Connecting multiple levels of governance for adaptation to climate change in advanced industrial states

E. Carina H. KESKITALO[1] (Carina.Keskitalo@geography.umu.se)
Sirkku Juhola [1] (Sirkku.Juhola@tkk.fi)
Lisa Westerhoff [1] (lisa.westerhoff@gmail.com)

Forthcoming in: *Connective Capacities in Water Governance* (eds. J. Edelenbos, N. Bressers and P. Scholten). Ashgate, London.

1 Department of Geography and Economic History, Umeå University, Umeå 90187, Sweden. Tel. +46-90-786 50 80. Fax. +46-90-786 63 59

Abstract
A coherent application of a multi-level framework that takes interactions between levels and how these are shaped by the political system into account is a prerequisite for understanding the development and implementation of climate change adaptation policies and practices. Drawing upon multi-level cases in the UK, Finland, Sweden, and Italy, the study shows that an exclusive focus on national adaptation policy obscures the complexity of emergence of adaptation across multiple scales. National policy development does not always result in local implementation or policy. In some cases, national policies develop with the support of initiatives from regional and lower levels, while policies may also develop locally in absence of state policy. Policy development at sub-national levels may also be formed by structures beyond the state, such as the European Union.

Keywords
Adaptation; Climate Change; Multi-Level Governance; Europe; Advanced Industrial States

1. Introduction

The need to adapt to the impacts of climate change (IPCC 2007) has resulted in the proliferation of adaptation strategies among advanced industrial states. The majority of countries in the European Union (EU) now have or are in the process of producing guidelines for action on adaptation (EEA 2010), joined by many industrial countries in other parts of the world, i.e. Canada and Australia. Many of these initiatives are contained within national adaptation policies, which range from broad statements on the need to adapt, to detailed assessments of sectoral vulnerabilities and possible measures for adaptation. In addition to developments at the national level, adaptation initiatives have also emerged at regional and local levels across Europe (Ribeiro et al. 2009) and elsewhere in the industrialised North (Westerhoff et al. 2010). These regional and local adaptation strategies have predominantly emerged in larger cities, or regions, and often address specific local vulnerabilities.

Studies on the development of planned adaptation in Europe and other highly industrialised states have begun to emerge, although their numbers are so far limited (Gagnon-Lebrun and Agarwala 2007; Massey & Bergsma 2008; Swart et al. 2009). Early studies on the emergence of adaptation policy focused on the National Communications of the United Nations Framework Convention on Climate Change (UNFCCC) in order to compare the developments between countries (Gagnon-Lebrun and Agarwala 2006; Gagnon-Lebrun and Agarwala 2007; Massey & Bergma 2008).

In general, explorations of specific adaptation policies has mainly focused on the national scale in the discussion of national adaptation strategies (cf. Swartz et al. 2009; Biesbroek et al. 2010). Arguing that until then these developments had 'only been assessed in a superficial manner' (Biesbroek et al. 2010, p. 441), one recent set of studies has analysed the development and content of national adaptation strategies to draw lessons on the emergence of adaptation (Swart et al 2009; Biesbroek et al. 2010). These authors briefly discuss national adaptation strategies through the lenses of science and policy, information dissemination, policy integration and multi-level governance. In an analysis that focuses particularly on the national level, the authors conclude that due to their recent development, most national adaptation policies do not explicitly specify the roles and responsibilities for adaptation at lower levels of governance (Biesbroek et al. 2010).

This issue of limited integration between levels – limited connectivity – constitutes an impediment to effective interaction on adaptation. In cases where divisions of responsibility and authority between different levels are not clear, effective multi-level governance is impeded as lower levels may not gain sufficient guidance as to what their responsibilities are or, indeed, funding to cover any implicit or explicit responsibilities (cf, Keskitalo 2008). Such problems may be particularly grave with regard to adaptation, as this constitutes a new policy issue for which actors at different levels may be unwilling to take on responsibility – and cost – unless determined through national decision-making processes. In local and regional cases where vulnerabilities and needs for adaptation are identified, the lack of clear divisions of responsibility, authority and funding may also limit the possibilities for lower levels to act on the issues or to claim support from the state. This is despite that identification of needs for adaptation may often emerge at local or regional levels (Naess et al. 2005). Studies of adaptation policy development at the regional level have so far been less prominent within the field, though studies of regional adaptation policy are currently under development (Ribeiro et al. 2009). Instead, the local level is often seen as the level at which impacts of climate change will fundamentally manifest, and that will ultimately need to respond to them (cf. Næss et al. 2005). As a result, a large number of case studies have targeted the local level and community adaptation specifically (see e.g. Hovelsrud and Smit, 2010).

