The **CLIMSAVE** Project

Climate Change Integrated Assessment Methodology for Cross-Sectoral Adaptation and Vulnerability in Europe

Report on the Policy and Governance Context for Adaptation

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0. Preface

This Deliverable was originally designed to accomplish Objective 2 (O2) of the CLIMSAVE project, that is, to analyse the policy and governance context for adaptation. The work was coordinated with the MEDIATION project to avoid duplication of effort and promote complimentarity of outputs.

To achieve its objectives, this Deliverable attempts to evaluate existing sectoral and cross-sectoral policy mechanisms for adaptation. At the CLIMSAVE kick-off meeting in February 2010, it was decided to choose Scotland for our regional case study. Hence, the policy analysis reported in this Deliverable focuses on Europe and Scotland to inform the development of other methodologies within the project which are addressing cross-sectoral climate change impacts, adaptation and vulnerability within the European and Scottish Integrated Assessment Platforms.

Part of this Deliverable builds on discussions with multiple partners of CLIMSAVE. In particular, we would like to express our appreciation to the Project Coordinator Paula Harrison, Pam Berry, Jill Jäger, Roger Jones, Areti Kontogianni, Marc Metzger, Ines Omann, Mark Rounsevell and Michalis Skourtos. Special thanks to Paula Harrison and Marc Metzger for their extensive comments on the text. Some colleagues involved in related EU funded projects have also shared with us their findings, we are grateful to Laurens Bouwer (RESPONSES), Piotr Matzak (ADAM), Rob Swart and Paul Watkiss (MEDIATION). Special thanks have to be expressed to our informants/interviewees who provided us with their experience and ideas during interviews conducted in Brussels, Budapest and Scotland. György Pataki owes much to the members of ESSRG, particularly Bálint Balázs, Györgyi Bela, Ágnes Kalóczkai, Eszter Kelemen, Eszter Kovács, Norbert Kohlheb and Cordula Mertens for discussions as well as technical assistance.

1. Summary of key findings

Key findings at the EU level:

- Mitigation is considered as dominating adaptation. The EU White Paper on adaptation also mentions mitigation being of primary importance and adaptation second.
- Piecemeal and spontaneous adaptation is judged insufficient and a strategic approach is advocated towards adaptation to the impacts of climate change.
- There is an overwhelmingly positive rhetoric about adaptation, such as providing co-benefits, double- and triple-win solutions. Less attention and careful consideration is paid to the potential conflicts and trade-offs between mitigation and adaptation options between different policy sectors.
- The main advocate of adaptation policy has been the European Commission so far, in other words the EU bureaucracy. Pressure towards raising the importance of adaptation was made through: setting the agenda; supporting scientific studies in this field; setting up working groups; and setting up DG Clima.
- Market-based instruments dominate the adaptation toolbox. In addition, "soft" tools, such as guidelines, are promoted to be developed, even in cases for conflict resolution between sectors or policy fields. Climate-proofing is also advocated, but not yet fully developed methodologically.
- Key terms, such as adaptation, resilience, and vulnerability, though extensively used by policy documents are rarely defined, leaving room for ambiguity.
- The four pillars of the EU Adaptation Framework are suggested to be based upon rigorous science and the economic calculation of costs and benefits. Strong emphasis is put upon finding cost-effective adaptation options. Social, cultural, ethical and political aspects of adaptation policy-making are not emphasised.
- Adaptation policy, in particular at the EU level, is searching for scientific inputs; scientists, thus, become relatively influential, key players in setting the adaptation agenda. Climate adaptation science is dominated by a positivist philosophy of science, post-normal or Mode 2 science is rarely advocated.
- Adaptation is an issue delegated primarily to lower governance levels – it is said to be place-based, contextually sensitive. The EU level has an added value in coordinating Member States, regional and local efforts for adaptation; building up a knowledge base for adaptation and establishing mechanisms for knowledge transfer. Furthermore, adaptation action at the EU level is required to ensure solidarity due to the uneven regional consequences of the impacts of climate change and in closely integrated sectors (such as agriculture and biodiversity) through common policy.
- Adaptation policy demonstrates the utility of a multi-level governance perspective. Non-state actors, such as environmental non-governmental organisations (ENGOs) are relatively active players in the policy field of climate adaptation.
- The EU adaptation framework and other policy initiatives progress in small steps, rather than great leaps, and advocate no fundamental changes in any other policy fields. Sectoral integration is understood as re-focusing or amendment without major re-structuring; no changes in sectoral policy frames are called for. Adaptation policy in general fits well with the theory of ecological modernisation.

- The relationship between climate change and biodiversity policy is characterised by a special cognitive frame: Ecosystem-based Adaptation (EbA) is promoted. EbA draws on the line of argument advocated by the Millennium Ecosystem Assessment; expresses a win-win-win mind-set; and draws heavily on economics arguments concerning the value of biodiversity, ecosystem services and investment in green infrastructure.
- There is an organisational tension within EU DGs; particularly important for adaptation policy-making is the tension which emerged after the functional separation of DG Clima from DG Environment. It remains to be seen whether a functionally separated climate unit will be successful in achieving policy integration. The horizontal policy interplay within EU administration is mainly played out in working groups and during the inter-service consultation of rules, regulations and position papers.
- DG Clima and climate relevant units within different DGs should receive every proposal having any relevance for climate change for consultation. However, if the relevance is not direct, the decision about consultation lies with officials in other DGs and units who often do not know much about climate change and might not realise the relevance. Since climate change is a horizontal objective, 'climate education' of all relevant officers and an institutionalised system of decision-making about who should be consulted by climate units would be desirable.
- There are great difficulties in monitoring and evaluating adaptation policies, since effects are long-term, qualitative and difficult to separate from external factors. This greatly weakens the position of adaptation policy during the struggle for position and resources within the EU policy system.
- No institutionalised solution is established for a vertical policy interplay that easily channels local, community knowledge into EU level policy-making. The space for this kind of policy interplay is only *ad-hoc*.

Key findings for Scotland:

- The governance context in Scotland has had a profound effect on mitigation policy, and there is very little disagreement on the need for strong policy on adaptation. Adaptation is an area where it is in the interests of all political actors to show willing.
- Adaptation policy lags behind mitigation policy, but there is a clear timetable of steps to be taken to establish adaptation to climate change on a statutory basis. 2012 is a key year for shaping the statutory programme.
- There has been a 'race-to-the-top' around mitigation policy and adaptation policy may well benefit from the same dynamic.
- The growing frequency and severity of extreme weather events (floods, storms, heat-waves, etc.) 'help to sell' climate change related measures and policy.
- There are no clearly defined policy coalitions around adaptation – there is general agreement that it is an important issue but it is not a developed enough policy area to cause much disagreement.
- There are explicit attempts to co-ordinate adaptation policy, but there are nevertheless some disjunctions and therefore opportunities to make better links between different areas of policy in respect of adaptation.
- The negotiations for the next CAP period are a key opportunity to incorporate adaptation policy in pillar 2 of CAP and thereby better incentivise land management to

account for climate adaptation. This has implications for agriculture, biodiversity and flood risk management.

- Recent extreme cold weather has been linked with climate change and is suitable for use in CLIMSAVE workshops to probe resilience and adaptation policy.
- Decision support tools are not used much to support decisions. They do have a role in facilitating dialogue, and this would be of benefit in the current context in Scotland.
- The use of the Scotland Performs indicators within the CLIMSAVE tool would help to ensure its relevance to the Scottish context.

2. Structure of the report

This report covers the following main elements:

- Purpose and focus of the study: research objectives, theoretical background and methodological choice;
- Adaptation policy in the EU and Scotland: a general overview based on content analysis of key policy documents and key informant interviews with official experts at DG Agri, DG Clima, and DG Environment, as well as key informants in the Scottish case study;
- Adaptation policy integration in EU biodiversity and agricultural policy and Scottish agricultural, biodiversity and water policy;
- Policy and practice in Scotland: the case of the Highland Council;
- Tools for developing policy: decision support tools and extreme weather events.

3. Introduction: Purpose and focus of the study

In order to carry out a sensible policy analysis, two research foci were defined. On the one hand, to assess the policy and governance context for climate adaptation through an analysis of selected global, EU, national and local adaptation strategies; and, on the other hand, to evaluate existing sectoral and cross-sectoral policy mechanisms for climate adaptation. While the first research focus requires a multi-level governance (MLG) approach, the second one establishes a policy integration perspective. A MLG approach will reflect climate policy interplay vertically: between state and non-state actors that construct the dynamics of the policy and governance context of climate adaptation at different spatial scales. Complimentarily, an integration perspective will enable a horizontal analysis of climate policy interplay between different sectors that are supposed to develop strategies and measures for climate policy integration (CPI).

Urwin and Jordan (2008) refer to the usefulness of the distinction between top-down and bottom-up perspectives on policy interplay. A top-down perspective assumes that legislation, regulation and organisations at higher hierarchical levels of public policy set explicit frames, objectives and instruments that are then put into practice, or translated into action, at/by lower levels of hierarchies of public policy. This was, and perhaps is, a conventional view of policy-making. However, policy analysts cannot avoid being confronted with examples of poor implementation and even policy failure (Gouldson and Murphy, 1998). In order to better theorise on this so-called implementation gap, some policy analysts, most notably Michael Lispky (1980), have developed a perspective that assigns meaningful roles for those state actors that are responsible for implementing public policies – called street-level bureaucrats (SLBs). This bottom-up perspective, in contrast to the top-down, recognises that policy-

making and development do not stop at the top but operate on the ground as well, in the face-to-face interactions between SLBs and the clients of a given policy field. Public policy is interpreted and re-interpreted in these personal encounters (see Lowe et al., 1997; Fineman, 1998). Urwin and Jordan (2008: 183) emphasise that these two perspectives are methodologically and normatively very different in how they interpret policy-making and policy interplay. These scholars suggest that a "top-down approach is better suited to exploring the interplay between the written content of policies formulated centrally and the standard adaptive responses which are identified in the climate change impacts literature," while a "bottom-up approach draws upon the expertise of sectoral actors" (Urwin and Jordan, 2008: 184).

The research reported in this Deliverable was designed in order to make best use of the two methodological perspectives (top-down and bottom-up). Our top-down policy analysis incorporates an analysis of key policy documents mainly produced by EU organisations. Key informant interviews were also conducted with official experts working for the EU administration, specifically for different DGs. Altogether 7 formal interviews were conducted with 12 official experts working for DG Agri (2 interviewees), DG Clima (4 interviewees), and DG Environment (Biodiversity Unit: 3 interviewees, Agriculture-Forestry-Soil Unit: 2 interviewees, Water Unit: 1 interviewee). The choice of key policy documents were supported by advice from CLIMSAVE partners as well as the key informant interviewees. The following policy documents were selected:

- White Paper on "Adapting to climate change: Towards a European framework for action" (COM(2009) 147);
- Commission staff working document accompanying the White Paper on "Adapting to climate change: the challenge for European agriculture and rural areas" (COM(2009) 147);
- "Climate Change and Forestry" – Report to the Standing Forestry Committee by the Standing Forestry Committee Ad Hoc Working Group III on Climate Change and Forestry (November 2010);
- "Adaptation to Climate Change in the Agricultural Sector" – AGRI-2006-G4-05, AEA Energy & Environment and Universidad de Politécnica de Madrid, ED05334, Issue Number 1 (December 2007, Executive summary);
- "Proposal for a new EU Common Agricultural Policy" – BirdLife International, European Environmental Bureau, European Forum on Nature Conservation and Pastoralism, International Federation of Organic Agriculture Movements – EU Group, WWF – World Wide Fund for Nature (December 2009);
- "Towards a Strategy on Climate Change, Ecosystem Services and Biodiversity" – a discussion paper by the EU Ad Hoc Expert Working Group on Biodiversity and Climate Change (no date given);
- "Working with Nature to Tackle Climate Change" – a report of the ENCA (Heads of European Nature Conservation Agencies) / BfN (Federal Agency for Nature Conservation, Germany) workshop on "Developing ecosystem-based approaches to climate change – why, what and how" (2010).

