

Climate Change Research Programme (CCRP) 2007-2013 Report Series No. 9



Ireland Adapts to Climate Change

Environmental Protection Agency

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EPA Climate Change Research Programme 2007–2013

Ireland Adapts to Climate Change

Assessing Ireland's Capacity to Adapt to Climate Change

CCRP Report

End of Project Report available for download on <http://erc.epa.ie/safer/reports>

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

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Executive Summary

An analysis has been carried out of Ireland's institutional capacity to adapt to the impacts of climate change in the context of regional and global actions and developments, with a view to informing options to develop a national approach to climate change adaptation.

This summary report outlines the main findings of the National Adaptive Capacity (NAC) assessment and makes recommendations on how adaptive capacity might be enhanced. Reliable information on expected impacts, adaptive capacity, vulnerabilities, and the costs and benefits of adaptation options is required to plan effectively for climate change. This allows the determination of how resilient society, the economy and ecosystems are to the consequences of climate change and to plan accordingly to minimise the risks.

A body of research has been undertaken with the support of the Environmental Protection Agency's Climate Change Research Programme to provide information and knowledge on climate change impacts and adaptation in Ireland. This assessment of Ireland's institutional capacity to adapt to climate change adds to the knowledge base and provides an important step in progressing to planned adaptation.

The approach used in this assessment was developed by the World Resources Institute based on the inputs and experiences of practitioners and experts in the field of adaptation from around the world¹. The NAC Framework takes a function-based approach to analysing adaptive capacity, which results in an assessment of how well a country is currently performing its core adaptation functions and helps to identify strengths and gaps in a country's adaptation system. These core functions are:

- Analysis of climate change impacts and vulnerability;
- Prioritisation of adaptation needs;

1. <http://www.wri.org/project/vulnerability-and-adaptation/nac-framework>

- Co-ordination of key actors and institutions;
- Information management; and
- Climate risk assessment.

The results of the NAC assessment indicate that Ireland is in the early stages of the adaptation process. Good quality information on climate change impacts is available, as this can provide a basis for adaptation planning. To date activities have focused on understanding climate change impacts and relating these to ecosystems and sectors of the economy. The next steps will involve:

1. Vulnerability and risk assessment;
2. Prioritising key adaptation needs;
3. Identifying and costing adaptation options;
4. Adaptation planning; and
5. The implementation of adaptation actions.

Sufficient information exists to start to plan for the positive and negative impacts of climate change.

The most effective strategy for adaptation planning is to integrate climate change adaptation into policies, plans, programmes and projects at all levels of government and across all sectors. There is potential to use established management tools and planning processes to assess climate risks and to integrate adaptation into all aspects of decision making. In most cases, simple amendments or additions to existing national guidelines would suffice to ensure that existing assessment tools, such as Strategic Environmental Assessment, incorporate climate change considerations.

There is also a need to strengthen and maintain efforts in data gathering, climate observations and analysis to inform adaptation planning. This requires long-term commitment and resourcing, building on the established solid base. The information and knowledge generated must be made available in a

form accessible to decision makers and accompanied by guidelines to enable their effective use. The proposed development of a climate information platform will play an important role in getting information to those responsible for risk assessment and adaptation planning and improving communication on climate impacts and risk.

Co-ordination across sectors and levels of decision making is vital if climate change adaptation is to be successfully addressed. This requires the clarification of roles and responsibilities at national, regional and local levels, and should be addressed in future climate change policy and legislation.

Recommendations

The key recommendations from the NAC assessment set out actions that can be taken to enhance adaptive capacity.

- **Assessment:** Undertake a national vulnerability assessment to inform adaptation planning. Develop a national approach to climate risk assessment. Cost priority adaptation actions identified at local, sectoral and national levels. Carry out an inventory of adaptation actions, processes and case studies at local, sectoral and national levels to allow experience sharing and lesson learning.
- **Prioritisation:** Carry out a national process to prioritise adaptation needs, which can be updated as new information becomes available.
- **Co-ordination:** Establish, or assign responsibility to, a national high-level body to co-ordinate action on climate change adaptation and strengthen institutional capacity by drawing on a pool of relevant expertise.
- **Information management:** Continue to develop the knowledge base through sustained commitment to data gathering and monitoring systems. Assign a lead organisation to oversee data gathering, analysis and dissemination. Develop a pilot climate information system for Ireland. Use the climate information system to share experiences and develop examples of best practice.
- **Risk reduction:** Develop guidelines on how to integrate climate change into policies, plans, programmes and projects through existing tools (such as Environmental Impact Assessment, Strategic Environmental Assessment, Appropriate Assessment, Regulatory Impact Assessment). Integrate climate change adaptation into policies, plans and programmes at all levels of government. Develop understanding of how to deal with residual risk (such as risk assessment, insurance mechanisms, early warning systems). Develop process/effectiveness indicators for monitoring and review purposes.

1 Introduction

1.1 Impacts of Climate Change

The Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) (2007) unequivocally confirmed that climate change is happening. This presents individuals and society with a new set of environmental conditions to which they must adapt. It also presents a challenge to conventional planning which tends to operate over shorter timescales than those required for adaptation planning. A constant climate is an implicit assumption in much of current decision making. Climate change overturns this assumption, and introduces a new element of uncertainty into decision making for medium- to long-term development. Additionally, climate change is forcing the development of systems and infrastructure to protect against or accommodate its impacts.

Effective decision making for climate change adaptation requires a clear understanding of expected impacts and the ability of systems to respond. The ability of a system to adjust to climate change is referred to as its adaptive capacity (IPCC, 2007). For the purposes of this study, adaptive capacity is defined as the ability of socio-economic and governance systems to adapt to the impacts of climate change. This is a function of the assets available and the ability to carry out a number of key functions, including assessing climate impacts and vulnerability, prioritising adaptation needs, co-ordinating key actors and institutions, gathering, analysing and disseminating information, and assessing climate risk (WRI, 2009). It is a combination of these factors that determines our capacity to adapt successfully to climate change and to minimise the impacts on the environment, the economy and our well-being.