Though the need to view local adaptation in the context of other levels has often been highlighted as a general requirement for adaptation studies, few studies have yet to focus on these interlinkages and connectivities across levels (see Keskitalo 2008 for a discussion on how adaptation at the local level is dependent on regional, national and even international governance). This study asks *how national adaptation policy or attempts to develop national adaptation policy have evolved across scales.* The study thus assumes that national policy may not only be a result of national level developments, but must be seen in context and possibly as a result of interaction at different scales. To do this, the paper advances a coherent framework for the functions and abilities at different levels, and targets its research at local, regional and national level actors in four countries: the United Kingdom (UK), Finland, Sweden and Italy. The paper reviews four industrialised countries with varying degrees of national engagement in adaptation policy, and draws on a multilevel case study using policy and interview data at national, regional and local levels. As water-related hazards were in particular focused within these developments on adaptation, the study has a particular relevance for the water governance field.

2. Theoretical framework

A coherent application of a multi-level framework that takes the interaction between levels and how these may be shaped by the political system into account is a prerequisite for

understanding the development and implementation of adaptation. Climate change adaptation is an issue that requires coordination across levels and sectors, and highlights the need for legislation and regulation that may support the varying impacts and circumstances experienced by different localities. The concept of multi-level governance helps to highlight this interrelation between levels by demonstrating that the steering of decision-making is no longer a function of government only, but of a broader array of actors and levels (Boland 1999; Hooghe and Marks 2003). The multi-level governance concept has been developed out of literature that shows that decentralisation to other levels may make regional/local and supranational (international and EU) steering more important. While this shift does not supplant the state, it both adds to and changes decision-making processes. Initiatives that manifest on the state level may therefore originate at other levels and be "lifted" to the level of the state and formal decision-making processes through such processes as lobbying from influential regional or local actors (Rhodes 2000). Initiatives may also manifest at the national level as a result of state commitments under international conventions that bind states to decision-making that originates elsewhere. Within the EU context, states have also agreed to be bound by EU legislation, so that directives taken on the EU level directly become law in EU states (Princen 2007).

The potential for more informal processes on local and regional levels or in connection with other actors such as the private or third sectors have resulted in the prevalence of less easily distinguished processes for decision-making as for hierarchical, state-steered decision-making. Governance may take place by more or less fluid networks or pressure groups, while decentralisation may further result in a larger role for city networks or voluntary local level declarations in decision-making (Rhodes 2000). Given that some processes have moved up to the international level (or in Europe, to the EU level), network governance may also allow some actors to "jump scale" (Gupta 2008, Princen 2007) by drawing on or even lobbying processes at such levels, thereby superseding the level of the state.

The way in which such processes take place and the extent to which national, regional, and local levels are able to gain influence largely depend on the characteristics of a given national system and the power it attributes to different levels and actors. These factors have been developed more generally in the political science and, to some extent, planning literatures, but have not been examined specifically in relation to the development of adaptation. National systems can be said to differ along formal structural lines, such as the unitary-federal organisation of the state or along a spectrum of centralisation-decentralisation, as well as along informal characteristics, such as the general decision-making culture. On the *national level*, a differentiation can be made between unitary states that are in some ways less attuned to acting on multiple levels, and federal states characterised by the relationship between self-governing states and the national (or federal) level (cf. Ljiphart 1999). However, these distinctions obscure the great variety among both federal and unitary states, where levels of decentralisation may differ significantly between states (Ljiphart 1999; Newman and Thornley 2002).

For adaptation, one important aspect regarding the decentralisation of power concerns the planning system and the responsibility for physical planning. Here, for instance, Sweden and Finland are unitary states which nevertheless have a very decentralised structure with 'planning monopolies' at the local level (cf. Peters and Pierre 2005), whereas the English administration within the UK is instead strongly centralised with limited power allocated to local and regional levels (Sandford 2005). Informal characteristics of each country framework may also impact national functioning: for instance, Newman and Thornley (2002) note that

northern Europe follows a structure of conformity to legal and formal requirements, whereas countries in southern Europe may exhibit some differentiation between formal law and implementation requirements. States also differ in the extent to which they rely on more traditional bureaucratic means of steering (such as regulation), or have included so-called New Public Management methods, including economically based incentives or partnerships with the private sector (Rhodes 2000).

This context defines the ability of different levels and actors to act within each system. Differences in the extent to which responsibilities are decentralised create differences in the role of the *regional level*, ranging from fully-fledged regional governments (in federal and some unitary states) to purely administrative levels that constitute the regional arm of the state (Keating and Loughlin 1997). Different regions within a country may also reflect diverging capacities, where larger, economically richer and politically more powerful regions may be able to create networks and lobby the EU or other regional or international power centres, thereby affecting regulation and accessing resources in a way that smaller, poorer and politically weaker regions cannot. This argument, which to some extent formalises aspects of adaptive capacity, is captured in 'new regionalism' literature (e.g., Veggeland 2000) in the political science field.