The analysis of EU level policy documents and interviews constitutes the empirical material for our top-down research approach. In order to gain insights from the bottom-up perspective as well, a regional case study was prepared analysing the Scottish adaptation policy and governance context. The Scottish case study was carried out through a mixture of

documentary analysis and interviewing key informants. Seven formal interviews were carried out, supplemented by 12 phone calls and informal discussions at the Adaptation Scotland conference in June 2011. The aim was to answer the following questions and draw out their implications for application of the CLIMSAVE project in the Scottish context:

- What are the current and future public policies on adaptation in Scotland and how have they developed?
- Which policy actors are engaged in adaptation policy?
- How is adaptation policy developing in the sectors of agriculture, biodiversity and water management?
- How is adaptation policy being implemented at the local level?
- Where are the gaps in understanding or communication that CLIMSAVE might contribute to?
- What are the enabling and constraining factors that result in effective policy integration?
- How are tools such those proposed within the CLIMSAVE process used in practice?

The Scottish case was prepared by Chris High, the EU level analysis was carried out by György Pataki and Gusztáv Nemes. Before we turn to our substantive empirical findings, the major concepts of our research approach (MLG and CPI) will be briefly elaborated.

3.1 *Multi-level governance*[1]

Over the last decades, policy-making processes have become more complicated as more actors have joined the decision-making arena. Consequently, there was a shift in the focus of policy studies from analysing governments to exploring governance (Fairbrass and Jordan, 2004; Jordan, 2001). The first term, thus, to be defined is governance. Governance usually means the processes through which collective goals are defined. Environmental governance consequently covers those processes of collective decision-making related to environmental protection, nature conservation, and partly to sustainable development. An often used term to express the globalisation and the political nature of these issues is global environmental governance (GEV). GEV takes place through processes and institutions operating at, and between, a range of scales and involving a range of actors (state as well as non-state actors) (Betsill and Bulkeley, 2004). Therefore, the concept of governance recognises the roles of supra- and sub-national state and non-state actors, as well as the complex interactions between them in the processes of governing (Betsill and Bulkeley, 2006).

This has major implications for any attempts to understand and analyse the policy and governance context for climate change, including adaptation. Any analytical perspective should pay attention to the diversity of actors at each scale of analysis. At the global scale, for example, climate policy is not only shaped by interaction between high level government officials of nation states but it is also influenced by a variety of non-state actors, such as the Climate Action Network (a transnational advocacy network) or the Cities for Climate Protection (a transnational network of municipal governments) by the International Council for Local Environmental Initiatives (ICLEI) (Lindseth, 2004; Kern and Bulkeley, 2009). New spheres of authority are emerging, breaking the monopoly for authority of national governments; political power is consequently re-arranging. State actors have lost their

[1] The content of this section builds on the doctoral research by Cordula Mertens (Environmental Science Doctoral School, St. István University, Hungary) that is highly acknowledged.

capacity for direct control of the policy process and have become involved in continuous bargaining with different networks relevant in a given field of policy-making (Betsill and Bulkeley, 2004). Another consequence for policy analysts is conceptualising policy-making as an argumentative struggle among different state and non-state actors; therefore, some commentators call for an argumentative turn in policy analysis.

The concept of multi-level governance (MLG) has emerged to capture the social, political and economic processes that shape global environmental governance. The concept of MLG was developed by Lisbet Hooghe and Gary Marks, initially based on their analysis of EU cohesion policy (Hooghe and Marks, 2001). MLG is also related to ideas of polycentric governance which implies relationships among multiple authorities with overlapping jurisdictions and policy outcomes emerging from relationships of actors at different governance levels (Andersson and Ostrom, 2008). The EU constitutes a very special case of international state-building and policy-making: a trend of "hollowing out" of the national state apparatus by reorganizing state capacities on sub- and supra-national levels influenced by de-statisation of the political system. This includes a shift from government to governance, as well as an internationalisation of policy regimes fostered by economic globalisation (Jessop, 2004). EU policy-making offers many points of access for different stakeholder groups and, consequently, provides good opportunities for the involvement and mobilisation of several sub-national state as well as non-state actors (Fairbrass and Jordan, 2004). Since many interactions are not formalised in several fields of EU policy-making, there is no clear dominance of one governance level over the others. The governance context in the EU is a complex, dynamic, fragmented, multi-level institutional arrangement (Scharpf, 2001; Piattoni, 2009).

However, it should be mentioned that the concept of MLG has not been usefully applied to all policy sectors, some (e.g. Jordan, 2001 and Baker, 2003) raise serious doubts about its applicability to "high politics" (i.e. monetary, foreign and defence policy). Nevertheless, MLG case studies have been successfully carried out in the field of "low politics," like cohesion, environmental or water policy (see Fairbrass and Jordan, 2001; 2004; Jordan, 2001; Baker 2003; Benz and Zimmer, 2010). Further, the MLG concept is increasingly applied in studies highlighting the role of non-state actors and local-scale actors in global climate change policy (see Betsill and Bulkeley, 2006; Corfee and Morlot et al. 2009; Kern and Bulkeley, 2009).

A considerable part of climate policy in the EU, as well as Member States, has originated from international environmental agreements and policy-making. In addition, local actors have also initiated climate adaptation strategies that feedback to the scale of EU climate policy-making. Particularly, adaptation activities and decisions are inherently local and based on contextual knowledge. Therefore, adaptation to climate change, and consequently the limits of adaptation, cannot be understood without reference to their local contexts. In order to gain insights into adaptation decisions and strategies, agency and scale should be carefully specified (Adger et al., 2009; Urwin and Jordan, 2008).

3.2 *Climate policy integration*

Analysing and understanding climate adaptation policy from a MLG perspective focuses on vertical policy interplay, i.e. the interactions between policies located at different spatial scales of governance (Urwin and Jordan, 2008). However, climate policy is, at the same time, a cross-sectoral, "whole-of-government" activity: there is a need for climate policy integration (CPI). CPI is defined as the integration of climate change dimensions across all areas of policy-making (Ahmad, 2009). In this sense, CPI constitutes the need for examining

horizontal policy interplay, i.e. relationships and interactions between policies at the same level of governance (Urwin and Jordan, 2008).

Looking at policy interplay horizontally will amount to raising questions concerning effective policy integration, on the one hand, and policy conflicts, on the other. The main questions to be answered are: What are the enabling factors that result in the effective integration of adaptation to climate change into non-climate policy areas? What are the constraining factors that result in disruptive conflicts between climate adaptation and non-climate policy fields? There are developments for CPI at the national level: the UK government, for example, has established an Adaptation Policy Framework in order to ensure that adaptation to climate change is integrated into wider policy-making processes (Urwin and Jordan, 2008). There are regional/local initiatives for practising "climate proofing" (i.e. new sectoral policies are designed in ways which facilitate adaptive decisions (Urwin and Jordan, 2008), such as taking into consideration the challenges climate change poses to achieving Good Ecological Status in River Basin Management Planning in Scotland (Blackstock et al., 2009).

However, there might be differences in the degree to which CPI will be achieved in policy-making. The literature on environmental policy integration (EPI) in general provides some useful hints and categorisation. On the one hand, "weak" CPI implies that sectoral policy-makers simply take climate change considerations into account; while, on the other hand, "strong" CPI corresponds to placing climate change considerations at the heart of decision-making in other sectoral policies (Jordan and Lenschow, 2010). Clearly, this amounts to a policy change. However, while it is relatively easy to find changes in policy instruments or the calibration of instruments (corresponding to single-loop policy learning), there is not as much evidence of changes in overall policy goals, i.e. CPI at the level of overall policy goals (corresponding to double-loop learning). A third-order type of change in policy would correspond to changing the policy paradigm binding together overall goals and instruments of a given policy field (Urwin and Jordan, 2008). It is no surprise that some authors call for a social learning perspective to conceptualise and analyse climate adaptation policy integration (Collins and Ison, 2009; Pelling et al., 2008; among others). This research stream confirms the importance of scale and the significance of local contexts: "Local actors are at the sharp end of adaptation" (Pelling et al., 2008). There are furthermore some useful conceptualisations of "adaptive pathways" (Pelling et al., 2008) and those of adaptive strategies, ranging from material adaptation to institutional modification (Pelling and High, 2005).

4. Adaptation policy in the EU and Scotland

The analysis in the sections below will present the governance and policy context for climate adaption in the EU and Scotland. It is based on the content of key policy documents and findings from key informant interviews with major actors in the field of climate change adaptation. We avoid discussing adaptation policy at the national level since many research projects targeted that scale and produced sensible results. See, among others, Biesbroek et al. (2010); Bizikova and Crawford-Boettcher (2011); Massey (2009); Pfenninger et al. (2010); Swart et al. (2009). Some of the key findings of these studies, without trying to cover all their important findings, are worth reiterating:

- Adaptation, in contrast to mitigation, cannot be managed or controlled from above – it is claimed to be a local issue;
- What is a good adaptation policy? – there is huge uncertainty and lack of specific guidance;

- National adaptation strategies (NASs) stress integration across sectors and governmental levels, but offer few clues on how to do it, and do not clearly specify policy instruments and roles and responsibilities;
- NASs put emphases on raising public awareness, but dissemination of climate information is generally poorly coordinated and restricts the peer community mainly to experts, not involving the general public;
- Well-functioning and polycentric planning systems support climate mainstreaming and local experimentation with adaptation.

4.1 EU adaptation policy

4.1.1 *Adaptation policy in the EU*

The key policy document for climate adaptation at the EU level is the White Paper on "Adapting to climate change: Towards a European framework for action" (COM(2009) 147). As the title suggests, the EU adaptation framework is elaborated in this communication; specifically, a "framework to reduce the EU's vulnerability to the impact of climate change" – as the text later claims. Moreover, we are reminded that this EU framework only complements Member States' actions and wider international efforts. At the very start, this document makes clear that mitigation is the number one, "important", response and adaptation comes next. Adaptation is needed due to some already "unavoidable" impacts. The phrasing suggests if we act early enough we do not have to face "unavoidable" impacts, since they are prevented from occurring in the first place. Adaptation becomes a necessity due to our not acting early enough.

A distinction appears early between adaptation that is already going on in a piecemeal fashion and strategic adaptation. Though it is not clarified, from the wording it seems that piecemeal adaptation is a "naturally" occurring process but not enough to solve the climate challenge. The EU needs a timely and effective strategic approach to adaptation which is coherent across sectors and levels of governance. Rhetorically, it is clear that something strategic is better than something that develops in a piecemeal manner, especially if one faces an urgent and great challenge. However, one might also be able to imagine bottom-up, community-based steps towards changing lifestyles, etc. that may seem piecemeal but might be equally important for societies to be able to adapt to changing circumstances.

After the introductory section the first substantive section addresses the question of why: why do we need to adapt and why at the EU level? Three main arguments are presented: first the impacts of climate change, second the economic reasoning, and third the added value of the EU level. Though the severity of impacts will vary across regions in Europe, important sectors (such as agriculture, biodiversity, energy, physical infrastructure, water/coast/marine, etc.) will be affected to a large extent. For policy-makers the challenge is phrased as one of ensuring an "optimal level of adaptation". However, no further explanation is given in what sense should policy-makers search for an optimum. Should one look for an ecological, economic, and/or social optimum? How is it possible to reach an optimum in a complex, uncertain setting?

Under the reasoning about impacts, one can find the suggestion that "working with nature's capacity to absorb or control impacts" constitutes a "more efficient" way to meet the challenge of climate change adaptation. "Green infrastructure" is assigned a crucial role in acting as an important resource base in buffering extreme climatic conditions. This line of

reasoning is the main characteristic of policy documents and experts in the field of biodiversity and nature conservation.

Arguments for the economic case for adaptation make a contrast between autonomous and strategic adaptation. The former is related to a sort of "spontaneous" or "natural" adaptation under free market conditions, basically responding to actual market signals that include information on climate change. However, due to market failure, this kind of adaptation can hardly be "optimal," indeed it might result in "mal-adaptation", that is, some forms of adaptation increase vulnerability instead of reducing it. If the invisible hand of the free market mechanism fails or even worsens the situation through mal-adaptation, other forms of institutional solutions may be needed, for example, the hand of government. The text provides no hints here with regard to the ways of solving market failures. This is the only place in the document where markets seem to be in the "problem box" and not in the "toolbox of solutions" which is the case for the other parts of the text where markets appear. This entails some contradiction.