This summary report outlines the main findings of an assessment of Ireland's capacity to adapt to climate change. It complements a sister report entitled *Integrating Climate Change Adaptation into Sectoral Policies in Ireland* (Desmond and Shine, 2011). Specifically, this report provides:

- An assessment of adaptive capacity within Ireland; and
- Recommendations on how adaptive capacity might be enhanced.

1.2 National Policy

Ireland's National Climate Change Strategy (DoEHLG, 2007) sets out a range of measures to ensure that Ireland reaches its target under the Kyoto Protocol. The Strategy provides a framework for action to reduce Ireland's greenhouse gas emissions and recognises that adaptation is a key response to climate change. It emphasises the need for research and systematic observations to improve our knowledge and understanding of the climate impacts in order to inform appropriate adaptation actions.

1.3 Why Assess Adaptive Capacity?

In order to plan effectively for climate change, reliable information is required on the expected impacts, adaptive capacity, vulnerabilities, costs and benefits and adaptation options. This allows us to determine how vulnerable society, the economy and ecosystems are to climate change and to plan accordingly to minimise the risks. A stepwise approach to adaptation planning is illustrated in [Fig. 1.1](#).

As part of a body of research being undertaken with the support of the Environmental Protection Agency's (EPA's) Climate Change Research Programme (CCRP), existing information on climate impacts in Ireland has been summarised in a State of Knowledge Report (Desmond et al., 2009) The information in this report is largely based on work carried out by Met Éireann/University College Dublin (McGrath and Lynch, 2008), the National University of Ireland Maynooth (Sweeney et al., 2002; McElwain and Sweeney, 2007) and material from the IPCC, Fourth Assessment Report (IPCC, 2007).

The assessment of Ireland's adaptive capacity adds an important dimension to understanding how to plan for adaptation. The National Adaptive Capacity (NAC)

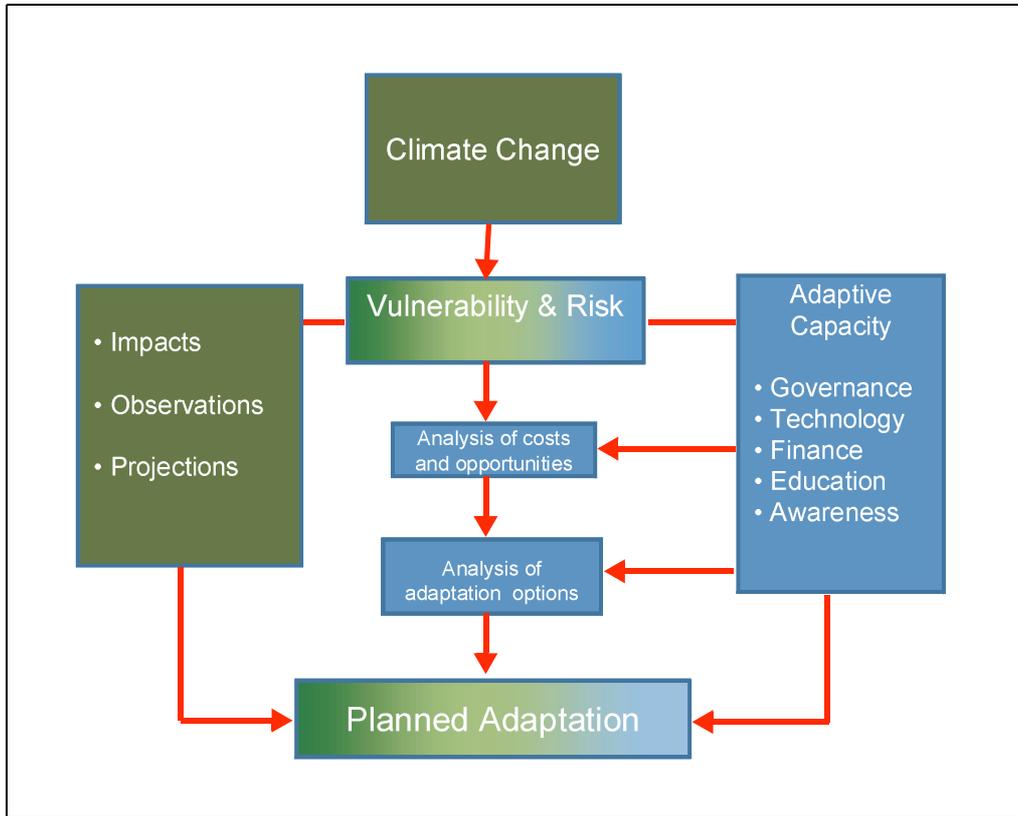


Figure 1.1. Schema of planned adaptation to climate change.

assessment is part of an iterative process in which knowledge of future climate change and its impacts is improved, and analysis of socio-economic and governance issues is refined to inform effective response mechanisms. Follow-on work is also under way on vulnerability assessment and climate change information provision to input into adaptation planning at national, sectoral and local levels.

The focus of this report and the methodology used are at the national level. While the assessment of adaptive capacity at the sub-national and local levels is beyond the scope of the report, the research team recognises that adaptation is a local issue and that local government will play a central role in this regard. The key role of local authorities in implementing climate

change activities has been recognised by the County and City Managers Association (CCMA)¹ environment subcommittee (CCMA, 2007). Adaptation planning is occurring at the local level in a number of city and county councils. Such work is being progressed through development plans (e.g. Cork, Wexford and Roscommon County Councils) and in some instances through specific local climate change strategies (e.g. Dublin City Council). In time, an assessment of adaptive capacity at the local level will be required to understand the implementation opportunities and barriers for local authorities.

