food supply across both Spain and throughout wider Europe.

Figure 3-2: Standardised Precipitation Evaporation Index, April 2023 (AEMET)

As well as the vulnerabilities of agricultural production, the supply lines that provide for this international exchange of products are also impacted by climate change. They are dependent on the stability of the environments they move through and increased rainfall, sea levels, temperatures and storm activity can all disrupt this stability and prevent the transport of food into or out of the country. In November 2023, Storm Debi wreaked havoc on Northern Ireland as it brought major disruption from landslides, fallen trees and flooding which led to power cuts, road closures and disruption to transport and distribution routes. Major weather events like this are set to increase in frequency and severity with impacts felt at all stages in a supply chain. All of these impacts to production and supply can have knock on impacts for public health as the disruptions can cause fluctuations in the price point of goods, stretching their affordability as demand outstrips supply.

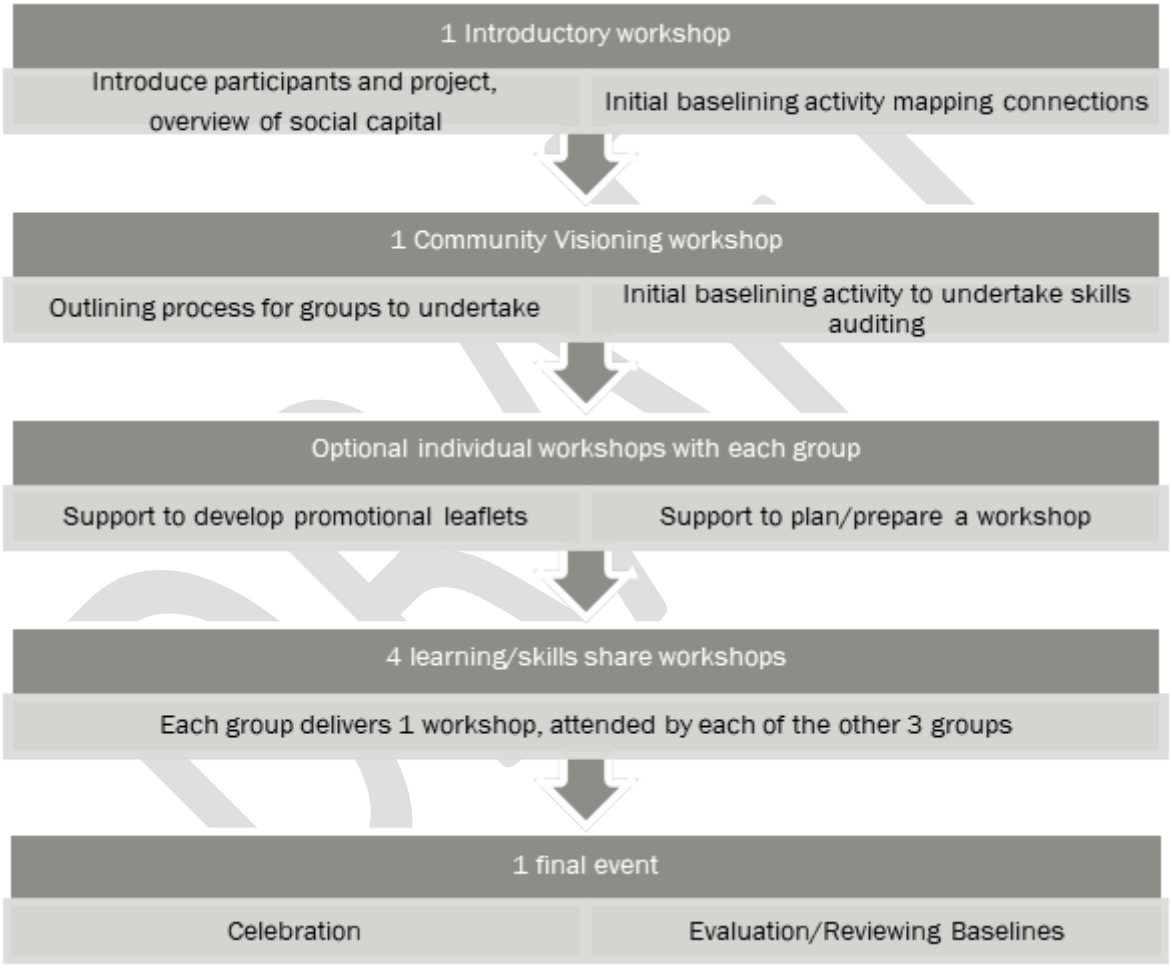
Locally the changes to the climate could have similar impacts to our ability to farm and produce food in the ways that we have done for generations, with the potential to impact on domestic production in the years ahead.

However, a key part of ensuring a resilient level of food security is looking for and seizing opportunities that the changing climate might bring. As conditions change and become less favourable to traditional crops for UK agriculture, they might also allow crops to thrive that have never been grown here before. Likewise, warming seas may provide opportunities for new fisheries associated with warm water stocks. Changes to the natural environment and climate conditions overseas might also bring about new opportunities for trade through other countries growing new crops, or new trade routes opening up. Continued research and investigation are required on these issues if we are to make the most of our adaptation to climate change and maintain the level of food security, we have become accustomed to.

[34] https://www.ons.gov.uk/economy/inflationandpriceindices/timeseries/cznj/mm23

Case Study 7: Social Farms and Gardens - Growing Resilience: Digging Deeper

The Growing Resilience project, launched in 2015, aims to enhance food security and community preparedness in Northern Ireland by connecting community growing groups. This initiative fosters collaboration, sharing of agricultural skills, and builds social capital to help communities prepare food systems shocks that are expected to increase due to climate change. According to the UN Food and Agricultural Organisation, these shocks will likely worsen by 2050 due to increasingly extreme weather events, heat, and consequent crop failures[35]. Led by Social Farms and Gardens NI, a charity that promotes community farming and growing across the UK, the project has received funding from the Big Lottery Fund, with the last phase running from July 2019 - July 2024.



Project Structure (Social Farms and Gardens)

The project focuses on strengthening community growing groups, which often face challenges such as disconnection, underfunding and a lack of representation in broader agricultural discussions. By creating a network of clusters across Northern Ireland, Growing Resilience aims to connect these groups with local councils, environmental Non-Government Organisations and decision-makers. These groups are not just beneficiaries but key partners in the project's success. A central aspect of the initiative is hospitality

[35] https://www.bbc.co.uk/news/science-environment-33910552

and food-sharing, which helps establish the strong bonds needed for effective collaboration. Participants are treated as whole individuals, with respect for more than just their contributions to the project.

While Social Farms and Gardens cannot fully sustain all the cluster networks alone due to limited resources, the project is structured so that these groups can eventually function independently. Several groups have successfully engaged with local councils and influenced policy. For example, the Belfast-based group "Reclaim the Commons" has released a manifesto, "9ft in Common," and influenced Belfast City Council policy through their recommendations, some of which were adopted.

Social Capital and Resilience Model (Social Farms and Gardens)

The project's key benefit lies in developing social capital within community growing groups, enabling them to share crucial skills and knowledge about local food production. This is particularly important in Northern Ireland, where many people lack the ability to grow food for themselves or their families. The global food system's reliance on complex supply chains, as seen during crises like COVID-19 and the Ukraine War, makes it more vulnerable to disruptions. Climate change further threatens food systems through shifting weather patterns and more frequent extreme events. Growing Resilience addresses these challenges by promoting adaptive methods such as permaculture, regenerative farming, and no-dig farming, while also fostering mutual aid networks that can be mobilised during emergencies.

Food and Hospitality Provided at Workshop (Social Farms & Gardens)

The project's success is measured largely through qualitative indicators, with evaluations reporting positive outcomes in terms of skill development, connection, and the fostering of "warm" social capital. Participants not only gain practical skills but also form supportive networks that can be crucial in times of crisis.

In conclusion, Growing Resilience empowers individuals with the skills needed to grow their own food and the social capital to mobilize collective resources and influence local governance. By building stronger, more connected communities, the project strengthens long-term food security and enhances resilience against future shocks from climate change.

Find out more here: https://www.farmgarden.org.uk/projects/growing-resilience-digging-deeper

The third Climate Change Risk Assessment climate risks associated with the Food Security theme are detailed in the following table:

Risk number and Receptor	Nature of risk/opportunity		Urgency Score
N4. Soils	Changing climatic conditions, including seasonal aridity and wetness	RISKS	More action needed
N6. Agricultural and forestry productivity	Extreme events and changing climatic conditions (including temperature change, water scarcity, wildfire, flooding, coastal erosion, wind and saline intrusion).	RISKS & OPPORTUNITIES	More action needed
N7. Agriculture	Pests, pathogens and invasive species	RISKS	More action needed
N9. Agricultural and forestry productivity	New/alternative species becoming suitable	OPPORTUNITIES	Further investigation
N10. Aquifers and agricultural land	Sea level rise, saltwater intrusion	RISKS	Watching Brief
N11. Freshwater species and habitats	Changing climatic conditions and extreme events, including higher water temperatures, flooding, water scarcity and phenological shifts	RISKS	More action needed
N12. Freshwater species and habitats	Pests, pathogens and invasive species	RISKS	More action needed
N13. Freshwater species and habitats	New species colonisations	OPPORTUNITIES	Sustain current action
N14. Marine species, habitats and fisheries	Changing climatic conditions, including ocean acidification and higher water temperatures	RISKS	More action needed
N15. Marine species, habitats and fisheries	Changing climatic conditions	OPPORTUNITIES	Further investigation
N16. Marine species and habitats	Pests, pathogens and invasive species	RISKS	More action needed
B6. Disruption to business supply chains and distribution networks	Extreme weather	RISKS	More action needed
H9. Food safety and food security	Higher temperatures (food safety) and extreme weather (food security)	RISKS	Further investigation
ID1. Food availability, safety, and quality	Decreasing yields from rising temperatures, water scarcity and ocean changes globally	RISKS	More action needed
ID2. UK food availability and exports	Increases in productivity and areas suitable for agriculture overseas	OPPORTUNITIES	Watching brief
ID6. Increased trade for the UK	Arctic ice melt opening up new trading routes	OPPORTUNITIES	Watching brief
ID7. International trade routes	Climate hazards affecting supply chains	RISKS	More action needed
ID10. Risk multiplication to the UK	Interactions and cascades of named risks across systems and geographies	RISKS	More action needed

Part 4: Infrastructure Services

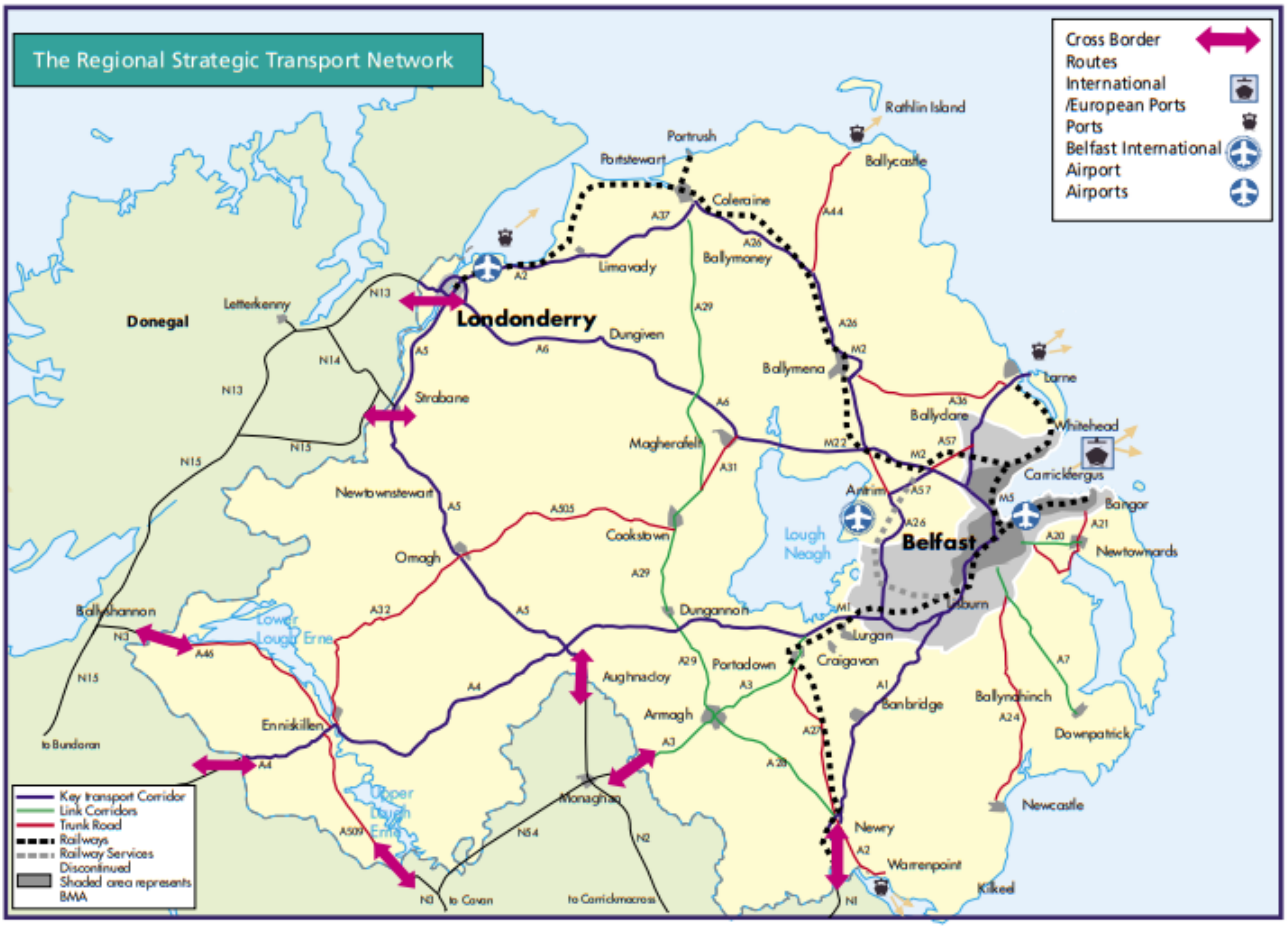


Figure 4-1: NI regional strategic transport infrastructure network (Department for Infrastructure)

Objective

Recognising the degree which infrastructure services rely upon each other to function effectively, we will collaborate across public sector organisations to identify vulnerabilities, manage these interdependencies and support the integration of climate adaptation into business operating models to ensure adaptation is delivered effectively and efficiently to ensure system level reliability, security and resilience across our infrastructure services and networks.

Our Infrastructure Services play a critical role in Northern Ireland as they are a key enabler of the economy and underpin key activities in day-to-day life. Infrastructure Services, such as transport, water and energy are very much interconnected and therefore any risk in one area of this theme can then have a knock-on impact on others.

Infrastructure Services will also have a major impact on Northern Ireland meeting Net Zero emissions targets. For example, encouraging green investment in infrastructure that will increase sustainability can be key to an effective green transition by delivering long term economic, social and environmental benefits and a reduction in carbon. The Energy and Transport sectors play a major role in contributing towards the achievement of net zero and therefore it is critical that these sectors are resilient to the current and future impacts of climate change.

Our Adaptation Objective for Infrastructure Services recognises the vital role that infrastructure services contribute to ensuring an environment that is resilient to both current and future climate changes. We understand the multidimensional aspects to infrastructure services and the many contributors to this theme. We aim to work with stakeholders within this sector to deliver and encourage adaptation measures that will deliver reliable and resilient Infrastructure Services and take advantage of the economic benefits adaptation to climate change can offer.

Within this Adaptation Program, the risks associated with Infrastructure Services from climate change have been distilled into the 4 thematic areas detailed in the following chapters:

- Chapter 7 - Water Supply,
- Chapter 8 - Energy,
- Chapter 9 - Telecommunications & ICT, and
- Chapter 10 - Transport.

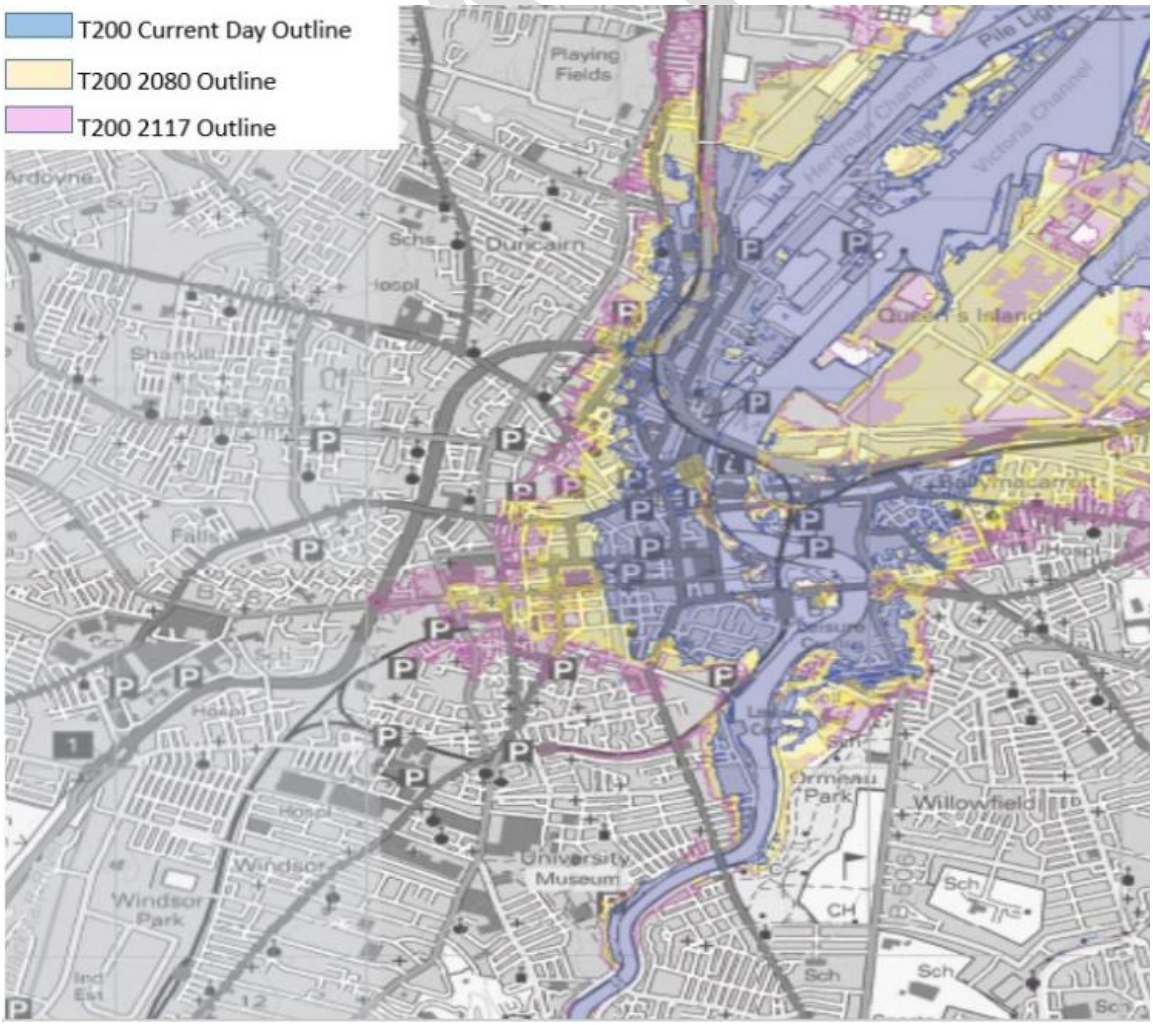
Case Study 8: Belfast Tidal Flood Alleviation Scheme (BTFAS)

The Department for Infrastructure's (DfI's) Belfast Tidal Flood Alleviation Scheme aims to provide a long-term approach to tidal flood risk management for Belfast.

This £30 million scheme comprises flood defences through five flood cells along the tidal reach of the River Lagan, including Lockview/Stranmillis, Ormeau, Ravenhill, Sydenham/East Belfast and Belfast Harbour/City Centre. Construction of the scheme commenced in July 2022 and was completed in December 2024.

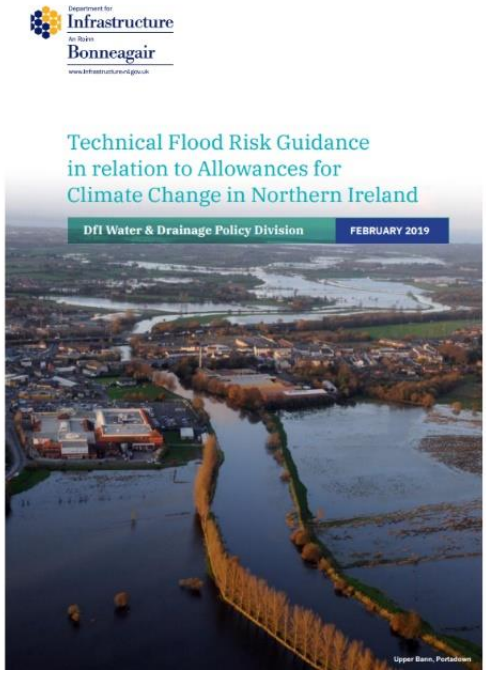
With the impact of climate change causing sea level rise this risk is predicted to increase to over 3,900 properties by 2080 (3023 residential and 902 commercial) and to over 7,300 properties by 2117 (5,865 residential and 1,466 commercial). The scheme is designed to the projected 2080 tidal flood level but includes future adaptability within the permanent structures to allow for any changes in projections.

As much of Belfast City Centre is between 1m to 2m below extreme tide levels, an extreme event would cause serious disruption to commercial premises, transportation networks, residential properties and the social fabric of the city. Additionally, any significant depth of tidal flooding within the city centre would be likely to drain away slowly as the capacity of the drainage network is exceeded which would also increase the risk of contamination of flood waters with foul sewage with increased clean-up and recovery consequences.



Map showing outline of T200 flood events and their extent (DfI).

The design of the project considered the UK Climate Projections 2018[36] (UKCP 18) the DfI "Technical Flood Risk Guidance in Relation to Allowances for Climate Change in Northern Ireland[37]" in consideration of projected sea level rise and defining design flood levels.



DfI Technical Flood Risk Guidance in relation to Allowances for Climate Change in Northern Ireland.

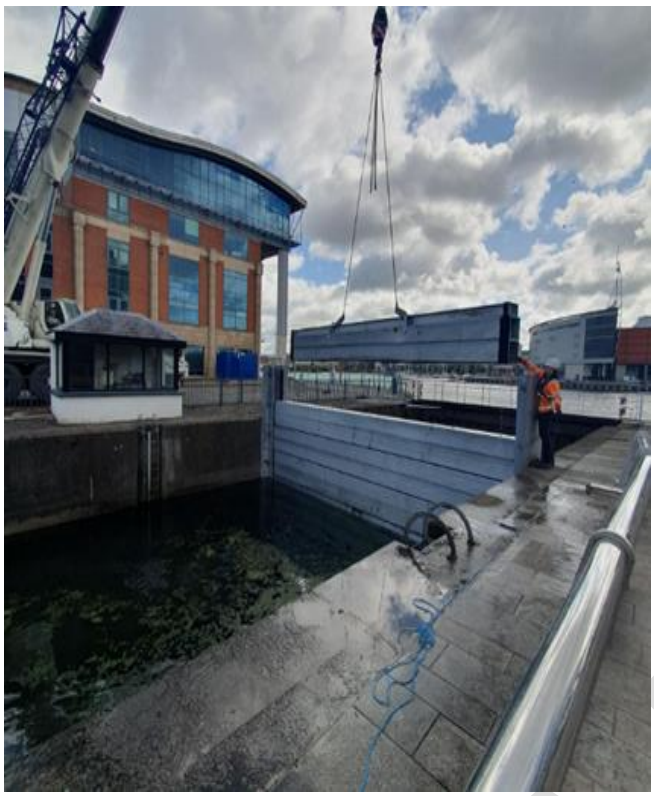
Glass Flood Wall installation at Donegall Quay May 2024 (DfI).

The scheme involved the design and construction of approximately 7.9km of defences including permanent reinforced concrete flood walls, an earthen embankment, glass flood defences, flood gates, demountable post and plank barriers, stoplogs and temporary K frame defences.

The scheme adopted an integrated approach, including:

- Reducing tidal flood risk to Belfast City Centre and parts of South and East Belfast.
- Alleviating risk of serious disruption to commerce and the transportation network due to tidal flooding.
- Reducing likelihood of contamination as tidal flooding overwhelms and mixes with existing drainage / foul sewerage system.
- Avoiding major disruption due to increased clean-up and recovery.
- Maintaining riverside amenity by the positioning and type of flood defense structure.
- Tree replanting programme and stone-cladding floodwalls to blend in with existing surroundings.
- Scheme designed to minimise in river working to mitigate potential environmental impacts.
- The scheme is designed with future adaptability within the permanent structures to allow for any increase in changes in climate change projections.

[36] https://www.metoffice.gov.uk/research/approach/collaboration/ukcp/index
[37] https://www.infrastructure-ni.gov.uk/publications/technical-flood-risk-guidance-relation-allowances-climate-change-northern-ireland

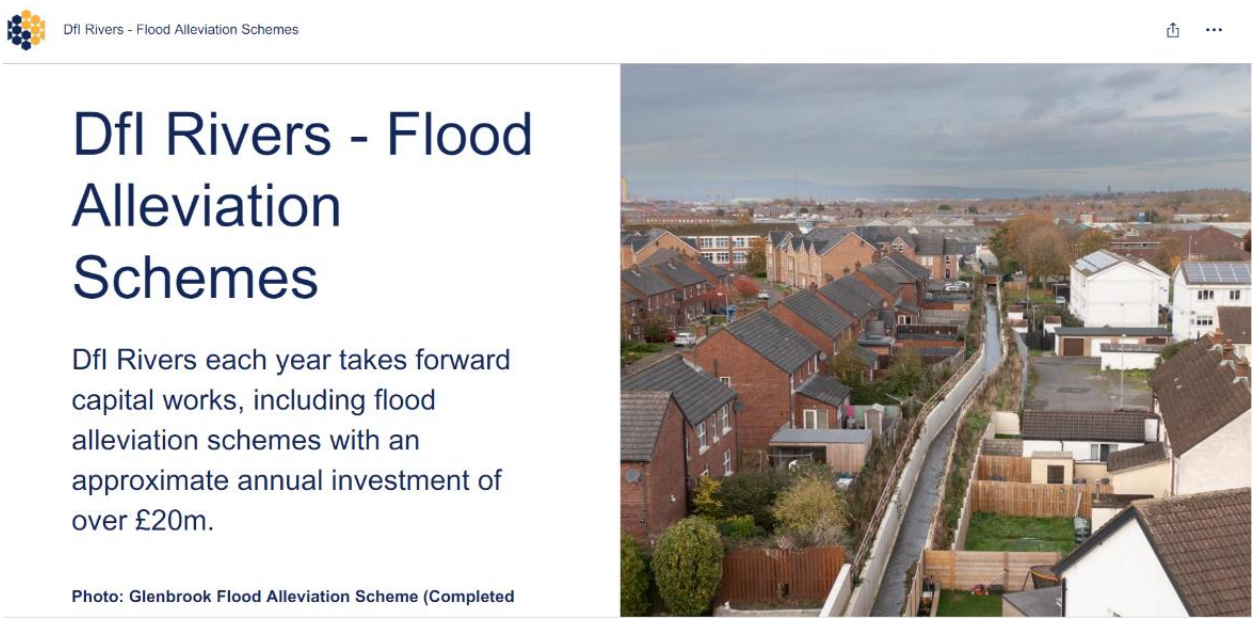


Stoplogs being deployed at Clarendon Dock August 2024 (DfI).

The properties identified at risk, include both commercial and residential at different locations along the River Lagan including vulnerable groups.

The scheme ultimately delivers enhanced protection for over 3000 homes and businesses from tidal flooding and maintained a healthy cost to benefit ratio.

Using standard flood damage analysis, over the 100-year life of the scheme the level of flood risk was estimated to cause damages valued today in excess of £168 million. This value excludes the additional impacts as a consequence of long duration flooding and surcharge of the foul sewer system in the commercial centre of Belfast. It also excludes the impact on the local economy as a result of unproductive employment and loss of access which is estimated at an additional £87 million (in accordance with current economic national appraisal guidance).



Further information on the scheme is available at the following links:

https://www.infrastructure-ni.gov.uk/articles/belfast-tidal-fas

https://storymaps.arcgis.com/stories/13d6d528e0a14dd993bdf9d837c09ea3

Information on other flood alleviation schemes is available at:

https://storymaps.arcgis.com/stories/32cb28e2dc744243bd2d2c48e7245008

Chapter 7: Water Supply

Sufficient water supply is essential for many aspects of life in Northern Ireland including energy, industry, agriculture, natural environment and public use. Because of this wide dependency, climate change could have significant impacts if there is not the necessary investment in adaptation action centred on this vital service.

While Northern Ireland is not expected to face water supply shortages, as severe as in other parts of the UK, it is still important to include consideration of climate risks in water supply plans[38] as highlighted in the Climate Change Committee's (CCC) review of the second Northern Ireland Climate Change Adaptation Programme (NICCAP2).

We have already seen the impact of climate change through increased frequency of flooding, storm events, prolonged periods with no rainfall, as well as more frequent periods of intense rainfall. All of these factors put pressure on, and so create challenges to, our water supply.

Image 4-1: Spelga Dam, June 2020 -3.3m below top water level (BBC)

These challenges were acutely felt during May 2020, when NI experienced a heat wave which saw an increased demand for water of 120 million litres. While supply had seen a reduction from 677 million litres per day in 2012[39] to 570 million litres per day during this period, this increase caused the reserves in impounding reservoirs to drop to levels which hadn't been seen since 1995. July 2021 saw a similar stress applied to our water supply when the average water usage went from 570 million litres per day to 750 million litres due to Northern Ireland experiencing its highest ever temperature.[40]

Unlike other parts of the UK, private households in Northern Ireland do not pay separate water charges. As usage is not metered there are no metrics for per capita consumption, individual household usage, or real-time demands on water supply. Therefore, this creates a data and monitoring issue as current indicators only target overall demand of both domestic and non-domestic usage.[38]

The impacts of flooding on water supply must also be considered. Surface water flooding (flooding directly from a rainfall event prior to the generated run-off reaching an established river or drainage channel) is a much higher risk than fluvial (where a river bursts its banks), or coastal flooding with 694 sites at some level of risk, particularly those with conventional piped sewer systems in dense urban areas. This is compared to 207 sites at risk from fluvial flooding and 26 at risk from coastal flooding. There is also evidence which suggests that this risk will increase due to climate change.[41]

[38] Adapting to climate change - Progress in Northern Ireland

[39] niwater.com/sitefiles/resources/pdf/2020/wrm/waterresourcesupplyresilienceplan-mainreport.pdf

[40] NI Water (2022) Annual Integrated Report & Accounts 2021/22, NIWAnnualReportweb.pdf (niwater.com)

[41] Sayers, PB., Horritt, M, Carr, S, Kay, A, Mauz, J., Lamb R, and Penning-Rowsell E (2020) Third UK Climate Change Risk Assessment (CCRA3): Future flood risk. Research undertaken by Sayers and Partners for the Committee on Climate Change. Published by Committee on Climate Change, London.

Figure 4-2: NI Water Climate Change Strategy Infographic (NI Water)

NI Water is a government owned company that provides water and sewerage services in Northern Ireland. They have various plans and polices in place with regards to meeting water demand. Northern Ireland Water's 25 year 'Our Strategy 2021-2046' has an aim to improve the resilience of the infrastructure of the public water supply.[42] They also have a draft Water Resource and Supply Resilience Plan to ensure there is sufficient water to meet future demand.[43]

The thematic area of 'Water Supply' is crosscutting in nature and climate risks and their impacts in this area will also impact on other themes such as nature, health and business. Therefore, when producing adaptation measures in this thematic area we must also consider any knock-on effects to these cross-cutting areas to ensure they are not negatively impacted.

[42] Our Strategy - Northern Ireland Water (niwater.com)

[43] Managing Northern Ireland's Water Resources - Northern Ireland Water (niwater.com)

The third Climate Change Risk Assessment climate risks associated with the Water Supply theme are detailed in the following table:

Risk number and Receptor	Nature of risk/opportunity		Urgency Score
N10. Aquifers and agricultural land	Sea level rise, saltwater intrusion	RISKS	Watching Brief
N11. Freshwater species and habitats	Changing climatic conditions and extreme events, including higher water temperatures, flooding, water scarcity and phenological shifts	RISKS	More action needed
N12. Freshwater species and habitats	Pests, pathogens and invasive species	RISKS	More action needed
N13. Freshwater species and habitats	New species colonisations	OPPORTUNITIES	Sustain current action
I1. Infrastructure networks (water, energy, transport, ICT)	Cascading failures	RISKS	More action needed
I2. Infrastructure services	River, surface water and groundwater flooding	RISKS	More action needed
I3. Infrastructure services	Coastal flooding and erosion	RISKS	Further Investigation
I4. Bridges and pipelines	Flooding and erosion	RISKS	Further investigation
I7. Subterranean and surface infrastructure	Subsidence	RISKS	Further Investigation
I8. Public water supplies	Reduced water availability	RISKS	Sustain current action
H10. Health	Water quality and household water supply	RISKS	Further investigation
B3. Business production processes	Water scarcity	RISKS	Further investigation
ID10. Risk multiplication to the UK	Interactions and cascades of named risks across systems and geographies	RISKS	More action needed

Case Study 9: NI Water - Satellite Leak Detection Technology

NI Water is open to new innovative ideas/opportunities in leakage detection, particularly with undetectable leakage from traditional methods, with the aim of reducing background leakage.

Satellite Imagery provides comprehensive, accurate and non-destructive remote sensing solutions for locating leaks in any potable water network. It provides full coverage of any type of terrain, plain or hilly, sparsely housed or densely populated high-rises by extracting information from Synthetic Aperture Radar (SAR) images taken above the ground. These are then converted into data points of underground water leaks (Points of Interest, POI).

The main objective of this project was to utilise Satellite Imagery to generate specific points of interest within NI Water's supply zones (including Distribution and Trunk Mains) for leakage investigations and detection surveys and assist NIW in achieving leakage reduction targets.

Costings

The total contract costs are estimated to be up to £2M over 4 years.

Benefits

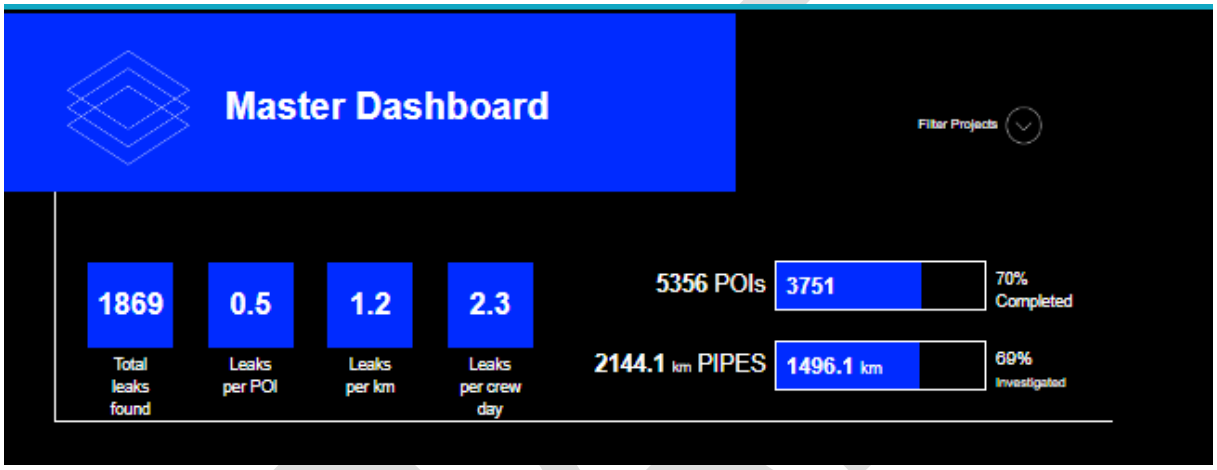
• Increased leakage detection efficiency

• Increasing the chance of finding undetectable leaks to reduce background leakage.

• Improve leak detection performance in urban and rural areas and trunk mains.

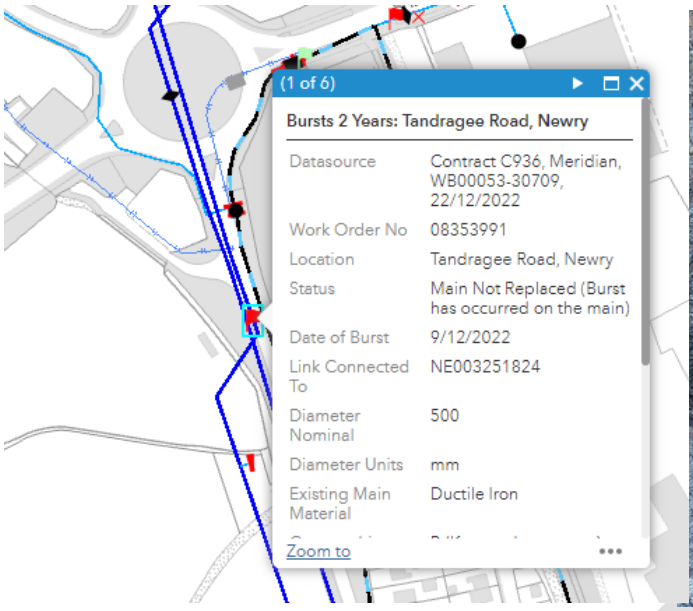
Results

On average over 50% of points of interest have returned leaks.



Point of Interest Highlighted Example

Satellite Imagery had highlighted an area (shown in orange below) for investigation, which led to the identification of a substantial leak on a 500mm Ductile Trunk Main, estimated at 2-3ltr/s. No visual indications of leakage were present as the water main is approx. 2.5 meters beneath the carriageway with a deep layer of asphalt preventing any water from rising.



In conclusion, the Satellite Leak Detection project has demonstrated significant advancements in identifying and addressing previously undetectable leaks within NI Water's supply zones. By leveraging cutting-edge satellite imagery technology, the project has improved leak detection efficiency and contributed to substantial water conservation efforts. With over 50% of identified points of interest resulting in confirmed leaks, the initiative underscores the potential of innovative solutions in enhancing infrastructure management and sustainability. The successful implementation and promising results pave the way for continued exploration and future adoption of such technologies.

Chapter 8: Energy

The Climate Change Committee's (CCC) independent review of NICCAP2 highlighted that further action is required in relation to energy supply in Northern Ireland to meet future adaptation needs.

To meet renewable energy consumption and emissions reduction targets, energy systems are currently undergoing a large-scale transformation to increase renewable energy production and move away from a reliance on fossil fuels. This transformation requires major investment in energy assets and networks but there is also an opportunity to build improved resilience to climate change in the energy system.[44]

Image 4-2: Slieve Kirk Wind Farm (SSE Renewables)

A resilient, renewable energy system supplied from a diverse mix of sources, with resilient network infrastructure will ensure a reliable energy supply that limits the potential for power outages to occur during severe weather events and will ensure that essential infrastructure and critical services are maintained. This will help to insulate us from impacts such as those seen during recent severe weather events such as storms Franklin and Dudley in February 2022 which caused major power outages throughout Northern Ireland. Future climate change projections highlight that severe weather events, such as these, will become more frequent and further highlight the need for the energy system to be climate resilient in its design, supply diversity and storage capacity to ensure that energy generation and supply can also continue during periods of low rainfall (which may impact upon hydroelectric production), periods of low wind speeds (which will impact upon wind generation) and periods of poor weather which may impact upon solar generation.

The Department for Infrastructure's Flood Risk Management Plan has stated that there are some energy infrastructures in Northern Ireland currently at risk from flooding. 3233 Northern Ireland Electricity Networks substations are at noteworthy risk from possible flooding.[45] This could have a major impact on electricity supply going forward during prolonged periods of heavy rainfall. Projected rises in summer temperatures could also affect the generation of electricity in the future with potential overheating of infrastructure during extreme heat events.

Image 4-3: Dale Farm's solar farm at Dunman, Cookstown (Dale Farm)

Renewable energy sources in Northern Ireland have improved from 14.8% annual average of electricity consumption coming from renewable sources in 2013 to 44.5% for the 12-month period October 2023 to September 2024. At present there is a high level of reliance on

[44] Adapting to climate change - Progress in Northern Ireland

[45] 2nd Cycle - Flood Risk Management Plan 2021-2027 | Department for Infrastructure (infrastructure-ni.gov.uk)

onshore wind as a renewable energy source in this area. From October 2023 to September 2024, wind accounted for 81.9% of all renewable electricity generated within Northern Ireland. This compares to 83.4% for the previous 12 month period (October 2022 to September 2023).[46], a greater diversity of renewable energy supply will help build resilience to variations in the weather and conditions which generate it.

The Energy thematic area is one which requires partnership on an East-West and North-South basis due to the grid and supply inter-connections which make up the energy system in Northern Ireland. North-South partnership takes an all-island approach by looking at the balance between supply and demand for an all-island electricity capacity market through projects such as the North/South Interconnector. The All-Island Generation Capacity Statement is issued annually by Soni Ltd, the System Operator Northern Ireland, and EirGrid Plc, the System Transmission Operator in Ireland, with the latest being published January 2024.[47] However, in February 2024 businesses called for a refocused all-island approach to energy policy and climate challenges[48] and the Shared Energy Futures report[49] reiterated that a lack of co-ordination would impact progress in these areas. In terms of East-West collaboration, a 500-megawatt interconnector between Scotland and Northern Ireland has been in place since 2001 and is operated by Mutual Energy, and in May 2023 plans were announced to build a new electricity link between Scotland and Northern Ireland by Transmission Investment.[50]

Figure 4-3: Transmission Investment LirlC Interconnector Project

The crosscutting nature of the Energy thematic area means the risks and their impacts in this area will also impact on other themes. Therefore, adaptation measures in this thematic area must also consider how they will impact these cross-cutting areas to ensure resilience is embedded throughout.