There is a general opinion in the scientific literature and policy documents that adaptation is eventually a "local" issue: effective actions are located at the national, regional and local level. The added value of the EU lies in supporting and strengthening actions taken at other levels of governance. The EU can act as a coordinator and integrator in order to raise the effectiveness of adaptation, ensure solidarity among Member States, and change policy in those sectors (such as agriculture and biodiversity, for example) that are closely integrated through the single market and common policies. The EU seems to be best suited for building up a knowledge base for adaptation that disseminates best practices and enables the sharing of experiences.

The next substantive section of the White Paper is devoted to the description of the proposed framework. The EU Adaptation Framework aims at improving the EU's resilience to deal with the impact of climate change. However, resilience remains undefined as does the concept of vulnerability which appears earlier in the text. This policy document definitely misses the opportunity to define its key terms, such as adaptation, climate policy integration, resilience, and vulnerability. The Framework is temporal in the sense that "Phase One" is set out in this official communication. In phase 1, the adaptation strategy is based on four pillars: (1) building up a knowledge base for impacts and consequences; (2) integration into key policy areas; (3) combination of policy instruments; and (4) international cooperation.

It is striking how the first pillar of the knowledge base is discussed: "reliable data", "more knowledge", "better understanding", "methods, models, datasets, prediction tools, forecasting", "monitoring and indicators" and "quantification of costs and benefits" are needed. There are no words about inherent uncertainty, ignorance, surprises, the limits of control or those of knowledge. Furthermore, no mention is made of social, ethical, cultural or political aspects. In a sense, it is clear that underlying is a "conventional" view of science (positivistic, hard science) in contrast to a scientific view expressed in Mode 2 science, post-normal science, or citizen science. The second pillar, mainstreaming (or CPI) is also required to be "carefully prepared," meaning that it is "based on solid scientific and economic analysis."

Under mainstreaming, climate policy integration into the sectors of health and social policy; agriculture and forestry; biodiversity, ecosystems and water; coastal and marine areas; and production systems and physical infrastructures is outlined. A main message is formed in terms of searching for co-benefits (win-win), that is, solutions benefiting mitigation as well as adaptation. This issue is presented as if there were no conflicts or trade-offs between some adaptation actions and mitigation measures. It seems that re-focusing and amendment are

enough in each sector to integrate climate adaptation into its current policy frame and practice. EU adaptation policy can focus on developing guidelines on best practices for each sector and organising dissemination; establishing common standards where appropriate (e.g. related to physical infrastructure); and developing a methodology for climate-proofing.

The third pillar, the combination of policy instruments starts with a claim, and reference to the Stern Review, that financial constraints are one of the main barriers to adaptation. Priority should be enacted in the multi-annual financial frameworks. The text also suggests, referring to the European Economic Recovery Plan (EERP), that climate change should be understood as an investment opportunity; investing in infrastructural modernisation, energy efficiency, and green products. However, all examples mentioned point to an idea of greening (i.e. making climate-friendly) existing products, infrastructure, etc. and no mention is given to the need for structural changes. Optimal and efficient use of market-based instruments (such as Payments for Ecosystem Services) are discussed (later "green trade" contributing to growth and job creation), clearly expressing a sort of market mentality. There are no frame-breaking suggestions and it seems that adaptation to climate change does not pose a radical challenge to existing mind-sets and institutional setting.

The fourth pillar discusses the need and measures for cooperation and partnership with Member States, neighbouring countries, and the most vulnerable developing countries; it calls for mainstreaming in the EU's external policies. On the institutional side, the Commission has set up an Impact and Adaptation Steering Group (IASG) with supporting technical groups, organised by sectors. Emphasis is put on the Clearing House Mechanism to build up and share widely the "evidence base" related to the impacts, risks, scope of increasing resilience, and costing options. In the partnerships under the UNFCCC, the EU sees itself as an ambitious actor to foster adaptation through establishing a Framework for Action and Adaptation (FAA). A failure to adapt is said to imply security implications. Thus, analysis of early warning systems and migration flows, climate policy integration in conflict prevention mechanisms and security sector reform are all recommended and partly underway.

In sum, the key adaptation policy document at the EU level entails a multi-level governance approach and is committed to climate policy integration; a strong emphasis is placed on the economics approach, including cost-effectiveness and on partnerships and stakeholder engagement. The added value of the EU level with regard to adaptation policy lies in establishing coordination and dissemination mechanisms (for knowledge transfer) and integrating adaptation into those policy fields that are closely coordinated at the EU level (such as agriculture and biodiversity). A "hard science" and economics approach is favoured in forming adaptation policy based on reliable data, prediction, indicators, and control – resembling the paradigm of "Managing Planet Earth." A market mentality is expressed through the promotion of mainly market-based instruments in the adaptation policy toolbox. The EU Adaptation Policy Framework is not frame-breaking in the sense that it mainly promotes greening (climate-proofing) of existing production systems, physical infrastructures, products and services, but does not mention the need for structural changes in either lifestyles or public institutions. In this sense EU adaptation policy sits well with the ideology and practice of ecological modernisation theory.

4.1.2 *Adaptation policy actors*

According to our interviews in DG Agri (Directorate General for Agriculture and Rural Development), the Commission is definitely a very important player in various ways. It has been the driving force for the creation of DG Clima, aimed at changing the general conservationist approach in environmental policy-making, which is claimed to be the ruling

paradigm within DG Environment, especially in the Biodiversity Unit. Their main concern is to protect/conserve what is still there, stopping the transformation, keeping European flora and fauna in its current state. Nevertheless, there is another interpretation claiming that nature should (and could) adapt to the changing circumstances. Policies should not try to stop changes, but rather help nature (and society) to adapt to the new conditions. The expansion of such an approach required a new institution, separate from DG Environment, and this could have been at least one of the main reasons for the establishment of DG Clima that is currently gaining importance and already becoming one of the most influential actors in climate issues in Europe. Their role is to synthesize and channel knowledge, to educate, and to work with DGs and other EU institutions lobbying for climate related issues. As the number of extreme events (floods, heat-waves, forest fires, etc) grows, their influence grows with it.

Another way of influence comes through R&D support. It is those issues about which we have knowledge that are put to debate and become an important subject for public policies. The Commission through scientific and applied research thus can bring up new topics, support some issues and neglect others in a pro-active way. As knowledge creators, research institutes and scientists are, obviously, also important actors in driving the issues. Nevertheless, their research (and existence) normally depends on EU (or national government) funding.

Green NGOs also have an important role in climate change adaptation. There are many different organisations working in this field, however, they are often strongly networked and create platforms. Probably the most important and influential one of these is an umbrella organisation, the so-called Green 10. It is an informal network of major Environmental NGOs (ENGOs) having a bureau in Brussels and playing in the European and the global arena. They coordinate joint responses and recommendations to EU decision-makers. Membership of the Green 10 alone is more than 20 million people. One of their member organisations, the Climate Action Network Europe (CAN-E), is recognised as Europe's leading network working on climate and energy issues. With 149 member organisations in 25 European countries, CAN-E works to prevent dangerous climate change and promote sustainable energy and environment policy in Europe. Besides Green 10 other influential organisations, such as the Royal Society for the Protection of Birds (RSPB) and FERN in the field of forestry are also very influential. They vigilantly monitor new scientific results and political arguments, send representatives to public debates, react instantly, bring out new issues for public debate and use public opinion to influence policy debates, regulations and redistribution of public money. They often require hearings, undertake bilateral negotiations with various DGs and industry representatives and are professional lobbyists, with good prospects and a track record of achievements in influencing policy.

According to our interviews the leading force is neither scientific knowledge, nor any level of EU bureaucracy, but political power in this topic. The final say is always with the European Council and the European Parliament, and at the end of the day both are strongly influenced by the Member States. Economic interests, industrial and agricultural lobbies (no examples were mentioned by interviewees) also have strong influence, both directly and through influencing domestic opinion within the Member States. Therefore, those issues with clear-cut and strong economic or/and political interests have little chance to be decided by anyone other than the strongest players. However, through expertise, setting agendas, debating and influencing public opinion much can also be achieved by other players.

4.1.3 *Objectives, roles and ways of operation of DG Clima*

DG Clima is a newly created institution, quickly gaining influence and power already having some 150 employees after a sole year of its establishment. The main motive of its creation came from the Commission (not from the Member States) with the objective of the implementation of the Kyoto protocol first of all in the field of climate mitigation. Climate change adaptation is a new task that is gaining increasing importance, and, again it is pushed for by the Commission, and not particularly by the Member States.

DG Clima is mainly concerned with policy-making, not with running projects. Its main objective is to influence other DGs while they are preparing for new regulations, redistribution of public money, etc., to ensure they consider climate change aspects in order to reduce impacts in every possible way. In other words, it is the mainstreaming of climate issues into all relevant policy areas which DG Clima considers its main task. DG Clima does this through the system of 'climate proofing', through working groups, green and white papers and personal contacts in different parts of the institutional system.

Climate change adaptation being a relatively new topic on the public agenda is quickly becoming well known and influential. It is a 'well branded concept' and is easy to 'market'. The best time for proposing measures for adaptation and forward thinking is straight after natural disasters (floods, heat-waves, storms). Though this is not 'very scientific' nor always even fair treatment, as a result of political dynamics and pressure of public opinion, during these times almost any sensible suggestion can go through easily. Nevertheless, they have to be careful not to overuse these possibilities and/or their credit either.

DG Clima is concerned with policy-making, and normally does not need to run large expensive programmes, or have to distribute financial aid. Thus, they don't need large amounts of resources that should be taken away from other DGs and though its creation took away responsibilities, personnel and finances from DG Environment, the establishment of DG Clima did not meet any serious opposition. Another factor making their job fairly easy so far is that DG Clima has not tried to achieve huge changes in policies or in the approach or philosophy of other DGs. Their policy is to advance through small steps and small changes. Nevertheless, to achieve significant results in adaptation, fundamental changes (of the CAP or competition policy, etc.) will be inevitable. Therefore, though their advance in influence is currently smooth and without major opposition, important conflicts with various sectors and DGs are foreseen in the future.

Current good results and increasing influence can mainly be attributed to personal contacts within the Commission and with industries and NGOs. DG Clima inherited much of its staff from DG Environment which had developed good personal links over previous years. This represents an important resource now for the work of DG Clima, since many officials in different subject areas had previously been educated in climate issues and can now recognise problems and issues that are of interest for DG Clima. In these cases position papers and working groups from many different areas (transport, water, competition, research, agriculture, etc.) reach DG Clima in time for climate proofing and influencing important new regulations where it is appropriate. Nevertheless, this system has an important element of contingency and cannot be trusted where personal contacts or at least officials with a deep understanding of climate issues are lacking. An important objective is therefore to create institutionalised ways for reaching out to as many areas that can be connected to climate change as possible.

The policy-making process – institutions and the ways of influence

DG Clima has 4 legs: (1) Science and knowledge; (2) Mainstreaming; (3) Financial aspects; and (4) International action and relations. Within the DG there is a division between geographic and thematic approaches, complementing each other. Within the geographic approach, those officers dealing with EU regions mainly work through their bilateral contacts in the Member States/regions. DG Clima is one of those DGs with 'shared competence,' meaning that the DG cannot make any important decisions without the consent of Member States. Thus, the opinion and the willingness of Member States towards their suggestions have great significance.

On the international level, DG Clima mainly concentrates on Third World countries. Closely co-operating with DG Home, the main objective is to stop or rather prevent climate change related migration towards Europe. Adaptation and forward thinking therefore are of crucial importance in their work.

The most effective way of influence varies according to whether the policy or legislation in question is initiated by DG Clima or arrives from other bodies for climate proofing. If it is a new topic, the standard procedure is to create a 'working group' or 'steering group' in case of projects. DG Clima normally invites representatives from all other DGs concerned, forming a reference group. This ensures involvement of actors from a wide range of topics and also prevents the future policy being attacked by other (left out) interests within the Commission. The reference group usually drafts a position paper that is distributed and discussed with representatives of industries, NGOs and the Member States. Industry and NGO representatives often ask for bilateral meetings with DG Clima, asking for information and trying to lobby for their interests. Industries and NGOs often have conflicting interests and DG Clima tries to mediate, but good co-operation can also sometimes occur.