1. The County and City Managers' Association (CCMA) is the representative body for senior managers in Irish Local Government.

2 Methodology

The approach used to assess Ireland’s capacity to adapt was developed by the World Resources Institute (WRI) and is based on the inputs and experiences of practitioners and experts in the field of adaptation from around the world². The NAC Framework takes a function-based approach to assess adaptive capacity which is flexible and can be applied to a wide range of country circumstances. It results in an assessment of how well a country is currently performing its core adaptation functions and helps to identify strengths and gaps in a country’s adaptation system. This can identify areas where improvement may be needed or where strengths may enable rapid progress on adaptation issues. This status assessment provides a baseline from which to advance planning for adaptation, or it can be used to review progress on adaptation after a period of implementation at the national level.

2. <http://www.wri.org/project/vulnerability-and-adaptation/nac-framework>

Systematic review of progress is central to the process of learning and adjustment that is well known as a core component of adaptability. [Figure 2.1](#) illustrates how a NAC assessment can fit into an adaptive cycle of planning, implementation, and learning.

The NAC methodology involves the preparation of a context document providing an overview of the political landscape and decision-making context in which adaptation takes place. This review then provides the basis for completing the NAC assessment based on capacity questions relating to five key adaptation functions:

1. **Assessment** – the process of examining available information to guide decision making;
2. **Prioritisation** – assigning special importance to particular issues, areas, sectors, or populations;
3. **Co-ordination** – co-ordination of the actions of actors inside and outside government to avoid

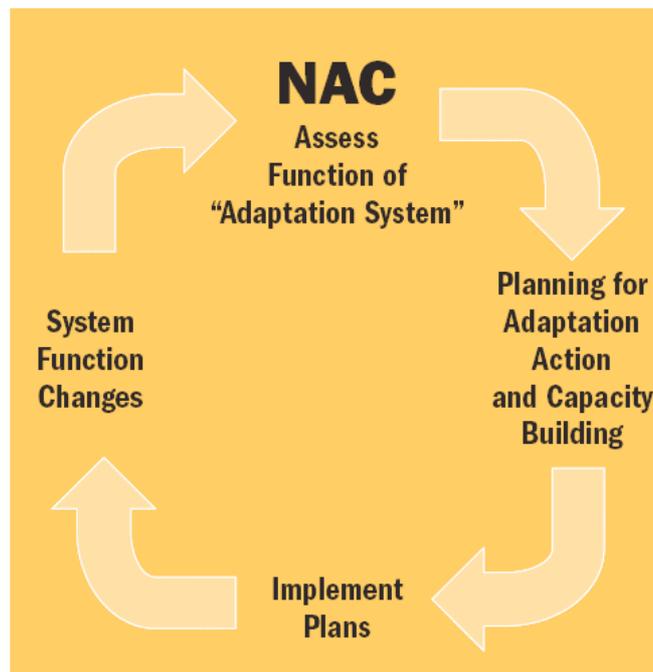


Figure 2.1. Adaptive planning cycle as envisaged by the National Adaptive Capacity (NAC) Framework (reproduced with permission from the World Resources Institute (WRI, 2009)).

duplication or gaps, and create economies of scale;

4. **Information management** – collecting, analysing, and disseminating knowledge in support of adaptive activities; and
5. **Climate risk reduction** – addressing climate risks requires a distinct process of identifying specific risks, evaluating the full range of options, and then selecting and implementing risk reduction measures.

The template for the questions was designed by the WRI (2009). The context document and the full findings of the assessment can be found in the report *Assessing Ireland's Capacity to Adapt to Climate Change* which will be available at <http://erc.epa.ie/safer/reports>.

A number of countries piloted the NAC Framework in 2010, including Ireland, Bolivia, Nepal and China. A seminar convened by the WRI in September 2010 facilitated the sharing of experience and lesson learning to refine and further develop the Framework and its supporting tools.

The NAC process in Ireland was overseen by the EPA-chaired Impacts and Adaptation Steering Group (IASG) under the CCRP. The Steering Group comprises members from government departments and agencies, academia and the private sector. It was consulted at various stages in the process and

provided useful input and feedback. In the preparation of the context document, publicly available information was consulted and followed up by correspondence or interviews (in person and by telephone) with the relevant actors (a full list of the departments, agencies and individuals consulted is contained in [Appendix 1](#)). The draft document was shared with relevant stakeholders to invite their comments and suggestions and to ensure that all actions relevant to adaptation to climate change were accurately reflected.

Three workshops were held as inputs to the process. The first, in April 2010, involved academics and researchers working on adaptation to climate change and focused on an initial review of the context document, input to the assessment process (based on the NAC answer worksheets), and a discussion on possible approaches to prioritisation in the context of the NAC. The second, in May 2010, involved members of the IASG and invited feedback on the draft context document and initial findings of the assessment. The final workshop was held in collaboration with the National Sustainable Development Council (Comhar), and its working group on climate change³. Members include representatives of environmental non-governmental organisations (NGOs), business, academia and local government. An overview of the assessment and its findings was presented and inputs invited to help finalise the assessment.

3. <http://www.comharsdc.ie/themes/index.aspx?TAuto=1>

3 Key Findings of the Assessment

The NAC assessment evaluated the ability of the institutions and actors involved directly and indirectly in adaptation in Ireland to fulfil the five adaptation functions identified in the methodology. The results of the assessment for each of the functions are presented here and are summarised in [Table 3.1](#).

3.1 Assessment

A key finding is that enough information exists to start climate change adaptation planning and to implement priority actions. The uncertainties inherent in climate change data and analysis should not prevent action being taken to address the impacts of climate change. It is critical to maintain research efforts on climate change and its expected impacts via a robust and iterative research framework that refines and updates the information provided to decision makers in this area. It will also be essential to put in place a review process to ensure information quality and to update information.