At the *local level*, differences between states range from those that provide the local level power of 'general competence' to take local actions permitted by law and perceived as in the interest of the local citizenry, to those that only give local level the right to fulfil explicitly given statutory aims (Wilson and Game 2006). Like regional actors, local actors may be able to access levels beyond those immediately relevant to them by 'jumping scale' (Princen 2007, Gupta 2008). As Princen (2007) notes for the EU, 'subnational and private actors will turn to the EU in order to bypass their national governments' (p. 26-27). This may take place through the use of EU funding mechanisms or by developing coordinated actions together with actors other than national level (cf. Bulkeley 2005). Local actors may also act through coordinated local government or city networks on national or international levels (cf. Bulkeley and Betsil 2005), or through dedicated local government interest organisations that exist in many European countries, thereby contributing to network governance (Rhodes 2000).

3. Methods

3.1. Case study selection and data collection

The selection of the UK, Finland, Sweden and Italy as the focus of this study was based on the need to explore a range of advanced industrial states with varying engagement with adaptation policy was identified for inclusion in this study. Firstly, the United Kingdom has been noted as one of the few developed countries that has begun to implement a "comprehensive approach to implementing adaptation and the 'mainstreaming' of such measures within sectoral policies and projects" (Gagnon-Lebrun and Agrawala 2007, p. 401). The UK has instituted measures to integrate adaptation into the activities of national, regional and local governments and stakeholders, taking a multi-level approach that explicitly links levels to each other. Finland is also noted as an early actor on adaptation, but has chosen to mainstream adaptation across sectors at the national level, as outlined in its 2005 National Adaptation Strategy. Though structurally similar to Finland, Sweden began to develop adaptation measures later on in its 2007 Commission on Climate and Vulnerability, out of which recommendations for the allocation of responsibility to different scales and sectors were included in a 2009 Bill on climate change. Finally, Italy represents a slow mover on

adaptation policy, though attempts to form a comprehensive adaptation policy at the national level have been made.

The countries above also reflect a range of systems of governance, and include a spectrum of varying degrees of decentralisation within formal unitary states. Both Finland and Sweden represent Nordic governance systems in which local governments retain considerable authority in planning and other measures, guided by administrative regional level bodies. Conversely, the English administration within the UK is a clear example of a centralised administrationin which actions and funding are attributed in a top-down fashion from the national level.1 Though Italy is technically considered a unitary state, it shares several characteristics with federal states, particularly with regards to the increasing authority and autonomy conferred to the regions.

For each country, nested cases at regional and local levels were selected in order to assess the relationship between scales with regard to the development of adaptation policy. Cases that demonstrated an active interest or engagement in adaptation policies were selected, as evidenced through the development of adaptation strategies, the publication of relevant reports, and/or the participation in networks that sought to address adaptation needs. A biased selection towards localities that have been proactive in adaptation policy was thus sought in order to determine the existence of constraining or enabling factors for adaptation development in these cases. Where adaptation policy remained underdeveloped at local or regional levels, cases were instead selected for a demonstrated engagement or interest in climate-related policy in general (comprising either mitigation or climate-relevant risk management). Finally, as policies on water-related hazards were those most developed in the cases, the study has focused on these issues. Flood risk (and to some extent drought) thus represent issues that have so far been among those most focused in practical adaptation policy development in these cases.

Primary data were collected for this study from two principal sources. Firstly, comprehensive literature reviews undertaken during 2008 and 2009 allowed for the identification of adaptation policies and other measures at each scale. Documents reviewed included policies and legislation, climate impact reports, studies, and project documents, published by either government or non-governmental (e.g. research and advocacy groups) organisations. Secondly, interviews were conducted with adaptation policy-relevant actors at each level, targeting those actors who are involved in policy development or administration, resulting in a total of 94 interviews across the four European countries. Each interview was conducted in the language of the interviewee, transcribed and translated (Table 1).