As climate change adaptation is a fairly young topic, influence and lobby power still mainly depend on knowledge, personality and enthusiasm of the actual actors. From the NGO side there are a number of organisations pushing for stricter legislation and wider action, the most important and influential being the Climate Action Network. They are well-prepared and always participate in the meetings. Concerning Member States, the main influence comes from the UK, Germany and Sweden. These countries have accumulated a lot of knowledge which can be used by their representatives in the committees and working groups. Nevertheless, Spain and Portugal, as the countries most likely to have serious negative effects (drought, heat-waves, storms, sea level rise) as a result of climate change in the short to medium term, are also becoming very active in this field. Another pattern is that member countries of the current 'troicas' (the country holding the presidency with its predecessor and successor) are more active than the others. At the end of the day the actual person who comes to the committee, his/her personality, knowledge, seniority, etc. also counts a lot in having influence and achieving good results on a particular question.

The Climate Change Clearing House Project

(URL: http://climate-adapt.eea.europa.eu/)

This is a major project of DG Clima, being developed by Unit 3 in close co-operation with DG Research & Innovation and the European Environment Agency, which was launched on 23 March 2012. The Climate Change Clearing House Project, now renamed the European Climate Adaptation Platform (Climate-ADAPT), is a publicly accessible, web-based platform, designed to support policy-makers at EU, national, regional and local levels in the

development of climate change adaptation measures and policies. Climate-ADAPT has been developed with the support of the European scientific and policy-making community and will be hosted and managed by the European Environment Agency. It will help users to access, disseminate and integrate information on:

- Expected climate change in Europe;
- The vulnerability of regions, countries and sectors now and in the future;
- Information on national, regional and transnational adaptation activities and strategies;
- Case studies of adaptation and potential future adaptation options;
- Online tools that support adaptation planning;
- Adaptation-related research projects, guideline documents, reports, information sources, links, news & events.

Climate-ADAPT aims to support the generation of the knowledge-base required to support the development of evidence-based adaptation policies. This seems to be of crucial importance, since one of the main problems about climate change is the unreliability/variation of scientific results, difficulties in monitoring and creating measurable and trustworthy indicators and the consequent scepticism, often stopping policy efforts and effects. The importance of having reliable and up-to-date information in the database is highly recognised and safeguards for achieving it are built into the project. For example, all DGs will have to screen the information concerning their competencies within the platform, and scientific projects connected to climate change will have to provide their results as inputs to the platform. Climate-ADAPT will also inform the development of a comprehensive EU Adaptation Strategy that the Commission plans to adopt in the beginning of 2013, with the goal of supporting the needs of Member States, transnational organisations and local stakeholders with appropriate actions at the EU level.

4.2 Scottish adaptation policy

4.2.1 *Governance in Scotland*

Scotland has always held a special position within the UK, with many separate institutions. Since 1998 it has been substantially devolved, and a Scottish Parliament was reconvened. Substantial powers were transferred from the UK Parliament in Westminster, and rather than list the things which the new government was responsible for, Schedule 5 of the Scotland Act 1998 listed those areas of responsibility which would not be handed over – known as reserved matters. These include areas such as defence, social security and foreign affairs.

However, analysing policy drivers in Scotland requires a wider lens than parliamentary legislation and civil service implementation. Governance, as opposed to government, (Thompson, 2003) incorporates the actions of non-state as well as state actors, and suggests that policy production and implementation is the work of a wider network of actors. Understanding where policy comes from under governance is particularly important in Scotland for a number of reasons: (i) The size of the polity makes for dense networks of relationships between government and other policy actors; (ii) civil society has traditionally been very strong in Scotland; and (iii) the direct and indirect influence of civil society and industry has intensified since devolution with the consultative style of government which has developed.

4.2.2 *Adaptation policy in Scotland*

Climate change, as a policy issue, is constructed as both an opportunity and a potential threat to Scotland. Much of the focus to date has been on mitigation, and there is a feeling that the ambitious emissions targets that have been adopted are world-class. Mitigation policy has benefitted from a 'race-to-the-top'. The UK as a whole has established ambitious targets for reducing greenhouse gas emissions. As a polity subject to those targets, Scotland has established even more challenging targets. The possible causes for this are a competition between political parties to be seen to be addressing important issues of the day, a desire to distinguish Scotland from other UK polities and an eye to the opportunity presented by Scotland's renewable energy resources for economic development. The political will to adopt these is at least in part due to the emphasis since devolution on sustainable economic growth.

Adaptation policy has lagged behind mitigation policy, and certainly does not have the same profile. However it is perceived as a risk to sustainable economic growth, and therefore something which needs to be addressed. Many of the building blocks are in place, and a number of interviewees indicated parts of other legislation which were relevant to adapting to climate change. As adaptation policy develops, there is an opportunity to build the co-ordination between these. The general goal is perhaps best summed up by the following definition of a well-adapted Scotland, which received broad support in public consultation:

"A well-adapting Scotland is one where individuals and organisations factor climate change probabilities into planning and implementation decisions on investment, infrastructure and civil contingency at an early stage in the development process. It is one where the tools and information exist to help individuals and organisations manage uncertainty; cost the relative benefits of action versus inaction; and co-ordinate and facilitate the flow of information between decision-makers. It is one where agreed levels of risk-management are applied across Scotland, based on up-to-date information of current and future risks of changing weather patterns. It is one where there is co-ordination across key decision-makers, such as local and central government and ongoing monitoring of impacts and climate adaptation effectiveness." (Scottish Government, 2008).

<u>Legislation</u>

Adaptation policy is devolved, and the key legislation is therefore the Climate Change Act (Scotland), which was passed in August 2009. This sets greenhouse gas emissions targets for 2050 and 2030, provides ministers powers to create climate change duties on public bodies (Scottish Government, 2011b) and makes some specific provision for mitigation and adaptation measures. It also sets up the reporting infrastructure for measuring progress against mitigation and adaptation targets. While the act was being debated in the Scottish Parliament, an amendment established the basis for a sustainable land use strategy, and this was published in March 2011 (Scottish Government, 2011a).

A key driver for current adaptation policy is the UK Climate Change Risk Assessment (CCRA) called for by the UK Climate Change Act 2008. This was published in January 2012, and the Climate Change Act (Scotland) requires the Scottish Government to draw up an Adaptation Programme to address the risks that have been identified in it for Scotland. The Scottish Government, as with other devolved administrations, has contributed to the costs of making the assessment and in return received a separate report on the risks in Scotland. There has been an ongoing effort to ensure that Scottish needs and data are included.

The Scottish Government has a duty to produce a programme to address the risks identified in the CCRA. The policy is thus still being established, although considerable work has already

been carried out. It is expected that the statutory programme will be published in 2013, and therefore 2012 is a key year for shaping the policy.

Climate Adaptation Framework

Preceding the statutory programme, the Scottish Climate Change Adaptation Framework was published in 2009, with the intention to catalyse improvements with respect to adaptation and resilience (Scottish Government, 2009c). The framework was based on two public consultations, a strategic environmental assessment and an equality impact assessment. The overall framework was followed in 2010 with the publication of 12 sectoral action plans covering the following sectors:

- Agriculture
- Biodiversity and ecosystem resilience
- Built environment
- Business and industry
- Emergency and rescue services
- Energy
- Forests and forestry
- Health and well-being
- Marine and fisheries
- Spatial planning and land use
- Transport
- Water environment and resource

The action plans are not homogenous and are at different stages of development. They have a common framework which includes an analysis of potential impacts, and policies and drivers for the sector. Each proposes a programme of action covering three pillars: (i) understanding the consequences of a changing climate; (ii) equipping decision-makers with skills and tools; and (iii) integrating adaptation into public policy and regulation. The balance between these varies across different sectors.

Policy delivery

In terms of the delivery of the legislation, the onus is on public bodies rather than on regulation of the private sector or individuals. Influence may be exerted through incentives or changes to the services that the private sector enjoys, but there are no direct duties imposed on them with respect to adaptation. Public bodies have a statutory duty to deliver adaptation policy (Scottish Government, 2011b), although this will only be obligatory when the statutory adaptation programme is launched. In practice some bodies have more relevant remits than others and can suggest ways to the Scottish Government in which they may be able to particularly assist.

The focus of the Scottish Government has been on preparation and co-ordination, and there has been a desire not to earmark too much money specifically for climate change adaptation because this may disincentivise organisations from taking the issue on if they receive funding. However there has been funding for research, for the adaptation unit itself and for the work of

Adaptation Scotland (formally known as the Scottish Climate Change Impacts Partnership; SCCIP). There have also been some specific projects and programmes with a very clear linkage to adaptation issues, such as the development of River Basin Management Plans.

Summary

In summary, much explicit adaptation policy is at present rhetorical but there is a considerable amount of relevant policy, which is largely technical. As there has been broad agreement on the rhetoric, adaptation policy is largely uncontroversial and there is little current evidence of substantive debate about it. This may well change as it becomes operationalised, when more resources are brought to bear on the issues, and conflicts with the interests of policy actors come to light.

4.2.3 *Adaptation policy actors*

The following organisations are active in shaping adaptation policy in Scotland. The list is not exhaustive, but tries to cover some of the most important, and also give examples for each of the different kinds of actors involved in adaptation policy. During the fieldwork there was no evidence of strong policy advocacy coalitions (Sabatier and Jenkins-Smith, 1999, 1993) around opposing positions relating to adaptation policy. This is not to say that various actors are not engaging in advocacy, but rather that there are no clear positions for or against various adaptation policies. This may change as the policy begins to attract resources and trade-offs, but for the present there is wide support for developing a strong and effective set of policies around adaptation.

Scottish government

The Scottish Government, formerly known as the Scottish Executive, is the body responsible for delivering the policies formulated by the Scottish Parliament. It is led by ministers drawn from the leading political party (or parties if there is a coalition), currently the Scottish National Party, who lead teams of civil servants. Politically the civil service is neutral, mainly comprising career officials rather than political appointments. In practice the civil servants exert a lot of influence as it is their responsibility to give advice about how a policy will be delivered, and whether it is practical.

The Energy and Climate Change Directorate comes under the Department of Enterprise and Environment, which is oriented towards the goal of increasing sustainable economic growth. It has particular responsibility for meeting the high level goal of making a transition to a low carbon economy, and grasping the opportunities provided by Scotland's abundant wind and wave energy potential.

The Adaptation Unit sits within Strategy and Economic Policy, the area of government that deals with sustainable economic development, delivering against the Scotland Performs indicators. It has the lead on making sure that the Scottish Government delivers on the requirements of the Climate Change Act (Scotland) 2009 in respect of adaptation. It is positioned here rather than in the Energy and Climate Change Directorate, as part of a project to mainstream adaptation to climate change. However, there is an intention to draw the unit back into the Energy and Climate Change Directorate, once the project is established. The unit works with sector leaders (primarily inside the Scottish Government) for each of the identified sectors. These leaders in turn work with stakeholders within each sector.

UK government

The UK government is not formally responsible for adaptation to climate change in Scotland as this is a devolved matter. However there are mechanisms such as the climate change concordat (HM Government, The Scottish Government, The Welsh Assembly Government, & Department of the Environment, 2008) that describe how policy can be co-ordinated. The Department of Environment, Food and Rural Affairs (DEFRA), a UK ministry with responsibility for adaptation, is the main contact on adaptation, while mitigation is now dealt with by the relatively new Department of Energy and Climate Change (DECC).

Local government

Scotland has 32 Unitary Authorities (Councils), which receive most of their funding from the Scottish Government. The councils are subject to the duties on public bodies established under the Climate Change Act (Scotland). They have a particular responsibility in terms of water policy as they hold principle responsibility for flood relief schemes. The Sustainable Scotland Network (SSN) has been co-ordinating local authority policy on climate change from before the Climate Change Act (Scotland) 2009.

Public bodies

Much Scottish policy is delivered by public bodies, organisations which are operationally independent from the government, but which report to it and receive much of their funding from it. Public bodies vary from project funded bodies such as Adaptation Scotland to more established organisations such as the Scottish Environmental Protection Agency (SEPA). As well as delivering policy on adaptation under the statutory duty imposed on them by the Climate Change Act (Scotland) 2009, many public bodies have played an active role in shaping policy.

Adaptation Scotland is considered the main agent for influencing public and private actors to act with respect to climate change. The programme is funded in its entirety by the Scottish Government, and funding has just been secured for another 2 years. Another important specialist body is the Committee on Climate Change an independent body which provides advice to the UK government and the devolved administrations on climate change. The committee has to date published two reports on progress in meeting climate change targets in Scotland. It has a subsidiary Adaptation Sub-Committee.