A key gap to be addressed is the completion of a national vulnerability assessment (assessing the sensitivity of sectors, populations, ecosystems and geographical areas to climate change impacts). This assessment needs to be designed in such a way that it can be updated over time and incorporate information on risk and vulnerability coming from sectoral departments and agencies and local government. A vulnerability assessment will also help in the process of determining national-level adaptation priorities.

An assessment of climate risks in existing national planning documents should be carried out. Responsibility and a process for doing so could be addressed via an updated National Climate Change Strategy (NCCS) or climate change legislation. It will be important to build on existing tools such as Environmental Impact Assessment (EIA), Strategic Environmental Assessment (SEA), Regulatory Impact Assessment (RIA) and Appropriate Assessment (AA) to assess climate risks. An advantage of using existing tools over the development of new tools is that many of

them are provided for in legislation and there is no time lag as new tools are developed and tested. A system for updating climate risk assessments should also be established and reflected in emerging climate change legislation and policy.

Finally, it will be important to carry out an inventory of adaptation actions as they start to be implemented in order to share experiences and learn lessons and to avoid maladaptation. This will include assigning responsibility for this action at national and local levels with a clearly defined lead institution.

3.2 Prioritisation

Prioritisation of key areas for adaptation to climate change (where, how, to whom) is in the process of being carried out in Ireland as part of an ongoing national vulnerability scoping study. This is an essential next step in further developing climate change adaptation policy, planning and implementation. Inputs from local government and sectors are required in determining priorities. These feed into the overall prioritisation process. Recognising that priorities are likely to change over time as impacts are better understood and adaptive capacity increases, a system will need to be put in place for ongoing review and adjustment. This is an important element of an effective prioritisation process and should be included in future policy and legislation.

3.3 Co-ordination

Although there is a high level of awareness that improved co-ordination is essential for effective adaptation, no single body or institution has such a co-ordination role. An authoritative body tasked with co-ordination should be established or mandated and a process for co-ordinating relevant sectors (horizontal), local government (vertical) and other stakeholders (inter-sectoral) put in place. This and measures for the review and amendment of co-ordination processes may be addressed via a future NCCS or future climate change legislation.

Table 3.1. Summary of key findings of National Adaptive Capacity assessment.

Function	Assessment of function
1. Assessment	<p>Assessment is the process of examining available information to guide decision making</p> <ul style="list-style-type: none"> • A body of work exists on climate change impacts – but this needs to be maintained and further developed • A national-level vulnerability assessment needs to be carried out • Adaptation actions should be inventoried as they start to be implemented • An assessment of climate risk in existing planning documents should be carried out • Need to clarify responsibility for assessing, reviewing and updating climate impacts and vulnerability
2. Prioritisation	<p>Prioritisation means assigning special importance to particular issues, areas, sectors, or populations.</p> <ul style="list-style-type: none"> • Adaptation priorities have not yet been identified • Assessments of vulnerability and climate risk at local, sectoral and national levels will help to identify priorities and to target resources accordingly • A system needs to be put in place for reviewing and adjusting priorities over time and responsibility for this should be clarified
3. Co-ordination	<p>Adaptation requires action by disparate actors at multiple levels, both within and outside of government. Co-ordination of their activities helps avoid duplication or gaps, and can create economies of scale.</p> <ul style="list-style-type: none"> • An authoritative body tasked with co-ordination should be put in place and a process for co-ordinating sectoral interests, different levels of government, and non-state actors initiated. The establishment or mandate of such an authority, as well as processes to allow co-ordination to develop and improve over time, could usefully be provided for in upcoming climate change legislation
4. Information Management	<p>Information management consists of collecting, analysing, and disseminating knowledge in support of adaptive activities.</p> <ul style="list-style-type: none"> • Systems for data gathering and analysis are established but need to be further developed and strengthened • Need to move away from project-based approaches to a more programmatic and sustainable approach • Need to designate a lead organisation for the co-ordination of climate information • A climate information platform is required and first steps are being initiated by the EPA • Important to raise awareness of climate change impacts and adaptation and to ensure that end-users have the capacity to use climate information effectively
5. Climate Risk Reduction	<p>Addressing climate risks requires a distinct process of identifying specific risks, evaluating the full range of options, and then selecting and implementing risk reduction measures.</p> <ul style="list-style-type: none"> • In the three areas examined – Water, Critical Infrastructure and Planning – there is emerging awareness of the need to assess and address climate risks • Existing policies (EU Directives, national legislation), processes (e.g. River Basin Management Planning, Flood Risk Mapping) and tools (SEA, EIA, RIA, AA, risk assessment, cost–benefit analysis) offer potential to better assess climate risk and plan adaptation actions • Guidance is required to enable better integration of climate change adaptation into the areas examined • This is a new policy area and there is little in the way of actual implementation of adaptation actions; however, much could be learned from reactive and unplanned activities that contribute to adaptation or that accentuate climate risks.

EPA, Environmental Protection Agency; SEA, Strategic Environmental Assessment; EIA, Environmental Impact Assessment; RIA, Regulatory Impact Assessment; AA, Appropriate Assessment.

3.4 Information Management

Systems for the provision of climate data are in place or being developed to provide analysis of essential climate variables (ECVs) (Dwyer, 2009; Nolan et al., 2010). Climate modelling capacity has been developed within research institutions and Met Éireann. However, further development and enhancement of these is required. A commitment to sustain data provision and climate modelling systems into the future is essential. Systems for information analysis are also well developed. However, a move away from a project-based approach to a more sustainable programmatic approach to analysis, which allows capacity to be maintained and developed, is desirable.

The need for a national information platform has been identified and initial work on developing a pilot system is under way. This is being funded by the EPA. This will complement work ongoing at European Union (EU) level to create a Clearing-House Mechanism on climate change impacts, vulnerability and adaptation.