Table 1: Case study selection on national to local levels

Characteristics / States	Adaptation policy development	Political system	Sub-national case study areas (specific nested local authorities or municipalities in brackets)	Semi-structured interviews
UK (England)	Often seen as leader with multi-level perspective,	Centralised administration (with regard	SouthEast England region (Hampshire and Surrey counties,	n=22

1 The UK administration covers what are considered as four countries in their own right: England, Scotland, Wales and Northern Ireland. This study particularly focuses on the English administration, which is governed by the UK government situated in London.

	regional organisations from early 2000s, Act 2008	to England)	selected lower-level local authorities Woking, Winchester, Portsmouth)	
Finland	First formal adaptation strategy (2005)	Nordic small-state with municipal planning monopoly	Uusimaa Region (Espoo, Tuusula, Kerava, Mäntsälä, Pornainen)	n=22
Sweden	Later and less focused adaptation development, Commission on vulnerability (2007), Bill 2009	Nordic small state with municipal planning monopoly	Västra Götaland (municipalities Gothenburg, Mölndal, Trollhättan, Munkedal).	n=25
Italy	No formally established national adaptation structure although attempts have been made	Large regional self-determination	Emilia Romagna (Province and City of Ferrara)	n=25

3.2. Applying the multi-level governance framework

To determine the ways in which adaptation policy has emerged or is emerging within a multi-level governance framework, it is necessary to assess the ways in which adaptation policies and other actions have been developed at each level. Such an assessment was conducted by applying a set of three broad questions to the empirical data:

1) What policies or initiatives have been developed on each level?
2) How have such policies been formed and through what influence by other levels?
3) How do such policies affect other levels?

Reponses to these broad lines of inquiry were situated within the respective system of governance of each country in order to determine the influence of the governance system in enabling or constraining adaptation action on and between different levels. In the following sections, adaptation policies and initiatives, the processes and actors involved in their formation, and their impacts at various levels are described for each of the four case study countries.

4. Results

4.1. Adaptation in the UK: England and South-East England

As a relatively centralised state, the UK's early action on adaptation has resulted in a multi-level, national to local framework with associated funding and funding criteria. Adaptation has been addressed at the national scale most importantly by the 2007 Climate Act (and an earlier Bill), and through the Adapting to Climate Change strategy for England in 2008 (UK Government 2008). Together, these have permitted the state to require any body that provides services to the state to report on their climate change adaptation activities, as well as to set up a framework for risk assessment. These actions were joined by state commissions for awareness and acceptance of the adaptation issue, such as the 2007 Pitt Review in response to flooding in 2006 (building upon long-term established concerns on vulnerability to flooding,

Cabinet Office 2007), and the widely acknowledged Stern Report (2006) on the economic impacts of climate change.

At the regional level, regional climate change partnerships (RCCP) were developed on central initiative from the late 1990s to support regional studies under the government's UK Climate Impacts Programme (UKCIP), a body that continues to support adaptation in English regions. Though the role of the region is limited, the RCCP act as a liaison between local authorities, existing regional agencies, industry and NGOs in each English region. As a result, the region has taken on a partnership-based role initiated by the state, while the UKCIP acts as a largely distinctive organisation that supports multi-level adaptation and integration. As one actor within the largely informal coordination group for RCCP noted, "without UKCIP. . .it would have been difficult, if not impossible, for regions to really take [adaptation] forward" (UK Interregional Climate Change Group, interview). In 2011, this role for the UKCIP was transferred to the Environment Agency, with consequences yet too early to determine.

The local level was also strongly steered from the central state during the time period of this study. In 2008/2009, the State institutionalised a new local performance assessment framework that comprises 198 National Indicators (NI), including one on adaptation (DEFRA 2009). Progress under this framework has implications for national funding attributed to individual local authorities, and thus constitutes an economic incentive. Out of 450 authorities, roughly 100 have selected the adaptation indicator as one of the 35 indicators on which they are assessed. The legislative and regulative framework therefore includes a well-integrated adaptation component to be undertaken within local authority partnerships with local stakeholders. The adaptation indicator has been particularly well received as a result of its more procedural approach and, in the words of a representative of an interest organisation for local government, has "encourage[d] people to … actually own the process a bit more" (Local Government Association, interview). In this case, then, strong national steering on adaptation was during this period supported by local interests.2

In one notable case, local process have also been expanded by national level organisations and used to develop stronger actions on adaptation. The Nottingham Declaration on local council mitigation and adaptation is a document that was voluntarily developed by local authorities and that binds signatories to certain commitments. Developed in Nottingham in the mid-1990s, the document gained in popularity following its re-launch in 2005 in cooperation with the UKCIP and other bodies. Noting the importance of this document for developing support for the local performance assessment (including the new adaptation indicator), one interviewee noted: "Government could never have set up something like that unless a bottom-up process had pre-prepared the regions and local authorities to accept it'" (UKCIP, interview). Voluntary local action was thus extended through the involvement of the UKCIP, and used as a basis for developing local priorities on adaptation, underlined by the Local Government Association's lobbying on adaptation. As such, the UK illustrates some level of network governance on adaptation despite the centralised nature of the English administration, where initiatives at the local level have influenced national activities.