In terms of more established agencies, SEPA is the lead body for dealing with flood risk, and has led on shaping and implementing recent work on increasing flood awareness. Other public bodies such Scottish Natural Heritage (SNH) and the Forestry Commission Scotland (FCS) focus more on habitat networks and biodiversity, whereas Historic Scotland has a focus on the management of historical properties exposed to river and coastal flooding. Finally, there are public owned companies such as Scottish Water who deliver regulated services where there is a recognised future impact from climate change.

NGOs

A number of NGOs have been involved in forming adaptation policy through lobbying and responding to public consultation. The environmental NGOs are particularly prominent, but others have a stake too. Scottish Environment Link provides an important site of advocacy and co-ordination for the environmental NGOs such as the Royal Society for the Protection of Birds (RSPB) and the World Wildlife Fund (WWF) who have taken a very active stance in

respect of climate change and the need to address particular adaptation goals (e.g. Scottish Environment Link, 2008b). Another NGO that has had a role in delivering adaptation policy is the Soil Association, which is contracted to deliver workshops on adaptation to the farming sector. Non-environmental NGOs have a stake too, and Oxfam, for example, has been lobbying to highlight the social dimensions of adaptation, such as the potential effects on poor and vulnerable communities and individuals.

Research community

The research community plays a particularly important role in climate change policy, given the profile of science internationally in shaping the issue. Significant funding on environment, biology and agriculture are channelled through the Main Research Providers such as the James Hutton Institute or the Scottish Agriculture College, including on climate change. In the Scottish Strategic 2011-2016 programme, a Centre of Expertise on Climate Change, ClimateXChange, has been set up with a £4.1 million budget. This collaborative initiative between sixteen of Scotland's leading research and higher education institutions will deliver objective, independent, integrated and authoritative evidence to support the Scottish Government in relation to its activities on climate change mitigation, adaptation and the transition to a low carbon economy.

Private sector

There is a perception that the private sector has not engaged with adaptation in Scotland to the same extent that other governance actors have. This is not to say that there is no interest. For example, the Scotch Whisky Association, which represents the interests of the whisky industry, has shown a keen interest and there is some evidence of interest from other, industry bodies such as the National Farmers Union Scotland (NFUS) as well as individual businesses. However it is probably fair to say that the private sector engagement with climate change has been much stronger on mitigation than adaptation.

5. Adaptation policy integration in the EU and Scotland

Our analysis below investigates adaptation policy integration in two policy fields, namely, agriculture and biodiversity – and in the Scottish case water policy, too.

5.1 EU biodiversity policy and climate adaptation

Studying the relationship between climate change and biodiversity policy one is immediately confronted with a cognitive frame. The "cognitive frame" of the relationship between biodiversity and climate adaptation policy can be summarised by the following slogan: "Working for Nature and Working with Nature". Another important element of the cognitive framing of this relationship concerns its economics: doing nature conservation contributes to climate adaptation in a cost-efficient way. The line of reasoning behind this cognitive frame is discussed in this section.

Nature conservation and biodiversity policy has a traditional role to protect the integrity of ecosystems and the diversity of habitats, as well as species and genetic diversity (biodiversity at different scales). An effective nature conservation and biodiversity policy contributes to the integrity and health of ecosystems and habitats; that means protecting the stability, resilience, and diversity of natural systems. By implication, nature retains her capacity for adapting to changing complex pressures and conditions, such as climate change. Natural systems, if not degraded or impaired, have the capacity of, and can provide us with, autonomous adaptation. Practices and tools of nature conservation and biodiversity policy, such as e.g. ecological

corridors (connectivity), ecological restoration (re-establishing ecological health and integrity), constitute, therefore, a cost-efficient way of climate adaptation: healthy natural systems provide their services to human communities free of charge. This is also called Ecosystem-based Adaptation (EbA). The Convention on Biological Diversity (CBD) Ad Hoc Technical Expert Group (AHTEG) on Biodiversity and Climate Change formulate a definition as follows:

"Ecosystem-based adaptation (EbA) may be described as the use of ecosystem management activities to support societal adaptation. EbA identifies and implements a range of strategies for the management, conservation and restoration of ecosystems to provide services that enable people to adapt to the impacts of climate change. It aims to increase the resilience and reduce the vulnerability of ecosystems and people in the face of climate change."

EbA also promises to find ways for reconciling the potential divergences between mitigation and adaption, providing co-benefits. Although policy documents emphasise that biodiversity is our ally in coping with climate change and interactions between mitigation and adaptation measures/actions can be positive, potential conflicts are not denied altogether. Again on the positive side, EbA is claimed to offer triple-win measures – those that (i) protect and restore ecosystems, (ii) contribute to mitigation by reducing emissions, and (iii) constitute a cost-effective way of adapting to the impacts of climate change. In addition, some raise an equity hypothesis: ecosystem-based adaption options seem to be more accessible to rural and poor communities. With this win-win-win mind-set, EbA aspires to be a route to sustainable actions.

Ecosystem-based adaptation can be applied in any sector affected by climate change. If other policy sectors take into consideration the potential services nature provides and build their policies accordingly climate policy integration will be evident. One may draw guidelines from healthy and resilient ecosystems to climate-proof other sectoral policies. In this sense, it is recommended not to put climate-proofing and biodiversity-proofing in separate boxes. They are the two sides of the same coin. EbA may be considered as an insurance policy against irreversible damage resulting from extreme weather events, in particular, and climate change, in general.

The line of reasoning of this cognitive frame draws a lot on that of the Millennium Ecosystem Assessment: linking biodiversity, ecosystem services and human well-being. In this respect, ecosystem-based adaptation means working with nature for human well-being. This well-being argument is basically an economics argument. It says it is a good investment to put our resources into maintaining our natural resource base and healthy functioning ecosystems, in restoring them (if necessary due to degradation), and even developing them through investments in green infrastructure. All these investments will pay back in the longer term since natural systems preserve, or enhance, their resilience and adaptive capacity, and will therefore be able to provide adaption options, as well as ecosystem goods and services, without compromise in their quality to human societies. Although there are no well-established markets yet where these investments can help to allocate efficiency, nevertheless adaptive environmental management, flexible policy design that is sensitive to contexts and uncertainties, learning from experience and engaging stakeholders with different types of knowledge in a social learning process, may result in improved institutional coordination – empowering the potential of EbA.

This framing of the relationship between adaptation and biodiversity policy entails another interesting point. It seems that the requirement of climate policy integration (mainstreaming) is turned upside down; it becomes a call for integrating an ecosystem-based perspective. However, in the cognitive frame of EbA it is the same to argue for CPI or biodiversity policy

integration (climate proofing and biodiversity proofing). If this is accepted, then one can understand the concerns of those who see problems emerging with the organisational separation between DG Environment and DG Clima that happened recently in the EU public administration. Functional separations might result in, for example, achieving a chapter on adaptation in every policy document but lose the spirit of adaptation permeating every policy field – as some key informants warned.

Not surprisingly, many see a huge institutional challenge in "working together", that is carrying out policy integration. For functionally organised administrative bodies, this might even constitute a revolutionary idea. To say the least, overcoming splits and obstacles in and between functionally separated policy areas is not an easy job. It might be argued that for climate adaptation the current institutional setting at the EU level is inefficient. Current integration initiatives are characterised by a working group setting, trying to involve, with differing success, different policy fields. In this setting, potential conflicts between policy fields may be hard to resolve constructively and consensually. Currently, developing guidelines is the common way in attempting to overcome conflicts between different policy fields. A related concern is financing: how is it possible to institutionalise funding that supports policy integration in an institutional setting characterised by functional separation of policy fields? How can the added value of the EU level adaptation policy-making be realised in terms of providing integrative financing (i.e. funding that supports climate policy integration) in a functionally divided policy setting? Is the current financial planning and budgetary system in the EU able to overcome functional division? These questions are very relevant for understanding or influencing the horizontal policy interplay.

As to the vertical policy interplay (relations between scales of governance), many argue that the local level outcompetes the EU level in terms of implementing adaptation. At the local-regional level, a lot of place-based initiatives that fit to local particularities are experimented with. (Again, the added value of the EU level could be an integrative funding for those initiatives.) However, despite the open stakeholder consultation practices at the EU level, EU level adaptation policy-making is not yet inspired by the wealth of experience at the local scale. Local and regional representation can give contributions through specialised conferences, workshops, and by the Committee of the Regions, but it seems that new, creative institutional solutions are needed in order to better fulfil this potential. In the policy field of biodiversity and environment, one space for cross-fertilising between different levels is provided by the intense and close interactions between DG Environment and non-state actors, since the latter might be positioned to carry at least some of the messages and experiences of their local affiliates.

5.2 EU agricultural policy and climate adaptation

5.2.1 *The climate change challenge and the CAP*

The Common Agricultural Policy and DG Agri have been of primary importance for our examination, since agriculture can be a cause, a victim and a solution for problems related to climate change:

- Modern high input agriculture is much dependent on fossil fuel energy and land management practices that are widely considered unsustainable in the long-term. Agriculture is a major source of the main non-carbon dioxide (CO_2) greenhouse gas emissions (methane and nitrous oxide). At the overall EU level, according to DG Agri, emissions reported in the agricultural sector represent 9.2% of total EU-27 emissions (against 11% in 1990). At the global level agricultural emissions account for almost

14%. In addition, agricultural activities also release CO_2 from fossil fuel use in buildings, equipment and machinery for field operations, which account for around 1% of CO_2 emissions of all sectors. Unlike other sectors, human-induced emissions in agriculture have a high degree of uncertainty as farming activities are very diverse and involve a complex and wide range of biological processes which naturally emit greenhouse gases.

- Agriculture is highly vulnerable to the impacts of climate change, which to some extent are already inevitable. In the short- and medium-term the main effects will be caused by the increasing frequency and severity of extreme weather events and changes in the availability of water. Adverse impacts are expected to have a greater effect on already marginalised regions (i.e. areas with lower economic, social and human capital which are often a greater distance from administrative, political and economic centres) due to generally lower adaptive capacity. This may also result in increasing regional disparities.
- Agriculture and forestry can contribute to the mitigation of climate change through the production of renewable energy and materials for industry and by maintaining and enhancing the carbon sink function of agricultural soils and forests. Nevertheless, this is only possible if appropriate adaptation strategies and practices are applied.

5.2.2 *DG Agri Unit H4 on Bioenergy, biomass, forestry and climatic changes – the responsible unit for climate change within DG Agri*

DG Agri was the first DG to recognise climate change back in the late 1980s. The first signs came out of statistics showing the increasing growth rate of trees as a result of elevated CO_2 concentration in the atmosphere. Climate change was already present in the 1998 CAP strategy planned for AGENDA 2000, though mitigation and adaptation had not yet been separated. However, a separate, independent unit for climate change related issues was only established in DG Agri in early 2007, to cover work related to biofuels (which were high on the political agenda at the time) and forests. Other aspects of climate change covered by the unit were the preparation of internal reports on the contribution of the agricultural sector to greenhouse gas emissions and possibilities for integrating mitigation into the CAP. They also contributed to the preparation of the Green Paper on adaptation (2007).

The main duty of those units within various DGs responsible for the preparation of new policies is acting as a contact point between science and public policies, collecting knowledge and information and channelling it into the policy-making process. Scientific knowledge is normally held or generated by contractors, in other words the scientists, but to make it functional for practical public use, this knowledge needs to go through a long process of verification, institutionalisation and harmonisation before it can be turned into actual policies or regulations. Unit H4 in DG Agri is responsible for doing this job in the field of bio-energy, biomass, forestry and climatic changes.

DG Research and Innovation supports scientific studies that are creating new knowledge. DG Agri (and Unit H4 within it) also supports studies but only to do secondary analysis, in order to fill knowledge gaps and to find out what and how information from the existing body of knowledge could be used in the policy-making process. The main activity is to channel knowledge from science into policy more than to create it.

Unit H4 is responsible for screening all plans and suggestions related to climate change and agriculture originating from within or outside DG Agri as well as making suggestions and

providing expert opinion. On request they are also supposed to help the work of the Parliament and the Council.