Electricity Consumption and Renewable Generation Statistics | Department for the Economy

[47] EirGrid SONI GCS 2023-2032

[48] Climate change: Business groups want all-island energy strategy - BBC News

[49] https://cdn.ibec.ie/-/media/documents/ibec-campaigns/shared-energy-futures-report.pdf?rev=a9d820cc7b1c436881261ea770ad252e

[50] Plans to build electricity link between Scotland and NI - BBC News

The third Climate Change Risk Assessment climate risks associated with the Energy theme are detailed in the following table:

Risk number and Receptor	Nature of risk/opportunity		Urgency Score
I1. Infrastructure networks (water, energy, transport, ICT)	Cascading failures	RISKS	More action needed
I2. Infrastructure services	River, surface water and groundwater flooding	RISKS	More action needed
I3. Infrastructure services	Coastal flooding and erosion	RISKS	Further Investigation
I4. Bridges and pipelines	Flooding and erosion	RISKS	Further investigation
I6. Hydroelectric generation	Low or high river flows	RISKS	Watching brief
I7. Subterranean and surface infrastructure	Subsidence	RISKS	Further Investigation
I9. Energy generation	Reduced water availability	RISKS	Watching brief
I10. Energy	High and low temperatures, high winds, lightning	RISKS	Further investigation
I11. Offshore infrastructure	Storms and high waves	RISKS	Sustain current action
H6. Household energy demand	Summer and winter temperature changes	RISKS & OPPORTUNITIES	More action needed
ID10. Risk multiplication to the UK	Interactions and cascades of named risks across systems and geographies	RISKS	More action needed

Chapter 9: Telecommunications & ICT

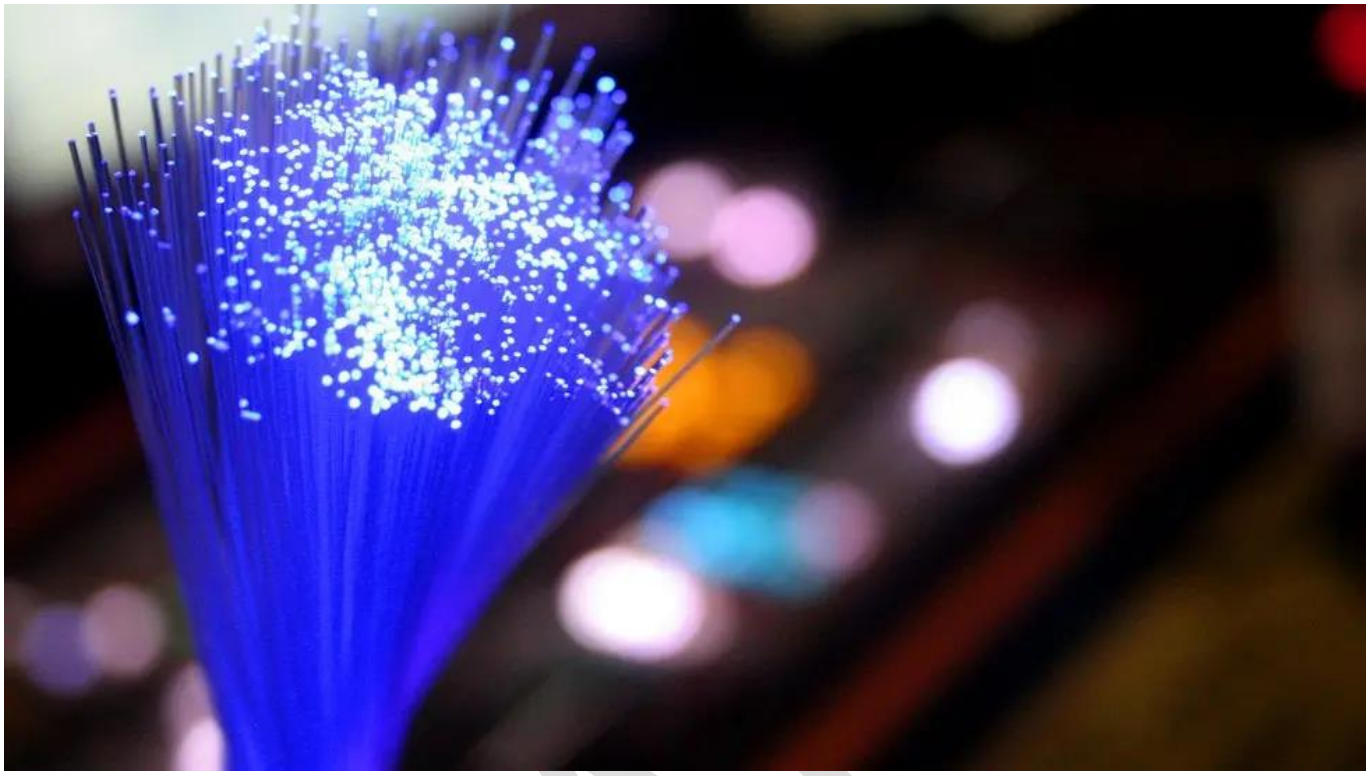


Image 4-4: Optical fibre cables used in high-speed internet connections (BBC)

The Climate Change Committee's (CCC) review of NICCAP2 highlighted gaps in plans to ensure telecommunications and Information and Communication Technology (ICT) infrastructure are resilient to climate risks. Given the growing reliance on these types of infrastructure, and the extent to which other types of infrastructure depend upon them, they recommended that this is a key gap which should be addressed in NICCAP3.[51]

Extreme weather, including flooding, storms, and heatwaves will have an impact on the provision of telecommunications and ICT, and it is predicted that significant events of this nature will occur more frequently over the coming years. The third Climate Change Risk Assessment (CCRA3) highlighted some of these risks:

- Failure of telecommunications leading to reduced capacity in a wide range of other essential services.
- Mobile base station power failure because of extreme weather.
- Local outages, given consumer reliability on digital technology today.
- Ground shrinkage can lead to failure of electricity, gas and water pipes, thereby damaging co-sited ICT infrastructure.
- High summer temperatures, as well as rapid fluctuations in temperature and humidity, pose challenges to data centres, which need to be kept cool to operate.
- Poorer performance of radio systems due to heavy rainfall.
- Greater international communication disruption due to increase sea temperature.[52]

[51] Adapting to climate change - Progress in Northern Ireland

[52] CCRA-Evidence-Report-Northern-Ireland-Summary-Final.pdf (ukclimaterisk.org)

Consideration also must be given to the increasing digitalisation of societal functions such as online banking, healthcare and benefit services. The move to digitalisation has seen 27% of the total NI bank branch network close by January 2023. These closures have been reported to impact on 25% of people living in rural areas and of those, 53% stated it had a major impact on their local community.[53] While increased digitalisation and branch closures are generally market driven, it leaves people living in rural areas particularly vulnerable to ICT related climate risks due to their greater dependence on digital services. In recent years, progress has been made in connecting those in rural areas to reliable, high-speed internet through Project Stratum. This is a joint project sponsored by the Department of Agriculture, Environment and Rural Affairs (DAERA), the Department for the Economy (DfE) and the UK Government, and delivered by Fibrus Networks following a procurement process[54].

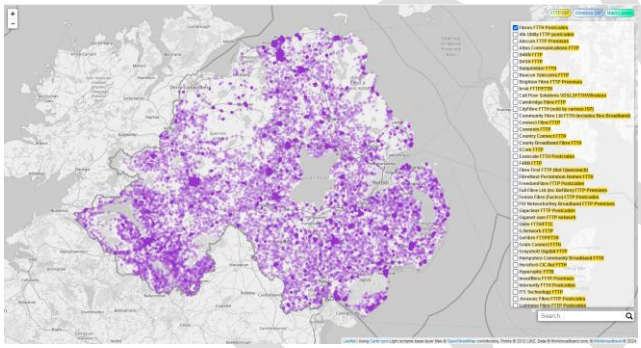


Figure 4-4: Postcodes in Northern Ireland where Fibrus network connections are available (Thinkbroadband)

Telecommunications and ICT networks are a reserved policy matter and therefore are dealt with at a UK level by the UK Government Department for Digital, Culture, Media, and Sport (DCMS). Digital infrastructure in Northern Ireland is privately owned and operated and these processes are regulated by Ofcom. This means there is limited data available to the DfE to assess how the risks highlighted in CCRA3 are being dealt with by suppliers. We will however continue to engage with DCMS who are addressing similar risks in the UK's third National Adaptation Programme through groups such as Electronic Communications Resilience & Response Group, which is a cross government and telecoms industry forum.

The thematic area of Telecommunications and ICT is crosscutting in nature and climate risks and their impacts in this area will also impact on other themes such as water supply, energy, transport, food security, businesses, buildings, towns and cities, community preparedness and response and finance which all, to varying degrees, require digital services. Therefore, when adaptation measures are being considered, knock-on effects to these cross-cutting areas must be considered to ensure they are not negatively impacted.

[53] https://www.consumercouncil.org.uk/news/vulnerable-consumers-and-those-rural-areas-most-impacted-27-bank-branches-northern-ireland

[54] https://www.economy-ni.gov.uk/articles/project-stratum-introduction

The third Climate Change Risk Assessment climate risks associated with the Telecommunications and ICT theme are detailed in the following table:

Risk number and Receptor	Nature of risk/opportunity		Urgency Score
I1. Infrastructure networks (water, energy, transport, ICT)	Cascading failures	RISKS	More action needed
I2. Infrastructure services	River, surface water and groundwater flooding	RISKS	More action needed
I3. Infrastructure services	Coastal flooding and erosion	RISKS	Further Investigation
I4. Bridges and pipelines	Flooding and erosion	RISKS	Further investigation
I7. Subterranean and surface infrastructure	Subsidence	RISKS	Further Investigation
I13. Digital	High and low temperatures, high winds, lightning	RISKS	Further Investigation
ID10. Risk multiplication to the UK	Interactions and cascades of named risks across systems and geographies	RISKS	More action needed

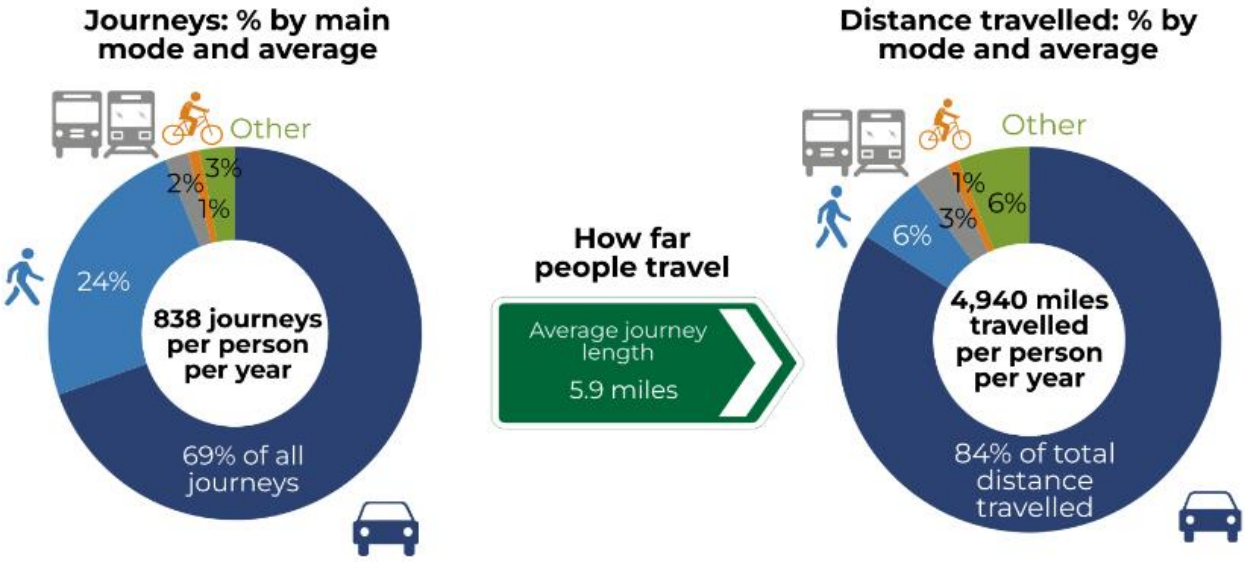


Figure 4-5: 2021 Travel Survey for NI (NISRA)

Transport in Northern Ireland is composed of a mix of modes of travel much like the rest of the UK. In Northern Ireland in 2021, car usage was the main mode of transport, representing 69% of all journeys made and accounting for 84% of the total distance travelled. Public transport (including bus and rail) in comparison only makes up 2% of total travel and 3% of the distance travelled[55]. This activity takes place over 25,790 kilometres of public road[56] and 354 kilometres of railway track[57]. While Northern Ireland's size makes air travel unnecessary within the province, in the first quarter of 2024, 1,889,856 passengers moved through our airports, which is an increase of 25% when compared with the same period in 2023[58]. We do of course make use of foot and pedal powered transport with 25% of all journeys taken on foot or by bike, but this figure only accounts for 7% of the total distance travelled.

Transport, and the infrastructure it requires is affected by various elements of climate change:

- Heavy rainfall, flooding, and storms
- Severe weather resulting in delays
- Extreme heat events
- Sea level rises

The effects of these factors have been seen in Northern Ireland in recent years with road, bus and rail services being disrupted by flooding and storm conditions causing issues such as fallen trees and closure of exposed bridges due to high wind speeds. Storms can also have an impact on ports and airports with complications coming from both snow and heatwave events. In January 2024 Storm Isha resulted in widescale disruption to the road network as well as bridge closures, and the cancellation of flights and ferries.[59] This was followed closely by Storm Jocelyn which struck only a few days later and

[55] https://www.infrastructure-ni.gov.uk/system/files/publications/infrastructure/tsni-headline-report-2021.pdf
[56] https://www.infrastructure-ni.gov.uk/system/files/publications/infrastructure/ni-transport-statistics-2020-2021.pdf
[57] https://www.data.gov.uk/dataset/0297b4a0-5cea-4c22-97cc-346c76df33ed/northern-ireland-railways-nir-railway-network
[58] https://flyinginireland.com/2024/06/northern-irelands-airports-statistics-for-q1-2024/
[59] Storm Isha: Power cuts and travel disruption across Northern Ireland - BBC News

resulted in more disruption across the road network as a result of heavy winds and fallen tress which also impacted rail and air travel, including causing the main road to the Belfast International Airport to be closed to traffic as a result of a fallen tree.[60]

Climate change projections highlight that we will see an increase in the severity and frequency of extreme weather events and in April of 2024, we also saw Storm Kathleen bring disruption to NI transport as its strong winds and heavy rain impacted on road, sea and air travel[61].

Image 4-5: Train damage from fallen trees (Translink)

The impact of these severe weather events can have knock-on consequences for transport infrastructure that have impacts that persist after the storm event itself. Stresses like this put added pressures on the condition of transport infrastructure, which reduces its resilience for dealing with subsequent weather events.

In Northern Ireland the Department for Infrastructure (DfI) has responsibility for transport policy along with their Arm's Length Body: Translink, who is Northern Ireland's main public transport provider. They collectively develop and deliver policies for roads and public transport infrastructure provision and the provision of bus and rail services.

The risks included in the transport theme also contain reserved policy matters relating to aviation and shipping which are dealt with at a UK level by the Department of Transport and the Civil Aviation Authority, while the airports and ports within Northern Ireland are mainly owned and operated by private companies. Devolved powers in these areas solely relate to land use planning and airport surface access issues.

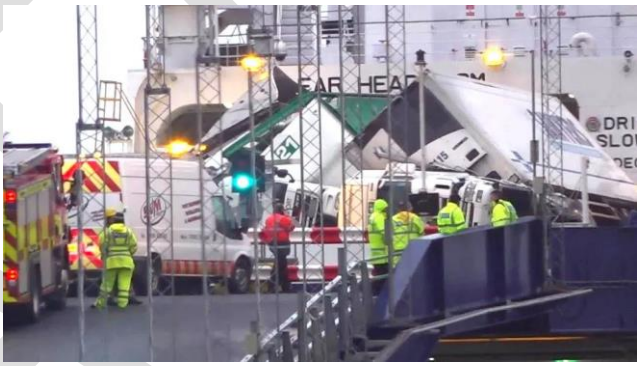


Image 4-6: Damaged lorries on Larne – Cairnryan ferry due to extreme weather during the crossing (BBC)

When producing adaptation measures in the thematic area of Transport we must also consider any knock-on effects as it is crosscutting in nature and climate risks and their impacts, will also impact on other themes such as food security, business, community preparedness and response, towns and cities and health.

[60] NI weather: Storm Jocelyn causes 'major disruption' to road network - BBC News

[61] https://www.bbc.co.uk/news/uk-northern-ireland-68746898

The third Climate Change Risk Assessment climate risks associated with the Transport theme are detailed in the following table:

Risk number and Receptor	Nature of risk/opportunity		Urgency Score
I1. Infrastructure networks (water, energy, transport, ICT)	Cascading failures	RISKS	More action needed
I2. Infrastructure services	River, surface water and groundwater flooding	RISKS	More action needed
I3. Infrastructure services	Coastal flooding and erosion	RISKS	Further Investigation
I4. Bridges and pipelines	Flooding and erosion	RISKS	Further investigation
I5. Transport networks	Slope and embankment failure	RISKS	More action needed
I7. Subterranean and surface infrastructure	Subsidence	RISKS	Further Investigation
I12. Transport	High and low temperatures, high winds, lightning	RISKS	More action needed
ID10. Risk multiplication to the UK	Interactions and cascades of named risks across systems and geographies	RISKS	More action needed

Part 5: People and the Built Environment

Image 5-1: Belfast 3D arial (Google Earth)

Objective

Recognising how dependent we are upon our built environment and the ability it has to shape and support our health and wellbeing, we will engage with community groups and organisations to increase community understanding of localised climate impacts, and their impact upon their health. By empowering communities to understand their risks and develop innovative solutions through making use of local knowledge and resources, we will build upon their shared experiences to target and address the climate risks specific to them to improve their climate resilience.

Climate related risks to people and the built environment are changing all the time. Increasing levels of rainfall, changing weather patterns, increased air temperatures and rising water levels are having a negative effect on our community's health, the buildings and the essential infrastructure needed for the wellbeing of the population.

The Third Climate Change Risk Assessment (CCRA3) states that the economic impacts of climate change, including damage to buildings and healthcare services, are higher in Northern Ireland and other devolved regions compared to England. Extreme weather events disrupt hospitals and can affect people's health and well-being. Heatwaves and extreme rainfall in NI have already caused disruptions to daily activities and services.

The effect of the climate changes we are already seeing presents new challenges to those in health and social care, planning, water and flood risk management, emergency management and community resilience.

Communities will also play a vital role in meeting adaptation targets. Often, they are the first responder in dealing with the aftermath of climate related events. They are usually the eyewitnesses as to how events unfold and therefore are a great source of information that can provide insights into emergency responses and allow for lessons learned. By engaging with local organisations in all adaptation solutions we can ensure that solutions will be community focused for that area.

Our objective for People and the Built Environment intends to explore and tap into the

experiences of our communities, the skills of our built environment and climate professionals, to develop strategies and solutions to make our towns and cities more resilient to the predicted effects of climate change. The importance of collaboration and the sharing of information and data on land and building-use, infrastructure, knowledge and skills cannot be overstated as we work towards achieving this objective.

There are four thematic areas containing the risks to People and the Built Environment, described in the following chapters:

- Chapter 11 - Towns & Cities,
- Chapter 12 - Buildings,
- Chapter 13 - Health, and
- Chapter 14 - Community Preparedness & Response.

Chapter 11: Towns and Cities

Image 5-2: Mill Street, Cushendall, County Antrim (Causeway Coast & Glens)

In Northern Ireland 60% of the population lives in an urban area. Our towns and cities are complex spaces relying on heavily used and interconnected infrastructure. As our population increases overall[62], the increase in urban population places further pressures on our buildings, transportation networks, communications networks, as well as key utility services such as power, water and sewage.

As well as providing homes for an increasing population, our towns and cities are rich with cultural heritage provided by the historic buildings, architectural landmarks and iconic greenspaces and features that make them up. They are places alive with activity, providing locations for over 40% of businesses[63] in addition to the people they support, and so the role they play in a vibrant and healthy population and economy cannot be overstated.

As an important provider of employment, food and transport, many of our towns and cities are built near water sources, either coastal or inland due to the natural resource benefits they provided. The safety and security this has traditionally provided is however under threat as climate change has seen increased rainfall and a rise in sea levels which has highlighted the need for, and importance of, effective flood communication, prevention, and alleviation systems; and storm water management systems.

[62] https://www.nisra.gov.uk/sites/nisra.gov.uk/files/publications/NI-In-Profile-November-2022.pdf

[63] https://www.nisra.gov.uk/publications/current-publication-and-idbr-tables-1

The Northern Ireland Flood Risk Assessment 2018[64] showed that 5% of all buildings in Northern Ireland are at risk of flooding and projected that climate change would see this number rise to 6.7% by 2080. As well as increasing the number of buildings at risk, the 2018 UK Climate Change Projections from the Met Office[65] forecast an increase in flooding events due to increased rainfall, sea level rise and increased frequency of extreme rainfall events. An example of such events are the storms which led to flooding in areas including Newry, Downpatrick, Portadown, Killyleagh and Ballyholme in October/ November 2023. These had a devastating impact on homes, business and livelihoods which the government made support funding (including one-off grants and rate relief available to effected businesses[66]) in response to the flooding events.

Image 5-3: Flooding in Downpatrick, November 2023 (BBC)

Progress has been made in monitoring properties at risk and coastal defence assets, as well as in planning for river and coastal flooding. The Department for Infrastructure (DfI) develops and maintains flood alleviation schemes aimed at reducing the impact of flooding from rivers and the sea[67].

In recent years extensive LiDAR (Light Detection and Ranging) survey work has been undertaken around the Northern Ireland coastline to improve the evidence base and awareness of coastal change and the impacts of our changing climate. The data gathered through this work has been made available on the Northern Ireland Coastal Observatory[68] and is covered in more detail in Case Study 5: Coastal Evidence Gathering in Northern Ireland, and in Case Study 12: Belfast Harbour - LiDAR Modelling to Map Risk and Response.

[64] https://www.infrastructure-ni.gov.uk/sites/default/files/publications/infrastructure/northern-ireland-flood-risk-assessment-report-2018-updated-may2019.pdf

[65] https://www.metoffice.gov.uk/research/approach/collaboration/ukcp

[66] https://www.executiveoffice-ni.gov.uk/news/further-financial-support-flooded-businesses-announced

[67] https://www.infrastructure-ni.gov.uk/articles/flood-alleviation-projects

[68] https://experience.arcgis.com/experience/b8454f3d62164518817e4c581b5555c8

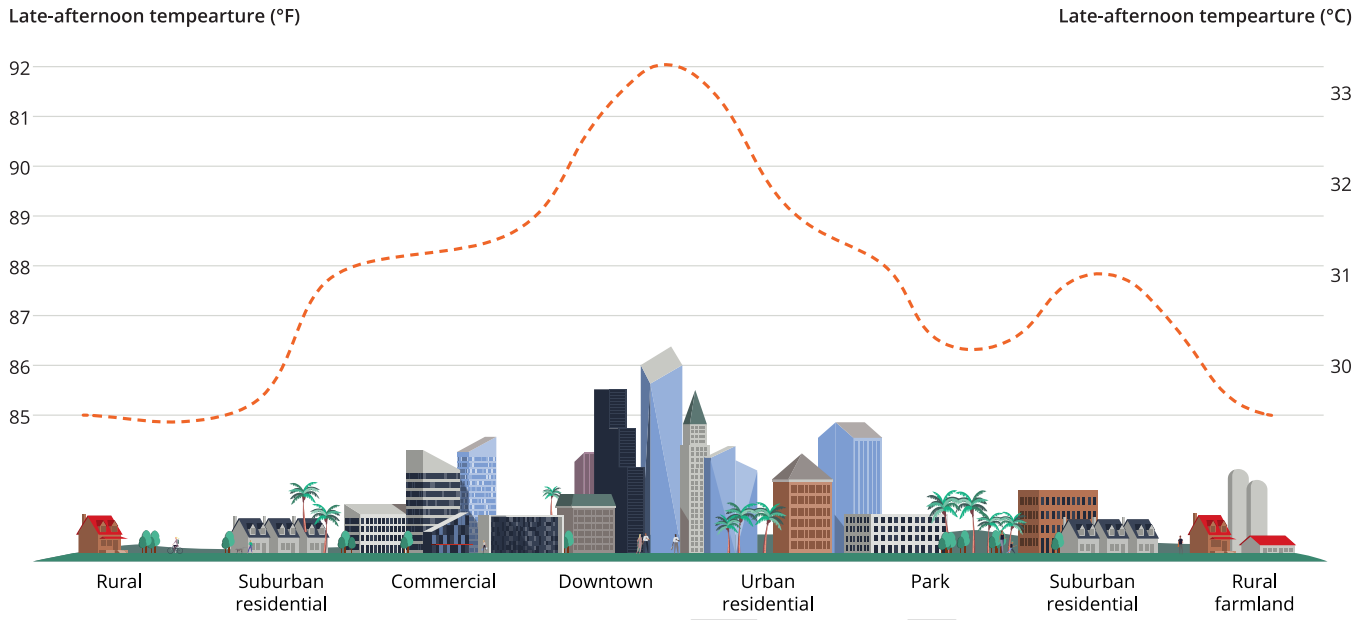


Image 5-4: Urban Heat Island Effect (World Meteorological Organisation)

Climate change impacts for our cities and towns doesn't just stop at flooding. Our cities and towns are also faced with challenges from the urban heat island effect[69] which is produced through the higher concentration of people, vehicles and concentrated heat sink environments such as tarmacked roads, footpaths and carparks.

This effect is exacerbated by the hotter drier summers projected for Northern Ireland, and from the heat-wave events we have seen in recent years. July 2021 saw the hottest recorded temperature for Northern Ireland when 31.3°C was recorded, and we have consistently seen periods of hotter weather including heatwave events occurring in early Autumn, such as September 2023[70]. The stresses these kinds of heat events can place on towns and cities can have impacts on the health of the people that reside in them, the buildings they inhabit and the infrastructure services they rely on.

It is important to recognise the important role that green spaces can play within our urban environment in mitigating the impacts of both heat and rain events. Nature based solutions such as planting trees and increasing vegetation have an inherent benefit to nature through their impacts on biodiversity, but additionally they can have multiple benefits for adaptation through the cooling effects they produce, by providing shade, and disrupting the concentration of heat sink environments such as roads and footpaths; and also through increasing the lag time between rainfall and its entry to the waterways through water absorption and storage.

Current and projected climate risks should be the basis of adaptation measures for our towns and cities. This thematic area will focus the efforts of government, local authorities and key stakeholders in building resilience into the urban environments many of us live in and work in.

[69] https://ukgbc.org/news/how-the-urban-heat-island-effect-makes-cities-vulnerable-to-climate-change/

[70] https://www.bbc.co.uk/news/uk-northern-ireland-66727497

The third Climate Change Risk Assessment climate risks associated with the Towns and Cities theme are detailed in the following table:

Risk number and Receptor	Nature of risk/opportunity		Urgency Score
H1. Health and wellbeing	High temperatures	RISKS	More action needed
H3. People, communities and buildings	Flooding	RISKS	More action needed
H4. Viability of coastal communities	Sea level rise	RISKS	Further investigation
I2. Infrastructure services	River, surface water and groundwater flooding	RISKS	More action needed
I3. Infrastructure services	Coastal flooding and erosion	RISKS	Further Investigation
ID10. Risk multiplication to the UK	Interactions and cascades of named risks across systems and geographies	RISKS	More action needed

Chapter 12: Buildings

Image 5-5: View across the River Foyle, Co. Londonderry (K. Mitch Hodge, Unsplash)

Northern Ireland has a diverse range of buildings of varying age, cultural and historical significance; and usage. These include our homes, businesses, schools, hospitals, visitor attractions, prisons, leisure facilities and cultural and historic buildings as well as State Care Monuments. Our buildings play such a fundamental part of our society, that their presence in our lives is often taken for granted. The significance they hold in our lives cannot be overstated and so a key presumption in the path to climate resilience is that our existing building stock should be retained and appropriately upgraded to improve energy efficiency, while new building stock will have resilience built into its design.

We have over 828,000 domestic homes,[71] more than 8,900 listed buildings[72] and in excess of 75,000 non-domestic buildings[73]. Our usage and interactions with all of them can play a role in contributing to, adapting to, or mitigating, climate change.

The increased temperatures we have been seeing during the summer months, especially the extreme heat events we have been experiencing with increased frequency,[74] is the first challenge that climate change brings to our building stock. As Northern Ireland's climate has been traditionally cooler, our building design has been concerned primarily with heat conservation, and in recent years steps have been taken to improve insulation and energy

[71] https://www.communities-ni.gov.uk/publications/northern-ireland-housing-statistics-2022-23

[72] https://www.communities-ni.gov.uk/articles/listed-buildings

[73] https://www.finance-ni.gov.uk/articles/ni-reval2026-frequently-asked-questions

[74] https://www.bbc.co.uk/news/articles/c2v0elxywedo

efficiency. While progress in this area is a positive step towards a well-adapted building stock, it is important to recognise that effective heat dissipation will become increasingly important as overheating of buildings has consequences for the structures of the buildings themselves, and also the health of its occupants. In particular for those more vulnerable members of our society with underlying health conditions who may be less able to adjust, withstand and cope with higher temperatures. Additionally, heat retention can have impacts on the productivity of workplaces, and so this consequence of climate change also has direct impacts on the health of our economy.

As well as higher temperatures, we are also experiencing more frequent, and prolonged cold snaps[75]. Despite the improvements to energy efficiency and insulation, older buildings in particular are often lacking adequate insulation making them poor in energy inefficiency, and so are particularly vulnerable during periods of cold weather. Working to retrofit these buildings will help to reduce this vulnerability and help to improve the energy efficiency of all our building stock which will mitigate the impacts of both low and high temperatures.

At present more than 60% of Northern Ireland households use oil boilers as their main source of heating[76]. Prolonged cold snaps requiring more heating usage not only leads to higher greenhouse gas emissions, but is also increasingly dependent on the resilience of global supply chains for its supply and delivery of fuel (discussed further in Part 6). However, progress in this sector is being made as new building stock moves away from using fossil fuels as the standard go-to for home heating sources.

Our buildings can also be impacted by the increased rainfall and frequency of storm events that Northern Ireland is experiencing as a result of climate change. High wind speeds have direct impact on building structures, in particular those in areas with trees nearby, while heavy, persistent driving rain can put added stresses on rooftops and guttering as well as potentially leading to water ingress which may cause damage and issues with damp which in turn may lead to mould growth which can cause health issues, in addition to reducing the energy efficiency of the building and increasing its heating costs.

The stresses and impacts of these, projected more frequent and severe storm events, can have a cumulative impact on tree safety and building structures, gradually weakening them until they reach breaking point.

Image 5-6: Impact of subsidence on a residential property (Claim Management Group)

Flooding from increased rainfall causes further problems for our buildings where it can cause long term structural damage, including to the foundations. Erosion of the earth from around the foundations can be caused by flooding and heavy rainfall, concentrated from broken guttering or downpipes and drains reaching capacity. In severe cases this can cause

[75] https://climatenorthernireland.org.uk/the-climate-challenge/extreme-weather-events-in-northern-ireland/

[76] https://www.nisra.gov.uk/system/files/statistics/census-2021-main-statistics-for-northern-ireland-phase-2-statistical-bulletin-household-spaces-and-accommodation.pdf

subsidence of the building, which has serious consequences for building integrity, even when only part of the foundations are affected.

This sort of erosion to the earth is of particular concern to coastal areas where rising sea levels and increased wave action, as a result of ocean warming[77], can have dramatic effects on the coastline and flooding events there. A technical summary report produced by the Climate Change Committee (CCC), as part of the third Climate Change Risk Assessment, focuses on the risks of flooding and coastal change, and found that 2,720 domestic properties on the coastline of Northern Ireland, as well as 19.5% of the coast is at risk of erosion and flooding. It goes further to warn that the largest increase in risk in Northern Ireland is related to coastal flooding, which is projected to increase by 550% by the 2080s in a high population scenario and with 4°C global warming at 2100 [78].

Image 5-7: Scrabo Tower, Newtownards (Department for Communities)

Many of Northern Ireland's most famous and iconic State Care Monuments are in exposed or coastal locations as they were purposely built in these locations for defence, transport of goods or as a strategic lookout. These include attractions such as Dunluce Castle, Scrabo Tower and Carrickfergus Castle amongst many other famous sites. Historic buildings are often susceptible to accelerated decay, and some of these sites have already experienced water ingress issues through the building fabric such as Scrabo Tower whilst others such as Dunluce Castle have required works to stabilise the very rocks on which they are built.

Adapting buildings to the impacts of climate change and ensuring our new building stock is designed to take account of it is imperative for Northern Ireland's climate resilience. The impacts from climate change can carry significant expense to remedy, and in severe cases repair is often impossible. Embedding climate resilience into our buildings will mitigate against these impacts and will have benefits to the health of our society and economy. It will require collaboration between the NI Executive Departments, local government, the private sector and communities themselves who will be crucial in implementing effective adaptation strategies and mitigating the adverse effects of climate change on Northern Ireland's buildings.

[77] https://www.nature.com/articles/s41467-018-08066-0

[78] https://www.ukclimaterisk.org/wp-content/uploads/2021/06/Technical-Report-The-Third-Climate-Change-Risk-Assessment.pdf

Case Study 10: Hall Black Douglas Architects - Adaptive Restoration of the Bank Buildings, Belfast

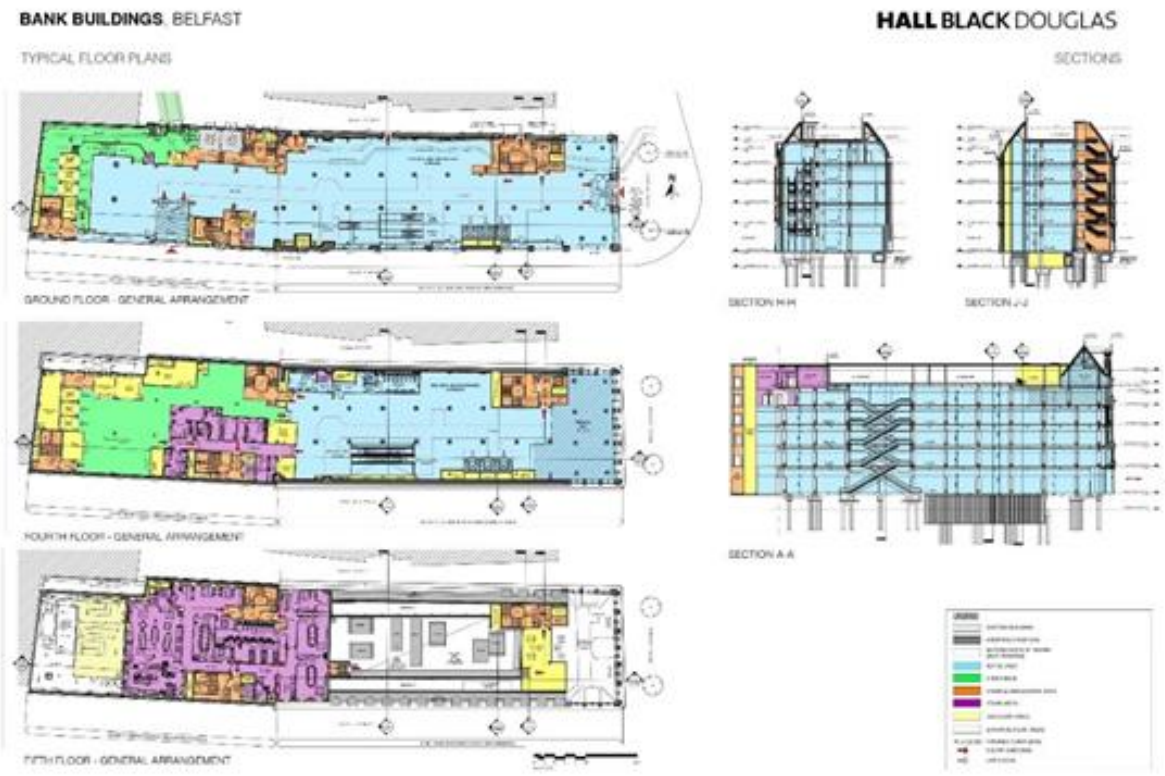
Restored Clock Dormer. Mervyn Black (Hall Black Douglas Architects)

The Bank Buildings, a historic landmark in Belfast city centre, suffered severe damage in a 2018 fire that destroyed its interior while leaving parts of the masonry façade intact. Owned by Primark since 1979, it was decided to restore the building to its original appearance, with significant adaptive measures to improve resilience against future climate impacts. Completed in October 2022, the project combined conservation principles with sustainability strategies to mitigate climate change impacts. The restoration involved two parallel projects: HBD Architects focused on restoring the historic façade, while JCA Architects created a new internal superstructure. A conservation-first approach was taken, following guidelines from the ICOMOS Charter and BS 7913:2013. Surviving masonry elements were carefully recorded, cleaned, and reused, with replacements made only when necessary. This allowed for maximum retention of the original masonry walls while improving its resilience.

Exterior elevation (HBD Architects)

Given its location above a culverted river in a high flood-risk zone, climate adaptation was essential. Flood risk scenarios were assessed up to 2080, and a waterproof plinth was incorporated into the façade to prevent water ingress from severe flooding. To manage modern rainfall, extensive lead and zinc weatherings were introduced to manage increasing rainfall and to protect the building from water damage and vegetation growth. The new cantilevered roof structure was also designed to work integrally with the building's new superstructure to prevent stresses affecting the existing masonry, thus preserving the structural integrity of the original façades. Energy-efficient insulation, smart energy systems, and advanced fire protection measures, including basement sprinkler tanks, were installed to ensure resilience to both climate extremes and fire risks. BREEAM and BRUKL standards were also applied throughout, enhancing the building's sustainability credentials. The project also highlighted the durability of traditional materials, for instance, the original Victorian masonry proved to be very adaptable to restoration and compatible with modern materials such as concrete and steel, confirming the value of incorporating both historical and modern materials in climate adaptation strategies.

The restoration achieved multiple benefits. The new roof design and autonomous superstructure reduced the need for future maintenance and removed the risk of structural stresses on the façade. Energy efficiency improvements led to a 30% boost in thermal performance, with savings of approximately 2,900 MWh and a carbon reduction of 500,000 kgCO2. This project serves as a model for adaptive conservation, demonstrating how historic buildings can be modernised for climate resilience while retaining their heritage value. The techniques used have been recognised with awards and the lessons learned have been applied to similar projects, such as at the St. Comgall's restoration. Beyond its technical achievements, the restoration preserved an iconic part of Belfast's cultural heritage. As one of the city's most recognisable landmarks, the Bank Buildings holds significant social memory for its citizens. The successful blend of architectural conservation and climate change preparedness ensures that this restored building will endure for future generations.



Floor plan sections (HBD Architects)

The project was highly complex, involving numerous stakeholders and navigating the building's unstable condition after the fire. A temporary support structure was installed to stabilise the building, and collaboration between Belfast City Council, Historic Environment Division, and other local bodies ensured compliance with conservation best practice and safety standards. The two architectural teams worked in parallel, with HBD Architects focusing on the exterior and interfaces with the interior fit-out by JCA Architects. Regular coordination meetings and a structured master programme helped keep the project on track. After completion, a one-year defect monitoring period ensured any remaining issues were resolved.

The restoration of the Bank Buildings is a landmark example of adaptive conservation, successfully blending heritage preservation with modern climate change resilience. The project demonstrates how traditional materials and innovative design strategies can protect historic structures from climate risks, setting a benchmark for future restoration projects.

More details on the Bank Buildings restoration can be found here:
https://www.hallblackdouglas.com/projects/39/bank-buildings

The third Climate Change Risk Assessment climate risks associated with the Buildings theme are detailed in the following table:

Risk number and Receptor	Nature of risk/opportunity		Urgency Score
H1. Health and wellbeing	High temperatures	RISKS	More action needed
H3. People, communities and buildings	Flooding	RISKS	More action needed
H5. Building fabric	Moisture, wind and driving rain	RISKS	Further investigation
H6. Household energy demand	Summer and winter temperature changes	RISKS & OPPORTUNITIES	More action needed
H11. Cultural heritage	Changes in temperature, precipitation, groundwater, land, ocean and coastal change	RISKS	More action needed
H12. Health and social care delivery	Extreme weather	RISKS	More action needed
H13. Education and prison services	Extreme weather	RISKS	More action needed
ID10. Risk multiplication to the UK	Interactions and cascades of named risks across systems and geographies	RISKS	More action needed

Chapter 13: Health

The changing climate in Northern Ireland, as in many regions around the world, can have a range of impacts on our health. Increased temperatures or prolonged periods of cold weather and more frequent extreme weather events such as flooding and storms can all have consequences for our health, both physical and mental. This can be either directly from the elements and weather itself through the dangers severe weather events can create, or indirectly from the impacts of climate change on the world around us.