In the South East England region, growth areas such as the upper-tier local authority Hampshire County Council have also played important roles in the development of early adaptation commitments, something that has been formalised for instance in an accord with central level on Hampshire developing good practice examples on adaptation. Due to its

2 The new UK government from 2010 has removed the indicator system, making it less clear how this national-local linkage will be developed in the future.

established position with regard to environmental policy it has also been lobbying the EU on adaptation. As a result, Hampshire may be seen as the type of actor able to benefit from mechanisms described in terms of "new regionalism", jumping scale to influence the EU level directly. However, significant discrepancies between areas do exist; for instance, both Hampshire and its neighbour Portsmouth have been concerned with climate-related impacts in the water management sector, but differ in terms of economic strength and leadership on environmental issues. In the lower-tier local authority of Woking, a novel funding arrangement and aspirations to leadership in environmental policy over the long term have instead supported the local authority's agency on adaptation. However, adaptation action in Woking has largely occurred as a result of the state performance assessment framework, again indicating the role that central state measures play at the local level. Following its development of adaptation actions in 2008, Woking was appointed one of the national "Climate Change Beacons" to serve as an inspiration to other local authorities.

4.2. Adaptation in Finland

In Finland, adaptation policy development has taken place mainly through the preparation process for the Finnish NAS in 2003, published in 2005 out of the recognition that adaptation will be required irrespective of the success of mitigation measures (Marttila, Granholm et al. 2005). The preparation of the NAS was led by the Ministry of Agriculture and Forestry and developed through horizontal interlinkages at government departments in Finland, with the aim to mainstream adaptation as an issue across administrative sectors. This method of preparation followed the same method for governmental strategies for other cross-cutting issues used in the past: 'there was enough practice of co-operation between the Ministries to do this' (Ministry of Agriculture and Forestry, interview). Implementation of the NAS has advanced fastest within the environment administration, within which the publication of an action plan in 2008 has outlined ways to mainstream adaptation across existing planning, implementation and monitoring measures (Ympäristöministeriön työryhmä, 2008). The importance for the Ministry of the Environment to proceed from a strategy document to implementation was noted by one interviewee: 'it is natural for this Ministry to pick it up as a topic' (Ministry of the Environment, interview).

The first evaluation of the implementation of the NAS outlines the use of an indicator to evaluate the extent to which adaptation has been mainstreamed within the different sectors of the government (Ministry of Agriculture and Forestry 2009). The evaluation concluded that some understanding of the impacts of climate change exists in most sectors of the government, and that the need for adaptation measures has been recognised by some decision-makers within a select few sectors. However, this recognition varies greatly between sectors, and has advanced the least within the economic and health sectors. One area in which adaptation has been taken into account in legislation is the revision of the 2000 Land Use Act to include adaptation in 2008.

Overall, well functioning horizontal linkages at the national level have aided the preparation of the NAS, during which each Ministry identified the needs for adaptation within their own administrative sector, and have contributed to its early publication. Explicit linkages to lower levels of government have, however, remained weak within the NAS, through which measures generally only trickle down through revisions in legislation. This is due to the fact that from the beginning, the NAS does not outline any specific measures for either the regional or local levels. This is partially due to the reason that it never meant to address lower levels of governance and also due to the fact that the national level is unable to steer the lower levels due to the devolvement of power to municipalities. This issue is currenly discussed in

the revision of the NAS that began in 2010 (Ministry of Agriculture and Forestry, interview). This may, however, be hampered by the fact that the state has no mandate due to the fairly extensive autonomy of the local level.

Although there has been no direct steering towards adaptation from the national level, regional and local initiatives have emerged in Finland. The regional level in Finland is characterised by non-elected regional councils that serve as co-operative bodies for municipalities, which in turn have autonomy over their territory. In the Uusimaa region, the Regional Council is pursuing a climate strategy that includes an adaptation alongside mitigation, and which has benefitted from a participation in project funded by the EU Regional Development Fund. Similarly, the Helsinki Environment Services Authority is currently pursuing an adaptation strategy in two different EU funded projects within the context of the Baltic Sea region in the absence of any government direction (Helsinki Environment Services Authority, interview). The only city to currently have an adaptation strategy, the City of Espoo published its climate change preparedness strategy with measures for adaptation in 2007 (Soini 2007). Preliminary flood mappings in the preparation phase were conducted as part of EU funded projects. Municipalities have also accessed national funding to begin work on adaptation in cases where they have not been part of EU projects. By using existing municipality co-operation networks and pooling funding, the KUUMA municipalities have been able to begin a preparation of a climate strategy that otherwise would have been beyond the means of small, single municipalities (Municipality of Mäntsälä, interview).