Ensuring that information is reaching the key stakeholders who need it is a challenge, as is communication on climate impacts and adaptation. There is a need to include adaptation in public awareness campaigns on climate change. The establishment of a climate information platform will also help to improve understanding of climate impacts and adaptation and the measures that can be taken to reduce risk.

3.5 Climate Risk Reduction

The key findings for each of the three priority areas assessed under this function are presented below. It should be noted that these priorities were selected for the purposes of this assessment only and do not reflect a national prioritisation process.

1. Water (supply, quality, resource management – inland and marine)

Climate risks have not been systematically addressed in the area of water. There is an openness and readiness to address climate change adaptation amongst researchers, practitioners and policy makers in the fields of water resource management, water supply, water quality, and marine and coastal resource

management. However, guidance needs to be provided to enable the integration of climate change adaptation into existing approaches and processes.

The provision of national-level guidance on integrating climate change adaptation actions into water-related plans and decision making is necessary and would enable the consideration of adaptation options in the area of water. It is too early in Ireland's adaptation process to assess actions and implementation; however, learning from reactionary measures could be improved. It will be important to include measures for reviewing the effectiveness of the implementation of adaptation measures from the outset.

2. Planning (terrestrial and marine spatial planning as well as sectoral planning)

Climate risks have yet to be systematically assessed in the area of planning. There is a good deal of scope for developing an effective approach to risk assessment by building on existing legislation, tools and mechanisms. There is a risk that overemphasis on developing new tools and procedures could delay action; hence, the focus should be on integrating climate risk assessment using existing statutory tools (such as EIA, SEA, AA and RIA). Guidance will need to be provided to local authorities and sectoral departments to enable them to assess risks and integrate adaptation into planning.

Adaptation options related to planning have yet to be considered. As mentioned above, opportunities exist to build on existing planning tools and processes. All existing tools are flexible enough to take adaptation into account if the correct guidance is provided. Planning processes have the necessary key elements (consultation, review, etc.) to accommodate adaptation planning.

Adaptation actions have not yet been implemented on the ground in the field of planning. Ireland is at an early stage in the adaptation process and time should not be lost in assessing the risks posed by climate change when making decisions related to planning and

investment. It is expected that government departments, local authorities and the private sector will be the primary implementers of adaptation actions.

3. Critical infrastructure

Critical infrastructures are assets that are essential for the functioning of a society and the economy, and include communications, energy, transport, and ecosystem goods and services⁴. Climate risk has started to be assessed in relation to some elements of critical infrastructure. A study by the Irish Academy of Engineering (IAE, 2009) provides a good template but more work is needed to assess the risks posed by climate change to existing and planned infrastructure. If not, significant levels of investment are likely to be placed at risk from climate-related events. It will be important to integrate analysis from different sectors to optimise resource use.

Adaptation options related to critical infrastructure have yet to be considered in a comprehensive way. The focus to date has been on hard engineering options, such as flood walls and sea defences, with less emphasis on softer management alternatives. There is potential to build on existing environmental, economic and

social assessment tools, and to revise design standards to take climate risk into account. To date, a lack of clarity and fragmentation of responsibilities may have weakened the effectiveness of assessment tools and this is something that could be improved.

Adaptation to climate change is a new policy area in the context of critical infrastructure. There is no agreed definition of what constitutes critical infrastructure or an effective adaptation action. Some measures motivated by factors other than climate change may be increasing resilience but could equally be increasing the risk of maladaptation.

There are opportunities to protect infrastructure and livelihoods from the impacts of climate change through measures for emergency planning and response and disaster risk reduction. The European Commission (EC) Communication (EC, 2009) on disaster risk prevention aims to integrate policies and instruments related to disaster risk assessment (e.g. for floods, droughts, wind storms), forecasting, prevention, preparedness and recovery, and this creates opportunities for adaptation planning. Likewise, improvements to early warning systems and work ongoing nationally to improve flood forecasting and flood warnings can inform adaptation strategies and actions.

4. These are elements of the 'Green Infrastructure' concept, which is defined as "*an interconnected network of green space that conserves natural ecosystem values and functions and provides associated benefits to human populations*" (Benedict and McMahon, 2002).

4 Conclusions and Recommendations

The results of the NAC process indicate that Ireland is in the early stages of the adaptation process. Good quality information, which can provide a basis for adaptation planning, is available on climate change impacts. A number of recommendations have been identified through the assessment process and these are presented here and are summarised in [Table 4.1](#).

To date, activities have focused on understanding climate impacts and relating these to key sectors. The next steps will involve vulnerability and risk assessment, prioritisation, adaptation planning and the

implementation of adaptation actions. Importantly, enough information exists to start to plan for the positive and negative impacts of climate change and no time should be lost in implementing actions to minimise economic, social and environmental impacts. The most effective strategy for adaptation planning is to integrate climate change adaptation into policies, plans and programmes at all levels of government and across all sectors. This will allow the prioritisation of adaptation actions and the identification of the resources necessary to implement them in an effective manner.

Table 4.1. Summary of recommendations.

Adaptation function	Key recommendations
1. Assessment	<ul style="list-style-type: none"> • Carry out a national vulnerability assessment to enable adaptation planning and the implementation of adaptation actions • Develop a national approach to climate risk assessment • Cost priority adaptation options identified at local, sectoral and national levels • Inventory adaptation actions, processes and case studies at local and national levels to allow experience sharing and lesson learning
2. Prioritisation	<ul style="list-style-type: none"> • Undertake a national prioritisation process that can be adjusted as new information becomes available
3. Co-ordination	<ul style="list-style-type: none"> • Establish or mandate a national high-level body on climate change adaptation drawing on a pool of relevant expertise • Strengthen institutional capacity to address adaptation to climate change
4. Information Management	<ul style="list-style-type: none"> • Continue to develop the knowledge base through sustained commitment to data gathering and monitoring systems • Assign a lead organisation to oversee data gathering, analysis and dissemination • Develop a pilot climate information system linked to the EU clearing house on climate change impacts and adaptation • Use the climate information system to share experiences and help develop best practice case studies
5. Climate Risk Reduction	<ul style="list-style-type: none"> • Develop guidelines on how to integrate climate change into policies, plans, programmes and projects, through existing tools such as EIA, SEA, AA, RIA • Integrate climate change adaptation into policies, plans and programmes at all levels of government • Develop understanding of how to deal with residual risk, e.g. risk assessment, insurance mechanisms, early warning systems • Develop process/effectiveness indicators for monitoring and review purposes

EU, European Union; EIA, Environmental Impact Assessment; SEA, Strategic Environmental Assessment; AA, Appropriate Assessment; RIA, Regulatory Impact Assessment.