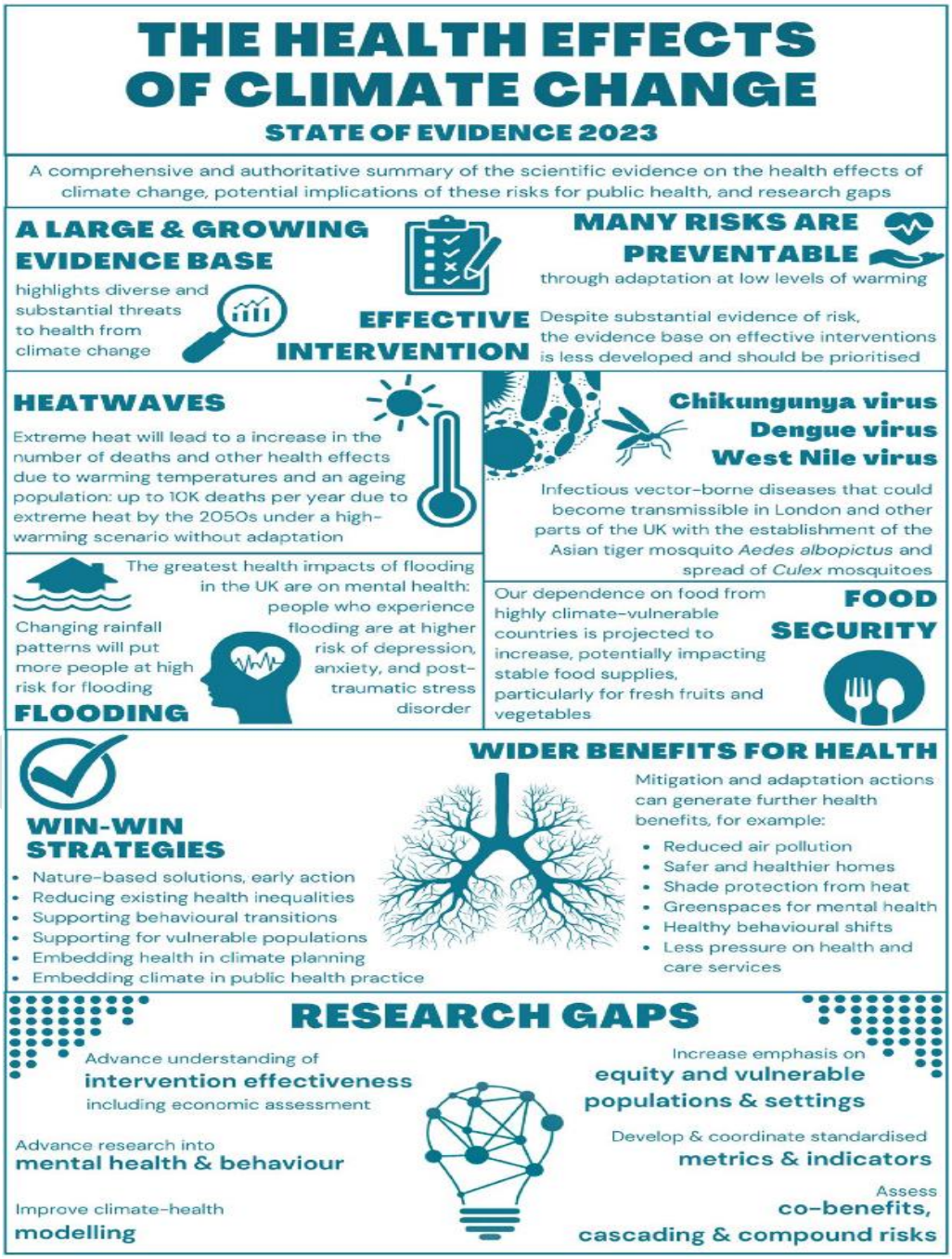


Figure 5-1: Health effects of climate change evidence summary[79] (UK Health Security Agency)

[79] https://assets.publishing.service.gov.uk/media/659ff6a93308d200131fbe78/HECC-report-2023-overview.pdf

As we have seen, with increasing frequency in recent years, flooding and storm damage caused by more severe and frequent extreme rainfall events can have severe consequences for those it impacts upon. Not only can floods cause immediate injuries, as it sweeps up debris of all manner in its path, but also by washing through sewage systems it can also increase the risk of waterborne diseases being washed into flooded homes and businesses as well as risking contaminating water supplies and entering our watercourses. For this reason, the clean-up required after flooding can also be just as hazardous for public health as the impact on the homes and businesses being damaged or destroyed can have a devasting long-term impact on mental health[80].

The storms that often bring this increased rainfall bring other risks to health from the high wind speeds that can accompany them. These winds can wreak havoc on structures such as bridges, riverside pathways, homes and trees alike. In January 2024, we saw first-hand the devastation this can bring. Storm Isha brought wind speeds of up to 80mph to Northern Ireland as well as widespread destruction and sadly caused the death of an individual when the winds caused a tree to fall across a road in Limavady.[81]

Due to health and safety concerns these storm events can reduce our opportunity to access open green space due to the risk of injury from falling branches / trees or in coastal locations from wave action washing onto coastal promenades. These impacts can also lead to delays in the response time of our emergency services due to forced road closures.

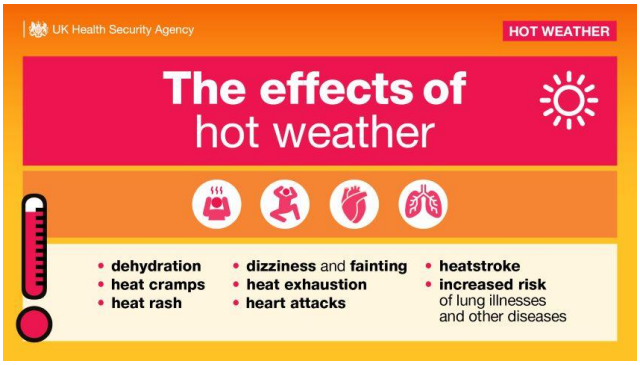


Figure 5-2: Impact of hot weather on health (UK Health Security Agency)

The increased temperatures and heatwave events we are seeing increase the risk of heat-related illnesses such as heatstroke and dehydration, as well as putting pressures on the cardiovascular systems more generally which can exacerbate other underlying health conditions. Vulnerable members of society, such as the elderly and those with pre-existing health conditions, are particularly at risk from these sorts of pressures[82].

On the flip side, more intense and prolonged cold weather events brings added risks to health, again through risks such as physical injury due to slips on ice as well as affecting vulnerable members of society, in particular the elderly, in a time of living cost increases and in particular increased heating costs.

Image 5-8: Asian tiger mosquito (BBC)

[80] https://assets.publishing.service.gov.uk/media/657086ad746930000d488919/HECC-report-2023-chapter-3-flooding.pdf

[81] https://www.bbc.co.uk/news/uk-northern-ireland-68057253

[82] https://www.who.int/news-room/fact-sheets/detail/climate-change-heat-and-health

Rising temperatures and changing rain patterns also increases the possibility of being exposed to diseases normally associated with other areas of the world. Insects such as certain species of mosquito, for example the Asian Tiger mosquito pictured above in image 5-8, not normally seen in the UK are becoming better able to survive in our new warmer, wetter climate, and with them they bring the risk of carrying new diseases to our shores[83] [84]. While yet to be documented in the UK, there is a similar risk from fungal infections where increased temperatures and humidity provide the ideal conditions for their growth and survival. Furthermore, fungal spores may be carried in the atmosphere along with pollen and other allergens from the continent.[85]

Many of the other thematic areas link into that of Health as good public health relies on so many interconnected elements ranging from well adapted buildings, resilient supply chains, and a robust emergency response to the availability of clean water, open greenspaces, food security, the use of active transport and a healthy environment. For this reason, effective adaptation across all the thematic areas will impact upon public health and work towards reducing the strain on our healthcare system, which itself will be strained directly by our changing climate and its impact on healthcare buildings and infrastructure.

[83] https://www.bbc.co.uk/news/articles/cw0721l9183o
[84] https://www.bbc.co.uk/news/health-67654008
[85] https://assets.publishing.service.gov.uk/media/6570509d3831ec0013c7496e/HECC-report-2023-chapter-6-aeroallergens.pdf

The third Climate Change Risk Assessment climate risks associated with the Health theme are detailed in the following table:

Risk number and Receptor	Nature of risk/opportunity		Urgency Score
H1. Health and wellbeing	High temperatures	RISKS	More action needed
H2. Health and wellbeing	High temperatures	OPPORTUNITIES	Further investigation
H3. People, communities and buildings	Flooding	RISKS	More action needed
H7. Health and wellbeing	Changes in indoor and outdoor air quality	RISKS	Further investigation
H8. Health	Vector-borne disease	RISKS	Further investigation
H9. Food safety and food security	Higher temperatures (food safety) and extreme weather (food security)	RISKS	Further investigation
H10. Health	Water quality and household water supply	RISKS	Further investigation
H12. Health and social care delivery	Extreme weather	RISKS	More action needed
ID9. UK public health	Increase in vector borne diseases due to climate change	RISKS	More action needed
ID10. Risk multiplication to the UK	Interactions and cascades of named risks across systems and geographies	RISKS	More action needed

Chapter 14: Community Preparedness and Response

Climate change brings a wide range of significant risks and challenges on a global scale. Although similar effects may be experienced across different regions, the impacts of these effects on individual regions can vary significantly. For example, the impacts of rising seas levels are vastly different for small Pacific Island nations than they are for landlocked, or even large island countries. Even within the UK, the impacts of climate are not felt evenly across the 4 nations and in recognition of this, the Climate Change Committee (CCC) in providing their Third Climate Change Risk Assessment Independent Assessment (CCRA3-IA) prepared national summary reports of their Independent Risk Assessments[86] to accompany their technical report of overall UK risk to the UK Government.

Countries are frequently made up of varying geographical features and so similar climatic effects are felt differently within countries as well. In this way it is individuals and their communities that are at the front line of climate change, experiencing its impacts first-hand. Northern Ireland is no different in this regard and with its unique geographic and socio-economic context, it faces particular challenges that require tailored responses.

Image 5-9: Flooding in Newry. Autumn 2023 (BBC)

This thematic area focuses on the impacts of climate change at the local level, recognising that a 'one size fits all' approach will not be the most effective way to build resilience on the ground. The increased frequency and intensity of extreme weather events such as flooding and storms must be considered through their impacts at this level in terms of their threat to properties, the local economy, our local environment and their direct threats to human health and safety.

A well prepared and resilient community is delivered by equipping local populations with the knowledge, resources and capabilities to effectively respond to these challenges. Prepared communities have an acute understanding of their climate risks and so can reduce vulnerability and recover more quickly from climate-related events. Moreover, community-based approaches ensure that the specific needs and capacities of local populations are considered, promoting inclusive and sustainable adaptation strategies.

Frequently, it is the local people who are the first responders in the event of a climate emergency event. As well as being first on the scene, they are eyewitnesses to an event unfolding and can be best placed to communicate and assist in directing resources to areas most of need and knowing those who may be most vulnerable in their communities. Increasing public understanding of climate change and its impacts, both local and on a wider scale is a key part of preparing the local population for climate emergency events and therefore helping to build localised community climate resilience.

Engagement with local community groups and stakeholders helps embed climate resilience as building networks among communities, local governments, and organisations increases the

[86] https://www.ukclimaterisk.org/publications/type/national-summaries/

exchange of knowledge, resources and best practice.

Effective communication channels, before, during and in the aftermath of an event provide opportunities for communities to recover more quickly and mitigate the impact of future events.

This local approach to climate preparation has been recognised in Northern Ireland for some time now and over the course of the second Northern Ireland Climate Change Adaptation Programme (NICCAP2) many local Councils built climate adaptation into their local council planning[87]. This Third Adaptation Programme sees the fruits of the local Councils' adaptation planning cycle being continued to be built upon as we include a range of actions from across the Councils and more strategic actions supported by the Society of Local Authority Chief Executives NI (SOLACE NI), as they utilise their knowledge of local risks to build climate resilience into their local communities. As climate change continues to pose significant challenges, the role of prepared and responsive communities will become increasingly important in safeguarding the well-being and sustainability of Northern Ireland.

In Northern Ireland, emergency planning and civil contingency arrangements are underpinned by the UK Civil Contingencies Act 2004 of which Part 2 applies to Northern Ireland.

In 2005, the first Northern Ireland Civil Contingencies Framework was introduced together with a guide to emergency planning arrangements which set out arrangements and roles and responsibilities for emergency planning.

Following on from these earlier arrangements the Executive Office have published 'Building Resilience Together: NI Civil Contingencies Framework'[88] (Figure 5-3) which, now in its second iteration (2023), has taken account of previous emergencies that have affected our communities. The framework provides a foundation of response from local level to regional and national events through a "Building Resilience Together" joint working approach.

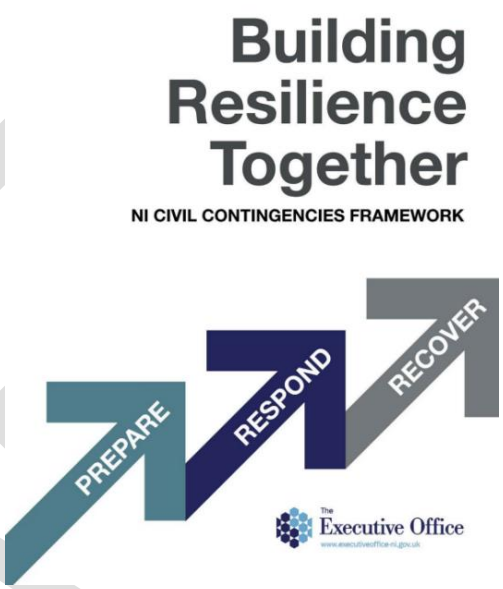


Figure 5-3: NI Executive's Civil Contingencies Framework (TEO)

At the core of working with local communities is the Local Government Civil Contingencies Team who provide project management to the multi-agency emergency preparedness groups in Northern Ireland.

Figure 5-4: The Regional Community Resilience Group Logo (RCRG)

[87] https://www.daera-ni.gov.uk/sites/default/files/publications/daera/Northern%20Ireland%20Climate%20Change%20Adaptation%20Programme%202019-2024%20Final-Laid.PDF

[88] https://www.executiveoffice-ni.gov.uk/sites/default/files/publications/ofmdfm_dev/The%20Northern%20Ireland%20Civil%20Contingencies%20Framework%20%28Revised%202023%29.pdf

In 2013, the Regional Community Resilience Group[89] (Figure 5-4) was formed to help communities prepare for and respond to weather related emergencies by bringing together multi-agency partner organisations from government, utility providers and the voluntary sector to work for and with communities at risk of severe weather. Today the group is actively engaging with over 40 communities across NI to inform and resource them to help prepare for and to deal with the impact of severe weather and climate change in their local areas. Please see case study 11 for further information.

[89] https://www.infrastructure-ni.gov.uk/articles/regional-community-resilience-group

Case Study 11: Regional Community Resilience Group Pilots: 'Prepare, Adapt, Strengthen'

The NI Regional Community Resilience Group (RCRG), established in 2013 by the Department for Infrastructure, brings together statutory and voluntary partners for emergency planning. Initially focused on flood response, the RCRG has since expanded its efforts, working with over 40 communities to enhance local resilience against the growing threat of flooding and extreme weather. These risks are expected to worsen as climate change progresses, making it essential to prepare communities for future challenges.

Recently, from January to July 2024, the RCRG funded two Community Resilience Group (CRG) pilot projects, led by Derry City and Strabane District Council (DCSDC) and Mid and East Antrim Borough Council (MEABC). These pilots aimed to address a broader range of risks and resilience strategies beyond flooding, while advocating for increased budgetary provision for community resilience. Both councils worked closely with existing local resilience groups, engaging communities in a collaborative, co-creative process.

The two pilots, though employing slightly different methodologies, shared the same goals: promoting a wider resilience agenda, coordinating resilience and emergency responses, and pushing for long-term budget allocations. Both pilots emphasized the importance of interactive, community-led engagement to ensure that local populations were active participants in the development of their resilience strategies.

In DCSDC, a scoping exercise involving eight local groups set the baseline for understanding community risk and resilience through a questionnaire. Two workshops followed: the first with community members to create a response protocol for local risks, and the second with council officers to integrate these findings into council workstreams.

DCSDC Community Workshop Group (DCSDC)

In MEABC, interviews were conducted with representatives from two rural communities to gather insights into what resilience meant locally. A question-and-answer session helped identify specific issues and resilience sources, which were later discussed with council officers. Using this input, a "resilience toolbox" was developed to equip communities with the necessary information to respond to identified risks.

MEABC Community Workshop (MEABC)

The results from both pilots were consolidated and recommendations were submitted to, and approved by, the RCRG. These included the creation of a regional resilience portal, securing a permanent place for community resilience within central government, and establishing a dedicated funding stream. To conclude the pilots, two workshops were held to share the lessons learned with the participating communities.

The CRG pilots have begun connecting existing resilience groups with each other and with local government. More broadly, they are key to the RCRG's business case for central coordination, expanding resilience efforts, and securing consistent funding. Strong community resilience networks and well-defined protocols have proven to significantly mitigate the impacts of severe weather and improve recovery efforts. These pilots provide valuable models for a coordinated response to climate change impacts in Northern Ireland, demonstrating how bottom-up community efforts can work in tandem with top-down government support.

More details about RCRG can be found here: https://www.infrastructure-ni.gov.uk/articles/regional-community-resilience-group.

The third Climate Change Risk Assessment climate risks associated with the Community Preparedness and Response theme are detailed in the following table:

Risk number and Receptor	Nature of risk/opportunity		Urgency Score
H1. Health and wellbeing	High temperatures	RISKS	More action needed
H2. Health and wellbeing	High temperatures	OPPORTUNITIES	Further investigation
H3. People, communities and buildings	Flooding	RISKS	More action needed
H4. Viability of coastal communities	Sea level rise	RISKS	Further investigation
H11. Cultural heritage	Changes in temperature, precipitation, groundwater, land, ocean and coastal change	RISKS	More action needed
H12. Health and social care delivery	Extreme weather	RISKS	More action needed
H13. Education and prison services	Extreme weather	RISKS	More action needed
N18. Landscape character	Climate change	RISKS & OPPORTUNITIES	Further investigation
ID3. Migration to the UK and effects on the UK's interests overseas	Climate-related international human mobility	RISKS & OPPORTUNITIES	Watching brief
ID10. Risk multiplication to the UK	Interactions and cascades of named risks across systems and geographies	RISKS	More action needed

Part 6: Disruption to Businesses & Supply Chains

Image 6-1: Warrenpoint Port, Co Down (Warrenpoint Port Authority)

Objective:

We will support businesses to understand and embed climate adaptation into their strategies and practices, to identify climate risks and to make the most of existing and emerging opportunities. Through encouraging cost-effective early action to strengthen operating models to the risks and impacts of Northern Ireland's changing climate, we will ensure our supply chains have the resilience needed to support our rich network of businesses for our climate today, and tomorrow.

Our Adaptation Objective for Disruption to Business & Supply Chains recognises that Northern Ireland businesses already have and will continue to feel the effects of climate change, particularly extreme weather events. We want to ensure that businesses not only adapt and strengthen their business practices to reduce or prevent the effects of these events, but also have the capacity to benefit from any opportunities that may emerge from climate impacts through timely adaptation.

The importance in making these adaptation changes as early as possible is clear. Whether it be to mitigate against impacts or seize new opportunities, such as the opening up of new trade routes or changes in demand for goods and services, it will be economically more beneficial to take early action and investment. Furthermore, by taking early adaptation steps, and being proactive in building operating model resilience, a wider breadth of opportunities could be realised.

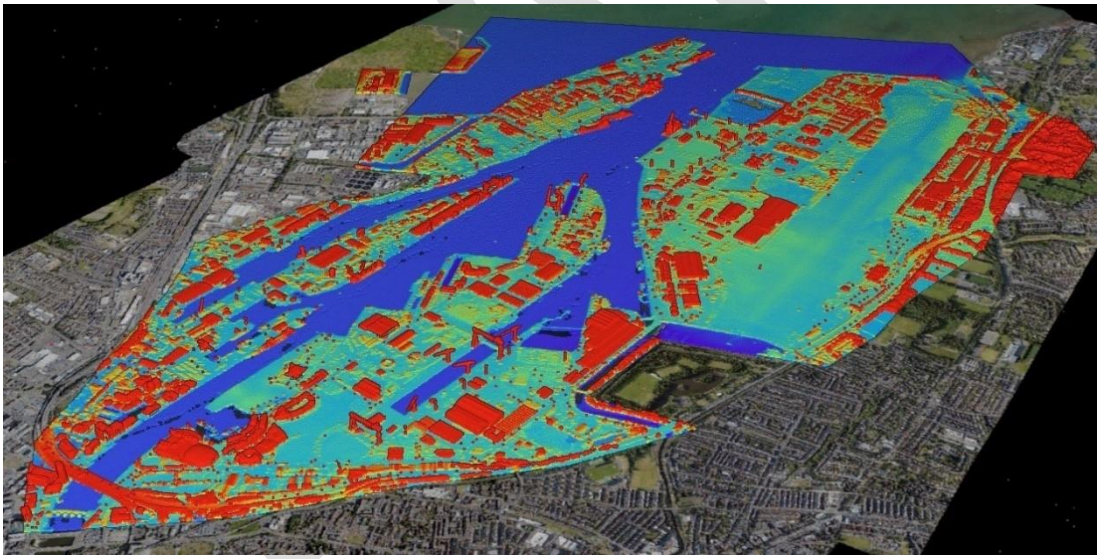
Within this adaptation program, the risks to 'Disruption to Business & Supply Chains' from climate change have been distilled into the following thematic areas and discussed in the following chapters:

- Chapter 15 - Business, and
- Chapter 16 - Finance.

Case Study 12: Belfast Harbour - LiDAR Modelling to Map Risk and Response

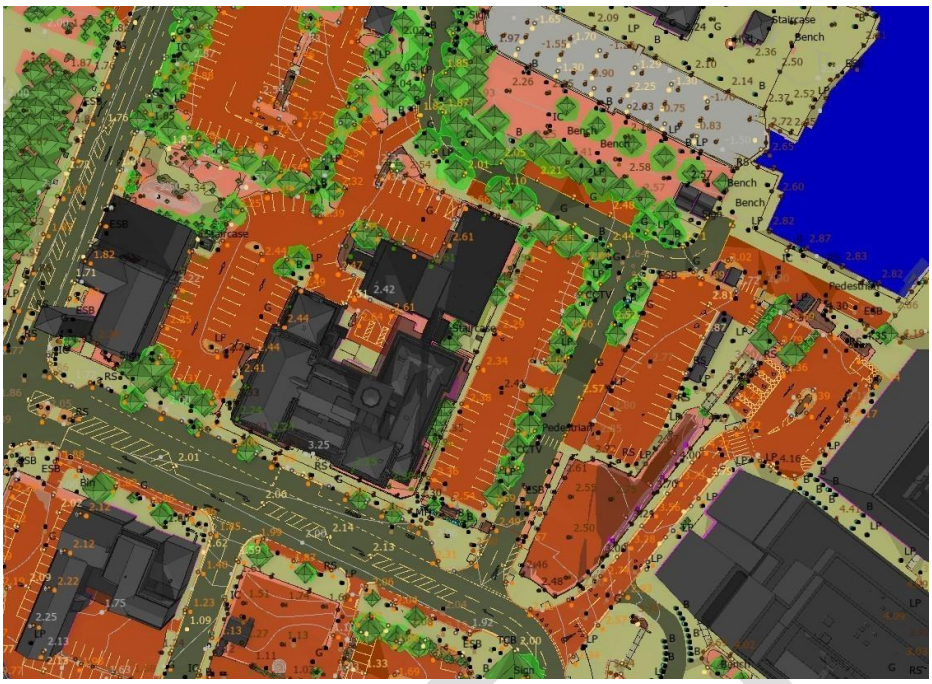
Belfast Harbour, occupying around one fifth of the city's landmass, plays a critical role in Northern Ireland's maritime trade and is one of the island's major ports. The harbour is situated on mostly reclaimed land at the mouth of the River Lagan, making it inherently vulnerable to rising sea levels and severe storm surges, risks that are expected to worsen due to climate change. As part of a long-term strategy to address these challenges, the harbour has employed Light Detection and Ranging (LiDAR) technology, paired with a digital twin, to better understand its assets, terrain, and risks. The first survey was completed in June 2023, with the data being used now to plan for future adaptation efforts.

LiDAR technology uses laser sensors from aircraft to create detailed 3-D models of the ground, gathering 25 points of data for every square metre of surface area, with an accuracy of 5cm. This allows for precise modelling of the harbour's estate and offers insights for various applications. Building on earlier hydrographic models used to assess sedimentation risks, this project integrates marine and land-based data to provide a comprehensive view of the port's ecosystem. The data has already been used to create surface, vegetation mass, and 3-D building models. The next step is developing an advanced topographical model of the harbour, which will be updated every 2-3 years to maintain accuracy. This data is incorporated into a "Digital Twin"—a virtual replica used to simulate future scenarios and assess how infrastructure might be affected by climate scenarios. This will allow Belfast Harbour to plan more effectively for both immediate and long-term climate challenges.



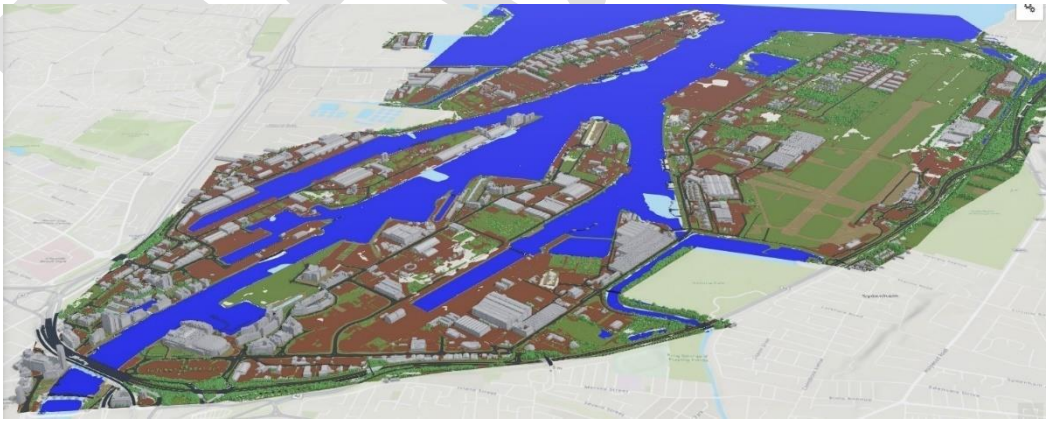
LiDAR Elevation (Belfast Harbour)

Given the technical nature of the project, third-party involvement was essential. The data was collected by Blue Sky International and hosted by ESRI, but the project was primarily managed by the harbour's marine, environment and biodiversity lead, reporting to the head of sustainability. While voluntary climate adaptation reporting in the port sector follows UK National Policy, Belfast Harbour aims to exceed basic requirements, using the percentage of buildings impacted by extreme weather as its primary adaptation progress indicator. The LiDAR and digital twin initiative will be featured in upcoming ESG reports and the Port Masterplan, which will outline the port's strategic direction for the next 20-30 years.



Topography example – Harbour Office (Belfast Harbour)

As the harbour has already developed modern infrastructure, it is well-protected against short- and medium-term risks, but this initiative focuses on preparing for the longer-term impacts of climate change. In addition to enhancing resilience, the LiDAR data has other benefits, such as evaluating the harbour's carbon storage potential and contributing to biodiversity enhancement projects. This makes it a cross-cutting investment that supports broader sustainability goals, including the port's Net Zero targets. The initiative also serves as a "thought leadership" project, demonstrating how LiDAR technology can be effectively used for climate adaptation. Belfast Harbour aims to set an example for other organisations by showcasing the practical applications of this technology in resilience planning and providing a model for best practices.



Wireframe Building Model (Belfast Harbour)

Belfast Harbour's LiDAR and digital twin project represents a forward-looking approach to climate adaptation. By leveraging advanced technology, the harbour is better equipped to manage risks from rising sea levels and extreme weather, while supporting wider sustainability goals. This initiative not only strengthens the port's long-term resilience but also positions it as a leader in innovative climate adaptation within the port sector.

Chapter 15: Business

The Climate Change Committee's (CCC) Third Climate Change Risk Assessment Independent Assessment for Northern Ireland (CCRA3-IA) highlighted that the greatest climate change risks to businesses in NI now, and in the future, are risks arising from flooding and extreme weather events resulting in damage to assets such as to the physical business premises and goods within it. The CCRA3-IA advised that '*the expected direct annual damages for non-residential properties in Northern Ireland at present is £42m, comprising of 6% of total UK damages'*.

The CCC also highlighted significant risks associated with disruption to business operations such as distribution to infrastructure networks and digital services impacting upon transport and sale of goods.

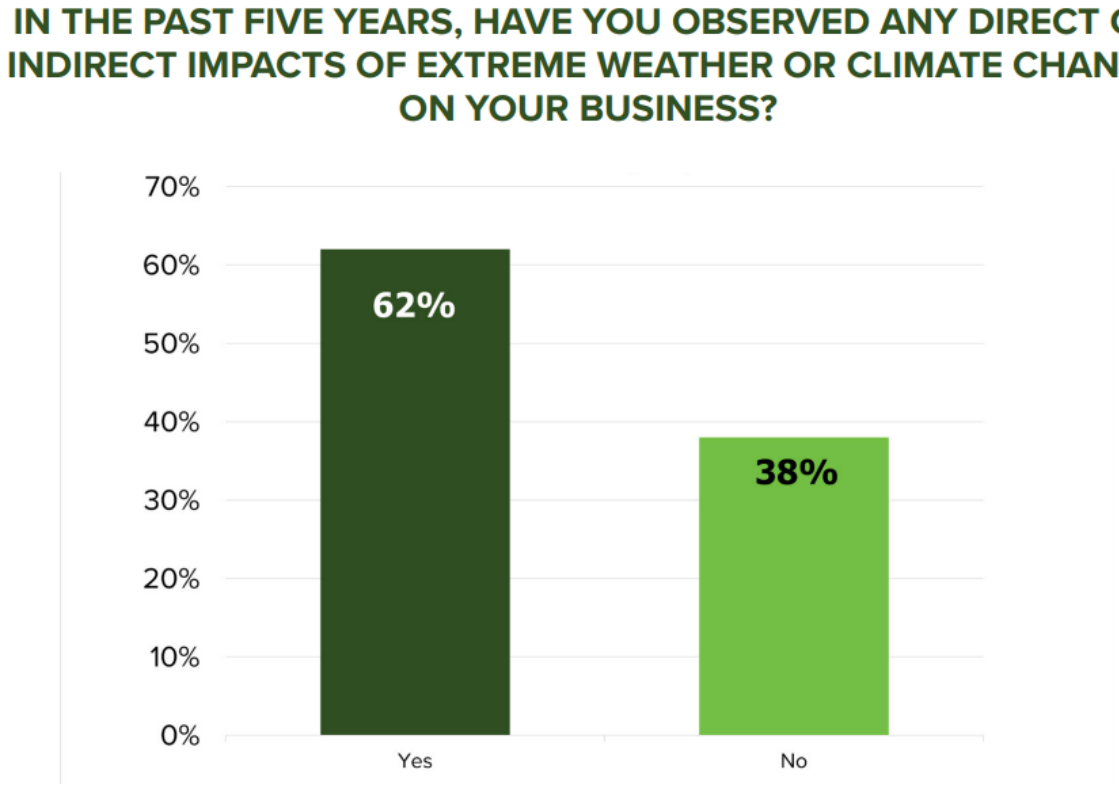


Figure 6-1: Observed impacts of climate change on Northern Ireland businesses over last 5 years (Business in the Community Northern Ireland 2024)

Many NI businesses have experienced first-hand the direct impacts of severe weather events on their premises, operations and supply chains. As seen in figure 6-1, in the Business in the Community Northern Ireland's Environmental Benchmarking Survey 2024[90], 62% of respondents who took part in the survey reported that in the past 5 years, their business had observed direct or indirect impacts of extreme weather events. Impacts experienced by businesses can include flooding during severe weather events and the associated disruption caused to infrastructure, on which they rely such as road and rail networks, information and

[90] https://www.bitcni.org.uk/wp-content/uploads/2024/11/241108_NIEBS-Report-2024.pdf

communication technology and electricity supply. A prime recent example of this is the flooding experienced in Downpatrick and Newry in Autumn 2023 which impacted severely on a number of business premises, and the loss of broadband services to thousands of customers for several days in Fermanagh due to damage caused to infrastructure during storms Isha and Jocelyn in January 2024.

These risks of physical impacts damaging businesses property or goods is highlighted as also having the potential to impact upon access to finance, investment and insurance which is covered in more detail in the finance section.

Other impacts highlighted include reduced customer access to premises, reduced staff productivity and staff absences due to infrastructure disruption and higher temperatures in working environments.

Some NI businesses are also exposed to the indirect impacts of climate change due to their dependence upon wider European and global supply chains such as food produce and manufacturing parts which may be impacted by climate change in their country of origin.

Northern Ireland's business sector is mainly made up of small and medium-sized enterprises (SMEs) which account for 63% of businesses, which is higher than the UK level of 51% as a whole.[91] Smaller businesses are considered to be more vulnerable to the impacts of climate change due to their ability to recover in the short term being lesser than larger businesses with multiple operating premises i.e. should their sole operating premises be impacted they may not have alternative premises to continue to operate from.

Image 6-2: Flooding impact on Downpatrick high street in 2023 (Liam McBurney)

The CCRA3-IA highlights that these issues are expected to worsen in coming years without sufficient adaptation action as flooding and coastal change risk to businesses is expected to move from medium risk to high risk. Water scarcity is stated to be low risk to business production processes now, but this could rise to a medium or high-level risk in future with periods of hot weather putting pressure on supplies.

The risks included in the business area also contain reserved matters relating to impacts on international trade routes and UK food availability through impacts to international imports which are dealt with at a UK level through the National Adaptation Programme[92] (NAP).

As local domestic food production and manufacturing are however devolved policy areas in NI the resilience of the food system in NI also depends on UK-wide policies which may impact on international supply of certain goods and services.

[91] Business population estimates 2022 - GOV.UK (www.gov.uk)

[92] https://www.gov.uk/government/publications/third-national-adaptation-programme-nap3

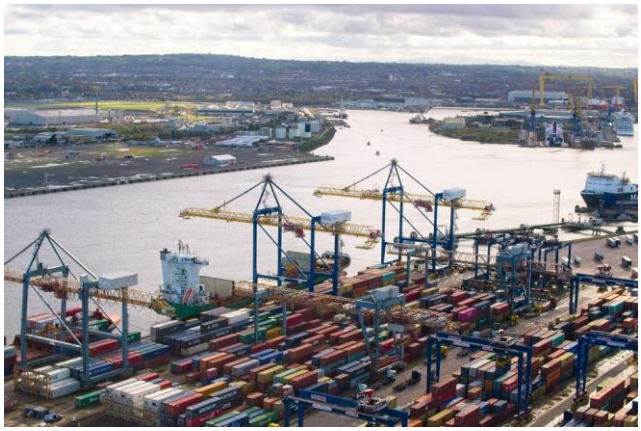


Image 6-3: Belfast port (Belfast Telegraph)

As outlined in the third UK National Adaptation Programme (NAP3) the UK Government's Department for Business and Trade published a new Critical imports and supply chains strategy[93] in January 2024 to strengthen the UK's ability to respond to threats to critical imports, such as from climate change.

As has been highlighted earlier in this Programme the 2018 UK Climate Change Projections[94] advise that Northern Ireland will experience wetter winters and hotter drier summers. These variables can impact upon agricultural production through the impact on ground conditions and in turn impact upon agricultural practices such as the planting of crops and growing of silage / hay. As way of an example, the prolonged period of wet weather experienced over the winter and early spring of 2023/24 which resulted in waterlogged fields impacted on the ability of farm businesses to plant seed potatoes in February / March 2024 which would have knock on implications to availability and prices.

The CCRA3-IA also recognises that there could be future opportunities through changes in supply and demand for particular goods and services.

The thematic area of Business is crosscutting in nature and climate risks and their impacts in this area will also impact on the following key areas:

- Natural capital.
- Food security.
- Infrastructure services.
- People and the Built environment.

Therefore, when producing adaptation measures in this area we must also consider any knock-on effects to these cross-cutting areas to ensure they are not negatively impacted.

[93] https://www.gov.uk/government/publications/uk-critical-imports-and-supply-chains-strategy/critical-imports-and-supply-chains-strategy-html-version

[94] https://www.metoffice.gov.uk/research/approach/collaboration/ukcp

The third Climate Change Risk Assessment climate risks associated with the Business theme are detailed in the following table:

Risk number and Receptor	Nature of risk/opportunity		Urgency Score
B1. Flooding of business sites	Increase in flood risk	RISKS	More action needed
B2. Coastal business locations and infrastructure	Coastal flooding, extreme weather, erosion and sea level rise	RISKS	More action needed
B3. Business production processes	Water scarcity	RISKS	Further investigation
B5. Reduced employee productivity in businesses	Infrastructure disruption and higher temperatures in working environments	RISKS	Further investigation
B6. Disruption to business supply chains and distribution networks	Extreme weather	RISKS	More action needed
B7. Changes in demand for goods and services	Long term climate change	OPPORTUNITIES	Further investigation
ID1. Food availability, safety, and quality	Decreasing yields from rising temperatures, water scarcity and ocean changes globally	RISKS	More action needed
ID2. UK food availability and exports	Increases in productivity and areas suitable for agriculture overseas	OPPORTUNITIES	Watching brief
ID6. Increased trade for the UK	Arctic ice melt opening up new trading routes	OPPORTUNITIES	Watching brief
ID7. International trade routes	Climate hazards affecting supply chains	RISKS	More action needed
ID10. Risk multiplication to the UK	Interactions and cascades of named risks across systems and geographies	RISKS	More action needed

Chapter 16: Finance

Image 6-4: Belfast financial district (Queens University Belfast)

The financial system is a highly connected network of financial institutions such as insurance companies, stock exchanges, and investment banks that work together to exchange and transfer capital from one place to another. Through the financial system, investors receive capital to fund projects and receive a return on their investments.

According to the Department for the Economy (2021) 'Mapping the Northern Ireland Financial Services Sector' report there are approximately 24,000 people employed in financial services in Northern Ireland. The key sub sectors are banking, insurance, fintech, credit providers, outsourced solutions, and financial advisors.[95] The insurance industry in Northern Ireland is made up of a number of UK based and internationally owned providers as well as a large number of insurance brokers.

This thematic area recognises the impacts of climate change on the availability and access to insurance, mortgages and investment stemming from access to finance to implement adaptation measures to climate risks such as flooding or wildfires for both households and businesses. A key example of this has been seen internationally recently where insurers have been declining to provide cover in high-risk areas, leaving communities financially vulnerable to the worst impacts of climate change[96].

This risk is becoming more relevant with increasing frequency of storms and flooding incidents as highlighted by the CCC in their assessment of the second Northern Ireland Climate Change Adaptation Programme[97].

The financial risks contained in the third Climate Change Risk Assessment (CCRA3) are mainly reserved matters which are dealt with at a UK level. Financial institutions in Northern Ireland follow the same legal and regulatory system as the UK. The Bank of England is responsible for maintaining overall financial stability by monitoring and responding to risks including climate change. The UK Government in the NAP3 have set out that they will work with industry, regulators and public finance institutions to deliver the Green Finance Strategy 2023[98], which sets out a range of actions being taken to protect the financial

[95] Mapping NI's financial services sector | Department for the Economy (economy-ni.gov.uk)

[96] https://www.cbsnews.com/news/fires-california-palisades-fire-homeowners-insurance-state-farm-fair-losses/

[97] Adapting to climate change - Progress in Northern Ireland

[98] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1149690/mobilising-green-investment-2023-green-finance-strategy.pdf

system from climate-driven impacts and to attract private investment into adaptation.

The thematic area of Finance is cross-cutting in nature and climate risks and their impacts in this area will also impact on other themes such as Business, therefore, when producing adaptation measures in this thematic area we must also consider any knock-on effects to these cross-cutting areas to ensure they are not negatively impacted.

The third Climate Change Risk Assessment climate risks associated with the Finance theme are detailed in the following table:

Risk number and Receptor	Nature of risk/opportunity		Urgency Score
B4. Business access to finance, investment and insurance	Extreme weather	RISKS	Sustain current action
ID8. Economic loss to the UK	Climate driven resource governance pressures and financial exposure	RISKS	Sustain current action
ID10. Risk multiplication to the UK	Interactions and cascades of named risks across systems and geographies	RISKS	More action needed

Part 7: Implementation Monitoring & Evaluation

Chapter 17: Implementation Monitoring

Implementation

The Northern Ireland Climate Change Adaptation Programme (NICCAP) is a statutory document produced under the Climate Change Act 2008. It is developed in response to the latest UK Climate Change Risk Assessment (CCRA) on a 5-yearly cycle as required by section 60 of the Climate Change Act 2008 (the 2008 Act).

In line with the requirements of the 2008 Act all Northern Ireland Executive Departments are responsible for the progression and delivery of policies and proposals for their respective risk areas of responsibility. The Adaptation Delivery Plan contained in Annex I of this Programme sets out specific action delivery leads and partners. As outlined in Chapter 1, given the important role key stakeholders play in delivering climate adaptation action, the actions contained within the Adaptation Delivery Plan are not solely limited to Departments, but include actions put forward from Councils, Academia, environmental Non-Government Organisations (eNGOs) and the private sector.

Monitoring oversight

To assist with monitoring the progress of delivery of this Programme, the Department for Agriculture, Environment and Rural Affairs (DAERA), with the support of the Climate Northern Ireland project (Climate NI), will lead on collating progress updates from action delivery owners on an annual basis. This information will be used to assist with ongoing internal monitoring of progress, in assisting the Climate Change Committee (CCC) in their statutory independent assessment of the Programme as required by the Climate Change Act (Northern Ireland) 2022 (the 2022 Act), and in the DAERA undertaking an end of Programme evaluation for incorporation in NICCAP4.

To ensure that ongoing delivery of the Programme continues to be implemented and monitored across Departments the Green Growth Strategic Oversight Group, which comprises senior officials from all Departments, will provide the senior governance oversight for the Programme.

Mid-term review

In advance of Year 3 of the Programme a comprehensive mid-term review will be initiated by DAERA.

This review stage will allow for a comprehensive stocktake of delivery progress as well as providing an opportunity for Departments and stakeholders to propose new actions to be included within the Programme.