4.3. Adaptation in Sweden

Issues of vulnerability and adaptation in Sweden have been addressed mainly through the Commission on Climate and Vulnerability (2005; Commission on Climate and Vulnerability 2007), from which main suggestions were adopted into the 2009 Climate Bill (Government Offices of Sweden 2009) and enforced through decisions later in 2009. Principal measures in the Bill pertaining to adaptation included the provision of funding for three major areas: to the regional arm of the state (the county administrative boards) to coordinate adaptation; to specific governmental bodies and agencies to develop a common elevation data basis; and for the assessment of flood risk and erosion defense measures around Lake Vänern. Risks considered by the Bill include the flooding of central Gothenburg, the second largest city of Sweden (a risk increasing with rising sea level). The Bill recommends an assessment of possible adaptation actions, including a tunnel for diverting water from Lake Vänern to the sea for which the distribution of funding between municipal and state levels is to be decided at a later point. The decentralised Swedish system thus manifests in issues such as the sharing of responsibility and funding for planned adaptations between national and local levels.

The development of the Commission on Climate and Vulnerability was at least in part attributed to lobbying by representatives at the regional (county) level around lake Vänern (including Västra Götaland, the case study region) to request special attention to flood risk following major floods in 2000. As one interviewee at the Commission on Climate and Vulnerability noted, “the counties had written to the Government, to the Department of Defense. They [the government] had to reply and do something about this” (Commission on Climate and Vulnerability, interview). The subsequent emphasis of the state on the need to address future flooding in the two lakes is highlighted by the Commission on Climate and Vulnerability’s release of two separate reports: the final report in 2007, and an interim report developed in 2006 focused specifically on flooding requested by the government (Commission on Climate and Vulnerability 2006). Despite the limited power attributed to

regional level within the Swedish state, it was nevertheless in this case able to voice concerns for constituent municipalities and influence the direction of adaptation policy development.

At the local level, projects relevant to adaptation have been underway in the city of Gothenburg (*Extreme Weather* Phases 1 and 2) since about 2003, and have resulted in concrete changes in minimum building elevations in light of sea level rise. These projects have also fostered general awareness of adaptation at the local level, and particularly as a result of comparative work on flooding completed within an EU project. However, the national Bill has attributed greater general responsibility to municipalities to adapt to climate change, with the exception of 'extraordinary' requirements such as the Göta Älv/Lake Vänern flood risk. During the review process, many municipalities contested this attribution and instead requested an increase in state grants to assist in the funding of preparedness at the local level. However, adaptation was determined to fall under the municipal responsibility for local planning, thereby decentralising responsibility to the local level in line with the Swedish regulative system. According to some local authorities, this decision may render greater difficulty for smaller municipalities to develop policy and planning on adaptation issues (Munkedal municipality, interview). While Gothenburg and the neighbouring municipalities of Mölndal have the funding and administrative resources of larger municipalities, the case study areas of Munkedal and Trollhättan have not yet developed measures or policy in the area of climate change adaptation.

4.4. Adaptation in Italy

Italian national activities with regard to climate change adaptation have been limited in both their extent and impact. A national conference in 2007 held by agencies under the Ministry of Environment, Land and Sea (MATTM) served to pool existing research and broaden understanding of sectoral and regional impacts and vulnerability, and produced two short documents. The first of these outlined the need to coordinate and integrate adaptation into existing policy and legislation within a national adaptation strategy to be produced by 2008 and implemented over the following three years (MATTM, 2007c), while the second outlined priority areas of intervention (MATTM 2007b).

However, a national strategy has not yet been produced. Conflict between research institutions, the change in administration, and the failure of the preceding Prodi government to organise or earmark funds for a national adaptation strategy are all cited as possible reasons behind the apparent stalemate. Select interviewees at the national scale also indicated that work on such a strategy would be resumed in the near future through an interministerial committee headed by the Directorate for Environmental Research and Development (under MATTM) and made up of representatives of relevant technical bodies (including the CMCC) and other ministries. In the interim, several existing plans and legislative frameworks that address various facets of adaptation, including the National Action Plan to Combat Drought and Desertification and the National Plan for the Prevention of the Effects of Heat on Human Health, are considered means to address adaptation. Though neither of these specifically target climate change impacts, they are recognised as having implications for implementation of measures at regional and local levels.