In order to make this strategy effective, there is a need to develop guidance to assist policy makers, planners, developers and local authorities to assess climate risks, identify adaptation options and implement appropriate strategies. There is potential to use established tools and processes to assess climate risks and integrate adaptation into policy, plans, programmes and projects. In most cases, simple amendments or additions to existing national guidelines would suffice to ensure that existing assessment tools incorporate climate change considerations. This applies in particular to risk assessment, cost–benefit analysis, SEA, EIA and RIA.

There is also a need to be able to track developments in adaptation planning over time, with a view to determining progress and ultimately the effectiveness of actions. As adaptation to climate change is a new and emerging area of work, there is no best practice; all actors are still engaged in a learning-by-doing process. This makes it critical to learn from experiences and to document and review outcomes and impacts achieved.

Critical to the effective integration of climate change adaptation is effective co-ordination and this requires the clarification of roles and responsibilities at national, regional and local levels. This should be addressed in a future NCCS or via climate change legislation and should clarify responsibilities in relation to climate change and develop systems to ensure effective vertical, horizontal and inter-sectoral co-ordination.

This assessment clarifies the need to establish systems for prioritisation, information management

and risk assessment. These systems need to be designed in such a way that they are flexible and responsive to changes in our understanding of climate impacts and improvements in adaptive capacity over time. There is also a need to strengthen and maintain efforts in data gathering, climate observations and analysis. This requires long-term commitment and resourcing, building on the very solid basis established to date. Initial work on the development of a climate information platform will play an important role in getting information to those responsible for risk assessment and adaptation planning and improving communication on climate impacts and risk.

Many of these issues emerge from actions specified in the 2007 NCCS and may be part of future legislation. It is also likely that developments and policy directives from the EU, and at the international level under the United Nations Framework Convention on Climate Change, will inform policy development related to adaptation to climate change. Most recently, the Cancun Adaptation Framework, agreed in December 2010, identifies actions that all countries should undertake to enhance action on adaptation. These reflect many of the issues and actions identified by this assessment, including vulnerability assessment, prioritisation, strengthening institutional capacities, facilitating adaptation planning, investing in research and improving communication to strengthen public awareness⁵.

5. <http://unfccc.int/resource/docs/2010/cop16/eng/07a01.pdf#page=2>

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Acronyms

AA	Appropriate Assessment
CCMA	County and City Managers Association
CCRP	Climate Change Research Programme
EC	European Commission
ECV	Essential climate variable
EIA	Environmental Impact Assessment
EPA	Environmental Protection Agency
EU	European Union
IASG	Impacts and Adaptation Steering Group
IPCC	Intergovernmental Panel on Climate Change
NAC	National Adaptive Capacity
NCCS	National Climate Change Strategy
NGO	Non-governmental organisations
RIA	Regulatory Impact Assessment
SEA	Strategic Environmental Assessment
WRI	World Resources Institute

Appendix 1 List of People Consulted

Name	Organisation
Aidan Fitzpatrick	Irish Aid, Department of Foreign Affairs
Áine Ryall	University College Cork
Alan Quirke	Forfas
Anne Irwin	Community Workers' Co-operative
Anne Marie O'Hagan	Hydraulics and Maritime Research Centre, University College Cork
Beatrice Kelly	Heritage Council
Cathal O'Mahony	Coastal and Marine Resources Centre, University College Cork
CCMA	County and City Managers Association
Colm Murray	Heritage Council
Conor Murphy	National University of Ireland Maynooth
Department of Agriculture, Fisheries and Food	
Department of Finance	
Department of Foreign Affairs	Now the Department of Foreign Affairs and Trade
Department of Health and Children	
Department of the Environment, Heritage and Local Government	Now the Department of the Environment, Community and Local Government
Department of Transport	Now the Department of Transport, Tourism and Sport
Elizabeth Cullen	Irish Doctors Environmental Association
Eoin McLoughlin	Comhar, National Sustainable Development Council
Erik O'Donovan	Irish Business and Employers Confederation
Eugene Hendrick	COFORD, Department of Agriculture, Fisheries and Food
Frank McGovern	Environmental Protection Agency
Gavin Harte	Sustainable Development Consultant
Gemma O'Reilly	Environmental Protection Agency
Ger Mullally	University College Cork
Glenn Nolan	Marine Institute
Jackie McLaughlin	National University of Ireland Maynooth
Jeremy Gault	Coastal and Marine Resources Centre, University College Cork
Jim Bowman	Environmental Protection Agency
Jim Casey	Office of Public Works
John Coll	National University of Ireland Maynooth
John Sweeney	National University of Ireland Maynooth
Jonathan Healy	Forfas
Kevin Black	COFORD, Department of Agriculture, Fisheries and Food