In recognition of the rapidly developing policy landscape for climate change it will also allow an opportunity to amend existing actions where required, to reflect any position changes. For example, advances in scientific understanding; or the completion of research projects allowing for progression to the implementation stage of any recommendations; or a move from policy being developed to being implemented. This approach will ensure that the Programme can be built upon and not treated as static during its lifespan.

The mid-term review, once completed, will be published on the DAERA website.

Climate Change Committee's Adaptation monitoring framework

To support their role in reviewing climate adaptation progress across the UK, the CCC have recently developed an adaptation monitoring

framework[99] which is aligned to 13 thematic areas for adaptation action as shown in Figure 7-1 below:

Box 1
Thematic areas for adaptation action

The thirteen themes for assessment in the monitoring framework focus on adaptation required to reduce the risks from climate change to:

- **Nature:** Terrestrial (including on farmland), freshwater and marine habitats.
- **Working lands and seas:** Agriculture, forestry and fisheries.
- **Food security:** Domestic and imported food supply chains, as well as vulnerability of society to climate-related food disruption.
- **Water supply**: Public water system which supplies households and businesses.
- **Energy**: Key energy systems, the electricity system (transmission, distribution, and generation), gas networks and novel sources of energy supply (such as hydrogen) as they develop.
- **Telecoms & ICT**: Communications and ICT infrastructure, including data centres, networks and other critical national infrastructure.
- **Transport**: Road networks (both the national strategic road network and local roads), railways, ports and airports.
- **Towns and cities**: The built environment at a settlement scale, covering flooding, coastal erosion and overheating risks.
- **Buildings**: Individual buildings and their occupants, covering overheating and flooding.
- **Health**: Public health, including mortality and morbidity, as well climate-sensitive vector-borne diseases and health care delivery.
- **Community preparedness and response**: Preparedness of communities for climate impacts, including the ability to protect cultural heritage, and their ability to effectively respond when climate and weather-related disruptions occur.
- **Business**: Businesses and their function as a commercial entity, including risks to supply chains (both domestic and international), sites and assets, access to capital and productivity impacts.
- **Finance**: Financial system, so that systemic risks from climate change are minimised and it can effectively support the economy in investing in necessary adaptation actions.

Figure 7-1: Thematic areas for adaptation action

Each thematic area has its own bespoke monitoring map detailing several different metrics and indicators to score adaption within a given area. An example is provided below in Figure 7-2 for the Nature thematic area.

[99] https://www.theccc.org.uk/publication/ccc-adaptation-monitoring-framework/

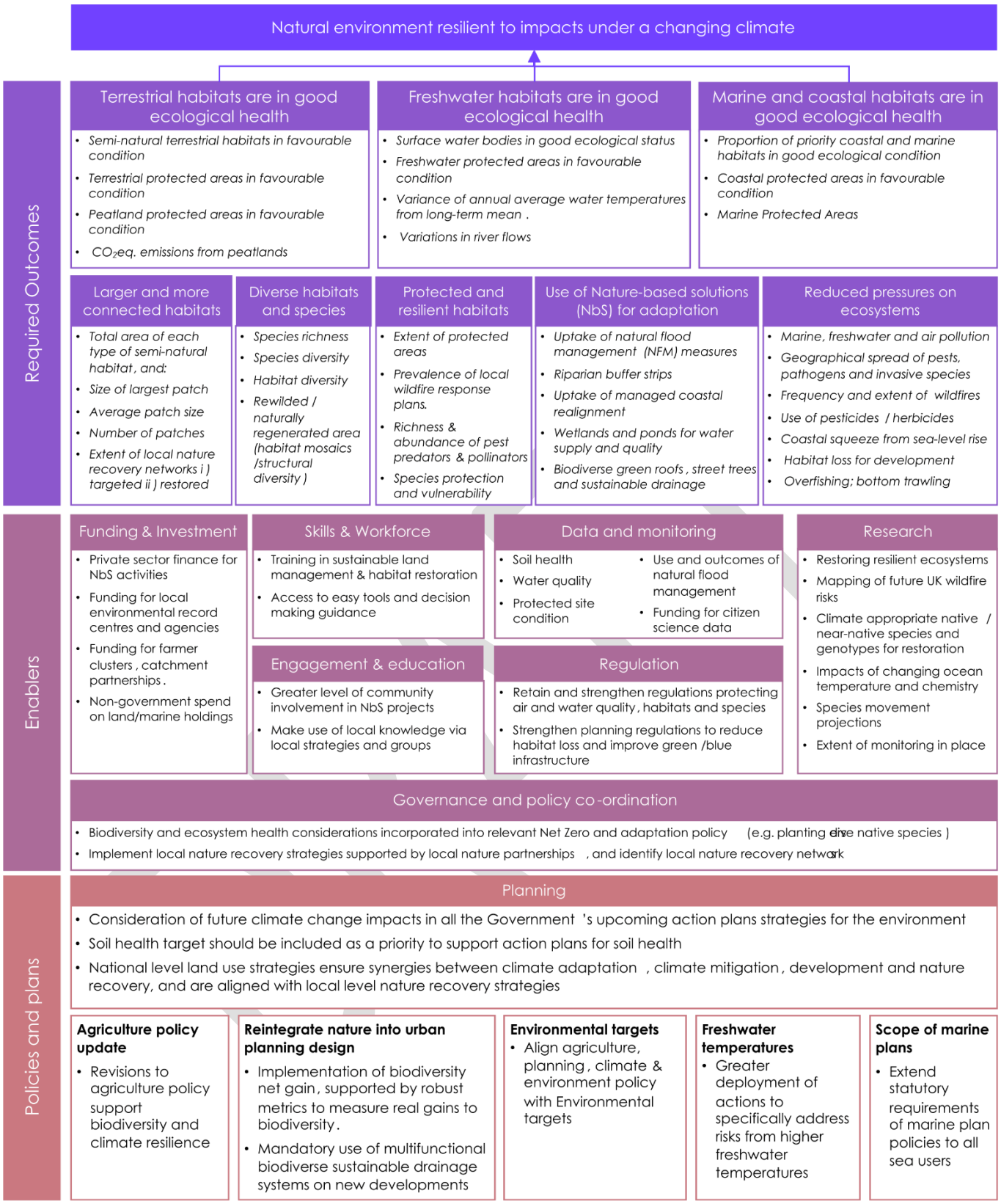


Figure 7-2: Nature thematic area Monitoring map

Thematic areas maps

Each thematic area monitoring map sets out and describes what a well-adapted goal looks like, the required outcomes for delivering those goals, key enabling factors, as well as the underlying policy directions which would be required to support delivery.

As discussed in Chapter 3, we have developed this Programme to align with the CCC's 13 thematic areas in terms of structure and the

overarching objectives to assist with the CCC's assessment under section 48 of the 2022 Act.

Indicators

Indicators and supporting datasets play a vital role in monitoring progress to adapt to and increase resilience to both the current and projected impacts of climate change. Indicators provide quantifiable data allowing for the monitoring of performance both good and bad.

In its 2023 assessment of NICCAP2, the CCC identified extensive data gaps which hindered its ability to fully monitor progress which is discussed further in Chapter 18. Whilst this may in part have been due to the Covid 19 pandemic commencing within 6 months of NICCAP2 being laid in the Assembly, it is important that we seek to improve our indicators and supporting data to allow for a more complete assessment to be carried out on the progress achieved by NICCAP3.

To help with this process, the thematic area monitoring maps and available data sets have been used to assist with the identification of a range of suitable indicators for monitoring progress. These are continuing to be built upon.

To support this work the Climate NI Network[100] has been utilised to establish a 'Policy and Research Panel' comprising of representatives from academia, eNGOs, the private sector and Government. This panel was established under an initial pilot in 2024 and has helped to identify available datasets and prioritise indicators for further development.

The work of this panel in the development of a suite of supporting indicators will ensure more accurate reporting, the closing of data gaps and a more efficient adaptation implementation monitoring.

These indicators are intended to be used for monitoring of progress both internally and by the CCC, and as work continues to build upon them and identify and source additional supporting datasets, their development is an active ongoing process and so they will not be published with this Programme.

Climate Change Committee Assessment

In June 2022, the Climate Change Act (Northern Ireland) 2022 received Royal Assent. This Act placed a requirement on the CCC under section 48 to undertake an independent assessment of the Programme no later than 3 years after it is laid in the Assembly. This assessment will provide the Committee's assessment on the progress made towards implementing the objectives, proposals and policies, and their recommendations for the next programme (NICCAP4).

In undertaking this assessment, the CCC will utilise their Adaptation Monitoring Assessment Framework which sets out scoring criteria for assessing:

i) Delivery and implementation; and
ii) Policies and plans.

as shown in Figures 7-3 to 7-5 below.

This assessment will be published on the CCC website and a link provided directly from the DAERA website.

Within 6 months of receipt of this report, section 49 of the 2022 Act requires DAERA to lay a response to the points raised in the report at the Assembly with the input of all Departments to which the recommendations made by the CCC are relevant. This response will also be published on the DAERA website.

[100] https://climatenorthernireland.org.uk/climate-ni-network/sectors/

Table 1
Scoring criteria for delivery and implementation

Score	Criteria
Good progress	Indicators are moving in the right direction or being maintained at a high level
Mixed progress	Some indicators are moving in the right direction, others are stagnant at a low level or moving in the wrong direction
Insignificant progress	Indicators are stagnant at a low level or are moving in the wrong direction
Unable to evaluate	Limited or no available data

Figure 7-3: CCC scoring criteria for delivery and implementation

Table 2
Scoring criteria for policies and plans

Score	Criteria
Credible policies and plans	Policy milestones: • are almost entirely achieved or in place • are comprehensive and appropriately ambitious • include monitoring and evaluation
Partial policies and plans	Policy milestones: • are achieved or in place for key milestones but some gaps remain • cover most important elements, could be more ambitious • include some monitoring and evaluation
Limited policies and plans	Policy milestones: • are partially achieved or in place with some key milestones missing • cover some important elements, could be more ambitious • include some monitoring and evaluation
Insufficient policies and plans	Policy milestones: • are mostly not achieved, only minor policies in place • lack important elements, do not cover key areas or lack ambition • have minimal monitoring and evaluation

Figure 7-4: CCC scoring criteria for policies and plans

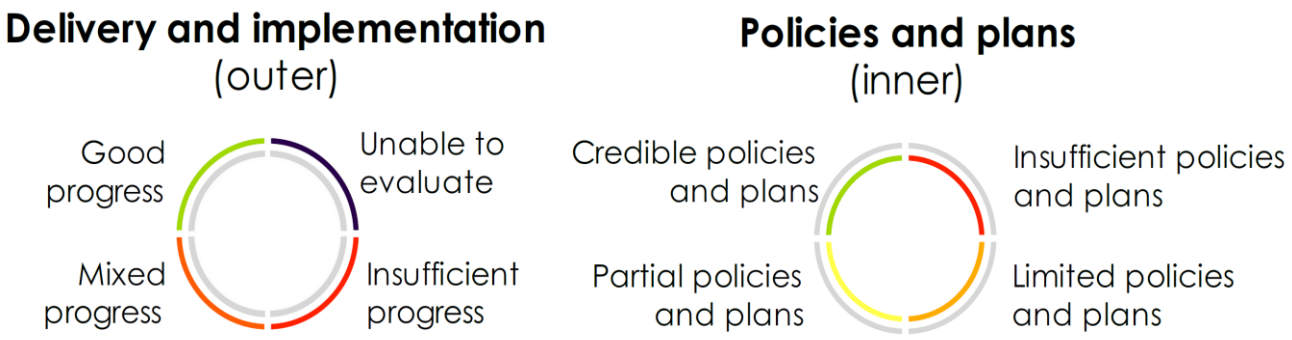


Figure 7-5: CCC diagrams to demonstrate scoring

Evaluation

In line with the requirement of section 60 (3) of the Climate Change Act 2008 an assessment of progress made towards implementing the objectives, proposals and policies set out in this Programme will be included in NICCAP4.

Whilst not a legal requirement under the 2008 Act a separate report which provides an end of programme delivery position, on the actions contained within the Adaptation Delivery Plan of this Programme, will be published on the DAERA website within 6 months of this Programme's 5-year lifespan being completed.

Chapter 18: Evaluation of NICCAP2

Background

Section 60 of the Climate Change Act 2008 requires that an assessment of progress made towards the implementation of previous Climate Change Adaptation Programmes is to be included in subsequent programmes.

NICCAP1 was published in January 2014, followed by NICCAP2 in September 2019 covering the periods 2014 to 2019 and 2019 to 2024 respectively. An assessment of progress made in NICCAP1 was incorporated into NICCAP2.

The overarching aim of NICCAP2 was:

'A resilient Northern Ireland which will take timely and well-informed decisions to address the socio-economic and environmental impacts of climate change'.

This aim was underpinned by 5 key priority areas and 7 outcome objectives and visions (figure 7-6). In addition to this, Climate NI supported Local Government to bring forward and develop strategic actions for each of their areas of responsibility. Each Council area put forward actions to develop a Climate Adaptation Plan and take account for Climate Adaptation within their Local Development Plans.

NICCAP2 Key Priority Areas	NICCAP2 Outcome Objectives and Visions
NC Natural Capital, including Terrestrial Coastal/Marine/Freshwater ecosystems,soils and biodiversity.	- **NC1:** We will have species, habitats and water bodies that are resilient to the impacts of climate change.
	- **NC2:** We have coastal communities, habitats, landforms and infrastructure that are resilient to impacts of climate change.
	- **NC3:** We have soils and woodland that are resilient to the impacts of climate change.
IF Infrastructure Services.	- **IF1:** We have Transport & Network Services that are resilient to the impacts of Flooding & extreme weather.
P People & Built Environment.	- **P1:** We have people, homes, buildings and communities that are resilient to the impacts of Flooding & extreme of weather.
B Disruption to Businesses & Supply Chains.	- **B1:** We have businesses that can adapt to impacts of Climate Change & extreme weather.
I Food Security/Global Food Production.	- **I1:** We have a food system that is resilient to impacts of climate change.

Figure 7-6: Priority areas and outcomes of NICCAP2

Delivery of actions within NICCAP2 implementation plan.

In preparation for the end of NICCAP2 an end of programme assessment was commissioned by DAERA, with the support of Climate NI, to establish progress made against the actions contained within the NICCAP2 implementation plan from Departments, Councils, Academia, eNGOs and other key delivery partners who had actions within the NICCAP2 implementation plan.

This review provides a stocktake of the delivery status against the actions contained within the implementation plan and a short narrative of progress. The stocktake scored each of the actions using the delivery assessment shown in figure 7-7 below.

Colour	Description
	The action was fully achieved within the NICCAP2 lifespan.
	The action showed a good level of progression, in line with expectations, but will require delivery into the next adaptation programme (2024-29).
	The action was progressed, but not sufficiently to meet expectations. Further work is required to improve delivery progress (2024-29).
	No progress was made against the action, or the action has been stopped.

Figure 7-7: NICCAP 2 action delivery assessment

Overview of NICCAP2 implementation plan delivery

The end of programme review of action delivery found that of the 137 actions contained within the implementation plan:

- 79 actions were fully achieved within the NICCAP2 lifespan;
- 45 actions were showing a good level of progression but will require delivery into the next programme;
- 10 actions were progressed but not as far as expected with further work required, while
- 3 actions had no or insufficient progress made against them.

The end of programme review for NICCAP2 containing a position update against each of the actions put forward in its implementation plan, has been published on the DAERA website.

CCC independent assessment of NICCAP2

As mentioned at chapter 17, DAERA, with the agreement of other Departments, commissioned the CCC, as the independent statutory advisors on climate change, to undertake an independent mid-term assessment of the NICCAP2 which they published on 20 April 2023[101]. In their report, they set out their assessment of progress in adapting to climate change in Northern Ireland, outlining 4 key messages:

- ***NICCAP2 has some of the elements required for a vision of a well-adapted Northern Ireland.*** *The current NICCAP objectives envisage a Northern Ireland that is adapted to climate change across seven areas. Most of the seven areas have one or*

[101] https://www.theccc.org.uk/publication/adapting-to-climate-change-progress-in-northern-ireland/

more key performance indicators. This vision centred structure is welcome. Further development of the programme structure is needed to make this vision operational and to drive policy creation and delivery. The seven areas do not span all the aspects of climate change that are critical to Northern Ireland and the current indicators are insufficient to demonstrate how each objective is being delivered.

- ***Planning for climate change in Northern Ireland remains at an early stage.*** *Across key areas of adaptation most of the critical policy and planning milestones that we identify as important for delivering adaptation are not in place. Preparation for climate change in areas falling outside of the scope of NICCAP2 is noticeably poorer than for areas within the programme. There are opportunities to address this, with several key policies currently in development.*
- ***Despite the critical importance of adapting to climate change, there is only limited evidence of delivery, and data gaps in key areas are unacceptably large****. The absence of relevant data is a key barrier to assessing all aspects relevant to delivery and implementation of adaptation policy. For almost two-thirds of the adaptation outcomes we look at in this report, the lack of relevant indicator data prevents us making a judgement on progress in delivery and implementation. This needs to be addressed with urgency.*
- ***The next NICCAP must go much further than its predecessor.*** *It must increase its scope to include the full range of sectors and policy areas which require adaptation, and critical data gaps need to be closed. The development of the programme is an opportunity to increase understanding and awareness of adaptation needs across government departments, local government, civil society and the public. It should seek to provide a clearer and more compelling link between the actions named in the NICCAP and delivery of the vision of being well-adapted to climate change. It is also an opportunity to embed climate resilience within upcoming plans for Net Zero being developed under the recent Climate Change Act.*

Their assessment went on to make 92 recommendations on further action which are available on their website[102].

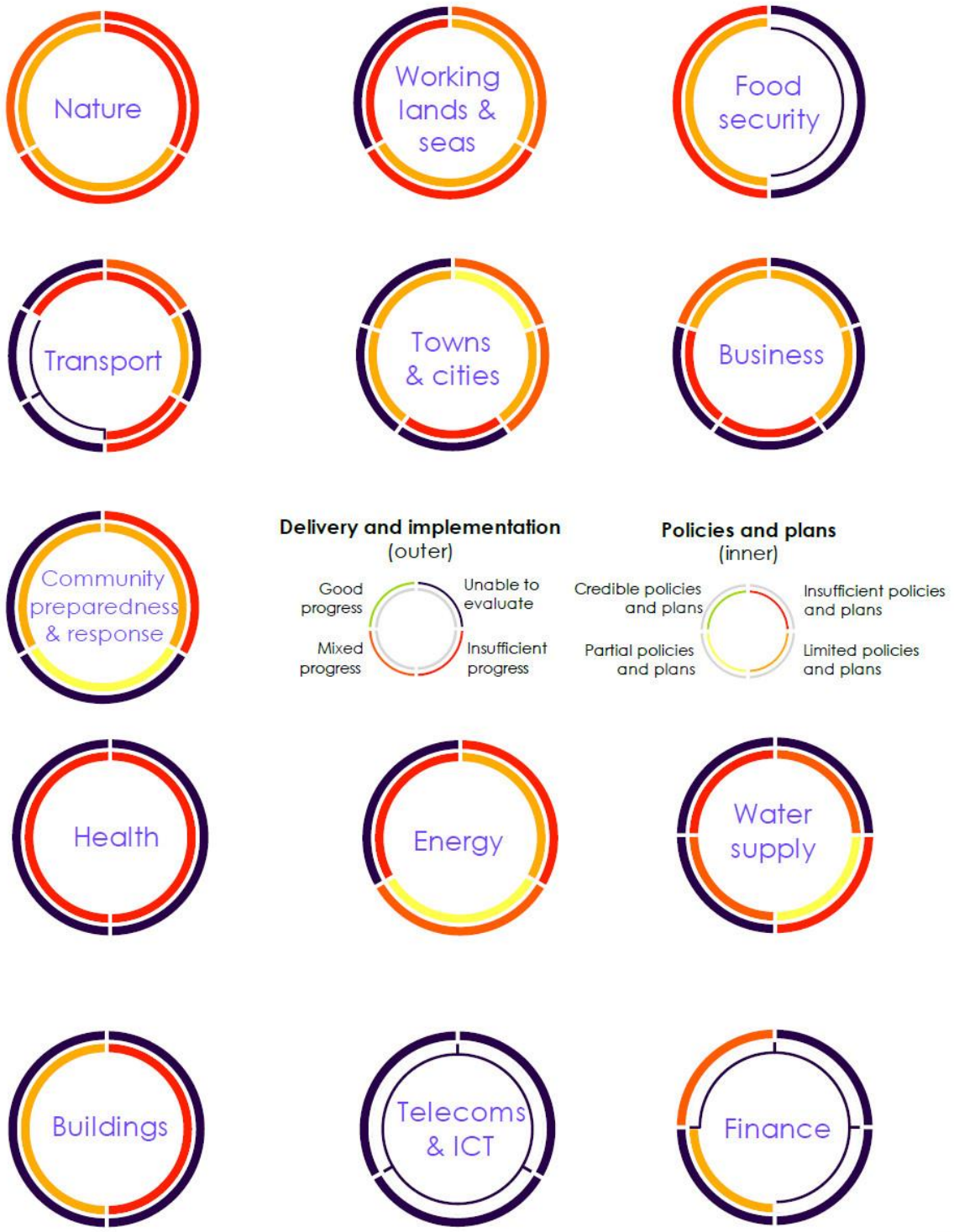
Summary overview of CCC's assessment findings

In chapter 17 we explained that in undertaking their assessment of NICCAP2 the CCC utilised their Adaptation Monitoring Assessment Framework which assesses:

i) delivery and implementation; and
ii) policies and plans.

Figure 7-8 below provides a visual overview of the CCC's assessment findings across the 13 thematic areas in their monitoring framework. While 7 of these areas were used in the development of the 2nd Climate Change Risk Assessment, to which NICCAP2 responded to, the 6 thematic areas of Health, Energy, Water Supply, Buildings, Telecoms & ICT, and Finance were introduced as part of the monitoring framework developed after NICCAP2's publication. As such, NICCAP2 did not address these thematic areas directly.

[102] https://www.theccc.org.uk/publication/adapting-to-climate-change-progress-in-northern-ireland/



Source: CCC analysis.
Notes: Each segment of the charts corresponds to an identified climate resilience outcome within our framework. The outer ring assesses delivery and implementation, while the inner ring assesses policies and plans. 'Unable to evaluate' for the delivery and implementation score is used when sufficient relevant indicator datasets are not available, up to date, or do not allow a trend to be robustly estimated. Segments are left white where policy is largely reserved.

Figure 7-8: CCC scoring assessment showing both adaptation areas covered in NICCAP2, and also those 6 areas newly introduced to the CCC's monitoring framework published after NICCAP2. This image and further information can be found in the full report available at https://www.theccc.org.uk/wp-content/uploads/2023/04/Adapting-to-climate-change-Progress-in-Northern-Ireland-Web.pdf

The CCC found that for those adaptation outcomes covered under NICCAP2, the credible plans and policies needed to drive forward the delivery of positive outcomes are not yet in place or had not yet been published. In several cases this was due to the lack of an Executive to approve cross cutting plans.

They also found that there was insufficient evidence across all sectors to suggest that climate exposure and vulnerability risk is being managed appropriately. They found that for those thematic areas not covered in NICCAP2 which subsequently had monitoring maps developed for them, planning and delivery was noticeably poorer.

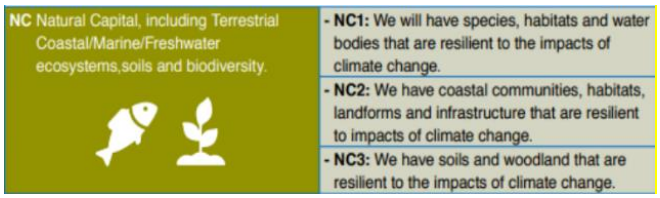
The CCC also found that the absence of relevant data was a key barrier to assessing all aspects relevant to the delivery and implementation of adaptation policy in Northern Ireland. They found that for more than 60% of adaptation outcomes, the lack of relevant indicator data prevented them from making an overall judgement on progress in delivery and implementation.

Assessment of delivery against NICCAP2 objectives.

The following is an assessment of the progress made towards the objectives of NICCAP2 through the implementation of the policies and proposals put forward towards each and summarised in Figure 7-9:

Key Priority Area	Total Actions	Fully Achieved	Good Progression	Insufficient Progression	No Progress or Action stopped
NC Natural Capital, including Terrestrial Coastal/Marine/Freshwater ecosystems,soils and biodiversity.	70	43	21	3	3
IF Infrastructure Services.	16	8	7	1	0
P People & Built Environment.	31	14	14	3	0
B Disruption to Businesses & Supply Chains.	4	4	0	0	0
I Food Security/Global Food Production.	7	2	4	1	0
Local Government Strategic Actions	22	13	7	2	0

Figure 7-9: Summary of NICCAP2 Actions Progress



Natural Capital

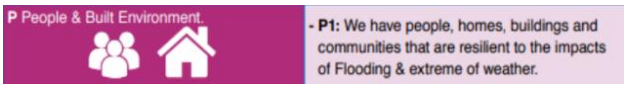
To move towards the achievement of this objective, 70 policies and proposals were put forward. Of which 64 saw significant progress made against them by the end of NICCAP2:

- 43 actions were fully achieved;
- 21 actions were showing a good level of progression but will require delivery into the next programme;
- 3 actions were progressed but not as far as expected with further work required, while
- 3 actions had no, or insufficient progress made against them.

Infrastructure Services

This objective also saw significant progress made towards the implementation of the policies and proposal put forward for it. From a total of 16 actions put forward, 15 saw significant progress made during NICCAP2:

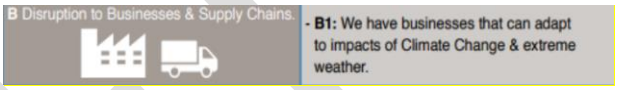
- 8 actions were fully achieved;
- 7 actions showed a good level of progression but will require delivery into the next programme; and
- 1 action was progressed but not as far as expected with further work required.



People and the Built Environment

A total of 31 policies and proposals were put forward to drive the advancement of this objective through NICCAP2. Of these 28 policies and proposals showed significant progress made through the programme:

- 14 actions were fully achieved;
- 14 actions showed a good level of progression but will require delivery into the next programme; and
- 3 actions were progressed but not as far as expected with further work required.



Disruption to Business

This objective saw each of the 4 policies and proposals put forward under it completed in full during the lifetime of NICCAP2, with no actions being carried over to this programme.

Food security

This objective saw 7 policies and proposals put forward, of which 6 saw significant progress made by the end of NICCAP2:

- 2 actions were fully achieved;
- 4 actions showed a good level of progression but will require delivery into the next programme; and
- 1 action was progressed but not as far as expected with further work required.

Local Government

Of the twenty-two strategic actions put forward by each of the 11 Councils, 20 showed significant progress made throughout the programme:

- 13 actions were fully achieved;
- 7 actions showed a good level of progression but will require delivery into the next programme; and
- 2 actions were progressed but not as far as expected with further work required.

The high level of significant progress made towards all the objectives of NICCAP2 is encouraging. However, we recognise that there is still much work to be done in terms of creating a climate resilient Northern Ireland and while several of these policies and proposals have been carried over from NICCAP2 to be built upon, NICCAP3 also contains a significant number of new and emerging policies and proposals to address this significant challenge.

Annex I - Adaptation Delivery Plan

Introduction

This Annex constitutes Northern Ireland's third Climate Change Adaptation Delivery Plan and is constructed around the 13 thematic areas which form the Climate Change Committee's monitoring framework for climate adaptation in the UK. It is composed of two parts and illustrates how the policies, plans and proposals put forward by NI Executive Departments, Local Government, Academia, Non-Government Organisations (NGOs) and wider society respond to the risk identified in the third Climate Change Risk Assessment (CCRA3).

Part 1

This first part details each thematic area and the third Climate Change Risk Assessment (CCRA3) risks that are relevant to each of them as they were presented at the end of each of the thematic area chapters above. In this Part they have been expanded to show the actions contained with Part 2 of this Adaptation Delivery Plan that contribute to addressing each of the risks within them. The actions are listed using a unique reference code which is prefixed with a 2-letter identifier to align to the main Key Area that they seek to address and are presented in the table in Part 2. This illustrates that many of the actions address a number of areas and CCRA3 risks.

Part 2

The second part lists the actions that have been put forward as a part of NICCAP3 along with the lead organisation and where applicable any organisation or body that is working in partnership on the action. This Part also establishes the reference code for each action in the Adaptation Delivery Plan, used in Part 1. Each Key Area has a distinct colour association to assist readers in navigating the list, and this is further supported by the page numbers in the Key at the beginning of each Part. This is to help the reader quickly identify any sections that are of particular interest.

Part 1:

Thematic Risk Maps

Nature

Risk number and Receptor	Nature of risk/opportunity	Actions		Urgency Score
N1. Terrestrial species and habitats	Changing climatic conditions and extreme events, including temperature change, water scarcity, wildfire, flooding, wind, and altered hydrology (including water scarcity, flooding and saline intrusion)	NC7, NC8, NC9, NC10, NC11, NC12, NC13, NC14, NC17, NC19, NC20, NC21, NC22, NC23, NC24, NC25, NC28, NC29, NC30, NC31, NC32, NC36, NC37, NC39, NC41, NC44, NC45, NC46, NC50, NC51, NC54, NC55, NC57, NC58, NC59, NC60, NC61, NC67, NC69, NC70, NC71, NC72, NC74, NC77, NC79, NC80, NC83, NC84, NC89, NC92, NC93, NC94, NC96, NC97, NC100, IS5, IS9, IS18, BE8, BE10, BE11, BE27, BE36, BE40, BE41, DB1	RISKS	More action needed
N2. Terrestrial species and habitats	Pests, pathogens and invasive species	NC6, NC7, NC9, NC10, NC15, NC16, NC19, NC25, NC28, NC32, NC42, NC43, NC47, NC52, NC53, NC57, NC59, NC60, NC63, NC67, NC71, NC73, NC79, FS5, FS6, IS9, DB1	RISKS	More action needed
N3. Terrestrial species and habitats	New species colonisations	NC6, NC25, NC47, NC57, NC60, NC71, NC74, FS5, FS6	OPPORTUNITIES	Further investigation
N4. Soils	Changing climatic conditions, including seasonal aridity and wetness	NC11, NC12, NC26, NC31, NC32, NC36, NC39, NC40, NC41, NC44, NC46, NC48, NC54, NC55, NC57, NC58, NC59, NC60, NC61, NC68, NC71, NC72, NC79, NC83, NC84, NC86, NC87, NC89, NC90, NC95, IS9, BE8, BE11, BE29	RISKS	More action needed

Risk number and Receptor	Nature of risk/opportunity	Actions		Urgency Score
N5. Natural carbon stores, carbon sequestration and GHG emissions	Changing climatic conditions, including temperature change and water scarcity	NC1, NC2, NC9, NC10, NC11, NC12, NC13, NC14, NC17, NC19, NC20, NC21, NC22, NC29, NC31, NC32, NC33, NC34, NC36, NC39, NC40, NC44, NC46, NC54, NC55, NC57, NC58, NC59, NC60, NC61, NC67, NC68, NC69, NC71, NC72, NC77, NC83, NC84, NC86, NC87, NC88, NC95, NC96, NC97, NC98, NC99, NC100, IS9, BE8, BE11, BE46, BE48	RISKS & OPPORTUNITIES	More action needed
N8. Forestry	Pests, pathogens and invasive species	NC6, NC7, NC16, NC22, NC25, NC28, NC32, NC43, NC49, NC52, NC53, NC57, NC58, NC59, NC60, NC63, NC70, NC71, NC74, NC76, NC97, NC100	RISKS	More action needed
N11. Freshwater species and habitats	Changing climatic conditions and extreme events, including higher water temperatures, flooding, water scarcity and phenological shifts	NC7, NC8, NC9, NC10, NC11, NC13, NC14, NC18, NC19, NC23, NC24, NC25, NC32, NC36, NC48, NC55, NC59, NC60, NC61, NC66, NC67, NC71, NC74, NC75, NC78, NC80, NC83, NC84, NC90, NC92, NC94, IS5, IS8, IS9, BE8, BE10, BE41	RISKS	More action needed
N12. Freshwater species and habitats	Pests, pathogens and invasive species	NC7, NC9, NC15, NC16, NC18, NC48, NC59, NC60, NC66, NC67, NC71, IS8, IS9	RISKS	More action needed

Risk number and Receptor	Nature of risk/opportunity	Actions		Urgency Score
N13. Freshwater species and habitats	New species colonisations	NC48, NC59, NC71, NC74, IS8	OPPORTUNITIES	Sustain current action
N14. Marine species, habitats and fisheries	Changing climatic conditions, including ocean acidification and higher water temperatures	NC1, NC2, NC8, NC33, NC34, NC35, NC38, NC71, BE10	RISKS	More action needed
N15. Marine species, habitats and fisheries	Changing climatic conditions	NC1, NC33, NC34, NC35, NC60, NC71	OPPORTUNITIES	Further investigation
N16. Marine species and habitats	Pests, pathogens and invasive species	NC3, NC15, NC33, NC34, NC35, NC71, NC73	RISKS	More action needed
N17. Coastal species and habitats	Coastal flooding, erosion and climate factors	NC4, NC11, NC13, NC14, NC16, NC27, NC33, NC34, NC35, NC37, NC39, NC44, NC60, NC71, NC74, NC82, NC94, BE29, BE46, DB1	RISKS & OPPORTUNITIES	More action needed

Risk number and Receptor	Nature of risk/opportunity	Actions		Urgency Score
N18. Landscape character	Climate change	NC5, NC13, NC14, NC19, NC20, NC23, NC24, NC32, NC37, NC39, NC42, NC43, NC44, NC54, NC55, NC58, NC59, NC60, NC61, NC71, NC72, NC75, NC77, NC82, NC83, NC84, NC86, NC87, NC89, NC95, NC96, NC100, IS1, BE8, BE11, BE29, BE35, BE44, DB1	RISKS & OPPORTUNITIES	Further investigation
ID10. Risk multiplication to the UK	Interactions and cascades of named risks across systems and geographies	BE9, DB1, ST8	RISKS	More action needed

Working Lands & Seas

Risk number and Receptor	Nature of risk/opportunity	Actions		Urgency Score
N4. Soils	Changing climatic conditions, including seasonal aridity and wetness	NC44, NC46, NC48, NC54, NC55, NC56, NC57, NC58, NC59, NC60, NC61, NC64, NC65, NC68, NC71, NC72, NC79, NC81, NC86, NC87, NC89, NC90, NC91, FS16	RISKS	More action needed
N5. Natural carbon stores, carbon sequestration and GHG emissions	Changing climatic conditions, including temperature change and water scarcity	NC44, NC46, NC54, NC55, NC56, NC57, NC58, NC59, NC60, NC61, NC62, NC64, NC65, NC68, NC71, NC72, NC77, NC86, NC87, NC88, NC97, BE48	RISKS & OPPORTUNITIES	More action needed
N6. Agricultural and forestry productivity	Extreme events and changing climatic conditions (including temperature change, water scarcity, wildfire, flooding, coastal erosion, wind and saline intrusion).	NC23, NC24, NC46, NC50, NC51, NC52, NC53, NC57, NC58, NC60, NC61, NC64, NC65, NC71, NC72, NC76, NC77, NC79, NC81, NC85, NC87, NC88, NC89, NC90, NC91, NC93, NC97, FS16, BE38	RISKS & OPPORTUNITIES	More action needed
N7. Agriculture	Pests, pathogens and invasive species	NC6, NC7, NC15, NC16, NC25, NC28, NC47, NC60, NC63, NC71, NC73, FS5, FS6	RISKS	More action needed
N8. Forestry	Pests, pathogens and invasive species	NC6, NC7, NC16, NC25, NC28, NC49, NC52, NC53, NC57, NC58, NC59, NC60, NC63, NC71, NC76, NC97, FS16	RISKS	More action needed

Risk number and Receptor	Nature of risk/opportunity	Actions		Urgency Score
N9. Agricultural and forestry productivity	New/alternative species becoming suitable	NC46, NC52, NC53, NC60, NC62, NC71, NC72, NC76, NC85, NC87, NC88, NC89, NC91, NC97, BE48	OPPORTUNITIES	Further investigation
N10. Aquifers and agricultural land	Sea level rise, saltwater intrusion	NC71, NC82, IS7	RISKS	Watching Brief
N11. Freshwater species and habitats	Changing climatic conditions and extreme events, including higher water temperatures, flooding, water scarcity and phenological shifts	NC7, NC23, NC24, NC25, NC48, NC55, NC59, NC60, NC61, NC66, NC71, NC78, NC90, IS8	RISKS	More action needed
N12. Freshwater species and habitats	Pests, pathogens and invasive species	NC7, NC15, NC16, NC48, NC59, NC60, NC66, NC71, IS8	RISKS	More action needed
N13. Freshwater species and habitats	New species colonisations	NC48, NC59, NC71, IS8	OPPORTUNITIES	Sustain current action
N14. Marine species, habitats and fisheries	Changing climatic conditions, including ocean acidification and higher water temperatures	NC35, NC71	RISKS	More action needed

Risk number and Receptor	Nature of risk/opportunity	Actions		Urgency Score
N15. Marine species, habitats and fisheries	Changing climatic conditions	NC35, NC60, NC71	OPPORTUNITIES	Further investigation
N16. Marine species and habitats	Pests, pathogens and invasive species	NC3, NC15, NC35, NC71, NC73	RISKS	More action needed
ID10. Risk multiplication to the UK	Interactions and cascades of named risks across systems and geographies	ST8	RISKS	More action needed

UK Food Security

Risk number and Receptor	Nature of risk/opportunity	Actions		Urgency Score
N4. Soils	Changing climatic conditions, including seasonal aridity and wetness	NC46, NC48, NC54, NC55, NC56, NC59, NC61, NC64, NC65, NC81, NC91, FS11, FS15, FS16, ST20	RISKS	More action needed
N6. Agricultural and forestry productivity	Extreme events and changing climatic conditions (including temperature change, water scarcity, wildfire, flooding, coastal erosion, wind and saline intrusion).	NC46, NC52, NC53, NC61, NC64, NC65, NC76, NC81, NC85, NC88, NC91, FS4, FS9, FS11, FS15, FS16, FS17, ST20	RISKS & OPPORTUNITIES	More action needed
N7. Agriculture	Pests, pathogens and invasive species	NC6, NC7, NC47, NC73, FS5, FS6, FS11, FS15	RISKS	More action needed
N9. Agricultural and forestry productivity	New/alternative species becoming suitable	NC46, NC52, NC53, NC62, NC76, NC85, NC88, NC91, FS9, FS11, FS15, BE48, ST20	OPPORTUNITIES	Further investigation
N10. Aquifers and agricultural land	Sea level rise, saltwater intrusion	IS7	RISKS	Watching Brief
N11. Freshwater species and habitats	Changing climatic conditions and extreme events, including higher water temperatures, flooding, water scarcity and phenological shifts	NC7, NC48, NC55, NC59, NC61, NC66, FS15, IS8	RISKS	More action needed

Risk number and Receptor	Nature of risk/opportunity	Actions		Urgency Score
N12. Freshwater species and habitats	Pests, pathogens and invasive species	NC7, NC48, NC59, NC66, FS15, IS8	RISKS	More action needed
N13. Freshwater species and habitats	New species colonisations	NC48, NC59, FS15, IS8	OPPORTUNITIES	Sustain current action
N14. Marine species, habitats and fisheries	Changing climatic conditions, including ocean acidification and higher water temperatures	FS15	RISKS	More action needed
N15. Marine species, habitats and fisheries	Changing climatic conditions	FS15	OPPORTUNITIES	Further investigation
N16. Marine species and habitats	Pests, pathogens and invasive species	NC3, NC73, FS15	RISKS	More action needed
B6. Disruption to business supply chains and distribution networks	Extreme weather	NC46, NC76, FS4, FS9, FS15, FS17, FS18, FS21, FS22, BE48	RISKS	More action needed

Risk number and Receptor	Nature of risk/opportunity	Actions		Urgency Score
H9. Food safety and food security	Higher temperatures (food safety) and extreme weather (food security)	NC46, NC47, NC76, NC81, FS1, FS2, FS3, FS4, FS5, FS6, FS7, FS9, FS10, FS12, FS15, FS18, FS19, FS20, FS21, FS22, ST20	RISKS	Further investigation
ID1. Food availability, safety, and quality	Decreasing yields from rising temperatures, water scarcity and ocean changes globally	NC61, NC62, NC81, NC85, NC88, NC91, FS4, FS8, FS9, FS10, FS12, FS15, FS21, FS22, ST20	RISKS	More action needed
ID2. UK food availability and exports	Increases in productivity and areas suitable for agriculture overseas	NC61, NC62, NC76, FS8, BE48	OPPORTUNITIES	Watching brief
ID6. Increased trade for the UK	Arctic ice melt opening up new trading routes	FS13	OPPORTUNITIES	Watching brief
ID7. International trade routes	Climate hazards affecting supply chains	FS12, FS14	RISKS	More action needed
ID10. Risk multiplication to the UK	Interactions and cascades of named risks across systems and geographies	FS12, ST20	RISKS	More action needed

Water

Risk number and Receptor	Nature of risk/opportunity	Actions		Urgency Score
N10. Aquifers and agricultural land	Sea level rise, saltwater intrusion	NC71, IS7	RISKS	Watching Brief
N11. Freshwater species and habitats	Changing climatic conditions and extreme events, including higher water temperatures, flooding, water scarcity and phenological shifts	NC36, NC48, NC60, NC71, NC78, IS5, IS8, IS9, BE4, BE5, BE6	RISKS	More action needed
N12. Freshwater species and habitats	Pests, pathogens and invasive species	NC48, NC60, NC71, IS8, IS9	RISKS	More action needed
N13. Freshwater species and habitats	New species colonisations	NC48, NC71, IS8	OPPORTUNITIES	Sustain current action
I1. Infrastructure networks (water, energy, transport, ICT)	Cascading failures	IS1, IS6, IS9, BE4, BE5, BE6, BE7, BE48	RISKS	More action needed
I2. Infrastructure services	River, surface water and groundwater flooding	NC60, IS1, IS5, IS9, BE4, BE5, BE6, BE7	RISKS	More action needed
I3. Infrastructure services	Coastal flooding and erosion	NC4, NC60, IS1, BE4, BE5, BE6	RISKS	Further Investigation