Other related activities concern officials working in other DGs. The fact that a new regulation, a policy or a certain problem or claim connected to climate change reaches the responsible unit H4 depends on desk officers (officials responsible for managing the national/regional rural development programmes), geographical unit leaders, or officials working in horizontal units that normally do not deal with climate change issues. To make sure that their colleagues at other desks can recognise the climate-significance of certain topics, unit H4 tries to provide continuous information and knowledge communication. There have been various ways to do this. In the past, specific training sessions on climate change (mitigation and adaptation) for officials working in rural development have been organised and external experts invited. Another good forum for this is the 'Lunch time debate series' in DG Agri, where week by week important topics are discussed.

5.2.3 *Procedures and institutions for creating or improving policies in climate change adaptation in DG Agri*

In this section, we explore the way policies connected to climate change are designed and influenced within DG Agri. The initiative for dealing with a particular issue or topic can come from many different sources: it can be an obligation from an earlier policy document or regulation, it can come from the Council, a Member State (MS), public opinion or from within the EU administration. The main instruments and institutions of the policy-making process are the different working groups (WGs), working and position papers, green and white papers and different ways of consultation and communication, such as inter-service consultation, public hearings, posting and receiving on websites, etc.

Once it is agreed to deal with a problem, a WG is set up by the appropriate department of DG Agri. According to our interviews, in the case of climate change related issues, such WGs normally consist of approximately 4-5 people from the Commission, 15 from Member States, 3-6 representing ENGOs and some representatives from relevant industry. The WG is organised and assisted professionally by the appropriate department of the DG, but experts can be employed, and studies can be commissioned if there is a lack of information or a knowledge gap to be filled. Members of the WG have their costs covered, but do not normally receive any payment for their work. WGs can meet some 3-5 times during the course of approximately 10-18 months. They first look through data, public debates, and the scientific and policy literature that are already available and through debates and a series of working documents they finally accept a draft working paper. This then goes to inter-service consultation, meaning that all relevant units within DG Agri and all other DGs are supposed to receive it and comment on it. All comments come back to the WG and this then finally results in a second version of the working paper that can become a point of reference for professional opinion, debates, policy papers, etc. Some of these background working papers become publicly available, whilst others remain internal documents and are only used as a basis for further work.

In other cases, when the purpose of the WG is the preparation of a policy document the procedure is extended and more opinions and comments are built into the final document. After having completed a working paper, this is sent for comment to all important EU institutions (appropriate units of the Council, the Parliament, Member States, etc.). They comment on it and sometimes even have public debates between each other. The material is also posted on official websites, where usually several hundred comments are made. The appropriate unit in DG Agri receives back all the comments, prepares a position paper that is

discussed and finally accepted by the WG. At this point the Commission can still decide if it wants to make the proposal official, or if it seems to be raising too many conflicts and a consensual solution is not possible yet, then the project can be cancelled, postponed or started again from scratch. If the Commission decides to proceed, an updated paper is prepared and provided for negotiations for the Council and the Parliament and this becomes the basis of policies, measures, decisions, etc.

An example of this process is the WG created for the analysis of the situation and required actions within European forestry concerning climate change, called 'Standing Forestry Committee Ad Hoc Working Group III'. In discussing the 2008 Standing Forestry Committee (SFC) work programme for implementation of the EU Forest Action Plan (FAP), in its 103rd meeting on 29 February 2008, SFC members expressed the need to set up an ad-hoc SFC working group (WG) on climate change and forestry. Terms of reference for the WG were published, with the specific objectives of contributing to the implementation of the FAP's key action 6, to "Facilitate EU compliance with the obligations on climate change mitigation of the UNFCCC and its Kyoto Protocol and encourage adaptation to the effects of climate change", activities 6.1 (reporting on land-use change and forest management) and 6.2 (post-2012 commitments) of the working programme 2007-2011 of the FAP.

The Advisory Group on Forestry and Cork, the Advisory Committee on Forestry Policy, the Forest-based Industries, the Green 10 (group of major environmental NGOs with representation in Brussels) and Member States were invited by the Commission to nominate experts representing forest sector stakeholders, with the possibility of seeking appropriate cooperation with other working groups or inviting experts on particular matters, if necessary. The WG, apart from members from the Commission, consisted of 17 Member State representatives and 8 members nominated by stakeholder groups (industry and ENGOs). Some 7 external presenters were also asked for contributions. Altogether six meetings were held, the first, accepting the work programmes and selecting volunteer rapporteurs being on 6 March 2009 and the last one, issuing the draft final WG report on 24 September 2010. To arrive there, the WG applied national surveys, analysed existing documents and development plans and asked for expert opinion.

Another example is the expert group on agriculture and climate change which was set up in 2009 and has held three meetings since then. A further forum for discussion of climate-related issues is the "Advisory Group on agriculture and environment" which consists of agricultural associations and environmental organisations.

5.2.4 *Entry points for influencing the policy process*

The first important entry point for lobbying and influencing the policy process is the selection of problems to be dealt with, since those areas where knowledge is missing or the main issues have not been explored are not likely to become part of the policy-making process. As we mentioned above, there can be many sources for any initiatives. Nevertheless, the Commission has a significant practical influence in making decisions about particular topics, urging or delaying their exploration and development so that they become part of the core issues. In fact, according to several interviewees, the Commission had a crucial role in putting climate change adaptation on the policy agenda as an important issue, through:

- raising public awareness (making public campaigns);
- increasing the knowledge base (paying for research, studies, conferences); and
- creating and supporting institutions (e.g. DG Clima).

The work in the different WGs is one of the main opportunities for lobbying and influencing, especially for those actors that do not have a direct institutionalised political influence, such as ENGOs, industry representatives and weaker, smaller or less involved Member States. Decisions made in the WGs are strongly based on knowledge, debates, professional attitude and rationale. Thus, those members of the WG having personal experience and wide knowledge of the topic, and/or personal charisma and persuasive power can make a strong influence on the outcome of the work, even without strong political or economic support in the background. The preparation resulting in the draft and final form of working documents, as normal during most bureaucratic procedures, obviously has a great influence on the final results, since it frames the issues, scenarios and possibilities that can be considered during decision-making.

Nevertheless, the main influence still lies with political institutions, namely, the European Council and the European Parliament. At the end of the day these institutions shape the main issues which are at stake, as well as the main directions and final decisions about policy issues. Here, strong forces tend to prevail, trying to influence the course of policies on the political level. This can mean the influence of:

- traditionally strong and influential countries directly in the policy debate;
- strong economic lobbies – farmers associations and their lobby organisations (e.g. COPA-COGECA); and
- trans-national corporations (Monsanto, etc.).

They influence the main political institutions of the EU directly as well as through the Member States, MPs, MEPs, national ministries and other available institutions. Since the Commission collects and analyses information, creates knowledge and does the preparatory work for decisions, it has a great influence on all matters, and is sometimes blamed for imposing decisions on Member States. Nevertheless, all important decisions and debates are undertaken in the Council and the Parliament (and between them), which are constituted by the Member States. Therefore, the decision itself always lies with the Member States and the Commission implements the official legislation.

Another way of gaining political influence is through the media and shaping public opinion. This is the method mainly used by ENGOs and other civil organisations that especially at times of hot public debates and adverse climate events threatening the life of EU citizens can be very effective. The mechanisms of lobbying processes are often complex and obscure and are far beyond the scope of this study. Nevertheless, without acknowledging their presence, the way of creating new policies cannot be understood.

5.2.5 *Inclusion of climate change in present and future regulations*

Climate change adaptation and mitigation in the current regulation

Rural development policy has the potential, particularly through renewable energy policies, to contribute to climate change mitigation and adaptation. The Health Check defined climate and renewable energy as new areas to which additional funding can be channelled (see Annex II of Council Regulation (EC) No. 1698/2005, as amended by CR 74/2009). The working document on "The role of European agriculture in climate change mitigation" (SEC (2009)1093) summarises mitigation measures and renewable energy policies based upon the screening of National Rural Development Plans (NRDPs).

One of the main findings was that climate change is addressed in a relatively comprehensive way, but in a rather general manner. Climate change adaptation and mitigation actions, either directly or indirectly, are only partly reflected in the programmes. It seems that there is still unrealised potential for rural development to contribute to EU climate change and energy policies. There is scope for improvement in the integration of climate relevant policy measures, applying more efficient techniques to reduce greenhouse gas emissions, and disseminating relevant information on the effectiveness of supported actions.

The agri-environmental payments seem to be the most relevant policy instruments in the rural development policy toolbox with regard to climate change mitigation and adaptation. It remains an issue for further examination whether result-based targets can replace the existing input-based system. Defining and measuring more relevant indicators can be considered a key issue in this regard. Actions and measures that contribute effectively to mitigating and adapting to climate change might be supported by higher co-financing or aid-intensity rates. This might, however, add to the complexity of the system and require additional book-keeping techniques, as well as resulting in reduced flexibility at the Member States level.

Climate change adaptation has a generally low emphasis within CAP measures. The Health Check, for example, only gives an indicative list of four types of actions in this field (see Table 1) while mitigation and/or renewable energies had a much stronger presence. Nevertheless, amongst the measures (type of actions) related to water management there are some that could be relevant to climate change adaptation. However, other reports (e.g. Annex II of the Commission WD on adaptation (2009)) give a more comprehensive view on how adaptation can be addressed through the existing rural development framework.

Table 1: The four types of actions related to climate change adaptation in the Health Check for the CAP. Source: Indicative list with types of operations and potential effects related to priorities referred to in Article 16a (Official Journal of the EU, 31.1.2009, L 30/107).

Type of operation	Articles and measures	Potential effects
Preventive mechanisms against adverse effects of climate-related events (e.g. setting up of hail nets)	Article 26; modernisation of agricultural holdings	Reduction of negative effects from extreme weather events on agricultural production potential
Flood prevention and management measures (e.g. projects related to coastal and interior flood protection)	Article 20; restoring agricultural production potential damaged by natural disaster and introducing appropriate prevention actions	Reduction of the negative effects of extreme weather events related to climate change on agricultural production potential
Training on use of farm advisory services in relation to climate change	Article 21; vocational training and information actions Article 24; use of advisory services Article 58; training and information	Provision of training and advice to farmers to reduce greenhouse gases and to adapt to climate change
Conversion to more resistant forest stand types	Article 47; forest-environment Article 49; non-productive investments	Reduction of negative effects of climate change on forests

Climate change adaptation and mitigation in strategy building

The negative consequences of climate change will increasingly have to be addressed by rural development. This includes improving the resilience of farming systems and rural areas in general and assisting prevention and restoration activities. More powerful incentives will be required to encourage land management practices which maintain ecosystem services and preserve carbon sequestration potential under a changing climate, and promote adaptation options which conserve water, protect against extreme weather events and combat desertification in specific regions of the EU.

To achieve this, climate has to be considered as a horizontal issue for strategy building. As a starting point in the implementation of a new programming period a Council Decision was needed to define strategic priorities of the EU; this decision provided the basis on which each Member State will prepare its national strategy plan as the reference framework for the preparation of rural development programmes. National strategies have to be created based on the Community Strategic Guidelines (CSG) which set out the common goals and priorities. The CSG are in principal binding for Member States, but its content is quite general and, consequently, it is difficult in practice to use them as a reference for judging whether a specific national strategy or a particular programme deviates from them. Therefore, the CSG has not proved to be a powerful guidance instrument in practice for the approval of programs.

The Europe 2020 strategy seems to imply a Single Strategic Framework for all structural funds and the European Agricultural Fund for Rural Development (EAFRD), rather than separate strategic guidelines. If the aim was that EU level strategy for rural development should be part of an overall EU strategy for structural funds, parts of the common strategy referring to climate change and renewable energy would be defined at an inter-service level. This would most likely strengthen the role of these objectives in the RDPs and if it is focused and includes guidelines with an operative content, the common strategy could provide a stronger tool for the programme approval phase.

National strategies are obligatory elements due to the current regulation, though they are not approved by the Commission. It is currently being discussed as to whether the strategy could be combined with programmes and hence become subject to a formal approval procedure. One possibility for orientating programme content more strongly towards common objectives, such as climate change adaptation and mitigation, would be to require more detailed and concrete national / regional strategies which include specifications on how EU level priorities have to be covered. More precise instructions on how to deal with climate change within the strategy and programming phases could be justified as the issue continues to have a high priority as a common objective.