Name	Organisation
Maria Falaleeva	Coastal and Marine Resources Centre, University College Cork
Maria Rochford	Comhar, National Sustainable Development Council
Mark Adamson	Office of Public Works
Mark Mellet	Irish Naval Service
Mary Stack	Fáilte Ireland
Matthew Kennedy	Sustainable Energy Authority Ireland
Michael Ewing	Environment Pillar – Social Partnership
Mike Fitzpatrick	Coastal and Marine Resources Centre, University College Cork
Ned Dwyer	Coastal and Marine Resources Centre, University College Cork
Niamh Kirwan	Comhar, National Sustainable Development Council
Noel Casserly	Comhar, National Sustainable Development Council
Paddy Purcell	Irish Academy of Engineering
Pamela Carter	Department of Health and Children
Pat Barry	Irish Green Building Council
Pat Finnegan	GRIAN
Pat O'Mahony	University College Cork
Philip O'Brien	Environmental Protection Agency
Ray McGrath	Met Éireann
Robert Devoy	Department of Geography and Coastal and Marine Resources Centre, University College Cork
Seamus Boland	Irish Rural Link
Sean Hogan	Department of the Environment, Community and Local Government
Stefan Gray	Coastal and Marine Resources Centre, University College Cork
Valerie Cummins	Maritime Energy Research Campus and Commercial Cluster

An Ghníomhaireacht um Chaomhnú Comhshaoil

Is í an Ghníomhaireacht um Chaomhnú Comhshaoil (EPA) comhlachta reachtúil a chosnaíonn an comhshaoil do mhuintir na tíre go léir. Rialaímid agus déanaimid maoirsiú ar ghníomhaíochtaí a d'fhéadfadh truailliú a chruthú murach sin. Cinntímid go bhfuil eolas cruinn ann ar threochtaí comhshaoil ionas go nglactar aon chéim is gá. Is iad na príomhnithe a bhfuilimid gníomhach leo ná comhshaoil na hÉireann a chosaint agus cinntiú go bhfuil forbairt inbhuanaithe.

Is comhlacht poiblí neamhspleách í an Ghníomhaireacht um Chaomhnú Comhshaoil (EPA) a bunaíodh i mí Iúil 1993 faoin Acht fán nGníomhaireacht um Chaomhnú Comhshaoil 1992. Ó thaobh an Rialtais, is í an Roinn Comhshaoil, Pobal agus Rialtais Áitiúil.

ÁR bhFREAGRACHTAÍ

CEADÚNÚ

Bíonn ceadúnais á n-eisiúint againn i gcomhair na nithe seo a leanas chun a chinntiú nach mbíonn astuithe uathu ag cur sláinte an phobail ná an comhshaoil i mbaol:

- áiseanna dramhaíola (m.sh., líonadh talún, loisceoirí, stáisiúin aistriúcháin dramhaíola);
- gníomhaíochtaí tionsclaíocha ar scála mór (m.sh., déantúsaíocht cógaisíochta, déantúsaíocht stroighne, stáisiúin chumhachta);
- diantalmhaíocht;
- úsáid faoi shrian agus scaoileadh smachtaithe Orgánach Géinathraithe (GMO);
- mór-áiseanna stórais peitreal; agus
- scardadh dramhuisce.

FEIDHMIÚ COMHSHAOIL NÁISIÚNTA

- Stiúradh os cionn 2,000 iniúchadh agus cigireacht de áiseanna a fuair ceadúnas ón nGníomhaireacht gach bliain.
- Maoirsiú freagrachtaí cosanta comhshaoil údarás áitiúla thar sé earnáil - aer, fuaim, dramhaíl, dramhuisce agus caighdeán uisce.
- Obair le húdaráis áitiúla agus leis na Gardaí chun stop a chur le gníomhaíocht mhídhleathach dramhaíola trí chomhordú a dhéanamh ar líonra forfheidhmithe náisiúnta, díriú isteach ar chiontóirí, stiúradh fiosrúcháin agus maoirsiú leigheas na bhfadhbanna.
- An dlí a chur orthu siúd a bhriseann dlí comhshaoil agus a dhéanann dochar don chomhshaoil mar thoradh ar a ngníomhaíochtaí.

MONATÓIREACHT, ANAILÍS AGUS TUAIRISCIÚ AR AN GCOMHSHAOIL

- Monatóireacht ar chaighdeán aer agus caighdeán aibhneacha, locha, uisce taoide agus uisce talaimh; leibhéil agus sruth aibhneacha a thomhas.
- Tuairisciú neamhspleách chun cabhrú le rialtais náisiúnta agus áitiúla cinntiú a dhéanamh.

RIALÚ ASTUITHE GÁIS CEAPTHA TEASA NA HÉIREANN

- Cainníochtú astuithe gáis ceaptha teasa na hÉireann i gcomhthéacs ár dtiomantas Kyoto.
- Cur i bhfeidhm na Treorach um Thrádáil Astuithe, a bhfuil baint aige le hos cionn 100 cuideachta atá ina mór-ghineadóirí dé-ocsaíd charbóin in Éirinn.

TAIGHDE AGUS FORBAIRT COMHSHAOIL

- Taighde ar shaincheisteanna comhshaoil a chomhordú (cosúil le caighdeán aer agus uisce, athrú aeráide, bithéagsúlacht, teicneolaíochtaí comhshaoil).

MEASÚNÚ STRAITÉISEACH COMHSHAOIL

- Ag déanamh measúnú ar thionchar phleananna agus chláracha ar chomhshaoil na hÉireann (cosúil le plananna bainistíochta dramhaíola agus forbartha).

PLEANÁIL, OIDEACHAS AGUS TREOIR CHOMHSHAOIL

- Treoir a thabhairt don phobal agus do thionscal ar cheisteanna comhshaoil éagsúla (m.sh., iarratais ar cheadúnais, seachaint dramhaíola agus rialacháin chomhshaoil).
- Eolas níos fearr ar an gcomhshaoil a scaipeadh (trí cláracha teilifíse comhshaoil agus pacáistí acmhainne do bhunscoileanna agus do mheánscoileanna).