Risk number and Receptor	Nature of risk/opportunity	Actions		Urgency Score
I4. Bridges and pipelines	Flooding and erosion	IS1, IS4	RISKS	Further investigation
I7. Subterranean and surface infrastructure	Subsidence	IS4, BE7	RISKS	Further Investigation
I8. Public water supplies	Reduced water availability	IS3, IS10, IS27, IS28, BE7, DB4, DB6	RISKS	Sustain current action
H10. Health	Water quality and household water supply	NC78, IS3, IS27, IS28, BE48	RISKS	Further investigation
B3. Business production processes	Water scarcity	IS2, IS3, IS27, IS28, DB4, DB6, DB8	RISKS	Further investigation
ID10. Risk multiplication to the UK	Interactions and cascades of named risks across systems and geographies	IS3, IS6	RISKS	More action needed

Energy

Risk number and Receptor	Nature of risk/opportunity	Actions		Urgency Score
I1. Infrastructure networks (water, energy, transport, ICT)	Cascading failures	DB3, ST27	RISKS	More action needed
I2. Infrastructure services	River, surface water and groundwater flooding	ST27	RISKS	More action needed
I3. Infrastructure services	Coastal flooding and erosion	NC4, ST27	RISKS	Further Investigation
I4. Bridges and pipelines	Flooding and erosion	IS32	RISKS	Further investigation
I6. Hydroelectric generation	Low or high river flows		RISKS	Watching brief
I7. Subterranean and surface infrastructure	Subsidence	IS29	RISKS	Further Investigation
I9. Energy generation	Reduced water availability		RISKS	Watching brief

Risk number and Receptor	Nature of risk/opportunity	Actions		Urgency Score
I10. Energy	High and low temperatures, high winds, lightning	NC62, IS11, IS32, BE51, DB4, DB6	RISKS	Further investigation
I11. Offshore infrastructure	Storms and high waves	IS32	RISKS	Sustain current action
H6. Household energy demand	Summer and winter temperature changes		RISKS & OPPORTUNITIES	More action needed
ID10. Risk multiplication to the UK	Interactions and cascades of named risks across systems and geographies	DB3, ST27	RISKS	More action needed

Telecoms & ICT

Risk number and Receptor	Nature of risk/opportunity	Actions		Urgency Score
I1. Infrastructure networks (water, energy, transport, ICT)	Cascading failures	IS25, IS33, BE4, BE5, BE6, BE21, BE48, ST27	RISKS	More action needed
I2. Infrastructure services	River, surface water and groundwater flooding	IS14, IS17, BE4, BE5, BE6, ST27	RISKS	More action needed
I3. Infrastructure services	Coastal flooding and erosion	NC4, BE4, BE5, BE6, ST27	RISKS	Further Investigation
I4. Bridges and pipelines	Flooding and erosion	IS4, IS14, IS20	RISKS	Further investigation
I7. Subterranean and surface infrastructure	Subsidence	IS4, IS14	RISKS	Further Investigation
I13. Digital	High and low temperatures, high winds, lightning	IS12, IS25, IS33	RISKS	Further Investigation
ID10. Risk multiplication to the UK	Interactions and cascades of named risks across systems and geographies	ST27	RISKS	More action needed

Transport

Risk number and Receptor	Nature of risk/opportunity	Actions		Urgency Score
I1. Infrastructure networks (water, energy, transport, ICT)	Cascading failures	IS13, IS24, IS25, IS26, IS41, BE3, BE4, BE5, BE6, BE7, BE29, BE61	RISKS	More action needed
I2. Infrastructure services	River, surface water and groundwater flooding	NC92, NC94, IS14, IS15, IS16, IS17, IS18, IS26, IS34, IS36, IS37, IS39, IS43, BE3, BE4, BE5, BE6, BE7, BE8, BE33	RISKS	More action needed
I3. Infrastructure services	Coastal flooding and erosion	NC4, NC11, NC82, NC94, IS19, IS31, IS35, IS39, BE3, BE4, BE5, BE6, BE33	RISKS	Further Investigation
I4. Bridges and pipelines	Flooding and erosion	NC11, IS14, IS20, IS36, IS37, IS39, BE3, BE29, BE33	RISKS	Further investigation
I5. Transport networks	Slope and embankment failure	NC11, IS14, IS18, IS20, IS21, IS22, IS23, IS24, IS30, IS35, IS36, IS38, IS39, BE29, BE33	RISKS	More action needed
I7. Subterranean and surface infrastructure	Subsidence	IS14, IS15, IS16, IS21, IS22, IS24, IS30, IS38, BE7	RISKS	Further Investigation
I12. Transport	High and low temperatures, high winds, lightning	NC93, IS16, IS24, IS25, IS40, BE61	RISKS	More action needed

Risk number and Receptor	Nature of risk/opportunity	Actions		Urgency Score
ID10. Risk multiplication to the UK	Interactions and cascades of named risks across systems and geographies	IS13	RISKS	More action needed

Towns & Cities

Risk number and Receptor	Nature of risk/opportunity	Actions		Urgency Score
H1. Health and wellbeing	High temperatures	IS24, BE1, BE2, BE8, BE9, BE11, BE13, BE36, BE43, BE49, BE59, BE61, ST6, ST15, ST17, ST18	RISKS	More action needed
H3. People, communities and buildings	Flooding	NC21, IS1, IS24, IS26, BE1, BE2, BE3, BE4, BE5, BE6, BE7, BE8, BE9, BE10, BE11, BE12, BE36, BE43, BE49, BE58, ST6, ST14, ST15, ST16, ST17, ST18	RISKS	More action needed
H4. Viability of coastal communities	Sea level rise	NC4, BE3, BE4, BE5, BE6, BE8, BE12, BE43, BE49, ST15, ST18	RISKS	Further investigation
I2. Infrastructure services	River, surface water and groundwater flooding	IS1, IS9, IS26, BE3, BE4, BE5, BE6, BE7, BE8, BE9, BE55, BE58	RISKS	More action needed
I3. Infrastructure services	Coastal flooding and erosion	NC4, NC82, IS1, BE3, BE4, BE5, BE6, BE58	RISKS	Further Investigation
ID10. Risk multiplication to the UK	Interactions and cascades of named risks across systems and geographies	BE9, ST6, ST8, ST9, ST14, ST15, ST16, ST17, ST18	RISKS	More action needed

Buildings

Risk number and Receptor	Nature of risk/opportunity	Actions		Urgency Score
H1. Health and wellbeing	High temperatures	IS11, BE1, BE13, BE14, BE17, BE22, BE24, BE44, BE45, BE52	RISKS	More action needed
H3. People, communities and buildings	Flooding	IS1, IS11, IS26, BE1, BE4, BE5, BE6, BE7, BE17, BE20, BE21, BE45, BE63, DB1	RISKS	More action needed
H5. Building fabric	Moisture, wind and driving rain	BE1, BE14, BE17, BE18, BE19, BE20, BE21, BE22, BE44, BE45, BE63, DB1, DB4, DB6	RISKS	Further investigation
H6. Household energy demand	Summer and winter temperature changes	BE14, BE17, BE18, BE22, BE56	RISKS & OPPORTUNITIES	More action needed
H11. Cultural heritage	Changes in temperature, precipitation, groundwater, land, ocean and coastal change	NC4, NC27, BE4, BE5, BE6, BE15, BE16, BE19, BE45, BE63, DB1	RISKS	More action needed
H12. Health and social care delivery	Extreme weather	BE23, BE25	RISKS	More action needed
H13. Education and prison services	Extreme weather	NC55, BE1, BE50, BE51, BE52, BE53, BE54	RISKS	More action needed
ID10. Risk multiplication to the UK	Interactions and cascades of named risks across systems and geographies	DB1, DB3, ST12, ST27	RISKS	More action needed

Health

Risk number and Receptor	Nature of risk/opportunity	Actions		Urgency Score
H1. Health and wellbeing	High temperatures	IS24, BE8, BE9, BE11, BE13, BE14, BE22, BE24, BE35, BE36, BE38, BE43, BE45, BE49, BE52, BE59, BE61, BE62, ST18	RISKS	More action needed
H2. Health and wellbeing	High temperatures	BE8, BE32, BE35, BE36	OPPORTUNITIES	Further investigation
H3. People, communities and buildings	Flooding	NC11, NC94, IS1, IS24, BE8, BE9, BE11, BE29, BE30, BE31, BE32, BE33, BE35, BE36, BE43, BE45, BE49, ST18	RISKS	More action needed
H7. Health and wellbeing	Changes in indoor and outdoor air quality	NC55, IS24, BE8, BE9, BE14, BE22, BE27, BE34, BE36, BE37, BE40, BE59, BE60, BE61, BE62	RISKS	Further investigation
H8. Health	Vector-borne disease	NC6, NC47, NC73, FS5, FS6, IS24, BE26, BE59, BE62	RISKS	Further investigation
H9. Food safety and food security	Higher temperatures (food safety) and extreme weather (food security)	NC47, FS1, FS2, FS3, FS5, FS6, FS12	RISKS	Further investigation
H10. Health	Water quality and household water supply	IS3, BE36, BE62	RISKS	Further investigation

Risk number and Receptor	Nature of risk/opportunity	Actions		Urgency Score
H12. Health and social care delivery	Extreme weather	BE23, BE25, BE38, BE40	RISKS	More action needed
ID9. UK public health	Increase in vector borne diseases due to climate change	NC73, IS24, BE9, BE26, BE59	RISKS	More action needed
ID10. Risk multiplication to the UK	Interactions and cascades of named risks across systems and geographies	FS12, IS3, BE9, BE28, ST18	RISKS	More action needed

Community Preparedness & Response

Risk number and Receptor	Nature of risk/opportunity	Actions		Urgency Score
H1. Health and wellbeing	High temperatures	FS11, BE8, BE9, BE11, BE14, BE35, BE43, BE44, BE45, BE49, BE52, ST6, ST7, ST13, ST18, ST21, ST22, ST23	RISKS	More action needed
H2. Health and wellbeing	High temperatures	FS11, BE8, BE35, ST7, ST13, ST21, ST22, ST23	OPPORTUNITIES	Further investigation
H3. People, communities and buildings	Flooding	FS11, IS36, IS37, IS43, BE3, BE4, BE5, BE6, BE8, BE9, BE10, BE11, BE12, BE29, BE35, BE41, BE42, BE43, BE45, BE46, BE47, BE49, BE63, DB1, ST6, ST7, ST13, ST14, ST18, ST21, ST22, ST23, ST25	RISKS	More action needed
H4. Viability of coastal communities	Sea level rise	NC4, NC37, IS35, BE3, BE4, BE5, BE6, BE8, BE12, BE29, BE43, BE45, BE46, BE47, BE48, BE49, ST7, ST18	RISKS	Further investigation
H11. Cultural heritage	Changes in temperature, precipitation, groundwater, land, ocean and coastal change	NC4, NC37, BE4, BE5, BE6, BE8, BE12, BE29, BE35, BE40, BE45, BE46, BE48, BE63, DB1, ST7	RISKS	More action needed
H12. Health and social care delivery	Extreme weather	BE40, ST7, ST13	RISKS	More action needed
H13. Education and prison services	Extreme weather	BE10, BE47, BE50, BE51, BE52, BE53, BE54	RISKS	More action needed

Risk number and Receptor	Nature of risk/opportunity	Actions		Urgency Score
N18. Landscape character	Climate change	NC37, BE4, BE5, BE6, BE8, BE11, BE29, BE35, BE44, BE63, DB1	RISKS & OPPORTUNITIES	Further investigation
ID3. Migration to the UK and effects on the UK's interests overseas	Climate-related international human mobility	BE39	RISKS & OPPORTUNITIES	Watching brief
ID10. Risk multiplication to the UK	Interactions and cascades of named risks across systems and geographies	BE9, DB1, ST1, ST2, ST3, ST5, ST6, ST7, ST9, ST12, ST13, ST14, ST18, ST19, ST21, ST22, ST23, ST25	RISKS	More action needed

Business

Risk number and Receptor	Nature of risk/opportunity	Actions		Urgency Score
B1. Flooding of business sites	Increase in flood risk	NC94, IS26, BE4, BE5, BE6, DB1, DB2, DB3, DB7, ST6, ST12, ST24	RISKS	More action needed
B2. Coastal business locations and infrastructure	Coastal flooding, extreme weather, erosion and sea level rise	NC4, NC94, BE4, BE5, BE6, BE29, BE48, DB1, DB3, DB7, ST12	RISKS	More action needed
B3. Business production processes	Water scarcity	IS2, IS3, IS27, IS28, DB4, DB5, DB6, DB7, DB8	RISKS	Further investigation
B5. Reduced employee productivity in businesses	Infrastructure disruption and higher temperatures in working environments	DB5, DB7, DB8, ST12, ST24	RISKS	Further investigation
B6. Disruption to business supply chains and distribution networks	Extreme weather	FS4, IS40, IS43, BE4, BE5, BE6, BE40, BE48, BE57, DB2, DB3, DB5, DB7, DB8, ST12, ST24, ST28	RISKS	More action needed
B7. Changes in demand for goods and services	Long term climate change	BE48, DB1, DB2, DB5, DB7, DB8	OPPORTUNITIES	Further investigation
ID1. Food availability, safety, and quality	Decreasing yields from rising temperatures, water scarcity and ocean changes globally	NC61, NC62, FS4, FS8, FS12, DB7, ST20	RISKS	More action needed

Risk number and Receptor	Nature of risk/opportunity	Actions		Urgency Score
ID2. UK food availability and exports	Increases in productivity and areas suitable for agriculture overseas	NC61, NC62, FS8, BE48, DB7	OPPORTUNITIES	Watching brief
ID6. Increased trade for the UK	Arctic ice melt opening up new trading routes	FS13, DB7	OPPORTUNITIES	Watching brief
ID7. International trade routes	Climate hazards affecting supply chains	FS12, FS14, DB2, DB7	RISKS	More action needed
ID10. Risk multiplication to the UK	Interactions and cascades of named risks across systems and geographies	FS12, IS3, DB1, DB3, DB7, ST6, ST12, ST20, ST24, ST28	RISKS	More action needed

Finance

Risk number and Receptor	Nature of risk/opportunity	Actions		Urgency Score
B4. Business access to finance, investment and insurance	Extreme weather	DB4, DB6, DB8, ST12, ST19, ST27	RISKS	Sustain current action
ID8. Economic loss to the UK	Climate driven resource governance pressures and financial exposure	ST12, ST19	RISKS	Sustain current action
ID10. Risk multiplication to the UK	Interactions and cascades of named risks across systems and geographies	ST12, ST19, ST27	RISKS	More action needed

Strategic

Risk number and Receptor	Nature of risk/opportunity	Actions		Urgency Score
ID10. Risk multiplication to the UK	Interactions and cascades of named risks across systems and geographies	IS3, IS6, IS13, BE28, ST1, ST2, ST3, ST4, ST5, ST6, ST7, ST8, ST9, ST10, ST11, ST12, ST13, ST14, ST15, ST16, ST17, ST18, ST19, ST20, ST21, ST22, ST23, ST24, ST25, ST26, ST27, ST28	RISKS	More action needed

Part 2:

Action Reference List

Reference Prefix	Primary Key Area	Page Number
NC	Natural Capital	31
FS	Food Security	79
IS	Infrastructure Services	90
BE	People & the Built Environment	102
DB	Disruption to Business & Supply Chains	134
ST	Strategic	138

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
NC1	The Northern Ireland Review of the Marine Protected Areas (MPA) Strategy went out to public consultation in 2024, and officials are currently analysing responses. Some of the proposed objectives and actions within the Review of the MPA Strategy consultation documents includes: - improving awareness of and access to existing data on species and habitats of conservation interest - making use of published management plans where available e.g. MarPAMM outputs - determine if existing legislation allows scope to designate and adapt MPA extent and features with changes in environmental conditions e.g. climate pressures and changing ranges	DAERA	The Review of the MPA Strategy was completed using a novel co-design approach with stakeholders across industry, eNGOs, Government and public bodies, and academia, many of whom may become delivery partners once the drafts are finalised and the programmes launch.	N5, N14, N15	Nature.
NC2	The Northern Ireland Blue Carbon Action Plan (BCAP) went out to public consultation in 2024, and officials are currently analysing responses. Some of the proposed objectives and actions within the BCAP consultation documents include: - advancing the inclusion of Northern Ireland's blue carbon contribution to the UK Greenhouse Gas Emissions Inventory and the UK Climate Change Risk Assessments - improving awareness of and access to existing data on species and habitats of conservation interest	DAERA	The BCAP was developed using a novel co-design approach with stakeholders across industry, eNGOs, Government and public bodies, and academia, many of whom may become delivery partners once the drafts are finalised and the programmes launch.	N5, N14	Nature.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
NC3	Marine invasive species action plans are being developed, to cover brackish and marine waters.	DAERA		N16	Nature. Working Lands & Seas. UK Food Security.
NC4	Progress the work of the Northern Ireland Coastal Forum and associated work programme. Build on the scientifically robust evidence base of coastal data, repeating high resolution surveys to identify coastal change and undertake coastal vulnerability assessments based on the evidence collected. Designate responsibility to a NICS department to oversee coastal management and bring forward policy and legislation on managing coastal change.	DAERA/DfI	NIEA, GSNI, National Trust, AFBI, academia, UK Hydrographic Office, local authorities with a coastal remit, private contractors	N17 I3 H4, H11 B2	Nature. Water Supply. Energy. Telecoms & ICT. Transport. Towns & Cities. Buildings. Community Preparedness & Response. Business.
NC5	Develop a rolling multi-year Landscape Action Plan by December 2025.	DAERA	Councils, Planning NI (DfI), NIEL	N18	Nature.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
NC6	Wildlife Surveillance - As humans increasingly encroach on previously wild land, interactions between humans, domesticated animals, and wildlife have become more frequent. DAERA continue to support solutions to enhance surveillance systems at the human-animal-environment interface. A knowledge of wildlife movements and interactions with domestic species is important in understanding the risks posed.	DAERA	Wildlife Specialists, NIEA, Forestry and private sector partners.	N2, N3, N7, N8 H8	Nature. Working Lands & Seas. UK Food Security. Health.
NC7	Shared Island Invasive Species and Biosecurity Initiative, to be managed by NIEA and National Biodiversity Data Centre, to support development of an All-Island Invasive Species Management Plan.	DAERA	National Parks & Wildlife Service, National Biodiversity Data Centre	N1, N2, N7, N8, N11, N12	Nature. Working Lands & Seas. UK Food Security.
NC8	Complete the programme of Conservation Management Plans for Northern Ireland's suite of Special Areas of Conservation by 2029.	DAERA	DAERA Marine Team and external delivery partners as required.	N1, N11, N14	Nature.
NC9	Nature & Natural Capital Data & Evidence Programme - to measure and monitor the state and extent of terrestrial and freshwater biodiversity and ecosystems, assessment of the pressures and threats on biodiversity and natural capital which can undermine provision of nature-based solutions, develop suite of biodiversity indicators, and ecological modelling and climate risk assessments to forecast biodiversity pathways and outcomes, and to inform opportunity mapping for effective nature-based solutions and targeted measures.	DAERA	JNCC, CEDaR, eNGO specialists, academic institutions, ecological specialists, AFBI, citizen scientists	N1, N2, N5, N11, N12	Nature.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
NC10	Protected Sites Stewardship Programme - to provide a framework for more effective enforcement of Protected Areas legislation covering the designation, protection, restoration and management of terrestrial and freshwater protected sites; develop robust and up to date conservation advice to protect sites and ensure compliance with Habitats Regulations and the Environment Order; develop systems to disseminate site-specific condition assessments and conservation management requirements and support enforcement of protected sites obligations, including Habitats Regulations Assessments and compliance with management requirements.	DAERA	DAERA EMFG NEPD to develop appropriate policy measures, DAERA FFRAG delivery through Farming with Nature, Depts and Public Bodies delivering obligations to safeguard sites, eNGOs delivering conservation action.	N1, N2, N5, N11	Nature.
NC11	Implement 6 yearly management plans for Country Parks and Nature Reserves which set out site conservation management objectives and activities to maintain and improve site condition.	DAERA		N1, N4, N5, N11, N17 I3, I4, I5 H3	Nature. Transport. Health.
NC12	Manage a program of prescribed grazing and cropping via licence agreements across 14 sites to promote sward diversity and control scrub encroachment.	DAERA		N1, N4, N5, N6	Nature.
NC13	Provide Advice to Local Planning Authorities and DfI, as a Statutory Consultee, on Local Development Plans at each stage and associated Sustainability Appraisals. Supporting councils in the preparation of better informed and locally distinctive plans.	DAERA		N1, N5, N11, N17, N18	Nature.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
NC14	Perform Consultation Body Role for Strategic Environment Assessments and associated HRAs for relevant plans and programmes. To ensure that environmental and other sustainability aspects are considered effectively in policy plan and programme making.	DAERA		N1, N5, N11, N17, N18	Nature.
NC15	Engage with GB Non-Native Species Secretariat (GBNNSS) and participate in the UK Programme Board for Non-Native Species to share best practice on invasive species.	DAERA	UK Non-Native Species Secretariat members	N2, N7, N12, N16	Nature. Working Lands & Seas.
NC16	Continue to implement the 21 key actions in the revised Invasive Alien Species (IAS) Strategy for Northern Ireland implementation plan.	DAERA	Various partners as identified in IAS Strategy implementation plan.	N2, N7, N8, N12, N17	Nature. Working Lands & Seas.
NC17	Develop and implement a Peatlands Strategy for Northern Ireland Description: Develop a Peatland Strategy and implementation plan which aims to restore 150k hectares of peatland to good condition by 2050, in line with Climate Change Committee recommendations.	DAERA	Policy implementation will be delivered with various delivery partners.	N1, N5	Nature.
NC18	In partnership with key delivery partners implement the Lough Neagh Report Action Plan.	DAERA	DfI, NIW, DFI, DoJ, AFBI.	N11, N12	Nature.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
NC19	Administer a 5-year grant programme that will contribute to EIP and Climate Action priorities. Plan: EIP and NICCAP. Policy: The Fund contributes to Environmental Policy Priority areas including Nature and Climate Recovery: Building Ecological and Climate Resilience.	DAERA	Delivery will involve Councils and eNGOs.	N1, N2, N5, N11, N18	Nature. Finance.
NC20	Wildflower Meadow Creation Project The goal of this project is to establish Wildflower Meadows at Household Recycling Centres. The aim is to cultivate diverse native wildflowers in designated areas, enhancing ecosystem resilience and providing numerous benefits such as improved carbon sequestration, enhanced biodiversity, and increased habitat connectivity. This project will be carried out from 2025-27.	Fermanagh and Omagh District Council	Community Groups, Schools	N1, N5, N18	Nature.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
NC21	Tree and Woodland Strategy The Council has secured funding through Woodland Trust for a 2-year project: The Climate Canopy. The workplan of this ongoing project includes the Tree and Woodland Strategy, which will set out a vision, aims, and objectives to build upon existing woodland habitat in order to increase biodiversity, improve carbon capture potential and to mitigate risks from flooding across the borough. It will be an active document to enable Council to manage current trees and woodlands as well as future opportunities for planting in a sustained and structured way. This will include key areas such as increasing tree cover, appropriate tree/woodland management, and a Council-wide approach to when and why tree/woodland work is carried out. The Tree Strategy will lead a training programme to ensure the Council has relevant staff trained in both tree surveys and tree works to an appropriate level. It is envisaged that the tree strategy will be out for consultation in Winter 2024/25 and implemented by year end 2024/25.	Mid and East Antrim Council	The Woodland Trust	N1, N5 H3	Nature. Towns & Cities.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
NC22	One Million Trees Project In a bid to adapt to climate change and reduce the Council's carbon emissions, the One Million Trees Project aims to plant one million native trees across the Borough over the next few years. Since its launch, the project has successfully planted 233,215 native trees. Based on current tree planting numbers, these trees are projected to absorb 1,922.1 tonnes of CO2 annually, effectively offsetting the annual CO2 emissions of approximately 2,869 residents in the borough, providing a tangible benefit to the community and contributing to global climate mitigation efforts. By focusing on native trees, the initiative also enhances local biodiversity and strengthens the resilience of natural ecosystems. Native trees are well-adapted to the local environment, support a variety of wildlife, and maintain the natural heritage of the area. This initiative also serves as a call to action for residents, encouraging community involvement and raising awareness about the importance of environmental conservation.	Antrim and Newtownabbey Council		N1, N5, N8	Nature.
NC23	Woodland Expansion and Lagan Corridor Project The vision of the Lagan Corridor project is a Green Flag accredited park which offers a thriving diverse and valued riverside heritage that welcomes exploration, learning and enjoyment whilst ensuring a sustainable environment for all. This project will establish areas of new native broadleaved woodland in appropriate areas within the Council area. Climate adaptation has been considered in this project as tree planting on sites along with river Lagan will support flood alleviation with sites cross-references with NI Flood Maps. It will also connect 16 fragmented habitats along the Lagan Valley Regional Park AONB.	Lisburn & Castlereagh City Council	Lisburn and Castlereagh City Council and Woodland Trust	N1, N6, N11, N18	Nature. Working Lands & Seas.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
NC24	Belfast Tree Strategy (formerly Preparation of an iTree Eco Report for Belfast) Belfast Tree Strategy was adopted in October 2023 to help manage and improve the tree-scape in the city, to provide a resilient and diverse urban forest. The city has developed a Tree Equity Score to evaluate and identify where trees should be targeted across the city to reduce climate vulnerability, improve health and wellbeing, and renature the city. From the Tree Equity work, the Council has developed a Tree Establishment Strategy for Belfast which will provide a coordinated and evidence-driven approach to delivering 'the right tree in the right place'. The Million Trees programme continues to promote the multiple benefits of trees in the city, and support delivery of new and improved treescapes through community, statutory, and business stakeholder engagement. Evaluation and development of phase 2 is underway with key project partners such as Belfast Hills Partnership and the Woodland Trust.	Belfast City Council	Belfast City Council Treeconomics	N1, N6, N11, N18	Nature. Working Lands & Seas.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
NC25	Ancient Woodland Restoration and New Woodland Creation - Create new woodlands, secure, restore and protect existing ancient woodlands. The Ancient Woodland Restoration project aims to restore ancient woodland to maximise ecological integrity and resilience. The 60ha of native woodland at Aughrim Hill, completed in 2021, serves as a carbon sink and supports biodiversity. The five-year project at Glas-na-Bradan Wood, commenced in 2021, engages the public in planting over 150,000 trees to create native woodland in the Belfast Hills. The Ancient woodland restoration at Mourne Park, ongoing since 2021, has cleared invasive species from over 39ha of habitat, fostering natural regeneration and supporting resilient woodlands. An additional 32ha of land at Mourne Park was acquired in 2023. In the Faughan Valley, the Woodland Trust's "From Fragments to Thriving Forest" project, completed in summer 2023, restored ancient woodlands, removed invasive species, and extended habitats through riparian planting, funded by The National Lottery Heritage Fund and DAERA's Rural Development Programme. Whilst two projects have completed, Mourne Park and Glas-na-Bradan Wood are ongoing.	Woodland Trust	Woodland Trust Forestry Agents, Landowners, Royal Forestry Society and Local Councils	N1, N2, N3, N7, N8, N11	Nature. Working Lands & Seas.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
NC26	Ancient Woodland Restoration and New Woodland Creation - Provide advice to landowners on good practices for plantation of new trees, improving conditions of land and soil, and implementation of sustainable management practices. The Woodland Trust's Emergency Tree Fund has supported initiatives including the Belfast Tree Strategy to help manage and improve the tree-scape in the city; and Lisburn & Castlereagh's Journey to Sustainability project which has to date planted over 68ha of new woodland and restored 11ha of ancient woodland. In 2023, the tree nursery at Lisburn & Castlereagh produced over 100,000 locally sourced and grown native trees. These projects support sustainable management practices to improve the condition and extent of woodland. All three projects are ongoing. The Woodland Trust NI engages with landowners to promote sustainable management practices and support woodland creation/restoration. Partnerships have restored 24ha of ancient woodland at Cultra & Delamont, with another underway at Clandeboye. Ongoing outreach work includes supporting landowners to plant new native woodland across NI.	Woodland Trust	Woodland Trust Forestry Agents, Landowners, Royal Forestry Society and Local Councils	N4	Nature.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
NC27	Climate Change Adaptation Plan for Mount Stewart Mount Stewart estate has been identified as a site in need of monitoring and protection from current climate change related impacts and future risks. In conjunction with DfC and UCL, the National Trust held a workshop to explore building consensus around adaptation decision making in historic environment assets. Monitoring is underway at Mount Stewart to gather data required for future decision making. A coastal realignment project is taking place at Anne's Point to achieve a better functioning tidal system and improve the development of saltmarsh. Adaptation options are being considered at the Sea Plantation, including planting saline resilient trees. Pilot workshops to identify hazards and vulnerability in Fermanagh and the Giant's Causeway helped develop the National Trust's adaptation 'handrail'. Further sites will participate in impact assessment workshops. In 2024, Fermanagh and the Giant's Causeway will move to step 2, the planning and decision making that will produce local adaptation strategies.	National Trust		N17 H11	Nature. Buildings.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
NC28	Rathlin Acting for Tomorrow The £4.5m Rathlin Acting For Tomorrow restoration project aims to eradicate rats and ferrets on the island to boost the population of breeding seabirds. Over 500 traps have been placed across the entire island with nearly 6 km of safety traverse lines installed on cliffs. A total of 98 ferrets have been captured so far, however a number of ferrets are still active on the island and plans are in place to eradicate the remaining ferrets. Conditions on the island have proven very challenging with significant rainfall and storm events hampering rapid progress or damaging project assets. A number of technical challenges remain but the partnership is working tirelessly to deliver the rat eradication project on time. In addition, the project will build the resilience of the seabird assemblage to the impacts of oceanographic change and increasing human activity at sea.	RSPB NI	Rathlin Development and Community Association, DAERA, Causeway Coast and Glens Heritage Trust	N1, N2, N7, N8	Nature. Working Lands & Seas.
NC29	Breeding Wader Recovery Project The Breeding Waders project aims to secure existing Breeding Wader populations and support population recovery through landscape management and policy development. The project focusses on delivery of conservation action for breeding waders in three areas - Glenwherry in the Antrim Hills, Upper and Lower Lough Erne, and Lough Neagh. The project continues to progress well with breeding waders (curlew, lapwing, snipe) stabilising/increasing in the project area against 78-89% declines in the wider countryside, using a combination of agri-environment and EU funding (EU-funded Curlew LIFE programme).	RSPB NI	NIEA, DAERA, farmers and other landowners	N1, N5	Nature.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
NC30	Rethink Nature is a partnership of seven leading species conservation organisations whose aim is 'to combine their extensive knowledge and experience to catalyse the action that species need across the four nations of the UK'. We have received £370K in funding from Esmée Fairbairn Foundation to set up a NI Species Recovery Partnership to strengthen and build the Rethink partnership, and work with government, eNGOs and key stakeholders to better deliver key outcomes for species. This will involve creating a set of Species Recovery Principles for NI; a cross-taxa list of highest priority species, and concise Species Action Plans (cSAPs); development of a Species bid to deliver the critical actions outlined in the cSAPs, that forms the basis of a bid to NLHF for development/delivery funding; and a document outlining key policy and legislative changes needed to deliver for species and associated advocacy. The project is running from June 2024 for 2.5 years.	RSPB	Funder - Esmee Charitable Foundation. Key delivery partners - Butterfly Conservation, Buglife, Bumblebee Conservation Trust, Bat Conservation Trust/NI Bat Group, Amphibian and Reptile Conservation, Plantlife, DAERA, NIEA, other NI eNGOs (tbc)	N1	Nature.
NC31	Accelerating the Recovery of Lowland Raised Bogs The project focuses on 7 sites primarily in the Lower Bann Valley area (with sites in south Lough Neagh and East Fermanagh also considered). It runs for 5 years between 2024 – 2029, developing fully costed recovery plans for sites so that funding can be sourced and targeted towards the recovery of at least one of the highest priority sites in that time. This programme will also look at the possibilities of the IUCN Peatland Code so that site owners can avail of this should they chose to do so. Accelerating the Recovery of Lowland Raised Bogs has received funding from the Esmée Fairbairn Foundation and from Northern Ireland Environment Agency to appoint a Programme Team.	RSPB	NIEA, Esmée Fairbairn Foundation, Turbary Trusts, private landowners	N1, N4, N5	Nature. Community Preparedness & Response. Finance.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
NC32	Accelerating Peatland Restoration The Ulster Wildlife Accelerating Peatland Restoration project funded through the DAERA Environment Fund aims to develop a pipeline of peatland restoration plans for over 4000ha and restore over 400ha of degraded peatland habitats across NI. This will focus on scientifically designated sites but also scope out opportunities for further restoration work outside these core areas. UW staff will be working closely with landowners, farmers and communities to both deliver restoration on the ground but also increase awareness of the importance of peatland habitats for biodiversity and climate change. This will be accompanied by monitoring at project sites to measure impact through water table analysis and aerial imagery. Alongside this the project will see the development of a Peatland Collaborative Network for peatland practitioners across NI. This network will not only facilitate training, knowledge sharing and best practice, but will also help develop common approaches and provide support to network members.	Ulster Wildlife	DAERA, UFU, An Creagán Centre	N1, N2, N4, N5, N8, N11, N18	Nature.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
NC33	Accelerating Blue Recovery is an Ulster Wildlife project which aims to deliver a native oyster nurseries network, supported by local volunteers, new citizen science programmes and wider restoration assessments. The project's geographic scope is from Glenarm/Larne to Carlingford, focusing on Larne Lough, Carlingford Lough, and Belfast Lough. The project was developed in the context of the using Nature-based Solution requirement of the Climate Act, with deliverables including – but not limited to – establishing one native oyster nursery per year; conducting intertidal and subtidal oyster surveys; commissioning seabed suitability and larval dispersal modelling; and training a dedicated group of local volunteers to undertake biodiversity and health monitoring of the nurseries. It aims to provide scoping of new, collaborative integrated coastal blue carbon restoration projects, and raise awareness for effective MPA management via local communities, councils and key stakeholders.	Ulster Wildlife	Working synergistically with MPA management groups and similar organisation with engagement staff.	N5, N14, N15, N16, N17	Nature.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
NC34	Coastal Recovery The project is focusing on local action and science-led real work change with tangible outcomes that make progress to marine recovery and a Northern Irish carbon neutral budget. It will develop site-based proof of concepts which can be scaled up to a regional recovery and adaptation strategy and implementation plans to provide a roadmap for the future. The project will focus on saltmarsh and seagrass, key 'blue carbon' habitats which are highlighted in DAERA's Blue Carbon Action Plan and are also key habitats for the Nature-based Solution requirement of the Climate Change Act (NI) 2022, and to ensure transition to Net Zero. The project intends to demonstrate positive outcomes for habitats and species through a programme of restoration actions, which will be embedded within community initiatives alongside education packages. A network of partner organisations will be harnessed to ensure an evidence base for regional recovery of biodiversity and a focus on key habitats for carbon sequestration - using area-based focal sites, including establishing an urban marine living lab. This project is currently in the bidding process for funding and subject to its approval, it is anticipated to last 4 years, between 2025 – 2029.	Ulster Wildlife	Working in PeacePlus consortium bid - 12 partners - includes Ulster University, RSPB, National Trust, Northern Ireland Environment Link, and Trinity College Dublin.	N5, N14, N15, N16, N17	Nature.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
NC35	Northern Ireland Marine Task Force Inside and outside of MPAs, blue carbon habitats and species will help mitigate against the impact of climate change by drawing down carbon, providing tangible benefits to biodiversity, and acting as a natural defence against increased storms. A long-term programme of restoration must be put in place to increase blue carbon habitats around NI, including seagrass meadows, maerl, and saltmarsh. Between 2024 – 2029, we will contribute to the following climate-focused policy work: 1. Offshore Renewable Energy Action Plan (OREAP); 2. Climate sectoral plans for Energy and Fisheries; 3. Respond to the Blue Carbon Action Plan (Consultation) and MPA Strategy Review advocating for the establishment of climate smart management of MPAs preserving natural blue carbon ecosystem functions and processes. In addition, NIMTF will be engaging with communities to increase ocean literacy in Climate Action and the marine environment's role in mitigating the impacts of climate change.	Ulster Wildlife	Ulster Wildlife (UW), Royal Society for the Protection of Birds (RSPB), Northern Ireland Environment Link (NIEL), National Trust (NT), Marine Conservation Society (MCS), Irish Whale & Dolphin Group (IWDG), Wildfowl and Wetlands Trust (WWT), Keep Northern Ireland Beautiful (KNIB), Friends of the Earth NI (FoE), Surfers Against Sewage (SAS) and WWF	N14, N15, N16, N17 I11	Nature. Working Lands & Seas. Water Supply. Towns & Cities. Community Preparedness & Response.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
NC36	PIPES: Pollutants in Peatlands Peatlands are critically important global carbon stores and habitats. However, peatlands have also been acting as sponges for several centuries – absorbing the pollution generated by human activities. There is a risk that peatlands are a ticking timebomb as they may release these vast stores of pollution under future climate change. The PIPES project will determine the levels of stored pollutants in a network of peatlands across the globe (including several sites in Northern Ireland). We will also use an experimental approach to determine which 'pathway' of release will have the greatest impact (i.e. airborne release or via water-borne transport). The project has received £296,000 in funding (Leverhulme Trust research grant), and is to be completed by September 2025.	QUB	Leverhulme Trust (grant: RPG-2021-354)	N1, N4, N5, N11	Nature. Water Supply. Health.
NC37	Mount Stewart Microclimate Monitoring 12 weather sensors have been set up around the National Trust's Mount Stewart gardens to better understand the unique microclimate at the site. This information about temperature, humidity, soil moisture and rainfall is being used to plan the future evolution of the garden to preserve it and its unique plant collection into the future, as the garden's current location may in the future be affected by rising sea level. Monitoring has been ongoing since July 2023 and the National Trust will be likely to start making changes to the site during the NICCAP3 period.	University of Bristol	National Trust	N1, N17, N18 H4, H11	Nature. Community Preparedness & Response.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
NC38	MarinePlan will co-develop with stakeholders and apply a Decision Support System (DSS) for ecosystem-based maritime spatial planning (EB-MSP) together with best practice guidance to enhance the design and effectiveness of spatial conservation and restoration measures for marine biodiversity in European Seas. The project is progressing well. The various tools have been developed and will be implemented in case study sites between 2024 and 2025. The project aims to co-develop with stakeholders a Decision Support System (DSS) for ecosystem-based maritime spatial planning (EB-MSP) together with best practice guidance to enhance the effectiveness of spatial conservation and restoration measures for marine biodiversity in European Seas. There is no case study site in Northern Ireland; however, there is a case site in the Celtic Sea.	QUB		N14	Nature.
NC39	All-Island Climate and Biodiversity Network The All-Island Climate and Biodiversity Research Network (AICBRN) is a researcher-led initiative linking multidisciplinary research groups across the island of Ireland and undertake research together to address the climate and biodiversity emergencies. AICBRN was successfully launched in November 2021 with the allocation of €160k to support a secretariat function delivered through the National Parks and Wildlife Service. A total of €0.5M has been secured through the Irish Government to support the AICBRN secretariat on an All-Island basis. The AICBRN has driven several initiatives, including a submission to the SFI led Co-Centres call for a Co-Centre for Climate + biodiversity + water. This bid was successful (€42M) and resulted directly from the AICBRN. The network is live and is an ongoing and vibrant entity with monthly meetings, webinars and seminars, and a range of ongoing activities and actions that are being explored.	QUB	All-Island Climate and Biodiversity Research Network (AICBRN)	N1, N4, N5, N17, N18	Nature.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
NC40	Sensor Application to Peatland Hydrology in Remote Environments (SAPHIRE) This project aims to evaluate the utility of sensor networks on peatlands to quantify hydrological processes, including the impacts of projected climate change on peatland hydrology and peatland degradation. Sensors have been developed and are currently applied to the field study area. Sensors are generating satisfactory data despite setbacks related to extreme flooding.	QUB		N4, N5, N6	Nature.
NC41	Identify libraries where grassed areas could be left uncut to encourage flora and fauna together with habits for insects.	Libraries NI	Education Authority Grounds Maintenance	N1, N4	Nature.
NC42	Current restoration of grassland meadows within the National Museums estate at the Ulster Folk and Transport Museums at Cultra to a semi natural state in favourable to good condition with a long-term goal of species rich meadows. National Museums NI signed up to the All-Ireland Pollinator Plan in June 2021. These actions relate to the All-Ireland Pollinator Plan and are highlighted through initiatives such as No Mow May and Let it Bloom June.	National Museums Northern Ireland	CeDAR	N2, N18	Nature.
NC43	On-going management of ancient woodland at National Museums NI Ulster Folk Museum Cultra Estate. Working with our partners we will manage the cleared areas to eradicate the invasives and encourage regenerative growth with some planting interventions of native trees and shrubs.	National Museums Northern Ireland	Woodland Trust; The Conservation Volunteers	N2, N8, N18	Nature.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
NC44	Subject to a review of current landscape policy and legislation, publish a Landscape Strategy by 31 March 2027.	DAERA		N1, N4, N5, N17, N18	Nature. Working Lands & Seas.
NC45	Continuing review of Northern Ireland Priority Species List as required by the Wildlife and Natural Environment Act (NI) 2011. This list guides local government and public bodies to meet their Biodiversity Duty through policy, strategies and decision making. The list supports landowners and funded bodies to deliver conservation actions to promote nature recovery.	DAERA	CEDaR (National Museums NI), various eNGOs and in particular individual subject experts.	N1	Nature.
NC46	A new programme of Farm Support and Development, designed in consultation with the Northern Ireland agricultural industry and other key stakeholders, will be phased in over the next few years, commencing in 2024. The new programme will lead and encourage industry development to become more: 1 Productive. 2 Environmentally sustainable. 3 Resilient. 4 Integrated into an effective functioning supply chain. The schemes and measures to be introduced will provide levers to contribute to statutory obligations under the Climate Change Act (NI) 2022, with a firm focus on just transition.	DAERA		N1, N4, N5, N6, N9 H9 B6	Nature. Working Lands & Seas. UK Food Security.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
NC47	The Epizootic Control & Public Health Delivery Division's key role is to maintain within Veterinary Service a high level of preparedness through the creation and delivery of disease control strategies, for an epizootic disease outbreak, ensuring the smooth, co-ordinated and auditable delivery of the disease control process, limiting disease spread and restore a prompt return to freedom from disease.	DAERA	AFBI, NIEA, OHS, PHA, DoH, Local Councils, Private Sector	N2, N3, N7 H8, H9	Nature. Working Lands & Seas. UK Food Security. Health.
NC48	Develop and adopt a Nutrient Action Programme and make and lay regulations to implement the Nutrient Action Programme and replace and carry forward the work of the previous Nutrient Action Programme (2019-2022).	DAERA		N4, N11, N12, N13	Nature. Working Lands & Seas. UK Food Security. Water Supply.
NC49	Maintain and update a NI Plant Health Risk Register to assess current and future threats to forests and woodlands and implement contingency plans as necessary for highest risks. Update will include recognition of the changes to the range of pests and pathogens likely to impact forests and woodlands in Northern Ireland as a result of climate change. Any changes to the plant health risk (pests and pathogens) which may be contributed to by the impact of Climate Change.	DAERA	DAFM, Scottish Forestry, AFBI	N8	Nature. Working Lands & Seas.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
NC50	Incorporate the 5th Edition of the UK Forestry Standard in reviewed forest management plans. The UKFS outlines the context for forestry in the UK. It sets out the approach of UK governments to promote sustainable and resilient forests and woodlands by defining requirements and guidelines and providing a basis for regulation and monitoring - including national and international reporting.	DAERA	Other UK DAs	N1, N6	Nature. Working Lands & Seas.
NC51	Protecting the Forest Service estate from fire incidents through the implementation of an emergency Forest Service Fire Plan, including monitoring and reporting the extent of fire damage to forest and open ground (hectares) annually.	DAERA	NI Fire and Rescue Service, NIEA	N1, N6	Nature. Working Lands & Seas.
NC52	Participate in UK Plant Health Service Common Framework Risk Management arrangements which informs on UK PH risks and Risk Register changes. Undertake annual EU risk-based surveillance and monitoring exercises to monitor risks to inform and support local land-based industries, forestry and horticultural, and maintain NI Protected Zones. These actions are supplemented by monitoring alerts issued by the European and Mediterranean Plant Protection Organization (EPPO), and intelligence from UK wide and DAFM monitoring arrangements.	DAERA	Defra, AFBI, DAFM, EPPO	N2, N6, N8, N9	Nature. Working Lands & Seas. UK Food Security.
NC53	Maintain overarching Emergency/Contingency Response Plans as well as Specific High Priority Pest Plans which are agreed within the NI Plant Health Risk Management Groups and informed through the science and evidence on plant health pest risks produced through the AFBI Annual Work Plan as well as collaboration with DAFM on a Pest Risk Analysis.	DAERA	Defra, AFBI, DAFM, EPPO	N2, N6, N8, N9	Nature. Working Lands & Seas. UK Food Security.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
NC54	Sustainable Land Management Branch Innovation teams focus on Air Quality, Biodiversity, Carbon, Livestock, Soil Health and Water Quality. They investigate innovative ways for farmers to meet the requirements of DAERA Agricultural Policy priorities of Improved Environmental Sustainability, Increased Productivity, Increased Resilience and Effective Supply Chain. There are a number of individual projects and investigations, however the main outcome is the compliance of the agricultural industry with Agricultural Policy and ultimately the improved environmental sustainability of food production in Northern Ireland.	DAERA		N1, N4, N5, N18	Nature. Working Lands & Seas. UK Food Security.
NC55	The CAFRE College Estate Strategy sets out CAFREs key sustainability targets for the ten-year period up to 2030. These targets ensure CAFRE delivers on climate change priorities for DAERA in its farm, agri-food and facilities activities but also demonstrates to the Northern Ireland Agri-Food Industry the practical implementation of measures that meet DAERA policy priority needs.	DAERA		N1, N4, N5, N11, N18 H7, H13	Nature. Working Lands & Seas. UK Food Security. Buildings. Health.
NC56	Undertake a scoping exercise to determine a suitable approach for taking forward the development of a future land use policy for Northern Ireland.	DAERA	To be confirmed. Early stages of development but is likely to cut across a number of policy areas.	N1, N4, N5, N18	Working Lands & Seas. UK Food Security. Water Supply.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
NC57	Woodland Trust Outreach Programme Woodland Trust Outreach supports the delivery of woodland creation, restoration and sustainable management of native wooded habitats on land outside the Trust's own estate. Outreach Advisors provide advice to landowners and land managers on woodland conservation and helping deliver conservation projects in partnership with other organisations. Advice includes support with grant applications for appropriate grants including DAERA Forestry Grants. Last year the Woodland Trust Outreach team supported the planting of over 300ha of new woodland on third-party land. This represents over half of all DAERA funded woodland creation that year. All woodland is planted to UK Forestry Standards and consist of a mix of native species that have been locally sourced and grown, ensuring greater resilience to the impacts of climate change.	Woodland Trust	DAERA, Forest Service Northern Ireland	N1, N2, N3, N4, N5, N6, N8	Nature. Working Lands & Seas.
NC58	Afforestation Opportunity Mapping This project is using habitat and species data to identify land suitability for afforestation and develop a landscape scale map with a range of planting objectives for climate and nature recovery.	Woodland Trust	Environment Systems	N1, N4, N5, N6, N8, N18	Nature. Working Lands & Seas.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
NC59	Environmental Farming Scheme Group Project Ulster Wildlife run a farmer facilitation project to assist farmers with agri-environment schemes at the pre-application stage with EFS planning, and to assist with successful scheme delivery. The project increases participation by removing barriers to application. The project provides capacity by completing farm plans and improves farmer understanding of farm biodiversity and scheme prescriptions. The project improves scheme compliance and outcomes through regular contact with farmers. There are over 500 farmer members of the Ulster Wildlife Group across Fermanagh, Tyrone, L'derry and Antrim, with hotspots of activity around SAC's and other statutory designations. 450 farms across NI are signed up to the EFS Group Project helping to deliver nature conservation at scale. Up to 40,000 hectares of farmed land is influenced, with 14,000 hectares under the EFS agreement. Species-rich grassland and peatland are the main areas of focus of the Group. Facilitator skills cover ecology, agronomy, forestry, and other technical aspects of the farm/environment interface, with an evolving delivery programme of training and events.	Ulster Wildlife	RSPB (Associate) and other individual experts as Associates	N1, N2, N4, N5, N8, N11, N12, N13, N18	Nature. Working Lands & Seas. UK Food Security.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
NC60	Nature Reserves Ulster Wildlife manages 18 nature reserves across NI. Much of the work is on protected sites and the aim is to have all 10 designated sites in favourable condition. Habitats include lowland raised bog, blanket bog, oakwoods, mixed ash woodland, species rich grassland, reedbeds, ponds, hedgerows, parkland, cliff, and wet dune slacks. Management work includes invasive species removal, biological surveys and monitoring and maintenance of fencing, paths etc. On our bog sites, we also carry out monitoring for water levels and ammonia which are key to the successful restoration of sphagnum cover and health. We work with farmers to optimise grazing on some of our sites to maintain species-rich grassland. These habitats act as a carbon store with healthy soils, grassland, woodland, and peat. Some of our reserves are managed particularly for visitors with the aim of connecting people with nature and encouraging them to take action to protect wildlife.	Ulster Wildlife	DAERA - funder, National Lottery Heritage Fund, North Down & Ards Borough Council, Glenarm Estate	N1, N2, N3, N4, N5, N6, N7, N8, N9, N11, N12, N15, N17, N18 I2, I3	Nature. Working Lands & Seas. Water Supply.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
NC61	The Growing Innovation Network (GrowIN) is a network of farmers sharing knowledge, ideas and inspiration around agroecology and regenerative farming practices in order to tackle the food, climate, nature, and health crises facing society. It is a farmer-led movement focused on working together, helping each other, sharing stories, ideas and knowledge to drive innovation. The network is funded by the Aurora Trust and delivered by FFCC Ltd in Northern Ireland. Funding of £45,000 per year supports a team of four part-time consultants (who are farmers) to deliver a range of community building and knowledge exchange activity over the course of 3 years from 2022-2025. The network currently has 350 members and has delivered knowledge transfer activities to 250 people in the past year. The network has recently established farmer clusters on soil biology, agroforestry, and horticulture to build community learning in these areas.	Food, Farming & Countryside Commission	The Aurora Trust (funders), a multidisciplinary team of 4 x consultants from NI responsible for delivering project outcomes	N1, N4, N5, N6, N11, N18 ID1, ID2	Nature. Working Lands & Seas. UK Food Security. Business.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
NC62	AgriTherm aims to provide a comprehensive understanding of the availability of Geothermal Energy Resources across the UK with the potential for its application across the UK agri-food sector in order to reduce Greenhouse Gas Emissions towards the national Net Zero Targets and to reduce the reliance on imported fossil fuels across the NI agri-food sector. Geothermal energy provides an abundant source for reliable, always-on energy, which ranges from deep high-temperature applications for electrical power generation to lower temperature systems for Direct-Use Geothermal Energy (DUGE) applications for heating & cooling. DUGE can be used to create the optimal environment for growing produce and support post-harvest preservation and increase productivity in greenhouse farming, aquaculture, and food processing. DUGE can yield high rates of decarbonisation in processing industries with high heat demand that require pasteurisation (e.g. dairy industry), sterilisation (e.g. drink & food canning), or fermentation & distillation (e.g. beer, wine, spirits). The project will run from October 2024 to September 2027.	QUB	University of Aberdeen	N5, N9 I10 ID1, ID2	Working Lands & Seas. UK Food Security. Energy. Business.
NC63	Mitigating Animal Health Impacts of Climatic Variation This research aims to improve methods of forecasting parasite transmissions from weather data to generate computer models for use by farmers and advisors. Models have been developed for predicting and adapting to impacts of climate change on parasite transition and control at farm level. The models were fully realised in the previous model period but application by farm advisors has been limited by lack of translation into accessible decision support tools. This progress was accelerated by new UKRI (BBSRC COADAPT project) and EU (Thematic Network SPARC) funding and we anticipate accessible online decision support tools to be launched in 2025.	QUB		N2, N7, N8	Nature. Working Lands & Seas.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
NC64	The GrassCheck project aims to provide high quality, up-to-date, grass information to assist farmers with grassland management decisions. The project monitors weekly grass growth and quality, and tracks effects of climate change on grass growth and NI farming systems with seven- and fourteen-day grass growth rate forecasts provided weekly throughout the growing season. The historical record shows significant variability year to year, but the overall trend does illustrate the impact of climate change and the need for climate adaptation on farms to ensure resilience going forward. The grass growth modelling is currently being used to predict what grass growth might be like in 2050 and beyond, with the hopes of establishing swards that are more resilient to increasing extremes of weather. The current programme of work is funded for 2023-2025.	AgriSearch	AFBI, CAFRE, DAERA	N4, N5, N6	Working Lands & Seas. UK Food Security.
NC65	The ZeroNsile project was developed with the increasing cost of fertiliser and a need to reduce carbon footprint on farms at the forefront. This on-farm research project will examine the feasibility and practicalities of producing silage without the use of manufactured N fertiliser. AgriSearch have previously led a number of multispecies sward (MSS) projects which mainly focused on grazing systems for beef and sheep farms. The dairy sector in comparison is heavily reliant on good quality silage. There was therefore a need to explore additional solutions which would work for all sectors such as Red Clover swards. A total of 12 farms from across the province are taking part in this project, with 6 of these being dairy farms and 6 being beef and/or sheep farms. The project will run from 2023 to 2027.	AgriSearch	AFBI	N4, N5, N6	Working Lands & Seas. UK Food Security.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
NC66	Inland Fisheries Inspectorate carries out a range of activities focussed on the conservation and protection of fish and fish habitats throughout Northern Ireland: • In collaboration with AFBI, carry out regular assessments of key fish stock species in the DAERA geographic jurisdiction using a range of techniques to gather key data. Instances where unexpected or invasive species are identified are discussed with key stakeholders such as the Northern Ireland Environment Agency. • Habitat enhancement schemes on primary salmon rivers to increase stocks including riparian zone planting to provide shade in areas identified as at risk of overheating during periods of low flow. • Identification and assessment of fish barriers on primary salmon rivers with mitigations carried out in consideration of climate change projections and impacts. • Provision of advice via statutory approvals, planning and water abstraction consultations and an annual programme of enforcement patrols throughout the DAERA geographic jurisdiction.	DAERA	AFBI	N11, N12	Nature. Working Lands & Seas. UK Food Security.
NC67	Protected Area Programme - to develop the vision, framework and delivery approaches, evidence-base and multiplicity of approaches to meeting the global Apex target that 30% of all land and freshwater are under effective conservation by 2030 (and associated targets for nature restoration and recovery networks), including the development of metrics to report, measure efficacy and encourage progress.	DAERA	NEPD, landowners (and landowner representative groups) JNCC, CEDaR, GSNI, eNGO specialists, academic institutions, ecological specialists, citizen scientists	N1, N2, N5, N11, N12	Nature.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
NC68	Continue the delivery of the Soil Nutrient Health Scheme to establish a soil health baseline on NI farms and an estimate of on farm carbon	DAERA	AFBI - Soil Nutrient Health Scheme (Delivery Agent)	N4, N5	Nature. Working Lands & Seas.
NC69	Develop and implement a Nature Recovery Strategy (NRS) for Northern Ireland to assist meeting the UK's obligations under the UN's Convention on Biological Diversity and to reduce the loss of biodiversity within the timeframe of the strategy. Many aspects of the strategy will have a positive outcome for supporting nature-based solutions to help to deliver climate resilience.	DAERA	n/a - policy implementation will however be delivered with various delivery partners.	N1, N5	Nature.
NC70	Justice for Woodlands - Magilligan Prison are working with the Woodland Trust and the local Landscape Partnership to plant and nurture 40,000 native tree saplings (Scots Pine, Oak, Chestnut and Birch) for replanting in the local area. The establishment of additional forest and tree cover is helping address climate concerns, prevent erosion on the banks of local rivers and increase carbon capture. The Magilligan project is the first large scale tree nursery of its kind in Northern Ireland and one of only two in Ireland which does not rely on European imported stock.	DoJ	Magilligan Prison, Binevenagh Landscape Partnership Scheme, Woodland Trust, Causeway Coast, Glens Heritage Trust, and the Northern Ireland Environment Agency.	N1, N8	Nature.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
NC71	The new Co-Centre for Climate + Biodiversity + Water brings together over 100 researchers, industry leaders and policy partners from across Ireland, Northern Ireland, and Great Britain to draw up project plans for integrated solutions to the most pressing challenges posed by climate change, biodiversity decline and water degradation.	DAERA	Queens University Belfast, Trinity College Dublin, University of Reading	N1, N2, N3, N4, N5, N6, N7, N8, N9, N10, N11, N12, N13, N14, N15, N16, N17, N18	Nature. Working Lands & Seas. Water Supply.
NC72	LUNZ - Transforming Land Use for Net Zero, Nature and People A UK Research and Innovation initiative, co-funded by DAERA consisting of a programme of strategic research and an associated coordination and translation HUB. It aims to drive transformational change in the efforts to reach Net Zero considering three interlinked thematic: 1. Soil system health and carbon dynamics 2. Reduced agricultural emissions 3. Land use change LUNZ consists of: 1) a £14M programme of strategic research, and 2) a coordination and translation HUB. The HUB is a transdisciplinary, cross-sectoral community through which DEFRA and the Devolved Administrations interact through: 1. Agile Policy Centre - a research-policy two-way interface to respond to requests for urgent policy evidence requests	DAERA	Aberystwyth University, Agri-Food and Biosciences Institute , Bangor University, Central Association of Agricultural Valuers, Centre for Landscape Regeneration, Univ. Cambridge, Countryside and Community Research Unit, Univ. Gloucestershire, Cranfield University, Eunomia Research and Consulting Ltd , Food, Farming and Countryside Commission, Forest Research, Innovation for Agriculture , John Gilliland, LEEP, University of Exeter, Menter a Business, National Trust, Natural England,	N1, N4, N5, N6, N9, N18	Nature. Working Lands & Seas. Water Supply.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
	2. Transdisciplinary Community - knowledge exchange and capacity building 3. Net Zero Futures Platform – for land use modelling		Place Collective, Queen's University Belfast , Rothamsted Research, Royal Agricultural University, RSK ADAS, Scotland's Rural College, Sustainable Soils Alliance, The James Hutton Institute, University of the West England Bristol, UK Centre for Ecology & Hydrology , University of Aberdeen, University of Greenwich, University of Leeds, University of Leicester, University of Oxford, University of Reading, University of Ulster , Vizzuality		