Rural development and climate change adaptation for the future

The rural development toolkit is already quite complete with regards to climate change, however, a number of new measures and changes in old ones could further strengthen the ability to combat the negative consequences of climate change. One possible new measure, mainly contributing to adaptation, could be support for insurance premia or mutual funds. This might require an assessment of the adequacy of existing instruments for addressing the impacts of climate change, such as under Articles 68-71 of the regulation on direct support, and where it would be most appropriate to place them among CAP instruments. Another possible new measure, mainly aimed at mitigation, could be a special instrument which encourages comprehensive action plans for climate change activities and offers a more powerful incentive for transition towards low emission farming. This could be in the form of

"climate contracts"; multi-annual engagements signed by farmers and/or other land managers defining a combination of actions that aim at improving the greenhouse gas balance of the farm, either by reducing emissions and/or by enhancing carbon sequestration, and stipulating associated medium-term targets. An extension of the instrument would also be possible to cover adaptation, co-financing action plans for fostering resilience against climate change impacts.

A number of changes to current measures could promote their better use. Those particularly related to climate change adaptation could include more effective communication and use of EU-level information to raise awareness and improve technical understanding of the most important land and soil management measures, adding requirements to address climate issues when granting support for setting up an advisory service, adding selection criteria that give priority to projects which help to combat climate change effects, stronger restrictions related to water use and greater promotion of small water retention systems at the farm level as well as the use of forests to protect water resources, and simplifying and regrouping the current forestry toolkit to a set of fewer measures with simpler and less restricting conditions. Finally, it would also be important to strengthen the possibilities of using RDP measures to mitigate the effects of climate change by increasing the resilience of ecosystems, including on a territorial scale beyond the level of individual farms.

Our interviewees stressed the importance of fostering resilience and adaptation to climate changes. Farming is prone to climate change impacts at different scales across the EU depending on the exposure to adverse impacts and on the socio-economic context. Some regions/productions will be more affected, and the unequal effects of climatic changes may deepen economic differences between rural areas. On a long term basis, climatic pressures may lead to further marginalisation of agriculture or even to the abandonment of agricultural land in some parts of the EU, which could fundamentally impact food security, landscapes and biodiversity and influence the overall development of European regions.

Numerous farm practices have substantial potential, both individually and in combination, to counterbalance adverse climatic changes and to benefit from positive ones. Farmers need to be aware of the possible changes and their impacts, and have available sufficient knowledge, advice as well as financial incentives through rural development in order to be able to apply appropriate adaptation practices.

5.2.6 *Some important issues*

Debate about conservation and/or adaptation

According to some of our interviews, a tension prevails between advocates of conservation and adaptation, the former represented mainly by DG Environment and often by ENGOs, the latter more supported by DG Clima, DG Agri and various industries. The 2006 EU Action Plan for Biodiversity set out the objective of stopping biodiversity loss in Europe by 2010. This has obviously not been accomplished, and the new strategy accepted in 2011 sets the same target for 2020, however, according to our interviews, it is equally impossible to achieve as the previous one.

"We should decide once and for all if there is climate change or there is not. If there is, we should give up the strict conservationist view (all of us) and put much more emphasis on adaptation, since the change is inevitable and unstoppable."

This would also put an end to the criticisms that supporting adaptation is dangerous as it takes attention away from mitigation that we met several times during our interviews. Namely, if

climate change is acknowledged as an ongoing, irreversible process with already apparent symptoms, it comes naturally that besides trying to reduce the cause of the change (mitigation) trying to reduce and/or eliminate adverse effects (adaptation) is a necessary and rational complimentary objective. The fact that binding international (from developed and emergent economies) commitments for strengthening mitigation are not progressing substantially, also reinforces the need for adaptation.

Difficulties in providing evidence on impacts

Measuring climate change and the effects of policies contributing to climate change mitigation and adaptation is inherently complex and difficult. The Common Monitoring and Evaluation Framework (CMEF) covers climate change only in a very limited way. There is a need to analyse in particular how the existing indicators can be further complimented to better reflect what is achieved by actions related to climate change and renewable energy. The baseline data is often missing, and agricultural and land management practices have effects on different dimensions of climate change, each of which is subject to a complicated chain of causalities in which a large number of factors play a role. Quantifying this mixture of effects and making them operational in rural development programmes is still at an early stage. Further, the policy instruments currently used under the umbrella of the CAP in view of combating climate change often serve multiple purposes. This can be illustrated by agri-environmental support for land use change which aims to achieve multiple environmental objectives, for example, the conversion of arable land to permanent grassland reduces nitrous oxide and enhances carbon sequestration but also benefits biodiversity and water quality.

General view on climate change adaptation/mitigation

The focus is mainly on mitigation, adaptation comes second. Mitigation is a more tangible (and measurable) policy goal when compared to adaptation. This is also apparent in the analysed documents, too, though adaptation is now there, in addition to mitigation, in almost every important sentence of key documents. However, it often looks like a late addition to the picture and when looking at the content of measures, adaptation still does not have a high relevance in policies. The available documents are first of all about biomass and energy production that does not change radically the unsustainable development path followed so far. Less emphasis is put on transforming current large-scale high input agriculture. Grandfathering and trading of CO_2 emission quotas have served the interest of existing market actors and been able to support gradual improvements at best. Climate adaptation is part of the vocabulary, but not as much strategically supported as some scientists and, in some cases, farmers (and foresters/forest owners) who feel most vulnerable would like to see it.

5.3 Sectoral policies in Scotland

In this section we examine adaptation policy as it is expressed in three areas. These have been chosen in the context of the wider CLIMSAVE project, but map to three of the sectors with adaptation plans under the Scottish Climate Change Adaptation Framework. During the interviews underpinning the research there were repeated mentions of issues such as weather proofing houses and the need to ensure that transport and utility infrastructure is more resilient, and it may be that these are higher profile sectors in adaptation policy at present than those presented here.

5.3.1 *Agriculture*

Scottish agriculture is expected to be a leading player in the protection and enhancement of our environment (Scottish Executive, 2001). The sectoral adaptation plan (Scottish Government, 2007a) recognises opportunities in climate change as well as risks, and is markedly upbeat. However there is not a very clear picture of the degree to which agricultural producers have engaged yet. The agricultural sector is diverse, and considered to be robustly adaptive (Scottish Government, 2007a). It is an important sector in terms of land use as 75% of Scotland is farmed (Scottish Environment Link, 2008a). Thus even though the direct economic contribution is much lower (around 2% of GDP), the impact of climate change on farming practice has implications for many social and environmental issues and for other sectors too.

Expected impacts include changes in precipitation and temperature, and there is also a recognition that significant effects will arise from climate change in other parts of the world. Agricultural production in Scotland depends on inputs from other parts of the world and thus climate change has the potential to severely disrupt current methods of production. Other issues include how to adapt to new production methods that emit less carbon, and the rise of new pests and diseases.

The Agriculture and Climate Change Stakeholder Group identified short term and long term responses at the farm level, as well as on-going but longer term institutional factors (ACCSG, 2008). In the current iteration of the adaptation plan there are three main priorities: enhancing research on agriculture and adaptation, improving farmers' adaptive capacity and strengthening the role of agriculture as a provider of ecosystem services. The weighting of the action proposed seems to lean towards research and understanding, although there have also been initiatives such as the Climate Change Programme, delivered by the Soil Association, that has delivered training to farmers on some adaptation issues. There is a clear sense that in the near future the main issues for agriculture are more strongly linked to mitigation than adaptation, although the measures to assist Scottish Agriculture in contributing to climate change mitigation may well apply to adaptation too.

During the next year or two, the debate on the next round of the EU's Common Agricultural Policy will be central. CAP incentivises land managers to pay attention to environmental issues through cross-compliance or support payments. There is not much in this at present linked to adaptation, and the pillar 2 agri-environment schemes, which are voluntary and discretionary allow more scope. However, the link to local and regional adaptation or land use strategies could be much stronger, and it is possible that much longer support will be required in order to bring famers into schemes which require significant commitment, for example, replanting woodlands for catchment management.

5.3.2 *Biodiversity*

It is said that there are around 90,000 native species in Scotland (Wright, 2009), many of which are under threat from human impacts such as habitat loss. Scotland has a particularly rich mosaic of threatened habitats and some effects of climate change on biodiversity and species distribution have already been observed. The Scottish Biodiversity Strategy (Scottish Executive, 2004) recognises that some changes to species and habitats through climate change are inevitable and irreversible. Challenges such as competition from new species extending their range, the rate of change, and a lack of migration options for species living at the edge of their range are all issues. Yet climate change is just one pressure amongst many on biodiversity and the issue is the extent to which it be will further threatened. Conversely,

mitigating other threats to biodiversity may be one of the most effective measures for enabling natural adaptive processes to operate.

The Biodiversity Action Plan covers biodiversity and conservation and ecosystems services on land and inland water bodies (Scottish Government, 2007c), and protecting biodiversity is constructed primarily in terms of maintaining or enhancing species and habitat resilience through (i) maintaining the extent and diversity of habitat types, (ii) enlarging existing areas of habitat, and (iii) strengthening habitat networks. This is embodied in measures such as the action to develop a national ecological network in the National Planning Framework (Scottish Government, 2009b). In fact, building resilience through improving the connectedness of habitats has been a pre-occupation for some time (Scottish Executive, 2004).

Policy support for protecting biodiversity is evident at all levels of governance, with biodiversity strategies and action plans evident from the EU level to the local (see Wright, 2009). There is considerable support for making use of the ecosystem approach (UNEP, 2010) something based on ecosystems services, although much work will be required to operationalise either. Current issues that are being addressed include the possibility of peat land drying out (which would have a negative impact on mitigation too, with the release of locked up carbon) and the potential loss of salmon fisheries as the rise of inland water temperatures reduces their breeding grounds.

5.3.3 *Water*

Water policy is at an interesting stage of development in Scotland, with the Flood Risk Management (Scotland) Act 2009 just being put into practice, and the development of River Basin Management plans. In terms of the Water Environment and Resource Sector Action Plan (Scottish Government, 2007d), this means there is more detail in terms of implementing measures than some of the other sectors and a clearer picture of how the action plans may work. There is also a more concrete role for local government, as they carry primary responsibility for flood protection measures.

Three issues are identified in the climate change adaptation sector action plan: (i) flooding, (ii) water supply, and (iii) water environment. Of these, the primary one is flooding. For individuals a flood can be a traumatic experience, with direct economic losses for those surveyed by Werritty et al. (2007) averaging around £45,000, as well as considerable effort to set things right and deal with insurers and so on. Werritty et al. (2007) report a good general awareness of increased flood risk due to climate change amongst stakeholders.

SEPA is the lead agency on implementing the response under the Flood Risk Management (Scotland) Act. Measures under the act include assessment of flood risk, preparation of flood risk management plans, improvements to co-ordination between stakeholders and the engagement of the public in managing flood risk. The Scottish Government has issued guidance related to the Flood Risk Management Act that specifically mentions climate change and the duties arising from the Climate Change (Scotland) Act when considering flood risk management options. However, the SEPA flood risk mapping is still running behind the effort of the UK Environment Agency (EA), and the incorporated climate risk is still not based on most recent climate change projections.

In terms of infrastructure, the act also covers dealing with the risks of reservoirs breaking. In addition, Scottish Water and OFWAT are required to make sure the supply network continues to operate under future conditions, and there has been work on creating sustainable urban drainage, such as the scheme in Glasgow. Improvements to utility networks are paid for by customers and the utility company and regulator negotiate the appropriate prices to support

the required investment, balanced against the need to keep the cost of basic utilities reasonable.

Throughout the policy documents, position papers and consultations on water policy there is a sense that working with nature is becoming the preferred option rather than hard engineering. Catchment management and ecosystems approaches that seek to slow water down with changes to vegetation cover are becoming more common. There are still issues to address though in terms of the investment scales required by landholders to secure such options, and that often the risks or benefits of catchment approaches happen in different local authority areas than where the investment is required.

5.3.4 *General features of policy integration*

Adaptation to climate change cuts right across sectoral boundaries, something which traditionally causes difficulty in setting and implementing public policy. Although within the Scottish Government there are clearly identified units and individuals with responsibility for addressing adaptation issues, their challenge is how to integrate policy production across departmental boundaries and in conjunction with a constellation of different external partners. The public duty on public bodies requires many policy actors to take account of adaptation and mitigation in carrying out their duties, and the important question is how. There are also wider questions about integrating the actions of other actors into the developing policy.