The absence of a national strategy on climate change adaptation and the existing measures that address vulnerabilities have certain implications for both Italy's regions and municipalities. Though State legislation guides the regions and allocates funds towards the implementation of certain policies, regions in Italy enjoy considerable autonomy in several sectors. In the case of the region of Emilia-Romagna, this freedom has translated into the

pursuit of climate change impact research through the Regional Environmental Protection Agency (ARPA). Policy action with regards to adaptation remains limited to brief consideration of climate change impacts in regional water and agricultural plans. For instance, the Water Protection Plan (2005) describes a need to address potential changes in water availability and recommends updates of the plan's strategies as new climate impact information developed by the ARPA becomes available. This reflects the general attitude towards climate adaptation at the regional level, as captured by one actor: "We do not have an adaptation plan to climate change. We try to adapt public policies to the climate change that is in action; so, climate change for us is a compass, an obligatory reference point" (Regional Ministry of Agriculture, interview).

Below the level of the region, provinces and municipalities make up the local scale in Italy, with differing responsibilities. In Emilia-Romagna, provinces represent the administrative arm of the region and carry out policies determined at the regional (and national) level. As such, many of their activities are guided by the region, but provinces may also choose to engage in other activities provided they are in line with the mandates set by the region. With regards to adaptation, the participation of the Province of Ferrara in a partly EU-funded project, the Climate Alliance's *Adaptation and Mitigation – an Integrated Climate Policy Approach* (AMICA), has allowed the province to access information and best practice networks on adaptation. Beyond this engagement, the Province of Ferrara and is responsible for implementing the region's water and other plans, including those aspects relevant to climate change adaptation.

The municipalities in Italy constitute a somewhat different scale of administration, in that they are obliged to follow regional and national guidelines (with associated funding) but have relative freedom in local planning. In the municipality of Ferrara, very little has been done in the way of adaptation. Interviewees highlighted the limited focus on adaptation at the national scale (and absence of allocated funds), few local human and financial resources, and limited observation of or information on climate impacts as reasons behind the lack of activity. As noted by one local actor, "we live in a phase in which an increase in our responsibilities corresponds to a reduction in resources…Now we are also in a moment of economic crisis and so the State is reducing, little by little, the resources that are transferred to the periphery" (Provincial Ministry of Environment, interview). Like the province, however, the municipality benefits from networks with other cities and has been able to engage in mitigative actions beyond state or regional requirements, indicating that any future interest in adaptation may yield comparable results.

5. Discussion and case comparison

The comparison of each of the above case studies yields interesting insights into the nature of multi-level governance of climate change adaptation. First, the study shows that an exclusive focus on national adaptation policy obscures the complexity of emergence of adaptation across multiple scales. In the UK, Finland and Sweden all, formal adaptation policies were developed at the national level, while such attempts at the national level in Italy failed. However, the UK, Finland and Sweden utilise largely different processes through which national actions were made possible. In the UK, the prioritisation of adaptation at the national level was supported by bottom-up, local government movements towards adaptation in the Nottingham Declaration. In Sweden, the investigation into adaptation at national level was given urgency and motivated at least in part by regional initiatives that asserted the state's responsibility to act on climate change to protect its regions as long as no other measures were in place. In Sweden, local adaptation initiatives also existed but were not linked to

developments at the national level. Only in Finland were local-national linkages difficult to discern, despite the fact that some local level actors were independently working on local adaptation policies.

Country case / Steering measures developed at different levels	The UK (England)	Finland	Sweden	Italy
National	Climate Change Act, UK Climate Impacts Programme, National Indicator system	National Adaptation Strategy	Commission and Bill	National conference and informal adaptation measures prioritarisation documents
Regional	Regional Climate Change Partnerships (initially developed as state initiative, some are now self-managing)	Project-based work in some cases	Incentive towards national Bill	Integration of adaptation on regional incentive in some cases
Local	Nottingham Declaration	Municipal or municipal cooperation strategies in some cases, mainly on own incentive	Municipal adaptation projects in some cases, mainly on own incentive	Project-based work on own incentive

Table 2: Case study comparison

The study's findings thus indicate significant variability with regard to the involvement and impact of local governments in national level adaptation decisions. Firstly, as others have also concluded, national action on adaptation does not always contribute to the emergence of adaptation on lower levels of governance (Swart et al. 2009, Biesbroek et al. 2010). This means that while national policy may exist, it may not coherently or deliberately attribute roles to other levels. In Sweden, general adaptation actions at the local level are deemed the responsibility of the municipality under the municipal planning monopoly. In Finland, the national adaptation strategy requires action only from national level bodies, and so has little impact on local adaptation policies that have developed principally in response to locally identified needs and funded through channels such as EU frameworks. Interviewees did themselves not comment on this fact, other than that this was seen as a normal practice and "the way things were done" in Finland. The research thus underlines the role not only of the formal organisation of the governmental systems at large, but the importance of informal norms and administrative practice that may differ between states and impact how and on what levels certain issues are handled. Further investigation into adaptation policy development and interlinkages in Finland are needed to review how such norms and implicit divisions of

responsibility impact steering on adaptation. While it may be that local levels would integrate with national demands were these to exist formally – thus supporting integration on adaptation – the Finnish case may also evidence some disconnect between levels on adaptation. The limited connectivity between local and national levels on this issue may thus constitute an important impediment to adaptation policy integration in the future.