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
NC73	A new DAERA report has been established to inform the UK Veterinary Risk Group on NI specific animal disease risks, threats and points for information (PFIs), which will regularly monitor and rank risks across the animal health landscape, including those with pose a public health risk, and escalate risks for action. Horizon scanning in DAERA Veterinary Service Animal Health Group (VSAHG) is the responsibility of relevant DVOs who act as risk managers. There isn't a central group within DAERA to bring together all animal disease risks and threats. This report is intended to fill in this gap and collect risks, threats and PFIs in NI into one document for ease of feeding into the UK Veterinary Risk Group (VRG), which was formed in response to the Anderson Review (Lessons Learned from FMD 2007) and meets monthly. The VRG provides a coordinated process that ensures systematic and timely assessment of threats and vulnerabilities (T&V) to the UK's animal health and welfare, which are reported to the VRG by risk management teams from Defra, APHA, VMD, FSA and the Devolved Administrations. The VRG reports to the four UK CVOs at the monthly four administrations liaison meeting.	DAERA		N2, N7, N16 H8 ID9	Nature. Working Lands & Seas. UK Food Security. Health.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
NC74	Developing extreme climate and biodiversity "storylines" For decision-makers, climate change is now arguably a problem in risk assessment and risk management. There is a recognised need to move beyond just discussing 'likely' outcomes and consider plausible worst-case scenarios. We will develop 'storylines', examining the consequences of extreme climate outcomes without the need to explicitly quantify the likelihood of plausible outcomes, for Ireland and the UK. The impacts of droughts and heatwaves have been extensively studied in terms of plant functioning, impacts on carbon cycling and plant mortality. This project will for the first time predict the impact of such extreme events on species distribution and biodiversity.	Co-Centre for Climate, Biodiversity + Water Reading University, Newcastle University, Trinity College Dublin	Maynooth University	N1, N3, N8, N9, N11, N13, N17	Nature.
NC75	Comprehensive, evaluated hydrological projections for the British and Irish Isles using multi-model hydrological ensemble This project will deliver comprehensive, evaluated hydrological projections for the British and Irish Isles using a multi-model hydrological ensemble.	Co-Centre for Climate, Biodiversity + Water UK Centre for Ecology & Hydrology, Newcastle University, University College Cork, Maynooth University		N10, N11, N18	Nature.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
NC76	Validated projects of global vegetation responses driven by climate, land use, and traits, to enable population risk forecasting We will deliver validated projections of global vegetation responses driven by climate, land use, and traits, and apply these projections to enable population risk forecasting. We will apply the Global Warming Levels and "storyline" climate projections produced for Ireland and the UK with our biodiversity models to project effects of these new projections on the types of species that will occur under these new climatic conditions and their dynamics.	Co-Centre for Climate, Biodiversity + Water Trinity College Dublin, Queens University Belfast		N6, N8, N9 H9 B6 ID2	Nature. Working Lands & Seas. UK Food Security.
NC77	Producing estimates of long-term carbon storage and ecosystem stability in restored ecosystems using Land Surface Models The most recent IPCC report (IPCC AR6) recognises the need for CO2 removal from the atmosphere to keep climate warming within 1.5oC. Perhaps the best solutions for such CO2 removal are in natural ecosystems, though reforestation, afforestation, or peatland restoration. Such solutions also have benefits beyond carbon storage such as increasing biodiversity and water quality. We will produce quantitative estimates of long-term carbon storage and ecosystem stability in restored ecosystems.	Co-Centre for Climate, Biodiversity + Water Trinity College Dublin		N1, N5, N6, N18	Nature. Working Lands & Seas.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
NC78	Monitoring and Assessing the effectiveness of ecological water quality restoration measures New monitoring systems and rapid response indicators will be developed to Inform the deployment of restoration measures for improvement in ecological water quality in line with the goals of the Water Framework Directive. A range of measures are being trialed in rivers across Ireland, targeting diffuse agricultural pollution and reducing fine sediment inputs. Monitoring of the effectiveness of these measures has been patchy to date but is urgently needed to inform on the most appropriate restoration measures and where they should be deployed to achieve the water quality improvement sought.	Co-Centre for Climate, Biodiversity + Water University College Dublin	University of Limerick University of Ulster UK Centre for Ecology & Hydrology	N11 H10	Nature. Working Lands & Seas. Water Supply.
NC79	Monitoring and assessing the effectiveness of soil health restoration measures This project will inform the deployment of restoration measures for improvement in soil health in line with the goals of the EU Soil Strategy for 2030. The new National Soils Strategy requires sound national data on soil biodiversity, ecosystem functioning, and ecosystem services and cost-effective measures for restoring soil health are needed. This project will (1) generate data on soil health, soil biodiversity, and ecosystem services for major land uses in Ireland, (2) test the effectiveness of existing restoration measures, and (3) inform policy decisions on the protection, sustainable management and restoration of soil systems and soil health.	Co-Centre for Climate, Biodiversity + Water University College Dublin	University of Limerick	N1, N2, N4, N6	Nature. Working Lands & Seas.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
NC80	Developing a reproducible methodology to map, assess and monitor habitats contributing to habitat mapping informed by UAV and Earth Observations We will construct the evidence base for achievement of sustainable livelihoods in upland ecosystems through delivery of improved ecosystem goods and services, by assessment, monitoring, restoration and improvement of natural capital assets. We will map, assess and monitor habitats informed by UAV and Earth Observation acquisitions as well as in situ measuring and monitoring equipment. We will fill knowledge gaps on gaseous and river fluxes, and important water balance outcomes (flood/drought resilience) from restoration treatments in the uplands.	Co-Centre for Climate, Biodiversity + Water Trinity College Dublin	Queens University Belfast University College Dublin University of Ulster	N1, N11	Nature.
NC81	Modelling the economic impacts of policy-induced land use transformation on the agri-food sector. We will develop a multi-platform modelling framework to assess the economic impacts (accompanied by associated environmental impacts) of policy-driven land use transformation on the agri-food sector, with a particular focus on the identification of low resilience groups and economic-environmental trade-offs.	Co-Centre for Climate, Biodiversity + Water Agri-Food & Biosciences Institute	University College Dublin Dublin City University	N4, N6, N18 H9 ID1	Working Lands & Seas. UK Food Security.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
NC82	Geo-spatial data integration through AI. We will use geo-spatial AI time series modelling to identify environmental changes linked to the multi-faceted spatial data sets now routinely collected. We will provide a framework whereby image and ground-truth data can be combined and analysed using the latest in AI systems with a clear, open-source and repeatable data pipeline using both pre-existing and de novo Climate+ generated data.	Co-Centre for Climate, Biodiversity + Water Queens University Belfast	Trinity College Dublin University of Galway Maynooth University	N10, N17, N18 I3	Nature. Working Lands & Seas. Transport. Towns & Cities.
NC83	Assessing and collating evidence describing fluxes and standing stocks of carbon, biodiversity and water across key ecosystems. We will assess and collate evidence from the literature describing the fluxes and standing stocks of carbon, biodiversity and water across a set of key ecosystems including 46 peatlands, forests, saltmarshes, and agricultural grasslands and soils. The restoration and/or creation of these ecosystems at landscape scales is a major challenge.	Co-Centre for Climate, Biodiversity + Water Queens University Belfast	Trinity College Dublin University of Ulster University of Limerick	N1, N4, N5, N6, N11, N18 H10	Nature.
NC84	Describing the efficacy of nature-based solutions for the key ecosystems. Nature-based solutions (NbS) refer to actions that aim to protect, sustainably manage, or restore natural ecosystems to address societal challenges such as climate change, food and water security, human health and disaster risk reduction. In the context of climate change, it is estimated that nature-based solutions could provide up to 37% of the mitigation needed until 2030 to achieve the targets of the Paris Agreement.	Co-Centre for Climate, Biodiversity + Water Queens University Belfast	Trinity College Dublin University of Ulster University of Limerick	N1, N4, N5, N6, N11, N18 H9, H10	Nature.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
NC85	Environmental foot printing for plant-based food transitions by horticulture sector This project will look at agri-food sustainability in the face of climate change, in particular nutritious food and environmental footprinting for plant-based food transitions by the horticulture sector.	Co-Centre for Climate, Biodiversity + Water University of Galway, Queens University Belfast	Keelings	N6, N9 ID1	Nature. Working Lands & Seas. UK Food Security.
NC86	Remote sensing measurement of carbon and natural capital on farms This project will look at the disproportionate impact of the agrifood sector on biodiversity loss, broader ecosystem services and identify land-use options to improve climate resilience.	Co-Centre for Climate, Biodiversity + Water University of Galway, Queens University Belfast	FarmEye	N4, N5, N18	Nature. Working Lands & Seas.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
NC87	Crop breeding to reduce footprint of grassland-based agri-systems & crop genetic resources for sustainability This project will look at the disproportionate impact of the agrifood sector on greenhouse gas emissions and identify land-use options.	Co-Centre for Climate, Biodiversity + Water University of Galway, Queens University Belfast	Barenbrug	N4, N5, N6, N9, N18	Nature. Working Lands & Seas.
NC88	Remote sensing for carbon & GHG emissions in agriculture landscapes This project will look at the disproportionate impact of the agrifood sector sustainability in the face of climate change, optimising food production with the lowest environmental footprint.	Co-Centre for Climate, Biodiversity + Water University of Galway, Queens University Belfast	Regrow	N5, N6, N9 ID1	Nature. Working Lands & Seas. UK Food Security.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
NC89	Resilient agricultural grassland systems This project will look at the disproportionate impact of the agrifood sector sustainability in the face of climate change including typologies and efficiencies towards balancing sustainability through a resilient agricultural grassland systems.	Co-Centre for Climate, Biodiversity + Water Agri-Food & Biosciences Institute, Queens University Belfast, Ulster University	AgriSearch	N1, N4, N6, N9, N18	Nature. Working Lands & Seas.
NC90	Sustainable use of soil conditioners for soil and plant health This project will look at sustainable use of soil conditioners for soil and plant health (SH, Pco) and their impact on water quality	Co-Centre for Climate, Biodiversity + Water Agri-Food & Biosciences Institute, Queens University Belfast	Natural World Products (NWP)	N4, N6, N11	Nature. Working Lands & Seas.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
NC91	Sustainable business models for lighthouse farms This project will look at the disproportionate impact of the agrifood sector sustainability in the face of climate change specifically livelihood targets and sustainable business models for lighthouse farms.	Co-Centre for Climate, Biodiversity + Water University of Galway, Queens University Belfast	Devenish Nutrition	N4, N6, N9, N18 ID1	Working Lands & Seas. UK Food Security.
NC92	Understanding hydrological extremes to support water resources planning and adaptation This project will develop next-generation flood risk models which will improve resilience and risk assessment and help develop high level nature and engineering based solutions. It will also provide more accessible data through web-based interfaces and shared analytical toolkits.	Co-Centre for Climate, Biodiversity + Water UK Centre for Ecology & Hydrology	Welsh Water/Anglian Water (TBC)	N1, N11 I2	Nature. Transport.
NC93	Windstorms This project will estimate risk from extreme windstorms by focusing on reconstructions of historical events. These results will be used to try and provide the likely impact of future extremes and improve risk estimates, warnings and mitigation options.	Co-Centre for Climate, Biodiversity + Water University of Reading	Aon	N1, N6 I10, I12, I13 H5	Nature. Working Lands & Seas. Transport. Health.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
NC94	Understanding combined wind and flood risks in historic and future climates This project will examine hazards of flooding by assessing joint probabilities and dependence in historical climate and seasonal forecasts and the changing risks with a future warming climate. These results will be used to try and provide the likely impact of future extremes and improve risk estimates, warnings and mitigation options.	Co-Centre for Climate, Biodiversity + Water Newcastle	Gallagher Re	N1, N11, N17 I2, I3 H3 B1, B2	Nature. Transport. Health. Business.
NC95	Luggala Future Landscapes This project will invest in carbon and nature spoke and will explore the interplay between land use and land use change and the roles of different land class types in sequestering carbon, with a particular emphasis on forests, peatlands and soils. By focusing on Luggala Future Landscapes there will be a better understanding the co-benefits and costs of land use transition which is vital if this transition is to be equitable and socially acceptable.	Co-Centre for Climate, Biodiversity + Water Trinity College Dublin, University of Limerick, Queens University Belfast, Ulster University, Dublin City University	Luggala Estate (TBC)	N4, N5, N18	Nature.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
NC96	Field sensors for multi-scale measurement of carbon cycling This project will investigate land use at a national scale to identify sustainable land use systems demonstrating the application of state of the art instrumentation to measure the stocks and fluxes of carbon, biodiversity and water, this project is focused on testing and validating new and emerging ways of collecting field data through in-situ field sensors for multi-scale measurement of carbon cycling.	Co-Centre for Climate, Biodiversity + Water Trinity College Dublin, Ulster University, University of Limerick	Delta-T Farrans AiDash Leica	N1, N5, N18	Nature.
NC97	Regenerating Ash forests This project will investigate land use at a national scale to identify sustainable land use systems demonstrating the application of state of the art instrumentation to measure the stocks and fluxes of carbon, biodiversity and water, in this specific project there will be an interdisciplinary approach to identify silvicultural, social and financial tools to transform ash plantations into semi-natural, multi-functional woodlands.	Co-Centre for Climate, Biodiversity + Water Trinity College Dublin, University of Limerick	NewGen Forestry	N1, N5, N6, N8, N9	Nature. Working Lands & Seas.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
NC98	Multi-phase and fine-scale gas dynamics This project will investigate land use at a national scale to identify sustainable land use systems demonstrating the application of state of the art instrumentation to measure the stocks and fluxes of carbon, biodiversity and water, specifically this project is looking at new and emerging ways of collecting field data in relation to multi-phase and fine-scale gas dynamics.	Co-Centre for Climate, Biodiversity + Water University of Limerick, Trinity College Dublin, Ulster University	Li-COR	N5	Nature.
NC99	Sensor deployment for measurement of greenhouse gas exchange in harsh environments This project will investigate land use at a national scale to identify sustainable land use systems demonstrating the application of state of the art instrumentation to measure the stocks and fluxes of carbon, biodiversity and water, specifically this project is looking at new and emerging ways of collecting field data in-situ through sensor deployment for measurement on greenhouse gas exchange in harsh environments.	Co-Centre for Climate, Biodiversity + Water Trinity College Dublin, University of Limerick	Eosense	N5	Nature.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
NC100	Application of private finance to incentivise the restoration of ash plantations This project will investigate the application of private finance to incentivise the restoration of woodland plantations affected by disease. Central to this spoke will be the recognition that the evidence base required to make informed decisions relies on field-based measurements of the fluxes and flows of carbon, water and biodiversity in the ecosystems under consideration. This will enhance understanding of these ecosystems and thereby inform more sustainable solutions for their future management.	Co-Centre for Climate, Biodiversity + Water University of Limerick	Nature Virtues	N1, N5, N6, N8, N9, N18	Nature.
FS1	Continue with mandatory EU surveillance & reporting of Antimicrobial resistance (AMR) bacteria under (EU) 2020/1729 and Article 9(1) of Directive 2003/99/EC. AMR and climate change are two of the top health emergencies globally, with many studies identifying a common link between the two. Both AMR and Climate Change are often looked at in a One Health approach.	FSA	DAERA	H9	UK Food Security. Health.
FS2	Food Standards Agency to continue to examine the trends and new risks in relation to food-borne illness, working with expert advisers, other government departments, and other partners, in the UK and internationally.	FSA	A range of external stakeholders	H9	UK Food Security. Health.
FS3	Continued development of a strategic approach to surveillance in the food system. The approach includes but is not confined to risks associated with climate change.	FSA	Local Authorities, District Councils and Port Health Authorities.	H9	UK Food Security. Health.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
FS4	The cross-departmental Northern Ireland Food Strategy Framework proposes a strategic food systems approach, and sets out a long-term vision, high level principles and areas for strategic focus. It will build strong alignment across linked policy areas helping NI transition to a society where everyone has access to safe and nutritious food. The Framework recognises the complexities of the global food supply system and the importance of maintaining food security to mitigate risks to consumers, including development of a cross departmental Food Security Emergency Plan. A strong focus will be on capability building and knowledge transfer to ensure all actors in the supply chain understand their social responsibilities and the important role they play. Other areas of focus include reducing Food Waste, efficient distribution of surplus food and more sustainable food packaging; and the potential for Public Procurement to create an economic stimulus through shorter supply chains, driving improved environment and health outcomes.	DAERA	Other NICS Departments and FSANI.	N6 H9 B6 ID1	UK Food Security. Business.
FS5	The purpose of farm animal disease surveillance is to provide intelligence on animal health and welfare to enable farmers, veterinarians and governments to take decisions which can improve animal health, animal welfare, productivity, protect public health, facilitate trade and prevent environmental and financial damage. It provides data that allows threats to public health, trade, and wider society from animal diseases to be identified and managed. Veterinary scanning surveillance enables early detection of new and re-emerging animal related threats so that prompt action can be taken to reduce their impact. It detects new threats to human health, new threats to animal health and welfare and acts as a safety net for the detection of known notifiable diseases.	DAERA	AFBI and Private Sector alongside other Branches within DAERA	N2, N3, N7 H8, H9	Nature. Working Lands & Seas. UK Food Security. Health.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
FS6	By December 2025, DAERA will update the domestic statute book to implement and enforce Regulation (EU) 2016/429 - 'The Animal Health Law' (AHL). The AHL provides a new legal framework for the surveillance, detection and control of animal diseases. The aim is to improve animal health, minimize adverse effects from animal disease incursions and outline measures to control them. Ensuring the policy and enforcement framework are in place for this piece of EU legislation will add resilience to Northern Ireland's ability to deal with emergent and novel animal disease as a result of climate change.	DAERA		N2, N3, N7 H8, H9	Nature. Working Lands & Seas. UK Food Security. Health.
FS7	Food security will be a priority under the NI Food Strategy Framework. CAFRE will deliver education, training and knowledge transfer programmes to industry entrants and those working in the agri-food industry. This includes support to 250+ food processing business per year on issues such as food safety and shelf life. CAFRE has a College Estate Strategy (CES) which will include building environmental resilience in existing enterprises and identify and trial new plant and crop varieties not currently grown in Northern Ireland.	DAERA	Food Standards Agency and industry stakeholders	H9	UK Food Security.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
FS8	Market intelligence is carried out by the Agriculture and Horticulture Development Board on behalf of Northern Ireland's main sectors including milk, red meat, cereals and oilseeds sectors. This provides farmers, growers and food businesses with the intelligence and insight to make decisions in relation to supply and demand for their commodities. This information is used by CAFRE advisers and technologists to give current indication in trends and expected market fluctuations so that farmers and growers can plan for these. The Livestock and Marketing Commission, Northern Ireland provide weekly and longer-term market reports and predictions for the Red Meat Sector - this allows CAFRE advisers to give an insight to the red meat sectors on emerging trends in price, supply and demand The World Agricultural Outlook Board publishes monthly reports on World Agricultural Supply and Demand Estimates which are analysed by CAFRE to give insight to the NI arable crop, pig and poultry sectors when making decisions on supply and demand for their commodities.	DAERA	AHDB, WAOB, LMCNI	ID1, ID2	UK Food Security. Business.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
FS9	Sustainable Food Strategy The Belfast Sustainable Food Partnership was re-established in 2023 in recognition of the need for cross sectoral and coordinated action to increase the resilience of the food system for Belfast, and to deliver on the Belfast Resilience Strategy ambition for greater sustainability of food in the city. The Partnership is currently gathering evidence and stories from across the city to better understand challenges we face around food supply, food citizenship and justice, community food growing, sustainable tourism and hospitality, how food is procured more sustainably, food's role in tackling the climate and nature emergency, and creating a circular economy for our food waste. Throughout 2024 we will be engaging citizens to tell their stories of food in Belfast and developing this into a Sustainable Food Strategy for Belfast up to 2027. The work is embedded and delivered through the Belfast Agenda 2024-2027, the strategic community plan for the city.	Belfast City Council	Belfast Sustainable Food Partnerships	N6, N9 H7, H9 B6, B7 ID1	UK Food Security. Community Preparedness & Response.
FS10	The Acorn Farm project is developing a sustainable urban food hub in St Columb's Park Derry. The project priorities are to improve food security and resilience to climatic shocks by increasing the capacity for local people to grow their own food. The urban food hub will be completed in Summer 2025. The wider community growing programme continues to be delivered throughout the City & District with engagement across food networks, communities, and agencies.	Derry City and Strabane District Council	Derry City and Strabane District Council Community Foundation Northern Ireland Conservation Volunteers	H9 ID1	UK Food Security.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
FS11	Growing Resilience programme From 2024-2029 Social Farms & Gardens plans to carry on the work of our Growing Resilience programme, which has been running since 2015. With a total of 96 groups involved with the programme, it brings together local clusters of community gardens to share climate adaptation, food growing and community development skills, all of which contribute to community resilience and food security. The programme is targeted to increase social capital within and between communities, which will contribute to their ability to respond to and recover from environmental shocks, food shortages, civil unrest, and other societal disruptions. Local community food growing, and contributing to shortening supply chains, also reduces the green skills gap and gives a broad range of the population basic horticultural and practical garden management skills. Our ongoing programme will also focus specifically on climate adaptation specific skills, including water and soil management, regenerative food growing practices, seed saving, composting, and storing and preserving food etc.	Social Farms and Gardens	Our Northern Ireland member Community Gardens.	N4, N6, N7, N9 H1, H2, H3	UK Food Security. Community Preparedness & Response.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
FS12	Improving the Safety and Security of the Food Chain Food Fortress is assisting feed businesses to quantify and mitigate contamination risks in animal feeds. This helps ensure efficiency of feed use and reduces emissions. Significant presence of Mycotoxin in some feed materials has been detected, guidance to feed businesses focussed on safe inclusion of these materials in feed for the various species of farmed livestock. Monogastrics (pigs & poultry) are particularly impacted by mycotoxins in the diet and our program of measurement and mitigation is essential to ensure animal welfare and performance. Further development of the scheme will be centred on use of artificial intelligence (AI) to analyse the data collected over the 10 years the scheme has been in operation. An EU funded research project is being undertaken along with Institute of Global Food Security at Queen's University. This will identify patterns of contamination in the global supply chains and help predict the threat of future events.	Food Fortress	Food Fortress Ltd. Institute of Global Food Security (IGFS) at Queen's University Belfast and NI Grain Trade Association.	H9 ID1, ID7, ID10	UK Food Security. Health. Business.
FS13	This policy area is not devolved. While DAERA maintains a watching brief on this policy area, there are no specific actions that the NI Executive can take to monitor for any opportunities relating to this receptor.	DAERA		ID6	UK Food Security. Business.
FS14	This policy area is not devolved. While DAERA maintains a watching brief on this policy area, there are no specific actions that the NI Executive can take to further investigate this risk receptor.	DAERA		ID7	UK Food Security. Business.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
FS15	A new Co-centre for Sustainable Food Systems has been launched with an aim to drive societal and political change in food system transformation and transition to climate neutrality by 2050. Managed jointly by Queen's University Belfast, University of Sheffield and University College Dublin this co-centre brings together world leading researchers from across Ireland, Northern Ireland, and Great Britian with expertise in specific shared areas of common interest, including food safety, food production, nutrition, plant and animal science, behavioural change, data science, food system governance, and the political process of food system transformation. The Co-Centre will include a Policy Response Centre and a Research Synthesis Working Group to react to arising needs for policy ready or fundamental evidence respectively.	DAERA	Queens University Belfast, University of Reading, University College Dublin	N4, N6, N7, N9, N11, N12, N13, N14, N15, N16 H9 B6 ID1	UK Food Security.
FS16	Resilient cropping systems. This project will address the challenge of driving change in breeding and variety testing to shift focus to plant traits of resilience and sustainability. Current plant breeding and variety testing systems focus on optimum yield and quality under high input growing scenarios where biotic and abiotic stresses are minimised to support profitability for the primary producer. In addition, given the pressures to reduce chemical inputs and enhance stress resilience in the face of the increasing global population, migration and climate change, there is also a need to develop and deploy technologies to enhance the precision of field-based interventions to combat crop diseases, and reduce time to market for new crop varieties with enhanced resilience and sustainability.	SUREFOOD Co-Centre	Teagasc, Agri-Food and Biosciences Institute, University College Dublin, John Innes Centre	N4, N6, N8	Working Lands & Seas. UK Food Security.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
FS17	Circular and Ruminant Production: Embedding sustainability and circularity into pig and ruminant production. Whilst the UK and ROI are considered leaders in developing innovative solutions for sustainable, environmentally friendly ruminant production, work on pig production systems are to date under-exploited, and can play a key role in a sustainable, circular food system. There is a gap in knowledge on system parameters for indigenous grown (NFI) and circular (CFI) feed ingredients as novel sustainable sources of nutrition for pigs. Work in the ruminant area has focussed on developing feed-based strategies (e.g. Bovaer, Red Seaweed, Microalgae, oils, Direct-Fed Microbials) which have been tested in a singular manner for their ability to sustainably enhance production, whilst reducing methane (CH4) emissions. We will investigate feeding strategies in an additive manner i.e. in combination rather than singularly. These combinations will be chosen based on biological-based complementarity to ensure effective longer-term suppression of methanogenesis (in ruminants) Co-Centre Programme 2022 whilst achieving production gains. In addition, there is scope to increase the capacity to convert currently wasted nutritional sources into high quality protein.	SUREFOOD Co-Centre	Teagasc, Agri-Food and Biosciences Institute, Queens University Belfast, University of Galway	N6 B6	UK Food Security.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
FS18	Development of predictive analytical strategies. There are a growing number of new risks to the safety and integrity of feed and food on the Island of Ireland. While there are industry and governmental monitoring schemes in place to monitor for currently known risks, these tend to report incidents long after feed and food enters the marketplace and has been consumed. The major challenge is to prevent feed and food contamination from occurring and if this is not possible to detect such events much earlier and allow mitigation strategies to be deployed. Supply chains will be mapped to determine the points of vulnerability to chemical and microbiological contamination and risk assessments of new and emerging risks undertaken for these intensive farming sectors. Predictive analytic tools will be developed to identify the likelihood of future food safety and authenticity incidents in food supply networks using real-time data captured at points of vulnerability.	SUREFOOD Co-Centre	Teagasc	H9 B6	UK Food Security.
FS19	Enabling Technologies. Food Safety is underpinned by complex monitoring carried out by governmental, commercial and to a lesser extent food laboratories. Most major food scares are caused by the adulteration/substitution of Food and Feed. Many of these challenges rapidly emerge, are short term but can cause immense financial and reputational damage to companies. Analytical testing capacity and capability is key for industry for ongoing monitoring of food integrity in normal times, and that of crisis, where large numbers of tests need to be carried out onsite to enable rapid decision-making. This project will develop rapid methods to measure food authenticity and gross contamination using high throughput methods and easy to use technologies	SUREFOOD Co-Centre	Teagasc	H9	UK Food Security.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
FS20	Integrated omics to map and model emerging food safety risks. Current global challenges present heightened potential for existing and hitherto unexplored food safety risks and their influence on One Health (WHO, 2022). To address this a systems-based approach to reduce food safety challenges across selected food systems using a holistic integrated omics approach, underpinned by machine learning will be implemented in direct collaboration with selected demonstrator food systems, research on predictive analytics and data modelling.	SUREFOOD Co-Centre	Teagasc, University College Dublin	H9	UK Food Security.
FS21	Scoping exercise to define with stakeholders, food systems, knowledge gaps, and boundaries of study domains. This project develops a food system conceptual framework together with stakeholders across the UK and Ireland to help identify stakeholder priorities for food system change as well as data needs for modelling food system intervention points.	SUREFOOD Co-Centre		H9 B6 ID1	UK Food Security.
FS22	Food Systems Modelling. This project will use modelling techniques to evaluate local food chain sustainability gaps and create a map of the food system with its dynamics, actors, activities, and outcomes. Shifts to sustainable diets impact the food system from agricultural practices and incentives to health and environmental consequences, and so this map will identify compatible, integrated food system outcome metrics to facilitate multi-actor negotiations on food system sustainability.	SUREFOOD Co-Centre	Queens University Belfast, University College Dublin, University of Oxford	H9 B6 ID1	UK Food Security.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
IS1	Implementation of the Living With Water in Belfast Plan. The Living With Water in Belfast Plan was published by the Department in November 2021, following Executive endorsement. The Living With Water approach focuses on developing integrated, catchment-based solutions to manage rainwater in a more natural way, whilst recognising that significant investment will also be required in our wastewater treatment works and sewerage and drainage networks.	DfI	DAERA, NI Water, Belfast City Council	N18 I1, I2, I3, I4 H3 B1, B2	Nature. Water Supply. Towns & Cities. Buildings. Health.
IS2	Develop PC21 water efficiency campaign and work towards delivering it.	NI Water	n/a	B3	Water Supply. Business.
IS3	Publish the next Water Resource and Supply Resilience plan and work towards delivering the actions within it.	NI Water	n/a	I8 H10 B3 ID10	Water Supply. Health. Business. Strategic.
IS4	Use the information in the Water Resource and Supply Resilience to balance supply and demand against future changes from population growth, climate change and environmental pressures	NI Water	n/a	I4, I7	Water Supply. Telecoms & ICT. Business.
IS5	Develop catchment water quality improvement plans and work towards delivering the actions in it. Consider climate adaptation in the development of our biodiversity strategy.	NI Water	n/a	N1, N11 I2	Nature. Water Supply.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
IS6	Business Continuity Plans (BCPs) and business continuity champions: ongoing activity. We are beginning to engage with the supply chain on approach to climate: develop an understanding of how our supply chains consider climate adaptation (and mitigation currently) so we can apply this to any updates to our procurement processes. Battery and solar implementation to improve our service resilience in the face of climate hazards. To note- this is all subject to budget availability.	NI Water	n/a	I1 ID10	Water Supply. Strategic.
IS7	Groundwater quality and quantity is routinely sampled and tested using a network of boreholes and springs across Northern Ireland. Data collected is used to assess the risk of saline intrusion as well as compliance with European legislation such as the Nitrates (91/676/EEC) and Groundwater (2006/118/EC) Directives.	DAERA		N10	Working Lands & Seas. UK Food Security. Water Supply.
IS8	Publish the River Basin Management Plan	DAERA	EMGF Water Policy	N11, N12, N13	Nature. Working Lands & Seas. UK Food Security. Water Supply.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
IS9	Water catchment resilience at Divis, the Black Mountain and Ballygomartin The National Trust will continue to work with partners (including DAERA and NLHF) and explore further opportunities for collaboration (including with DfI's Living With Water (LWW) Team) to better understand and improve the quality of habitats on Divis and the Black Mountain – for biodiversity and ecosystem services. Rewetting wetland and peatland habitats will help improve water storage capacity, potentially reducing flood risk downstream in Belfast. Initial work to begin to understand the hydrology and condition of habitats has been completed. During the next phase, monitoring of stream flow and water quality will enhance this knowledge before peatland restoration begins in September 2025. A new weather station on Divis will support this work and increase understanding of evapotranspiration rates, improving wildfire resilience planning. On newly acquired lands downslope around Ballygomartin, the National Trust will undertake hydrological monitoring and is planning significant tree-planting, to help increase natural flood management in the area alongside other environmental benefits.	National Trust	Department of Agriculture, Environment and Rural Affairs; National Lottery Heritage Fund; DfI LWW Team	N1, N2, N4, N5, N11, N12 I1, I2	Nature. Water Supply. Towns & Cities. Community Preparedness & Response.
IS10	Review NI Water's Abstraction & Impoundment Licences on water bodies with potential seasonal vulnerability / climate change impacts to water resource availability by 2029.	DAERA	NI Water	I8	Water Supply.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
IS11	Capital Energy Fund & Property Energy Strategy 2019-2030 The Capital Energy Fund is being used to effectively deliver the outcomes of the Property Energy Strategy 2019-2030. Council assets are continually being monitored with respect to energy consumption and CO2 levels. If any issues are identified, action can be taken promptly to ensure systems are working efficiently and effectively, i.e. energy infrastructure and overheating. In addition, if opportunities exist where systems can be upgraded or replaced then this fund can be accessed to support works e.g. LED replacements, Biomass pellet installation, boiler replacements, solar arrays, heating control modernisation etc. Current projects include the upgrade of Biomass systems to wood pellets and the exploration of installing solar panels on two key buildings within the next 5 years. DEC's can be an additional source of information to base improvement works as their recommendation reports can focus future works.	Antrim and Newtownabbey Council	N/A	I10 H1, H3	Energy. Buildings.
IS12	Project Stratum is a joint venture led by the Department for the Economy which has the aim of improving broadband connectivity by extending Next Generation Access (NGA) broadband infrastructure to rural populated areas across Northern Ireland by March 2025. In November 2020 Fibrus Networks Ltd was appointed as the contractor to deliver gigabit-capable (i.e. capable of speeds of 1,000 Mbps) broadband to 81,000 eligible premises in predominantly rural areas of Northern Ireland. DAERA contributes approximately 10% of the total funding for the scheme and is represented on the Project Board.	DAERA	DfE	I13	Telecoms & ICT.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
IS13	Develop and Implement a Climate Change Adaption Action Plan (CCAAP) - this would draw together the various current and planned actions and support strategic oversight to deliver on the corporate objective "provide a reliable railway service that is resilient to climate change". Strategy to be published in 2026 (subject to approvals).	Translink	n/a	I1 ID10	Transport. Strategic.
IS14	Drainage Resilience - Inspection, assessment and inventory completion of on and off-track drainage assets on a drainage system basis. Translink have prioritised the assessment of drainage assets through an Earthworks & Drainage Resilience Study (EDR) capital project.	Translink	n/a	I2, I4, I5, I7	Telecoms & ICT. Transport.
IS15	Crest Drainage - a programme of inspection and maintenance of crest drainage associated with soft slope cuttings is being undertaken on a risk priority basis adjacent to the railway network. This follows a review of higher risk earthworks cuttings across the railway network	Translink	n/a	I2, I7	Transport.
IS16	Flood Risk Assessments (FRA) - are being undertaken across all infrastructure assets. This will determine the risk in relation to flooding likelihoods and business impacts for various present day and future flooding scenarios. Phase 1 of works has been completed, and Phase 2 has commenced, which will include hydraulic analyses.	Translink	n/a	I2, I7, I12	Transport.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
IS17	Upgrade Signals and Telecoms (S&T) infrastructure to improve resilience to extreme weather – through improved planning and improvements in the design, location and setting of S&T elements which reduce the exposure or impact	Translink	n/a	I2	Telecoms & ICT. Transport.
IS18	Nature Based Solutions - Biodiversity Strategy and Action Plan 2030 focuses on NbS with a target: By 2030, conserve and enhance biodiversity to at least 30% of our landholdings through Nature-based Solutions in support of carbon sequestration and local nature recovery networks.	Translink	n/a	N1 I2, I5	Nature. Transport.
IS19	Improve coastal defence resilience - a Sea Level & Climate Change Assessment is being undertaken across all railway coastal defence assets. This will determine the areas of the network at highest risk from over-topping by rising sea levels for various change projections.	Translink	n/a	I3	Transport.
IS20	Scour Protection - a series of Scour Risk Assessments is being undertaken across all related railway assets in preparation for a capital project to upgrade defences at 50 sites at highest risk.	Translink	n/a	I4, I5	Telecoms & ICT. Transport.
IS21	Earthworks condition assessment, strengthening and improvement - an Earthworks & Drainage Resilience Study (EDR) will deliver an Earthworks Asset Criticality Banding (EACB) assessment of failure consequences, allowing prioritisation of resources under capital and maintenance programmes.	Translink	n/a	I5, I7	Transport.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
IS22	Earthworks condition assessment, strengthening and improvement - a programme of inspection and renewal of slopes in critical areas will reduce the risk of failure due to extreme weather events and enhanced mechanical and biological weathering.	Translink	n/a	I5, I7	Transport.
IS23	High-Risk Tree Management - a detailed trackside survey has identified trees which pose a risk to safe operation of the railway under current and expected climatic conditions. A prioritised removal project will reduce risk while replacement supports biodiversity targets.	Translink	n/a	I5	Transport.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
IS24	The Eastern Transport Plan 2035 (ETP) is an on-going project which will set the framework for making transport policy and investment decisions up until 2035 for a 5 council area: - (Antrim and Newtownabbey Borough Council (ANBC); - Ards and North Down Borough Council (ANDBC); - Belfast City Council (BCC); - Lisburn and Castlereagh City Council (LCCC); and - Mid and East Antrim Borough Council (MEABC)). The ETP will support the development of the Councils' Local Policy Plans. The plan aims to: 1. Re-balance the transport network in favour of sustainable modes; 2. Connect communities; 3. Deliver a reduction in GHG emissions; 3. Develop safe active travel options; 4. Reduce travel distances by promoting safe inclusive neighbourhoods; 5. Improve air quality; and 6. Enhance the built and natural environment.	DfI	Sustrans, NI councils, AtkinsRéalis, Paul Hogarth	I1, I5, I7, I12 H1, H3, H7, H8 ID9	Transport. Towns & Cities. Health.
IS25	Safety and Emergency Planning Review, assess and amend risk assessments on a quarterly basis in compliance with regulatory requirements for the Airport. This aims to protect the safety of aircraft in the vicinity and on the ground from increasing frequency of extreme weather events including extreme heat, high winds and lightning. Work is ongoing to assess climate risks including consideration of sea level projections at the closest marine projections data point. This assessment will be carried through in the development of BCA's climate strategy.	Belfast City Airport		I1, I10, I12, I13	Telecoms & ICT. Transport. Towns & Cities.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
IS26	LiDAR modelling of the Harbour Estate to establish a Digital Terrain Model (DTM), Digital Surface Model (DSM) and advanced Topographic mapping, to identify both existing flood risk defence requirements and to inform port master-planning in respect of future climate adaptation requirements (planning for sea level rise, storm surge and flooding, terrain stability, navigation and channel maintenance and infrastructure resilience). Results will also inform ongoing participation in DfI's Belfast Tidal Flood Alleviation Scheme. The topography mapping is aiming to be completed towards the end of 2024, with development of the digital twin ongoing. Data is then expected to be adopted in 2025.	Belfast Harbour Commissioners	Bluesky International, Royal HaskoningDHV	I1, I2 H3 B1	Transport. Towns & Cities. Buildings. Business.
IS27	Carry out research into and develop options for water supply from groundwater aquifers in Northern Ireland. This will help to diversify the public water supply and mitigate potential water shortages during drought conditions. These will be developed to be included within the optioneering phase of the NI Water's Water Resource and Supply Resilience Plan.	DfE (GSNI)	NI Water	I8, I9 H10 B3	Water Supply. Business.
IS28	Carry out research into groundwater aquifers within the Ballinderry Catchment to reduce vulnerability and to improve management of groundwater resources to augment both private and public water supplies.	DfE (GSNI)		N6 I8, I9 H10 B3	Water Supply. Business.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
IS29	Research into the peat landslides in Northern Ireland in relation to climate change and extreme weather events, with particular reference to their impact on energy infrastructure such as wind farms. Research will be carried out at three comparable sites to understand differences between developed, undeveloped and managed site with results informing future adaptation measures.	DfE (GSNI)	QUB, British Geological Survey, Met Office	I7	Energy.
IS30	Research into landslide risk across Northern Ireland, including the impact and influence of climatic factors. Whilst this work will not exclusively focus on transport networks, the vast majority of research will be carried out on roads that are subject to regular landslides including the Antrim coast road.	DfE (GSNI)		I5, I7	Transport.
IS31	Research to monitor coastal change at three pilot sites. The research will assess the erosion susceptibility of each location chosen due to their varying geology, setting and exposure. Whilst research will not focus exclusively on transport networks, each site is in close proximity to either road or rail infrastructure and the results of the work will help to understand the impact of coastal and climate change on the wider area.	DfE (GSNI)	Ulster University	I3	Transport.
IS32	NIE Networks has responsibility for the electricity network. As a prudent and responsible operator, it monitors & collates data on weather related outages, including the number of properties affected. DfE will work with NIEN and other stakeholders to identify and rectify any data gaps. Going forward, DfE will use the data to support energy policy development to ensure a reliable energy supply in the transition to net zero.	DfE	SONI, Utility Regulator, NIE Networks	I4, I10, I11	Energy.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
IS33	Develop a stakeholder engagement plan to work with NI Stakeholders in the telecoms sector to highlight the issues in relation to Climate Change and adaptation, subject to resources being made available. Work with private operators in Northern Ireland to understand their adaptation and risk management plans as part of Business As Usual. Engage with BDUK/DSIT to advocate for the development of resilience standards for operators in Northern Ireland to streamline adaptation objectives in highly privatised sectors through existing networks and channels.	DfE	OFCOM, DSIT, Telcos, Electronic Communications - Response and Resilence Group (EC-RRG), OFCOM NI Telecoms Stakeholder Forum,	I1, I13	Telecoms & ICT.
IS34	Ongoing monitoring of track temperatures through a network of remote sensors. This will provide information on stress and risk to the asset and services. Following the completion of the pilot and roll-out of a full network, this has become an ongoing BAU function.	Translink		I2	Transport.
IS35	DfI will assess the impact of coastal erosion on the public road network, including its sea walls and other coastal infrastructure where it meets the coastline and make use of any relevant information from the LiDAR survey.	DfI	DAERA	N17 I3, I5 H4 B2	Transport. Community Preparedness & Response.
IS36	Risks to DfI-owned bridges, headwalls, wingwalls and culverts from high, fast river flows, scour and bank erosion. Monitor, inspect and maintain road, bridge network and implement maintenance action plans based on specific risk assessments and prioritisation matrix.	DfI	Translink	I2,I4,I5 H3 B1	Transport. Community Preparedness & Response.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
IS37	Future design of DfI-owned bridges and culverts will take into account climate change and mitigate against its impacts. Relevant Design Manual for Roads & Bridge (DMRB) standards have been reviewed and allowances included to ensure climate change is accounted for within the design decision making process and in choosing the final detailed design option.	DfI	Translink	I2,I4 H3 B1	Transport. Community Preparedness & Response.
IS38	Risks to road and rail transport networks from slope & embankment failure - Continue geotechnical inspection regime as per CS 641 for DfI road embankments and prioritise actions using the Geotechnical Asset Register and Geotechnical Asset Management Plan. DfI TRAM to appoint a Geotechnical Maintenance Liaison Engineer (GMLE).	DfI	Translink	I5,I7 B5	Transport. Community Preparedness & Response.
IS39	Provide input to review and update the standards contained within the Design Manual for Roads and Bridges (DMRB) and Manual of Contract Documents for Highway Works (MCHW) which will include addressing climate change adaptation and mitigation.	DfI	National Highways	I2,I3,I4,I5	Transport.
IS40	Carry out a detailed tree survey to develop a tree management programme and strategy which will examine the risk of tree related incidents due to high wind events, specifically for trees adjacent to the public road under DfI's responsibility.	DfI		I12 B6	Transport. Business.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
IS41	DfI will be involved in the development and drafting of TD 401 (DMRB) - Design of Renewable Energy Systems. When the RAD (Research and Development) is complete DfI will use it to adapt its network infrastructure to further integrate renewable energy sources.	DfI	National Highways	I1	Transport.
IS43	DfI will develop a Resilient Road Network Plan to determine the durability of the road network and the ability to ensure its continued use or swift recovery during and after adverse weather events, responding to the challenges of climate change. Also invest in structural drainage to reduce the impact of surface water on the operation and structure of the road network, as resources permit.	DfI		I2 H3 B6	Transport. Community Preparedness & Response. Business.
BE1	Review and update of the Architecture and Built Environment Policy for Northern Ireland - Review and update the Architecture and Built Environment Policy for Northern Ireland which aims to outline how high-quality design can improve environment impacts and climate resilience. Design Reviews are a key component of the implementation plan of the current policy. MAG intend to increase the number of Design Reviews undertaken in 24/25 from 8 to 12.	DfC	NI Executive Departments and the NI Prison Service	H1, H3, H5, H7, H13	Towns & Cities. Buildings.
BE2	The NIARP23 - 'Adapting to Climate Change' report on progress in Northern Ireland April 2023, recommended that an urban greenspace target is introduced to ensure towns and cities are better adapted to more flooding and heatwaves. The proposed action is to examine the feasibility of an urban greenspace target and to bring forward a proposal.	DfC	Department for Agriculture, Environment and Rural Affairs (DAERA), Department for Infrastructure (DfI), Local Councils, NISRA, NI Environment Link (NIEL) & the National Trust	H1, H3, H7	Towns & Cities.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
BE3	Delivery of the objectives and measures in the 2nd Cycle of the NI Flood Risk management Plan and Rivers 10 year Asset Management Plan	DfI	DfI (Rivers, LWW Team, WDPD, TRAM, NIW) and multi-agency emergency partners	I1, I2, I3, I4 H3, H4 B1, B2	Transport. Towns & Cities. Community Preparedness & Response.
BE4	Update Technical Flood Risk Guidance in Relation to Allowances for Climate Change in Northern Ireland for UKCP18	DfI	DfI across department incl Rivers. TRAM, NIW & LWW Team. DAERA	N1, N4, N11, N17, N18 I1, I2, I3 H3, H4, H11 B1, B2, B6	Water Supply. Telecoms & ICT. Transport. Towns & Cities. Buildings. Community Preparedness & Response. Business.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
BE5	Review the 2018 Northern Ireland Flood Risk Assessment (NIFRA).	DfI	DfI across department incl Rivers. TRAM, NIW & LWW Team. DAERA	N1, N4, N11, N17, N18 I1, I2, I3 H3, H4, H11 B1, B2, B6	Water Supply. Telecoms & ICT. Transport. Towns & Cities. Buildings. Community Preparedness & Response. Business.
BE6	Progress review of 2nd Cycle NI Floods Risk Management Plan (FRMP2). Publish as updated 3rd Cycle Plan in 2nd half of the NICCAP3 2024-2029 cycle	DfI	DfI across department incl Rivers. TRAM, NIW & LWW Team. DAERA	N1, N4, N11, N17, N18 I1, I2, I3 H3, H4, H11 B1, B2, B6	Water Supply. Telecoms & ICT. Transport. Towns & Cities. Buildings. Community Preparedness & Response. Business.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
BE7	Progress Water, Flooding & Sustainable Drainage Bill	DfI	NI Water (Water and Sewerage Undertaker)	I1, I2, I7, I8 H3	Nature. Water Supply. Transport. Towns & Cities. Buildings.
BE8	Ards and North Down Borough Council Nature Enhancement Initiatives A range of projects have developed to ensure we not only protect our natural environment but enhance it: Rewilding areas have seen reduced mowing to enhance grassland habitats, provide carbon stores, improve air quality etc. More sustainable planting has created better displays at lower costs whilst being better for the environment. The Tree & Woodland Strategy has set a target to plant 160,000 trees by 2032 - providing a key role in mitigation and health & wellbeing, it also provides areas of shade in increasingly hot weather. Ward Park, Bangor is undergoing an environmental improvement scheme to create a more modern park increasing biodiversity, enhancing green space, improving carbon sequestration and increasing flood attenuation by increasing capacity of the ponds. Whitespots is being redeveloped into a Regional Park, creating opportunity to significantly enhance the natural environment with sustainable design at its heart.	Ards and North Down	DAERA & Community Groups	N1, N4, N5, N11, N18 I2 H1, H2, H3, H4, H7, H11	Nature. Transport. Towns & Cities. Health. Community Preparedness & Response.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
BE9	Greening the City contributes to the delivery of the Place, Planet, People and Participation elements of the WHO European Healthy Cities Network framework. The overall goal of the programme is to prioritise stakeholder and community engagement to create mutually beneficial relationships between citizens and the urban environment for improved physical and mental wellbeing, through greening projects such as the development of Green Health Maps. A Greening the City Advisory Group has been created to inform and support the delivery of these projects and includes members from across relevant sectors who focus on inequalities, greening and health. Greening the City projects will be used to change the landscape of Belfast to promote greenspace, support biodiversity, adapt to flood risks, lower the urban heat island effect, improve air quality, and provide space for community growing and active travel infrastructure, thus creating a healthy environment for people and the planet.	Belfast Healthy Cities	Queens University Belfast: GroundsWell, and Greening the City Advisory Group: Belfast City Council, Belfast Health and Social Care Trust, Belfast Healthy Cities, Department for Infrastructure, EastSide Partnership, Keep Northern Ireland Beautiful, Northern Ireland Environment Link, Public Health Agency, Queen's University Belfast, RSPB NI, Social Farms & Gardens and West Belfast Partnership Board.	I2 H1, H3, H7 ID9, ID10	Nature. Towns & Cities. Health. Community Preparedness & Response.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
BE10	Eastside Greenways Building on the success of Connswater Community Greenway (CCG), EastSide Greenways intends to influence and explore the potential for a wider network of Greenways across east Belfast linking people and places to a city wide and regional network. In the years 2024-29 we plan to; 1. Develop a "citizens assembly", empowering communities to understand the impact that climate change will have on them and affect change 2. Build citizen science projects along CCG 3. Develop and share model of best practice for development of CCG 4. Assist in ongoing maintenance of CCG as an NBS 5. Undertake a 5-6 year follow-up evaluation of the public health impact of the CCG led by QUB 6. Action recommendations made in our recent report developed in partnership with the GroundsWell consortium at QUB through a commissioned consultation process titled: Climate and Nature, A Vision for the Future of the CCG exploring the role of urban green and blue spaces in climate change.	Eastside Partnership	Belfast City Council; Groundswell Consortium; Centre for Public and Planetary Health at QUB; political, community and business sectors in East Belfast; city/regional forums and networks	N1, N11, N14 H3, H13	Nature. Towns & Cities. Community Preparedness & Response.