BAINISTÍOCHT DRAMHAÍOLA FHORGHNÍOMHACH

- Cur chun cinn seachaint agus laghdú dramhaíola trí chomhordú An Chláir Náisiúnta um Chosc Dramhaíola, lena n-áirítear cur i bhfeidhm na dTionscnamh Freagrachta Táirgeoirí.
- Cur i bhfeidhm Rialachán ar nós na treoracha maidir le Trealamh Leictreach agus Leictreonach Caite agus le Srianadh Substaintí Guaiseacha agus substaintí a dhéanann ídiú ar an gcrios ózón.
- Plean Náisiúnta Bainistíochta um Dramhaíl Ghuaiseach a fhorbairt chun dramhaíl ghuaiseach a sheachaint agus a bhainistiú.

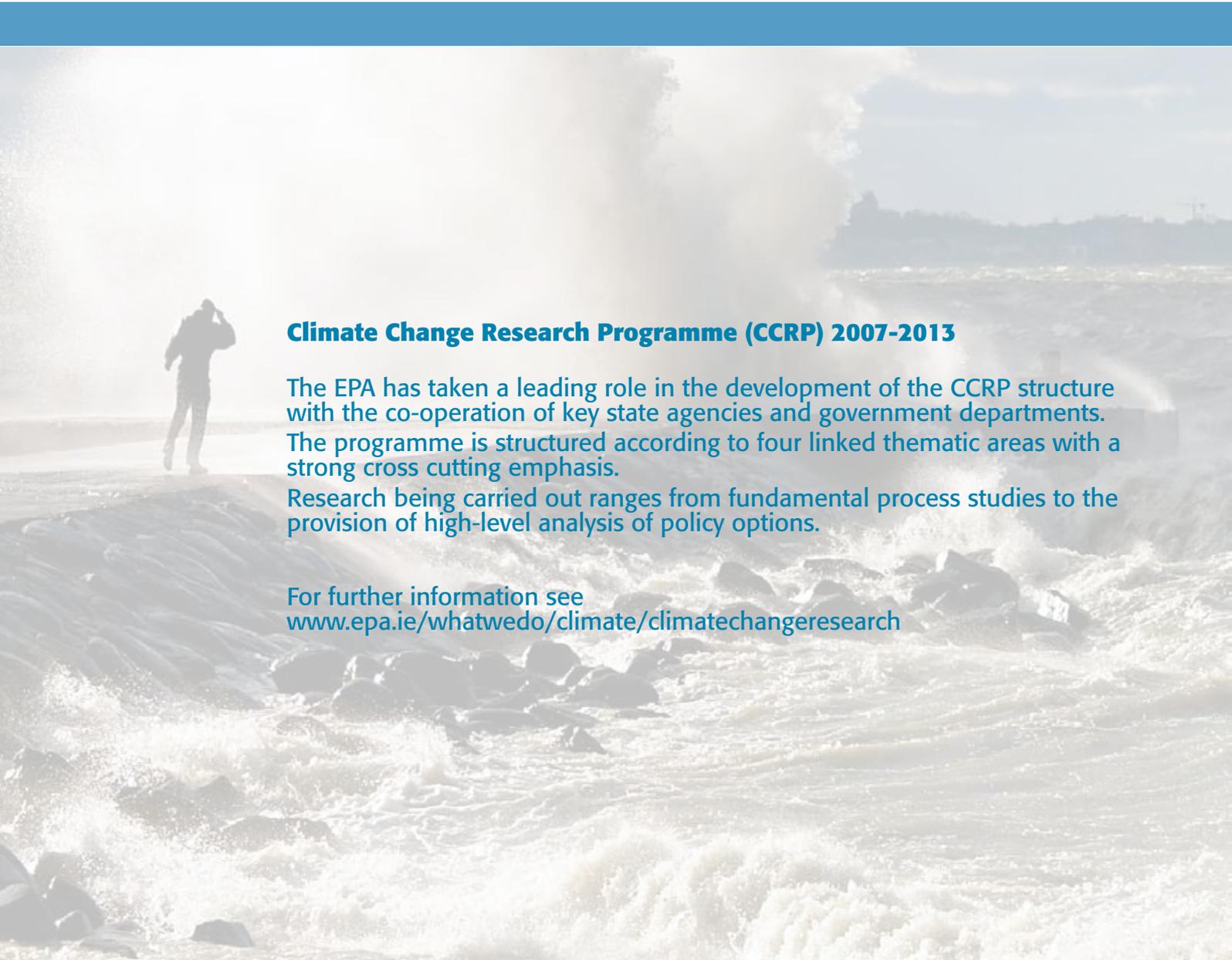
STRUCHTÚR NA GNÍOMHAIREACHTA

Bunaíodh an Ghníomhaireacht i 1993 chun comhshaoil na hÉireann a chosaint. Tá an eagraíocht á bhainistiú ag Bord lánaimseartha, ar a bhfuil Príomhstíúrthóir agus ceithre Stíúrthóir.

Tá obair na Ghníomhaireachta ar siúl trí ceithre Oifig:

- An Oifig Aeráide, Ceadúnaithe agus Úsáide Acmhainní
- An Oifig um Fhorfheidhmiúchán Comhshaoil
- An Oifig um Measúnacht Comhshaoil
- An Oifig Cumarsáide agus Seirbhísí Corparáide

Tá Coiste Chomhairleach ag an nGníomhaireacht le cabhrú léi. Tá dáréag ball air agus tagann siad le chéile cúpla uair in aghaidh na bliana le plé a dhéanamh ar cheisteanna ar ábhar imní iad agus le comhairle a thabhairt don Bhord.



Climate Change Research Programme (CCRP) 2007-2013

The EPA has taken a leading role in the development of the CCRP structure with the co-operation of key state agencies and government departments. The programme is structured according to four linked thematic areas with a strong cross cutting emphasis.

Research being carried out ranges from fundamental process studies to the provision of high-level analysis of policy options.

For further information see
www.epa.ie/whatwedo/climate/climatechangeresearch