Legislation

In terms of the legislation and the resulting strategies there has been considerable effort to make linkages between different initiatives. The Scottish Climate Change Adaptation Framework (Scottish Government, 2009c), for example, pays attention to cross-linkages within each of the sectoral action plans. The need for a sustainable land use strategy was written into the Climate Change (Scotland) Act, because of a perceived need for connections to be made between different strategic frameworks for land use, and to resolve conflicts between them (Scottish Environment Link, 2008a). It is important because adaptation is about making choices and the framework is intended to provide a basis for that.

However, in practice, there is still much work to do in terms of implementing such strategies. The Sustainable Land Use Strategy is primarily rural in focus, with urban and infrastructure development covered in the National Planning Framework (Scottish Government, 2009b), which has an even less developed treatment of adaptation issues. Co-ordination between the strategy and the framework is going to be necessary (Scottish Environment Link, 2008a), but it is not yet clear that this is in hand. In addition many policies and strategies are in their first iteration, and as a result still very high level. It may well be necessary to produce more regionally focussed policies in order for them to become more concrete, and the experiences of the two National Parks in Scotland may show the way forward for this.

Governance

Institutionally, Scotland benefits from a strong governance culture and the dense network possible within a smaller polity. Outside of government, the NGOs have taken a leading role in developing adaptation policy and there is evidence of some very effective lobbying. The private sector is less visible, but as their interests are affected this is likely to change and there is some evidence of some industries such as the salmon fisheries engaging with adaptation.

In terms of vertical linkages, there are strong mechanisms with both local and national government. Local government, for example, is subject to the public duties with regard to

climate change arising from the Climate Change (Scotland) Act, and the resulting reporting. Where local authorities and other public bodies can link this to their remits, this becomes very useful, and there is considerable effort to build awareness and capacity around climate change issues. While much of the current capacity has been around mitigation, initiatives such as the Climate Challenge funds have adaptation measures buried within them, and existing bodies such as the Sustainable Scotland Network have been working in this area for some time.

Co-ordination of climate change policy with the rest of the UK is dealt with through several mechanisms. The UK Climate Change Act in 2008 was followed with a concordat (HM Government, et al., 2008) between the two UK government departments and the three devolved administrations with responsibilities under the act. The concordat, which is a statement of principles rather than a legally binding agreement, lays out how the different administrations will co-ordinate their work. It describes the work of, and core funding model for, the Committee on Climate Change, which provides independent advice to the various parties, and the subsidiary Adaptation Sub-Committee, which provide independent advice to the Scottish Government, alongside the other UK administrations. There was not much evidence of direct linkages to EU policy on adaptation, though this could become important during the CAP negotiations.

Discourse

Policy integration also happens around ideas, and the discourse around sustainable development seems important. It has a long history as a cross-cutting policy issue in British politics, and thus has wide exposure as a concept and also as a practical implementation issue. As well as explicit recognition of climate change as a sustainable development issue, many of the institutions and ways of thinking about policy for climate change owe something to the policies developed in response to Agenda 21 (UNCED, 1992). For example, having a central policy unit to deliver co-ordination rather than policy per se, and an emphasis on governance and partnership.

Another example of the effect of discourse as a point of integration is the commonly shared project to make Scottish Governance work. Given that devolution is fairly recent, there seems to be considerable goodwill for ideas and policies which demonstrate Scottish success. Headline projects such as developing a very progressive mitigation policy have already come into fruition, and adaptation is another site of potential national pride.

Links between adaptation and mitigation policy

An issue that was raised by several interviewees was the links between mitigation and adaptation policy. In the past there has been a hesitation to link these, possibly because of past concerns that paying attention to adaptation implies watering down commitments on mitigation. However, as elsewhere, there is now an appreciation that some climate change is inevitable and that adaptation is not an alternative to mitigation. As delivering mitigation proceeds, the need to adapt to the effects of mitigation policy is becoming important. Where mitigation and adaptation measures reinforce one another (such as preserving peat lands which has benefits for both carbon sequestration and biodiversity conservation) there are considerable opportunities for integrated policy development.

Summary

In summary there is considerable effort being expended to deliver integrated adaptation policy in Scotland. While there is evidence of gaps, particularly when it comes to implementation,

some of this may be because adaptation policy is still relatively undeveloped. Given the underlying strengths in governance and the demonstrable intention to create a strong climate change policy, the disjunctions in policy can be interpreted as opportunities as much as problems.

6. Policy and practice in Scotland

6.1 Highland Council

The Highland Council is the largest of the 32 local authorities in Scotland, with a population of around 250,000 (see Figure 1). Its size makes it less than straightforward to manage in terms of climate change, with significant diversity in both current and projected climates, particularly between the east and the west of the region. The local authority is based in Inverness, but maintains local offices throughout the area. At present the administration is controlled by a coalition of independent councillors, the liberal democrats and labour parties. Council elections are due in 2012.

Figure 1: Location map for the Highland Council (light green areas) in Scotland.

There is good political support in the Highland administration for climate change and environment. This is possibly linked to a perception of the Highlands as an area with a very good natural environment, and environmental issues as a vote winner. The external policy drivers include the council's duties under the Climate Change (Scotland) Act, and the UK's Civil Contingencies Act. However the council, as other local authorities in Scotland, has been an active advocate of action on climate change, contributing to initiatives such as Scotland's Climate Change Declaration, and a joint Regional Declaration on Climate Change. Under the Scottish Climate Change Declaration, the Highland Council has committed to producing an annual statement on local progress towards mitigating climate change and identifying how the local authority should adapt to its likely effects. This is submitted to the Sustainable Scotland Network, and such reporting is providing a template for the reporting required under the Climate Change (Scotland) Act.

Within the Council, climate change policy is dealt with by the Policy and Performance unit within the Chief Executive's office. There is a climate change working group that meets quarterly, and its recommendations go to the appropriate committees for ratification. The Council's policy on climate change has three strands: (i) mitigation in operations; (ii) carbon emissions data for the region; and (iii) adaptation. Screening has been introduced in decision-making, and all papers have a section at the end that spell out the implications in terms of

standard headings, such as gender equality. This includes a section on climate change, and therefore every decision is made on the basis of information that includes a consideration of climate change. However evidence from internal surveys shows that there is a huge variance in understanding of climate change issues, and in practice examinations of committee decisions shows that often the consideration of climate change is cursory. There is now a plan to do some training and awareness on climate change through the Council's continuing professional development.

Adaptation policy is the least developed so far, and perhaps has less political buy-in than mitigation. However, there is a draft report laying out the council's position on adaptation (Highland Council, 2010) and this is currently being revised after a consultation exercise. Amongst other things, the action plan in the report will seek to map out the key physical areas and vulnerable communities at risk. There have been a range of initiatives within the council and with its stakeholders, and local events such as the last two very cold winters, flash flooding, moorland fires and the collapse of the Wick harbour wall have been useful in raising awareness of the risks from climate change and the relative costs of preventative and remedial action to deal with it.

In terms of local governance, much climate change policy comes under the single outcome agreements negotiated with community planning partners. This covers the issues that the partnership agrees to work on jointly under a national framework. Thus, for example planning habitat corridors and networks is covered through the Highland Community Planning Partnership, and the Highland Environment Forum. In terms of the other sectors covered in this report, the agriculture sector has had the lowest response to council initiatives so far. With water policy, there is a Flood Advisory Board being set up in Highland, but the council isn't quite yet thinking in terms of catchment management. It is working with SEPA on implementing the new flood warning system, and has new powers under the flood management legislation to inspect all water courses to locate and remove obstacles.

The Highland Council has also been developing tools to work with local communities to build up awareness of adaptation and to start to plan for it. This has required work to build up a knowledge base gathering data on past weather impacts and climate trends, looking at future climate trends, and conducting workshops looking at delivery and impacts. A Local Climate Impact Profile (Highland Council, 2008) was carried out, which examined recent climate events in the media and any reported response. Some of these events where then explored further to look at the costs to the council and what could have been done to reduce these. A community level adaptation planning process has been piloted in Gairloch, and it is intended that this will become a template for other communities to do the same.

7. Tools for developing policy

CLIMSAVE's main products are the Integrated Assessment Platforms for Europe and Scotland which are exploratory tools which aim to help stakeholders increase their understanding of cross-sectoral climate change impacts and opportunities for adaptation. It is therefore worth examining the place of such tools in policy and practice in Scotland. We also look at the value of using extreme weather events to trigger discussion about adaptive capacity and whether analysis of such events can provide useful information on general lessons that can be learnt on resulting policy responses, the type of trigger(s) for the response and the effectiveness of the policy response.

7.1 Decision support and exploratory tools

As a key objective of CLIMSAVE is to deliver an interactive web-based tool, the policy relevance of such tools was explored during interviews. Decision support tools (DSTs) are currently fashionable and there is a documented desire for evidence based decisions in climate change policy-making amongst Scottish stakeholders (Scottish Government, 2009a). Most interviewees had used them in one way or another, and this section summarises their opinions and advice on how to optimise the CLIMSAVE output for use in Scotland. It should be stressed here that the CLIMSAVE Integrated Assessment Platforms are not intended to be DSTs, but rather exploratory or learning tools that increase the users understanding of cross-sectoral vulnerability to multiple drivers of change (both climate change and socio-economic change).

There was a very mixed response to the idea that decision support tools are used directly in decision-making. Several interviewees challenged the idea directly, pointing to the need for an understanding of the evidential base for a recommendation. In this way of thinking, such tools provide interesting background information and possibly have application in demonstrating the basis of a decision, but are often not transparent enough to provide confidence. On the other hand, particularly in local government, there was an appreciation of the range of tools available to decision-makers in the UK.

An area in which exploratory tools are being used successfully is as tools for driving discussions and highlighting where different interests are aligned or in conflict. This requires the tools to be useful in areas where there is a difficulty and a need for dialogue and resolution. Tools need to be evidently relevant, and this requires a strong appreciation of the nature and interest of the proposed clients of the system. In current practice in Scotland, these range from highly informed technical experts to members of the public. There is a wide range of professionalism amongst potential clients and while intelligent interface design can help, it may be that some mediation is always going to be required. Existing tools each have their own particular quirks and an examination of existing tools used in Scotland, such as the UKCP09 projections, will assist in interface design.

Being able to tailor outputs to appropriate spatial boundaries is important. Local authorities, for example, like to be able to explore things at the scale of their local authority area. Use of existing indicators such as the Scotland Performs (see Scottish Government, 2007b) targets, outcomes and indicators established in the 2007 spending review may help make the CLIMSAVE tool more accessible.

7.2 Extreme weather events

There is evidence that past extreme weather events are being used at national and local levels of governance to explore resilience and highlight adaptive options. This does not seem to have been a strong focus of policy or practice particularly, but rather something that has been used on occasion to provoke discussion. For example, a media trawl for extreme weather events is part of the Local Impact Climate Profile (LCIP) tool piloted in Scotland in 2008 (e.g. Highland Council, 2008), and this may have resulted in a general awareness of the approach.

The recent cold winters in the UK and the resulting challenge for individuals, businesses and public services were mentioned in several of the interviews. The cold winters had a high media profile throughout the UK and a particularly severe impact in Scotland, and were explicitly linked with climate change in much of the discussion. In winter 2010-2011 media stories featured research (Petoukhov & Semenov, 2010) that explicitly linked global warming with an increase in extreme cold during winter in Europe. A presentation of the science

behind the suggested link (and prediction) and an analysis of recent media reports affecting Scotland, following the LCIP tool would be a useful way of probing resilience, contingency planning and potential adaptation policy amongst stakeholders.

What extreme cold does not yet do very effectively is to provide a strong narrative that explores long term trends with repeated high impact across all levels of governance. Given the timescales involved in the CLIMSAVE models, there are two further options and perhaps one of these could be used to supplement the extreme weather event approach. One is to present a history of flooding policy and flooding events over the last 50 years, as this is reasonably well documented and researched. However it may take considerable effort to compile. The second option would be to use the media stories and surrounding analysis of the ongoing financial trouble as a proxy for climate change – there is a good general awareness of the issue, it is ongoing and tests resilience across the public and private sector to a global stressor that is mostly beyond their influence.

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