BE11	UPSURGE (2021-2025) is an EU Regenerative Lighthouse project focused on testing nature-based solutions (NBS) to share learning and good practice on pollution alleviation, citizen health and climate resilience. Five cities: Belfast, Breda, Budapest, Maribor and Katowice, are demonstrating different kinds of NBS to tackle a range of socio-environmental challenges. A multi-disciplinary team at QUB's School of Natural and Built Environment are supporting all cities to co-design, construct and deploy NBS on real sites. In Belfast, Belfast City Council's Climate Team are implementing agroecology solutions including a research garden and community garden. QUB researchers are exploring the impact of NBS on the urban heat island effect, lessons on the co-creation of urban NBS, the risks of soil pollution on urban farming, and opportunities of soil carbon sequestration. Potential impacts include policy change, journal papers, public awareness, and a new NBS implementation advice service led by the consortium.	QUB	Funder - European Commission (EU HORIZON). NI-based partner: Belfast City Council (Climate Team). Other Municipal partners in Europe: Budapest's District 18, Katowice City, Patras, Prato, Breda, RDAPM (Maribor). Research and innovation partners: AITIIP & LEITAT(Spain), Biodiversity & University of Antwerp - Global Change Ecology (Belgium), University of Natural Resources and Life Sciences Vienna (Austria), Burst (Hungary), E-Institute (Slovenia), ICLEI & University of Passau (Germany), Institute of Communication Studies (Republic of North Macedonia), IETU (Poland), Operate & Open Content (Italy), POR (Croatia), University of Leeds (UK). Other partners in Belfast: Friends of the Field Community Group, Friends of Botanic Gardens Community Group, The Conversation Volunteers	N1, N4, N5, N18 H1, H3	Nature. Towns & Cities. Health. Community Preparedness & Response.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
BE12	The BluePrint project engages flood-affected communities across generations, in the Derry City and Strabane District Council area, from villages Eglinton and Newtownstewart, in an artistic co-creation process to share and exchange their lived-experiences around flooding and climate adaptation. A social engaged artist will creatively engage communities to co-create an artwork to communicate their lived experiences and support wider climate resilience outreach, engagement and policy in Derry-Londonderry and beyond. The project started in October 2023 and will run through until 31st December 2024.	University College Cork	Playhouse Derry, Derry City and Strabane District Council and Mayo County Council. Climate NI/ NI Environment link is a collaborator.	H3, H4, H11	Towns & Cities. Community Preparedness & Response.
BE13	Introduce an overheating mitigation requirement under The Building Regulations for new dwellings and other residential building work.	Dof	District council will be the enforcement authority	H1	Towns & Cities. Buildings. Health.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
BE14	Develop the design and refurbish five buildings to EnerPhit standard between 2024-2029 subject to funding so that they are resilient to climatic variations including overheating. To date the Passivhaus Retrofit has identified sites at Bessbrook, Killyleagh, and Ballymoney libraries to undergo refurbishment and carbon retrofit projects. The retrofit projects have been designed to maintain comfortable indoor temperatures with minimal energy consumption, even in the face of increasing summer heat. This involves the adoption of high-performance wall and roof insulation to minimise heat transfer, triple-glazed windows to reduce heat gain, deciduous trees planting to provide shading during summer months, and mechanical ventilation with heat recovery (MVHR) systems – which includes a heat pump with a reversible cooling circuit that can cool or heat supply air according to requirement. The airtight building envelope prevents hot air infiltration, maintaining internal climate stability and reducing the need for active cooling. On completion, these public libraries will achieve EnerPHit standard which is a Passive House standard intended for refurbishment projects. The libraries will require very little energy to achieve a comfortable air temperature throughout the year, reducing both costs and carbon emissions.	Libraries NI	Department for the Economy, Department for Communities, Strategic Investment Board, McLean & Forte Architects, Hamilton Architects	H1, H5, H6, H7 B5	Buildings. Health. Community Preparedness & Response.
BE15	Grey Abbey Climate Change Pilot Study - the aim of this project is to create an operational pilot study which will guide and inform the Historic Environment Division, and other stewards of heritage assets on how, when and whether to adapt their management and conservation planning for sites and assets in their care.	DfC	Data collection will involve the use of community / citizen science	H11	Buildings.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
BE16	Annual Programme of Condition Surveys at State Care Monuments - HED have a rolling programme of quinquennial monument condition surveys in-place which allows the organisation to flag maintenance and structural issues to be followed up by its internal Conservation Works Team and/or external specialist contractors.	DfC	N/A	H11	Buildings.
BE17	Northern Ireland Housing Executive is developing its first internal Climate Adaptation Plan which will be used by the organisation to provide information on, and to guide actions in response to climate change impacts. This work will compliment other strategies being developed within the Housing Executive to reduce the impact of the Climate Emergency, and the work of other public bodies. The Plan has reached Step 2 of the Process using the NI Adapts toolkit.	Northern Ireland Housing Executive	Climate Northern Ireland	H1, H3, H5, H6	Buildings.
BE18	To develop Minimum Energy Efficiency Standards for the Private Rented Sector	DfC	DfE, NIHE, LANI, HRS	H5, H6	Buildings.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
BE19	Sport NI has commitments within its Corporate Plan to lead the sports sector to make significant progress on reducing its environmental footprint, contributing to reducing carbon emissions and becoming self-sustaining. Sport NI will develop and deliver a capital grants programme that will enable the sports sector to install capital interventions to improve the environmental impacts of their facility. A programme with the following stages: - Phase 1: Sports Sector Climate Literacy Training. - Phase 2a: Sports Facility environmental audit. - Phase 2b: Sports Club Environment & Climate action plan and governance. - Phase 3: Capital delivery for sporting organisations that have successfully complete phases, 1, 2a and 2b.	Sport NI	N/A	H5, H11	Buildings.
BE20	Building Design Minimum Standards - The Property department has introduced a Sustainable Building Design Plan which will be used to incorporate consideration of climate risk & resiliency and embed appropriate indicators in the design of new build from the outset.	Translink	n/a	H3, H5	Buildings.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
BE21	The ArcGIS Pro-based Climate Project will build up an asset database which identifies Council assets most at risk from the impacts of climate change in relation to extreme weather impacts. A spatial layerset will be developed for assets at risk from flooding (3 source types), storms, heat, and extreme cold. Consideration will also be given to assets potentially impacted from coastal erosion. Input from key officers across all service areas will help to build a profile of high-risk sites to understand their full economic, environmental, and societal value, which may result in the risk level being reviewed. Facilities maintenance will provide information on existing solutions including availability of onsite generators, frost protection, and sewerage treatment on site. This will assist in identifying gaps in adaptation and to justify proposed investment.	Mid and East Antrim Council	DfI Rivers, Met Office - UK Climate Projections	I1 H3, H5 B1, B2, B5	Telecoms & ICT. Buildings.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
BE22	Research on Passivhaus in a Changing Climate A study of how new buildings built to the Passivhaus Standard or existing buildings retrofitted to the Passivhaus Enerphit Standard in Northern Ireland would perform in a range of different future climate scenarios, whether that be a warming or cooling climate, compared to buildings constructed to minimum building regulation standard. The outcome of the research is expected to validate the ability of Passivhaus design to be adapted cost effectively for changing climates and perhaps feedback particular design elements which need to be carefully considered, with data supporting advice on climate adaptable design of our buildings today. The undertaking of modelling is proposed to show how the dwellings would perform against different climate scenarios, with previous monitoring and ongoing monitoring results from different climate zones also adopted. The planned start of the project is in 2024/2025, and the proposed length of study is to last between 6 to 12 months.	Passive House Association of Ireland	International Passive House Association UK Passivhaus Trust	H1, H5, H6, H7	Buildings. Health.
BE23	Risk assess the direct impact of climate change on service delivery (e.g. extreme weather, transport / workforce disruptions, utility outages) and plan for any adaptation measures deemed necessary. Review and update business continuity plans (BCP), where necessary, to include contingency measures to deal with the climate change related risks to service delivery. Report climate related adverse incidents to allow risk areas and trends to be identified, and appropriate adaptation measures to be taken forward.	DoH	Belfast, Northern, Southern, South Eastern and Western HSC Trusts. NIAS, NIFRS, BSO, PHA & SPPG.	H12	Buildings. Health.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
BE24	Monitor and report on overheating in hospital buildings, to determine the locations and frequency of overheating events.	DoH	Belfast, Northern, Southern, South Eastern and Western HSC Trusts.	H1	Buildings. Health.
BE25	Assessment of resilience against increased likelihood of power disturbances / outages caused by extreme weather / climate change.	DoH	Belfast, Northern, Southern, South Eastern and Western HSC Trusts.	H12	Buildings. Health.
BE26	New health protection legislative framework for NI which will update current public health legislation to better respond to health security issues or threats and broadening pandemic resilience and preparedness planning to include all routes of disease transmission including vector-borne transmission with a cross-departmental approach.	DoH	Belfast, Northern, Southern, South Eastern and Western HSC Trusts. Public Health Authority (PHA) and Strategic Planning & Performance Group (SPPG).	H8 ID9	Health.
BE27	Intervention, prevention and response work around wildfires and flooding. Wildfires whilst seasonal have a significant impact on the natural environment (nature, biodiversity, habitats, air quality). Prevention and Response resources for environmental protection including efficient use of resources and specialist capabilities such as High-Volume Pumping and Flood Response resources.	DoH	Northern Ireland Fire and Rescue Service (NIFRS)	N1 H7	Nature. Health.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
BE28	The Climate NI Health and Wellbeing Platform was launched in September 2019 to meet a request from Health stakeholders for easier access to climate and health information relevant to NI. This work was done in partnership with Climate NI as an adaptation measure under NICCAP2. The platform remains accessible and retains a broad range of information. As of Spring 2024 membership is around 65 members, from a range of public, private, academic and voluntary bodies. Aside from sporadic updates to the platform between April 2022 and 2024 there has been very little activity. The DoH and Climate NI will review whether the platform will continue during the NICCAP3 period.	DoH	Climate NI	Strategic	Health. Strategic.
BE29	Include Climate Change considerations within the development of an updated Outdoor Recreation Action Plan/Strategy for Northern Ireland. Inclusion of opportunities for grant investment to enable policy makers and providers of access to nature trails to assess climate change risk and implement plans and projects to mitigate those risks. Consideration of Climate Change risk within grant assessments (as a risk or as part of Sustainability).	DAERA	DoI, Councils, eNGOs will be involved in long-term delivery	N4, N17, N18 I1, I4, I5 H3, H4, H11 B2	Nature. Transport. Health. Community Preparedness & Response. Business.
BE30	Implement a tree safety policy across all NIEA managed Country Parks and Nature Reserves to include regular commissioning of tree safety surveys and actioning of recommended works in line with the policy.	DAERA		H3	Health.
BE31	To ensure public and staff safety from severe weather events monitor for Met Office weather warnings and where appropriate, via DAERA communication channels, issue public advisory information regarding site access.	DAERA		H3	Health.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
BE32	Develop Risk assessments for NIEA managed sites for adverse/extreme weather events	DAERA		H2, H3	Health.
BE33	Where site infrastructure, such as riverside pathways, is at risk of the impacts of adverse weather events, such as flooding, when undertaking works consideration will be given to incorporating improved climate resilience in the works design.	DAERA		I2, I3, I4, I5 H3	Transport. Health.
BE34	Development of Northern Ireland's first Clean Air Strategy is driven by the need to protect public health. Following a period of public discussion in 2020, responses were analysed, and a synopsis of the responses published. Responses showed interest in expansion of the monitoring network, restrictions on residential solid fuel burning and increased funding for air quality. Following clarification of Minister Muir's policy direction, the draft Strategy is being revised and will be issued to the Inter-Departmental Steering Group, made up of the other key departments, and it is at that stage that those Departments, namely DfE and DfI, will confirm their Ministers' views, in advance of a public consultation.	DAERA	DfE, DfI	H7	Health.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
BE35	The Greenways Project is creating a network of greenways to provide free recreational opportunities for all ages and abilities, encourage healthier lifestyles, bolster local economic development, reduce car trips and carbon footprints, provide additional transportation options, and encourage better environmental stewardship. These proposals represent a total investment of £20M in green infrastructure. It is envisaged that 50% of this will be met by DfI in addition to £3,216,000 awarded in Round 1 of Levelling Up Fund. The three proposed greenways include: 1. Comber to Newtownards 2. Newtownards to Green Road 3. Green Road to Donaghadee Flood risk and drainage assessments have been undertaken, with designs mitigating any risk of flooding by filtrating the water. The network will create nature connectivity for wildlife, with areas marked for wildflower hedging native trees. Circa 97% of the path is protected with hedging and native trees on both sides to provide heat resilience. This project has a 25-year appraisal period.	Ards and North Down	UK Gov. Levelling Up Fund Department for Infrastructure	N18 H1, H2, H3, H11	Nature. Health. Community Preparedness & Response.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
BE36	The SPACE project aims to provide evidence to inform policies and interventions that will provide supportive urban environments to promote healthy ageing, including promoting brain health. It has specific objectives to explore the association between climate-related factors such as weather, infrastructure etc., and healthy ageing, to inform climate mitigation and climate adaptation interventions and policies for climate vulnerable populations such as older people. The project has the following steps: 1. Involve older adults and a range of stakeholders. 2. Review existing research to understand the relationships between our biology, lifestyles, and environment. 3. Analyse data from over 8,000 older people in NI, to explore how different environmental factors relate to brain health. 4. Collect new data from 1,000 older people to explore how the environment influences our brain health. 5. Explore how our biology plays a role in how the urban environment affects our brain health. 6. Host workshops with local citizens to 'sense-check' our findings and co-develop promising prevention approaches.	QUB	Funder: Economic and Social Research Council (ESRC); Key partners: Belfast Healthy Cities, Department for Health; Age NI; Belfast City Council; The Paul Hogarth Company; Ordnance Survey NI	N1 H1, H2, H3, H7, H10	Nature. Towns & Cities. Health.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
BE37	Developing system-oriented interventions to reduce car dependency for improved population health in Belfast This project aims to co-develop sustainable and scalable policies and programmes that reduce the reliance on cars in Belfast. The research included: 1. A survey of stakeholders to help understand the network of stakeholders involved in the car dependency system; 2. A review of past and present policies and programmes; 3. A review of evidence on interventions to reduce car dependency; 4. A survey with road users in Belfast to evaluate and rank the importance of influences on car use and alternative travel modes; 5. A visual diagram of the system; 6. A citizens' jury with local citizens to sense-check promising intervention approaches and policies to explore acceptability. The citizens' jury made recommendations that inform climate mitigation and climate adaptation policies and interventions, including but not limited to improved provision of public transport; improved provision of cycling infrastructure; more city centre housing; and increased awareness and education to the public about the health, economic, social and environmental impacts of car dependency.	QUB	Partner: Belfast Healthy Cities; Funder: Medical Research Council (MRC)	H7	Transport. Towns & Cities. Health.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
BE38	"Climate risk assessment and local knowledge in rural Northern Ireland" is a research paper funded by the UK Climate Resilience programme through the climate impact modelling project OpenCLIM. It highlights climate risks to NI covering multiple sectors: namely heat-health impacts, agricultural impacts on crop yields and livestock heat stress, and changes in hydrology and rainfall. It recommends greater use and integration of qualitative, local knowledge in research and policy to capture examples of climate impacts and adaptation options in NI where quantitative data is lacking. The paper is currently in preparation and is due to be submitted to a peer-reviewed journal in 2024. The project is anticipated to provide improved monitoring and reporting of climate impacts and adaptation from under-reported sectors.	University of Bristol	OpenCLIM project partners (University of East Anglia, Newcastle University, Centre for Ecology and Hydrology), co-authors at QUB and NIEL	N6 H1, H12	Working Lands & Seas. Health.
BE39	This policy area is not devolved. While DAERA maintains a watching brief on this policy area, there are no specific actions that the NI Executive is able to take to monitor for any risks or opportunities relating to this receptor.	DAERA		ID3	Community Preparedness & Response.
BE40	Adopt and publish Wildfires in Northern Ireland Draft Strategic Way Forward	DAERA	Northern Ireland Fire and Rescue Service	N1, N6 I1, I8 H7, H11, H12 B4, B6	Nature. Health. Community Preparedness & Response. Business.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
BE41	Nature Based Solutions to Flooding Project The project aims to establish Riparian Buffer Strips along floodplains that are at high risk of flooding. This involves planting native trees in these areas to act as natural reservoirs for excess water during flood events. The goal is to reduce peak water flow downstream, mitigating the negative effects of flooding. Initially, this will be implemented as a pilot at Campsie in 2025, with plans to expand the project over the next four years based on the success of the pilot, with the project to be completed by 2029.	Fermanagh and Omagh District Council	Loughs Agency, Department for Infrastructure, Landowners, Woodland Trust	N1, N11 H3	Nature. Community Preparedness & Response.
BE42	Climate Adaptation at Lough Navar The project will undertake educational programmes at Lough Navar surrounding local climate risks and the importance of climate adaptation. The objective would be to build more climate resilient communities and to improve engagement on climate related topics within the district to support behavioural change. Educational training sessions for incident responders will be carried out from 2024-29, focusing on priority communities and schools.	Fermanagh and Omagh District Council	Community Groups, Schools	H3	Community Preparedness & Response.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
BE43	Community Resilience Tools The multi-agency Regional Community Resilience Group (RCRG) is a civil contingencies partnership formed in 2013. The RCRG has now engaged with over 40 communities to raise awareness and build local resilience across Northern Ireland in response to the increasing risk of climate change on people's lives. RCRG has progressed on two significant projects: 1. Two pilot projects entitled "Prepare, Adapt, Strengthen" have been delivered in DCSDC and MEA areas with the aim to focus on all types of civil emergencies risk, including severe weather and other impacts from climate change. Accessible toolkits have been co-produced by the Red Cross with people who have lived experience of flooding. The Community Resilience toolkit is designed to help local community groups better prepare for major events, including extreme weather. These participatory, place-based approaches to co-producing resilience in local communities are being evaluated, with the anticipation that the methodology can be mainstreamed. 2. Ongoing work is underway with the Education Authority, focused on Key Stage 2, to develop a Thematic Educational Unit for Resilience Material from a number of agencies.	Regional Community Resilience Group	Regional Community Resilience Group	H1, H3, H4	Towns & Cities. Health. Community Preparedness & Response.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
BE44	The Bangor Waterfront Redevelopment Programme This project is the redevelopment of a 2-mile stretch of Bangor Waterfront, combining high-quality public realm with site-responsive place-making initiatives and facilities to support recreational and commercial activity, and good health and wellbeing. All components will meet ANDBC's sustainability objectives, minimise carbon emissions, address climate adaptation, and optimise energy efficiency. Key projects will include ponder restoration works to alleviate flooding potential. Adaptation measures may include: - the introduction of additional/improved sea defences to manage the impact of coastal erosion and rising sea levels; - the use of appropriately durable materials and components, designed to last for their predicted long lifespans; - energy efficiency of new and refurbished buildings, with the capacity to adapt to extremes of high and low temperatures; - the development of soft landscaping solutions that support biodiversity and are suitable for a marine environment. Combined, proposals represent an investment of circa £72M, with construction works planned to commence in 2027.	Ards and North Down	Belfast Region City Deal - Funding Body	N18 H1, H5	Nature. Buildings. Community Preparedness & Response.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
BE45	Preparation of a Climate Change Risk Assessment, Action Plan and Investment Framework for Belfast City Council Completed in 2023, the Climate Change Risk Assessment aims to identify key risks, assess the magnitude of climate risks for the Council's assets, supply chains, and infrastructure, and recommend appropriate actions. A Climate Action Plan, which aims to identify and prioritise climate actions that are feasible, impactful, and cost effective has been drafted and is currently moving through Council approval processes. The plan integrates both mitigation and adaptation action, focusing on key risks of flooding and overheating, however a full vulnerability assessment is not possible due to current data and evidence gaps. Investment Plan is awaiting additional studies to be completed before being implemented.	Belfast City Council	Belfast City Council Climate NI, Department for Infrastructure	H1, H3, H4, H5, H11	Buildings. Health. Community Preparedness & Response.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
BE46	Working in partnership to improve coastal resilience The National Trust will continue to work in partnership to improve coastal resilience in Northern Ireland, including for coastal communities. This includes coastal vulnerability surveys (in partnership with Ulster University) at National Trust and other significant heritage sites as part of the Heritage on the Edge project (part-funded by DfC) to identify future risk of coastal erosion; and coastal monitoring at Cushendun and Inner Dundrum Bay (DAERA-funded) to help inform recommendations for managing future change. Work to increase the resilience of coastal habitats will also continue: assessing blue carbon habitat at some sites will increase understanding of their role in coastal adaptation; identifying future habitat for breeding terns impacted by coastal squeeze (funded by DAERA) will help improve the species' resilience; and a coastal realignment project at Anne's Point, near Mount Stewart, will help achieve a better functioning tidal system and improve the development of saltmarsh at the site.	National Trust	Department for Communities; Ulster University; Department of Agriculture, Environment and Rural Affairs	N5, N17 H3, H4, H11	Nature. Community Preparedness & Response.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
BE47	Climate Action A 2-year, Climate Ready project, 2024-2026 that focuses on raising awareness in communities about climate change, climate shocks and local, regional, and global impacts. The training focuses mainly on mitigation but improves knowledge and awareness about adaption and how community resilience projects can contribute to both elements of our collective response. The training and support resources are made available to teachers, pupils, students (third level), youth and community leaders and associated groups e.g., sports sectors, church groups. 250+ teachers will be trained with an extended influence of 7,500 students with teacher knowledge and a wide range of T&L resources. 600+ individuals within community groups will be trained, along with 100+ youth leaders trained with a further extended reach of 1,500 young people influenced via shared YL climate resources for training groups. 900+ individuals have also been given direct access to relevant and local climate action opportunities within NI.	KNIB	DAERA	H3, H4, H13	Community Preparedness & Response.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
BE48	Future Island-Island is one of four (£4.6m) Green Transition Ecosystems (GTEs), which are large scale projects that focus on translating the best design-led research into real-world benefits (2023-2025). The project focuses on the Rathlin Island community, working in a just way to co-design an innovation testbed that aligns with their Net Zero 2030 strategy. By managing product waste, nature-based or organic waste as a commodity, and enhancing sustainable tourism through digital technologies, the project aims to protect and enhance the local environment and community resilience against climate change impacts. Climate resilience is enabled through design interventions, and this can reduce the vulnerability of Rathlin Island; creating sustainable economic opportunities and improving environmental health. Emerging findings from the project, combined with the perspectives of interested parties, will be translated into draft policy recommendations. We aim to upscale viable proposals to other regions in NI and Ireland, and beyond to other countries and offshore islands.	Ulster University	Queens University Belfast, Glasgow School of Art, University of the Arts London. COMPANY PARTNERS: Big Small Design, Big Motive, The B!G Idea, CARD Group, National Museums NI, Rathlin Development and Community Association (RDCA), the Royal Society for the Protection of Birds (RSPB), The Odyssey W5, Todd Architects and Yellow Design. FUNDERS: Arts & Humanities Research Council [AH/Y003780/1], The Design Museum's Future Observatory programme.	N5, N9 I1 H4, H10, H11 B2, B6, B7 ID2	Nature. Working Lands & Seas. UK Food Security. Water Supply. Telecoms & ICT. Community Preparedness & Response. Business.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
BE49	A Local Authority Climate Service (LACS) is being developed in response to a need from Local Authorities (LAs) for clear and authoritative information to raise awareness on the need to adapt to climate change, identifying and justifying priority risks and opportunities, and evidence to support adaptation planning. The LACS is a platform that will enable LAs across the UK to: 1. Access ready-to-use climate information for their local area, 2. Develop a climate report summarising key results for awareness raising, 3. Obtain helpful resources and further support for adaptation planning. The LACS is being funded as a one-year pilot, as part of the UK's Third National Adaptation Programme to provide all LAs with access to critical data to inform adaptation decision-making in local areas. The service will be launched in summer 2024. It will be free to use and publicly available to all.	Met Office	DEFRA	H1, H3, H4	Towns & Cities. Health. Community Preparedness & Response.
BE50	The Northern Ireland Prison Service has a Climate Change Action Plan which provides for adaptation and mitigation measures against future risks such as flooding, storms and drought. Additionally all major new build accommodation continue to be designed in compliance with BREAAM environmental performance standards and give consideration to Net Zero solutions in order to mitigate against the risks of Climate Change. We also continue to closely monitor research going on within the UK Ministry of Justice to examine Summer overheating and possible adaptation measures to mitigate against rising temperatures.	DoJ		H13	Buildings. Community Preparedness & response.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
BE51	Building Energy Management Systems (BEMS) are installed at all the sites to monitor and control heating and room temperatures across the prison estate. A recent upgrade programme has seen BEMS refreshed in 3 of the 4 prison sites in recent years. A project to design and install a new BMS across the largest site at Maghaberry is currently being progressed. Additionally, a Solar Farm was installed at Hydebank Secure College during 2024 and plans are being developed to introduce a Solar Farm at Maghaberry in the coming years.	DoJ		I10 H13	Energy. Buildings. Community Preparedness & Response.
BE52	To address the risks of overheating in the wider education estate: Building Energy Management Systems (BEMS) are incorporated into the planning and construction of all new school buildings to control and monitor temperature, air flow and heat retention. EA plan to develop a BEMS Strategy and Action Plan that will include a commitment to review current provision of BEMS in the schools estate, to ensure existing systems are operating and working to optimum level and plan provision for those schools without a BEMS in a phased way, subject to available funding.	DE	Education Authority	H1, H13	Buildings. Health. Community Preparedness & Response.
BE53	Flooding risk is considered during pre-construction/planning stage of planning process for new build schools and mitigating actions identified. Risk assessments are carried out and reviewed on the education estate to identify potential impacts of extreme weather, with mitigations identified and put in place.	DE		H13	Buildings. Community Preparedness & Response.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
BE54	The Education Authority has published guidance to schools on dealing with extreme weather events which is reviewed and updated periodically. A series of Emergency Maintenance Phone numbers are maintained, including out of hours to ensure the education estate can react swiftly to extreme weather emergencies.	DE	Education Authority	H13	Buildings. Community Preparedness & Response.
BE55	Research into the extent of groundwater flooding in Northern Ireland and how this interacts with fluvial flooding.	DfE	DfI	I2	Towns & Cities.
BE56	DfE policy development - Increased awareness of adaptation as part of current and future policy development for energy efficiency programmes that aid mitigation towards Net-Zero, measures will include, e.g. ventilation & overheating.	DfE	DfC	H6	Buildings.
BE57	Maintain the Construction and Sourcing toolkits which provide best practice guidance following the addition of adaptation criteria in April 2024.	DoF		B6	Business.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
BE58	Oversight of Councils Local Development Plans. LDP's are being taken forward by Local Councils and involve engagement with Government Departments as consultation bodies to the Plans. Plan Programmes and timetables are set by Councils and agreed with DfI. LDPs are required to take account of the Regional Development Strategy and Strategic Planning Policy Statement and address a range of subject policy areas including flood risk.	DFI	Local Councils lead on this action, DFI has specific oversight duties as well as acting as a consultation body along with other Government Departments. The Planning Appeals Commission conduct Independent Examinations of local development plan documents.	N1, N18 I2, I3 H3	Towns & Cities.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
BE59	Active Travel Behavioural Change Programme Sustrans are currently delivering an Active Travel Behavioural Change Programme through three projects: 1. An Active School Travel Programme aims to provide schools with the skills and knowledge to get more children walking, cycling, and scooting as their main mode of transport to school. The programme helps reduce air pollution, improves road safety, and is a key behaviour change programme to reduce driving and associated emissions. 2. Leading the Way promotes walking and cycling to increase physical activity through active travel to work, and promote physical/mental health and wellbeing. The project is currently delivered in Belfast and the Northwest, with one active travel officer in each region working in partnership with public sector organisations. 3. Active Travel Hubs offer programmes to support people to overcome the barriers to walking and cycling. Establishing an Active Travel Hub in 6 key strategic locations across NI, with a Coordinator in post will enable teams to tailor services to the needs of the local community.	DfI/PHA	Sustrans delivers these programmes on behalf of PHA (DfI and PHA in the case of Active School Travel) with the following delivery partners: School travel Programme - Schools across NI Leading the Way Workplaces Programme - Public sector workplaces in Belfast and L'Derry Active Travel Hubs: Various Councils, DAERA	H1, H7, H8 ID9	Towns & Cities. Health.
BE60	DfI are working with other NICS Departments to explore options to meet the Executives commitment for all departmentally owned or leased cars and vans being zero emission by 2035. DfI have developed a 'Framework' for fleet decarbonisation which has been agreed by all Government departments and which will be monitored through a NICS fleet log. Development of the framework is to be shared with Local Councils to help inform actions in individual Council areas through the DfI Council Fleet Working Group.	DfI		H7	Health.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
BE61	Development of Active Travel Delivery Plan for Northern Ireland (ATDP). Once complete, this Plan will complement the Belfast Cycling Network Delivery Plan and the Strategic Plan for Greenways to provide a firm basis for the effective delivery of active travel networks in our villages, towns and cities.	DfI	Local Councils	I1, I12 H1, H7 B5, B6 ID7	Transport. Towns & Cities. Health.
BE62	Linking climate, biodiversity and water quality to human health and well-being This project aims to review and synthesize evidence describing the impacts of climate change, biodiversity loss and water quality on human health, and identify evidence-based solutions to mitigate these impacts. Climate change has both direct and indirect impacts on society and public health.	Co-Centre for Climate, Biodiversity + Water Queens University Belfast	University College Cork Newcastle University Reading University University College Dublin	H1, H7, H8, H10	Health.
BE63	As part of the Heritage, Culture and Creativity Programme, Northern Ireland's Historic Environment (HE) Policy is at draft stage (April 2025). HE Policy will be subject to public consultation and approval with the view to publication early 2026. HE Policy includes (draft) aims which embed climate change considerations into the Historic Environment such as: Capitalizing on the management of the historic environment to meet decarbonization goals and sustain historic assets in the face of climate change; and Ensuring that well cared for and managed heritage assets contribute to high quality rural and urban places, landscapes, coastal and marine landscapes supporting biodiversity.	DfC	Government Departments, Local Government, NI Heritage Sector - to be confirmed at policy implementation	N18, I4, H3, H5, H11	Buildings. Community Preparedness & Response.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
DB1	Developing how climate change impacts are assessed at National Trust places. The National Trust is working to make adapting to climate change an everyday part of how the charity is run. It has co-created an 'Adaptation Handrail', a framework designed to ensure staff are informed and enabled to plan for the future and deliver appropriate actions, whilst having the flexibility to adjust their response to local circumstances. By the end of 2026, all seven of the National Trust's property teams in NI will have undertaken climate impact assessments to determine the risks and hazards associated with the places they look after – covering any area of the charity's operations, across natural and built heritage, including access and visitor operations. These assessments will inform future adaptation planning and prioritisation of actions across the National Trust's places in NI. As part of the process, a new GIS-linked app allows staff to record weather-related impacts on site – providing evidence to support risk-mapping and to trigger responses. The framework will continue to evolve as understanding and data on climate risk and impacts improves. Working with the Met Office and ESRI, the National Trust is exploring how to improve the use of the app, including how recordings could be compared with Met Office data on weather events, to increase understanding of climate risk and whether predicted weather events are producing the expected impacts on the ground. Longer term, it is hoped this will help inform future pathway planning and triggers, reinforcing or challenging planned actions.	National Trust	National Trust with ESRI, Met Office	N1, N2, N17, N18 H3, H5, H11 B1, B2, B7 ID10	Nature. Buildings. Community Preparedness & Response. Business.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
DB2	Kainos - Climate Risk and Scenario Planning Kainos recognises the importance of taking action on climate change across the business both internationally and in Northern Ireland. Kainos report on climate change risks through CDP and align to the Task Force on Climate-related Financial Disclosures (TCFD) reporting framework as reported in our Annual Report. Kainos ensure that climate related risks are managed through the Kainos enterprise risk management process and associated risk management policies, this ensures that climate risks are managed alongside other business risks, with the same level of senior leadership visibility. A scenario planning exercise will be completed in 2024 to assess the climate risks and inform plans to adapt to these risks.	Kainos		B1, B6, B7 ID7	Business.
DB3	BITC Climate Action pledge. This is an online platform hosting a series of information, training resources and access to climate advisors. The aim is to help steer businesses towards achieving their climate goals. Education is a cornerstone of the platform, touching upon both mitigation and adaptation. The plan is to prepare businesses for the effects of climate change, while also guiding them to assist in reducing emissions. This is a second 3-year project and is planned to be an ongoing resource available for businesses.	DAERA	DfE, plus a series of private companies.	I1 B1, B2, B6 ID10	Energy. Buildings. Business.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
DB4	Invest NI currently delivers a suite of Energy and Resource Efficiency support for businesses, including specialist advice and investment capital, to enable NI businesses to become more efficient and resilient through green competences. This includes: • Technical Consultancy, • Sustainability Reports, • a Resource Matching Service, • Resource Efficiency Capital Grant, • Energy Efficiency Capital Grant. These schemes support businesses to optimise and futureproof their operations by implementing green efficiencies by reducing their consumption of materials, water and energy, thus reducing carbon emissions and associated costs.	Invest NI		I8, I10 H5 B3, B4	Water supply. Energy. Buildings. Business. Finance.
DB5	Invest NI's Operational Excellence Solutions support can help businesses develop competitive advantage by facilitating improvements to productivity and in turn, profitability. Operational excellence support is offered to businesses of all sizes across all sectors in NI. Operational Excellence coaches work with businesses through workshops, specialist advice, best practice events etc., utilising new concepts, tools and techniques to maximise available resources to help the business become more competitive, efficient, and effective. Whilst the primary aims are to make work easier, better, faster, and cheaper, the secondary benefit helps ensure businesses are more resilient and equipped to adapt to change.	Invest NI		B3, B5, B6, B7	Buildings. Business.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
DB6	The Green Economy Development Team focus on identifying and promoting opportunities in existing and emerging green economy markets, sectors, and supply chains. It assists NI businesses to both position NI capability on the global stage and diversify their current offerings to support trade and investment goals. It works with stakeholders and partners on strategic projects: • delivering industry leading expertise and targeted investment to generate green jobs and drive cross sectoral green economy growth. • engages with external partners, supporting businesses to improve resilience in response to the challenges of Climate Change and the transition to Net Zero • to help NI businesses overcome challenges and create innovative solutions, through specialist expert guidance and financial support, thereby reducing energy and resource costs.	Invest NI		I8, I10 H5 B3, B4	Water Supply. Energy. Buildings. Business. Finance.
DB7	Invest Northern Ireland's nibusinessinfo.co.uk website will maintain, develop and deliver support and guidance to equip local businesses with the knowledge and tools to adapt to climate change risks, challenges and opportunities. Activities will include content production and providing access to dedicated resources to assist them with adaption and mitigation understanding and application. The site will showcase local business case studies demonstrating successful adaptation actions. nibusinessinfo.co.uk will utilise its Support Finder and Events Finder to highlight programmes and opportunities for business engagement in climate action. News and promotional channels will leverage the communication and promotion of new initiatives from partner organisations and government departments.	Invest NI		B1, B2, B3, B5, B6, B7 ID1, ID2, ID6, ID7, ID10	Business.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
DB8	Invest NI's Supply Chain Solutions support can help businesses improve their supply chain resilience and competitiveness. Supply Chain support is open to manufacturers and internationally tradeable services businesses who manage a supply chain as part of their business, or who are involved in the extended supply chain. Supply Chain Solutions provide a graduated framework of support to business. A team of supply chain professionals provide specialist advisory support to help businesses identify supply chain risks and appropriate mitigations. This support can be complemented by financial assistance towards a new dedicated supply chain role. Adaptations to supply chain can improve resilience and competitiveness, reduce costs, identify new opportunities and develop capability.	Invest NI		B3, B4, B5, B6, B7	Water supply. Energy. Buildings. Business. Finance.
DB9	DfI is leading on the Infrastructure Sectoral Plan as an obligation within the Climate Change Act (NI) 2022, and is considering the potential of embedding PAS 2080 into the plan for infrastructure delivery.	DfI		B6	Business.
ST1	Use the reputation and national reach of Armagh Observatory & Planetarium to nurture a public awareness of climate change, of its drivers and of the risks posed by climate change to the community. Action will be to seek funding to develop and deploy novel CC education resources and CC education events. Raise awareness on renewable energies (e.g. solar panels) and of common emission reduction measures (e.g. house insulation) Monitor evidence of behaviour change among Armagh Observatory & Planetarium visitors in the coming years	DfC		Strategic	Community Preparedness & Response. Strategic.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
ST2	Continue to manage the NI Civil Contingencies Framework to ensure an integrated approach to emergency management	TEO	All NI Executive Departments, Local Government Civil Contingencies.	Strategic	Community Preparedness & Response. Strategic.
ST3	Rural Area Development hosts the Forum for Rural Organisations which can be used to connect relevant policy leads with rural stakeholders. This Forum meets on a quarterly basis and is chaired by the Director of Rural Affairs. The Forum is used as a vehicle to share information and bring the 'rural family' together to shares issues and ideas, and to strengthen collaborative working amongst rural partners. If policy leads wish to avail of this Forum they should contact RAD Communications Branch - RADcommunicationsteam@daera-ni.gov.uk	DAERA		Strategic	Community Preparedness & Response. Strategic.
ST4	In developing the Green Growth Test incorporate climate adaptation and resilience considerations to ensure that future policies and proposals are required to consider the most recent UK Climate Change Risk Assessment (CCRA) and also take account of current science and evidence related to the impacts of climate change	DAERA		Strategic	Strategic.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
ST5	Derry Strabane Sustainability & Climate Commission A Derry Strabane Sustainability & Climate Commission is being established during 2024. This will provide the necessary governance, policies, and procedures to enable effective climate adaptation across the City & District. The multi-stakeholder commission will deliver collaboration and effective project planning and delivery to ensure resilience and preparedness to climate risks. Working in partnership with Council and Your Climate Strategy, the Commission will also be responsible for the development of project pipelines and finance and investment plans.	Derry & Strabane		Strategic	Community Preparedness & Response. Strategic.
ST6	Regional Community Resilience Group: Climate Action and Severe Weather response The multi-agency Regional Community Resilience Group (RCRG) is a civil contingencies partnership formed in 2013. The RCRG has now engaged with over 40 communities across Northern Ireland to raise awareness and build local resilience in response to the increasing risk of severe weather and other impacts of climate change. Accessible toolkits, co-produced by the Red Cross and those with lived experience of flooding, have been key resources in this effort. Community resilience pilots were recently undertaken in Derry City and Strabane, and Mid and East Antrim councils. From 2024 to 2029, the focus will be on expanding this work, ensuring closer integration between emergency response and proactive climate action. This includes incorporating climate action strategies into debriefing processes following severe weather events, which will improve data collection and inform local risk assessments.	Regional Community Resilience Group	Regional Community Resilience Group (RCRG)	H1, H3 B1 ID10	Towns & Cities. Community Preparedness & Response. Business. Strategic.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
ST7	As part of the regional Elected Member Development Programme, NILGA provides elected member development training exercises twice in each four-year mandate. These workshops aim to: - Build a shared understanding amongst elected members (and other attendees) on the role of the councillor. - Improve understanding of what emergency planning is, why it's important, how to do it and what support is available. - Increase confidence and competence of councillors in their community leadership role when emergency events occur. - Ensure councils are targeting resources in the most impactful way. - Safeguard the council reputation as a responsible decision maker.	NILGA	Northern Ireland Local Government Association, in partnership with the Regional Community Resilience Group/Local Government Civil Contingencies team.	H1, H2, H3, H4, H11, H12 ID10	Community Preparedness & Response. Strategic.
ST8	Nature Recovery Networks (NRN) The Ulster Wildlife NRN work funded through the DAERA Environment Fund aims to ensure that there are more, bigger, better and more-connected spaces for nature and people to help with climate change mitigation and adaptation measures. This means working to ensure that UW Nature Reserves act as key biodiversity nodes and that the wider landscape surrounding them is made more wildlife friendly. Ulster Wildlife staff are working closely with public bodies and policymakers to increase awareness and capacity around the need of landscape-scale conservation and its relationship with climate change by making recommendations and providing evidence. Alongside this, staff will provide support and collaborate with internal and external networks to support nature recovery projects, connectivity research and identification of strategic pieces of land for purchase. The work mainly focuses on pushing for policy change (to achieve a legislative backing for NRNs) and supporting on the ground delivery by providing support for different initiatives and projects.	Ulster Wildlife	DAERA (Funder), RSPB NI, National Trust & Woodland Trust	Strategic	Nature. Working Lands & Seas. Towns & Cities. Strategic.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
ST9	TALX 2: Place-Based Climate Action Partnerships Building on the outputs of research from the first Transboundary Adaptation Learning Exchange (TalX) (McCullagh et al., 2023), the TalX2 project will work to enhance place-based adaptation partnerships on the island of Ireland. A key focus will be to reduce the siloed working that still exists across all sectors and departments; to build capacity and long-term all-island partnerships, while leveraging synergies and opportunities for action. This research will adopt an innovative 'living lab' approach, engaging communities and wider stakeholders as equal partners, working alongside government agencies to plan and adapt for an uncertain future and widen the solution space. Alongside the creation of living labs across the island of Ireland there will be a programme of activities designed to facilitate and support transboundary dialogue for enhanced partnership working, holistic place-based adaptation action and locally led decision making for climate action.	University College Cork	Northern Ireland Environment Link Funded by EPA (ROI)	Strategic	Towns & Cities. Community Preparedness & Response. Strategic.
ST10	Climate Adaptation Planning By 2025, councils will be delivering at least the first iteration of a climate adaptation action plan, linked to a regularly reviewed risk register, in alignment with public body reporting duties brought forward by DAERA.	SOLACE and NILGA	Endorsed by SOLACE and NILGA	Strategic	Strategic.
ST11	Corporate Risk and Adaptation Climate change adaptation will be embedded in each council corporate plan by 2029, recognising the challenges of increasing climate impacts over coming decades.	SOLACE and NILGA	Endorsed by SOLACE and NILGA	Strategic	Strategic.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
ST12	Develop a baseline of Climate Impacts on Finance From 2025, councils will create a climate impact 'tagging' system, to create a baseline of financial impacts on council business operations from severe weather events. This will complement existing Met Office information gathering on non-financial impacts of weather events.	SOLACE and NILGA	Endorsed by SOLACE and NILGA	B1, B2,B4, B5, B6 ID8, ID10	Buildings. Community Preparedness & Response. Business. Finance. Strategic.
ST13	Emergency Planning By 2029, Regional Community Resilience Group (RCRG) will have widened its remit to consider the promotion and development of societal resilience.	SOLACE and NILGA	Endorsed by SOLACE and NILGA, and RCRG	H1, H2, H3, H12 ID10	Community Preparedness & Response. Strategic.
ST14	Up to and beyond 2029, the Regional Community Resilience Group will continue to work with communities impacted by flooding to enhance preparedness, to better understand requirements for support, and identify what interventions should be prioritised to mitigate the impacts of flooding.	SOLACE and NILGA	Endorsed by SOLACE and NILGA, and RCRG	H3 ID10	Towns & Cities. Community Preparedness & Response. Strategic.
ST15	Spatial Planning Councils will ensure local development plans demonstrate how climate adaptation considerations will be embedded in all approval decisions, recognising increasing climate impacts over coming decades.	SOLACE and NILGA	Endorsed by SOLACE and NILGA	H1, H3, H4 ID10	Towns & Cities. Strategic.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
ST16	Local Development Plans will specify that developments are designed using the most up-to-date floodplain definitions from DfI, and councils will publish figures of how many approvals are granted by exception annually.	SOLACE and NILGA	Endorsed by SOLACE and NILGA	H3 ID10	Towns & Cities. Strategic.
ST17	Green and Blue Infrastructure targets are set by councils to ensure places and people are well informed and more resilient to more intense and frequent flooding and heatwaves.	SOLACE and NILGA	Endorsed by SOLACE and NILGA	H1, H3 ID10	Towns & Cities. Strategic.
ST18	Community Planning Councils will collaborate through the community planning partnership to undertake work on how adaptation relates to community planning by 2026.	SOLACE and NILGA	Endorsed by SOLACE and NILGA	H1, H3, H4 ID10	Towns & Cities. Health. Community Preparedness & Response. Strategic.
ST19	Procurement Councils will ensure that any sustainability/net zero procurement screening includes climate adaptation considerations, to take advantage of co-benefits, ensure consistency and avoid unintended consequences.	SOLACE and NILGA	Endorsed by SOLACE and NILGA	B4 ID8, ID10	Community Preparedness & Response. Finance. Strategic.
ST20	Food growing/local ownership Work with sustainable food places partnerships/communities to develop initiatives which enable more local food growing and community-owned food partnerships by 2029.	SOLACE and NILGA	Endorsed by SOLACE and NILGA	N4, N6, N9 H9 ID1, ID10	UK Food Security. Business. Strategic.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
ST21	Climate Northern Ireland: Regional Coordination of Adaptation Climate Northern Ireland (Climate NI) is a cross-sectoral partnership devoted to understanding and enabling adaptation and mitigation actions in Northern Ireland that can address the climate emergency. It brings together a significant range of actors from across the region as part of its 20+ member cross-sector Steering Group, which provides an important space for coordination, collaboration and shared learning from NI and other regions. Climate NI also supports development and implementation of climate policy, engaging researchers and practitioners through its sector networks, such as the Local Government Climate Action Network (LGCAN), and piloting a Policy and Research Panel to look at major climate evidence gaps in NI. By 2026, Climate NI will have enabled civil society and local government actors to develop and engage with major adaptation policy, such as the NI Climate Change Adaptation Programme and the fourth UK Climate Change Risk Assessment. It will also develop support around the adaptation and mitigation elements of the Public Body Reporting Regulations brought forward under the Climate Change Act (NI) 2022.	Climate NI	Facilitated by Northern Ireland Environment Link Funded by Department for Agriculture, Environment and Rural Affairs	H1, H2, H3 ID10	Community Preparedness & Response. Strategic.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
ST22	Climate Northern Ireland: Communication and Awareness of Climate Adaptation The Climate NI Communications and Stakeholder Engagement Strategy 2024-26 is designed to bolster Climate NI's mission to increase the understanding of the impacts of climate change in NI and enable action to address climate change across all sectors of society. It reviewed current practice and pinpoints areas for development. Current practice includes the consistent delivery of monthly newsletters, website and social media presence and engagement, and the fostering of the Climate NI network. Ongoing communications, for example on policies and reports like NICCAP3 and CCRA to sectors and public, are required to sustain momentum and effectively achieve Climate NI's objectives. Climate NI is one of the key regional sources of adaptation information. It will continue to enhance its strategic partnerships with organisations to expand engagement and outreach on both adaptation and mitigation. It will also consistently review climate resources and information, and share curated content with relevant sectors, developing an annual infographic to show some of its successes.	Climate NI	Facilitated by Northern Ireland Environment Link Funded by Department for Agriculture, Environment and Rural Affairs	H1, H2, H3 ID10	Community Preparedness & Response. Strategic.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
ST23	Climate Northern Ireland: Enabling Adaptation Planning Climate NI worked with Derry City and Strabane District Council and a range of other European partners of the INTERREG-funded CLIMATE project, which enabled development of the first climate change adaptation plan in Northern Ireland. In 2020 Climate NI then further developed the learning from that project into NI Adapts, which is an online planning toolkit to enable local councils (or any organisation) in Northern Ireland to develop a first climate adaptation plan. The toolkit uses 5 steps, to bring users through a vulnerability assessment, development of a risk register and creation of an action plan and monitoring framework, while providing a free-to-use resource which is bespoke and unique for Northern Ireland. This approach was complimented by development of a peer learning group, called the Local Government Climate Action Network (LGCAN). At time of writing in June 2024, this dual approach has enabled 10 of 11 councils and the Housing Executive to begin adaptation planning, with 3 councils now having finalised adaptation plans in place. In the years to 2026, this approach will be extended, as reporting requirements are now in place from a wider range of public bodies under the Climate Change Act (NI) 2022. NI Adapts will be reviewed and updated accordingly, to align with regional requirements, international best practice, and also with a new Net Zero NI toolkit also being developed at Climate NI.	Climate NI	Facilitated by Northern Ireland Environment Link Funded by Department for Agriculture, Environment and Rural Affairs	H1, H2, H3 ID10	Community Preparedness & Response. Strategic.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
ST24	Business In the Community (NI) Climate Action To date, over 100 business organisations in Northern Ireland have signed the Climate Action Pledge, committing to ambitious greenhouse gas emissions reduction targets by 2030. In 2024, the Pledge and reporting process will undergo an independent review, with any changes requiring approval from our Climate Steering Group. BITC is open to integrating climate adaptation into the annual feedback for the Climate Action Pledge and will present this to the steering group for consideration. We recognise the critical link between climate resilience and emissions reduction actions. This information could also enhance the reporting gathered from public bodies under the new Climate Change Act (NI) 2022, providing a comprehensive view of adaptation action, capacity, and readiness in Northern Ireland. BITC will promote resilience guidance on its Climate Action Hub, include adaptation-related questions in the NI Environmental Benchmarking Survey, and support the development of workshops, webinars, and case studies on business climate adaptation in Northern Ireland.	BITC		B1, B5, B6 ID10	Business. Strategic.
ST25	Climate Action Considerations in Severe Weather Debriefing Consider opportunities for climate action in debriefing processes in the aftermath of severe weather events, to assist in data collection and assessment of local risks.	RCRG	Regional Community Resilience Group	H3 ID10	Community Preparedness & Response. Strategic.

#	Action Description	Department / Organisation	Additional Partners	Risks addressed	Thematic Areas
ST26	DE recognises that education is one of the most important keys to tackling the climate change emergency, and that the NI curriculum plays a vital role in supporting the green economy and nurturing environmentally conscious citizens. The Department of Education has commissioned CCEA to greater embed sustainability and climate change education into the curriculum. This will involve the development of a progression framework and resource hub to draw together up-to-date resources and sources of support for teachers, pupils and young people in green growth and climate change knowledge, skills and understanding.	DE	CCEA	ID10	Strategic.
ST27	DfE has formed an Adaptation Working Group that will take forward the development and delivery of new departmental policies in areas of responsibility in relation to adaptation. The Adaptation Working Group proactively identifies and acts on the economic risks and opportunities presented by Climate Change in Northern Ireland.	DfE	Invest NI, GSNI	I1, I2, I3 B4 ID10	Energy. Telecoms & ICT. Buildings. Finance. Strategic.
ST28	DfI to adopt a collaborative approach with the Transport Infrastructure Ireland (TII) to implement the strategic actions and targets of the Climate Action Plan 2024 (CAP24) on cross-border infrastructure projects.	DfI	Transport Infrastructure Ireland, Department of Transport.	B6 ID10	Business. Strategic.

Annex II – Acronyms & Abbreviations

Acronym / Abbreviation	Meaning
2008 Act	Climate Change Act 2008
ADP	Adaptation Delivery Plan
AFBI	Agri-Food and Biosciences Institute
AHDB	Agriculture and Horticulture Development Board
AHL	Animal Health Law
AI	Artificial Intelligence
AICBRN	All-Island Climate and Biodiversity Network
AMR	Antimicrobial resistance
ANBC	Antrim and Newtownabbey Borough Council
ANDBC	Ards and North Down Borough Council
AONB	Area of Outstanding Natural Beauty
BBSRC	Biotechnology and Biological Sciences Research Council
BCA	Belfast City Airport
BCAP	Blue Carbon Action Plan
BCC	Belfast City Council
BCP	Business Continuity Plans
BEMS	Building Energy Management Systems
BITC	Business in the Community
BREEAM	Building Research Establishment Environmental Assessment Methodology
BSO	Business Services Organisation
BTFAS	Belfast Tidal Flood Alleviation Scheme
BTO	British Trust for Ornithology
BTV-3	Bluetongue Virus
CAFRE	College of Agriculture Food and Rural Enterprise
CANN	Collaborative Action for the Natura Network
CAP	Climate Action Plan
CARIB	Climate Adaptation Research and Innovation Board
CC	Climate Change
CCAAP	Climate Change Adaption Action Plan
CCC	Climate Change Committee
CCEA	Council for the Curriculum, Examinations & Assessment
CCG	Connswater Community Greenway
CCRA	Climate Change Risk Assessment

Acronym / Abbreviation	Meaning
CCRA-IA	Climate Change Risk Assessment Independent Assessment
CDP	Carbon Disclosure Project
CEDaR	Centre for Environmental Data and Recording
CES	College Estate Strategy
CFI	Coppens Feed Ingredients
Climate NI	Climate Northern Ireland
CO2	Carbon Dioxide
CO-ADAPT	Adaptive management of endemic coinfections in ruminant livestock under climate change
CRG	Community Resilience Group
cSAP	concise Species Action Plan
DA	Devolved Administration
DAERA	Department of Agriculture, Environment and Rural Affairs
DAFM	Department of Agriculture, Food and the Marine (Ireland)
DCMS	Department for Digital, Culture, Media, and Sport
DCSDC	Derry City and Strabane District Council
DE	Department of Education
DEFRA	Department for Environment Food and Rural Affairs
DfC	Department for Communities
DfE	Department for the Economy
DfI	Department for Infrastructure
DHLGH	Department of Housing, Local Government and Heritage (Ireland)
DOE	Department of the Environment
DoF	Department of Finance
DoH	Department of Health
DoJ	Department of Justice
DSIT	Department for Science, Innovation and Technology
DSM	Digital Surface Model
DSS	Decision Support System
DTM	Digital Terrain Model
DUGE	Direct-Use Geothermal Energy
EA	Education Authority
EACB	Earthworks Asset Criticality Banding
EB-MSP	Ecosystem-Based Maritime Spatial Planning
EC-RRG	Electronic Communications - Response and Resilience Group
EDR	Earthworks & Drainage Resilience Study

Acronym / Abbreviation	Meaning
EFS	Environmental Farming Scheme
EIP	Environmental Improvement Plan
EMFG	Environment Marine Fisheries Group
eNGOs	environmental Non-Government Organisations
EPA (ROI)	Environmental Protection Agency (Republic of Ireland)
EPPO	European and Mediterranean Plant Protection Organization
ESRC	Economic and Social Research Council
ESRI	Environmental Systems Research Institute
ETB	Eastern Transport Plan
EU	European Union
FoE	Friends of the Earth
FRA	Flood Risk Assessments
FFRAG	Food, Farming and Rural Affairs Group
FRMP	Flood Risk Management Plan
FSANI	Food Standards Agency in Northern Ireland
GBNNSS	GB Non-Native Species Secretariat
GIS	Geographic Information System
GrowIN	Growing Innovation Network
GSNI	Geographical Survey of Northern Ireland
GTEs	Green Transition Ecosystems
ha	Hectares
HBD	Hall Black Douglas Architects
HED	Historic Environment Division
HRA	Habitats Regulations Assessment
HRS	Housing Rights Service
HSC	Health and Social Care
IAS	Invasive Alien Species
ICT	Information and Communication Technology
IGFS	Institute of Global Food Security
INTERREG	Interregional Co-operation Programme
IPCC	Intergovernmental Panel on Climate Change
IUCN	International Union for Conservation of Nature
IWDG	Irish Whale & Dolphin Group
JCA	Jack Coughlan Architects
JNCC	Joint Nature Conservation Committee
KNIB	Keep Northern Ireland Beautiful

Acronym / Abbreviation	Meaning
LA	Local Authority
LACS	Local Authority Climate Service
LANI	Landlords Association for Northern Ireland
LEEP	Land, Environment, Economics and Policy Institute
LGCAN	Local Government Climate Action Network
LiDAR	Light Detection and Ranging
LMCNI	Livestock and Meat Commission for Northern Ireland
LUNZ	Transforming Land Use for Net Zero, Nature and People
LWW	Living With Water
MCS	Marine Conservation Group
MEABC	Mid and East Antrim Borough Council
MarPAMM	Marine Protected Area Management and Monitoring
MOJ	Ministry of Justice
MPA	Marine Protected Area
MRC	Medical Research Council
MSS	Multispecies Sward
MVHR	Mechanical Ventilation with Heat Recovery
NAP	National Adaptation Programme
NBA	Nature Based Solutions
NBS	National Building Specification
NDNA	New Decade, New Approach
NEPD	Natural Environment Policy Division
NFI	Net Feed intake
NGA	Next Generation Access
NGO	Non-Government Organisation
NI	Northern Ireland
NIARP23	Adapting to Climate Change' report on progress in Northern Ireland April 2023
NIAS	Northern Ireland Ambulance Service
NICCAP2	2nd Northern Ireland Climate Change Adaptation Programme
NICCAP3	3rd Northern Ireland Climate Change Adaptation Programme
NICS	Northern Ireland Civil Service
NIE	Northern Ireland Electricity
NIEA	Northern Ireland Environment Agency
NIEL	Northern Ireland Environment Link
NIEN	Northern Ireland Electricity Networks

Acronym / Abbreviation	Meaning
NIFRA	Northern Ireland Flood Risk Assessment
NIFRS	Northern Ireland Fire and Rescue Service
NIHE	Northern Ireland Housing Executive
NILGA	Northern Ireland Local Government Association
NISRA	Northern Ireland Statistics and Research Agency
NIW	Northern Ireland Water
NLHF	National Lottery Heritage Fund
NRS	Nature Recovery Strategy
NT	National Trust
OFCOM	Office of Communications
OHS	Occupational Health Service
OREAP	Offshore Renewable Energy Action Plan
PH	Public Health
PHA	Public Health Agency
PIPES	Pollutants in Peatlands
QUB	Queens University Belfast
RCRG	Regional Community Resilience Group
RDCA	Rathlin Development and Community Association
RPG	Renewable Power Generation
RSPB	Royal Society for Protection of Birds
S&T	Signals and Telecoms
SAC	Special Areas of Conservation
SAPHIRE	Sensor Application to Peatland Hydrology in Remote Environments
SAS	Surfers Against Sewage
SDGs	Sustainable Development Goals
SFI	Science Foundation Ireland
SME	Small and Medium-sized Enterprise
SNHS	Soil Nutrient Health Scheme
SOLACE	Society of Local Authority Chief Executives
SONI	System Operator for Northern Ireland Ltd
SPACE	Supportive Environments for Physical and Social Activity, Healthy Ageing and Cognitive Health
SPARC	Sustainable Parasite Control in Grazing Ruminants
SPPG	Strategic Planning and Performance Group
TALX	Transboundary Adaptation Learning Exchange
TCFD	Task Force on Climate-related Financial Disclosures

Acronym / Abbreviation	Meaning
TRAM	Transport and Road Asset Management
UCL	University College London
UFU	Ulster Farmers Union
UKCP18	UK Climate Change Projections data from 2018
UKRI	UK Research & Innovation
UW	Ulster Wildlife
WAOB	World Agricultural Outlook Board
WDPD	Water and Drainage Policy Division
WHO	World Health Organisation
WWF	World Wildlife Fund for Nature
WWT	Wildfowl and Wetlands Trust