Secondly, local and regional initiatives may in some cases support or provide initiative for national actions, or help form the shape that national actions take. This illustrates the fact that though a national policy may be the most visible, it may have been motivated or informed by lower levels in a way that is not apparent from an examination of the NAS alone. Examples include the influence of the regional level in Sweden in placing adaptation to flood risk on the national agenda, fundamentally contributing to the development of a Commission on Climate and Vulnerability through which a Swedish adaptation framework was developed. In the centralised English administration within the UK, the Nottingham Declaration government network still played a significant role in garnering local acceptance on adaptation (and mitigation), and which to some rendered the state inclusion of adaptation in the local performance assessment framework possible. While it is difficult to pinpoint conditions beyond differences in state systems under which local or regional initiatives may develop to support national action and policy development, local and regional action in these cases seem to have related to experiences of extreme events (in Sweden) and to developed priorities on the issue (in the UK, potentially related to experiences with flooding). Issues such as media reporting and awareness on climate change, which may support local development, could also play a role (Kingdon 1995).

Thirdly, the study also indicates that adaptation action may occur at lower levels even in the absence of a national adaptation framework. This study thereby supports findings of local level policy development for adaptation as previously examined by Bulkeley and Betsill (2005) in relation to mitigation. This has taken place in particular in Italy, where local and regional levels have begun to include adaptation-relevant measures for flooding and drought within regional and local plans; however, these are yet to be explicitly designed as planned adaptations or in response to changing risks over time (i.e. climate change impacts). The Italian case therefore further illustrates how the absence of a national framework for adaptation may constitute a hindrance or impediment for the development of local adaptation policies, as well as a limitation on local awareness or resources that could have supported the development of local actions.

To a large extent, the development of planned adaptations at the local level have drawn upon the ability to network with other levels, or ‘jump scales’, as has been noted more generally with regard to multi-level governance interactions (e.g. Princen 2007). We show that adaptation is not only reliant on or formed in relation to the state context. Cases in Italy, Finland and Sweden in different ways show the importance and potential impact of EU funding and projects. In Italy, the measures that exist on the local level have largely been made possible through EU funding and been shaped by requirements within the EU framework, as no national framework for adaptation yet exists. While actions may thus develop locally by drawing upon various non-national frameworks, the existence of a national framework for adaptation to motivate and support local development is seen as beneficial. In Finland, planned adaptation at the local level has, lacking national funding, largely been reliant on funding in EU projects, whereas such projects for the Swedish case of Gothenburg constituted an incentive for a relatively early start in the framing of frame flood risk as an adaptation issue.

The capacities of different actors as illustrated above is dependent on how they are situated within types of states and on which capabilities they possess, for instance in terms of political and economic strength. The national system thus constitutes the context for how the different governance levels are related to one another in the four cases, and whether they reinforce each other or not. Connectivity in multi-level governance may here play a crucial role for whether policies on national level are really implemented locally, and may be supported for instance at national level by explicit priorities for the local level, as well as by indicators or grant systems (depending on the possibilities in the state system). Bottom-up indications of the role of adaptation may here also support national development of adaptation policies.

While a centralised administration may – if wished – easier steer on adaptation, decentralisation may make it easier for planned adaptations to develop even in the absence of strong steering from the state, as the regional or local level (depending on the level of decentralisation in the particular country) may have greater leeway in the construction of local initiatives than the corresponding level of a centralised state. The study for instance illustrates that the format in which planned adaptation is developed differs between countries, where the UK's focus on steering through partnerships and performance assessment has largely shaped the UK response on adaptation. This system is currently under large transformation given the impact of the economic crisis on the UK, and the entry in 2010 of the new coalition government. Having access to resources at the national scale does, however, not necessarily translate into access to resources or at the local level. In addition, though sufficient access to resources may exist at the local level, as in Trollhättan in Sweden or Woking in the UK, planned adaptations may not necessarily emerge unless such priorities exist at the national level, or are rendered urgent at the local level (cf. Næss et al. 2006). This development of priorities may then, in turn, depend on contextual factors (e.g. extreme events) as well as local political priorities and leadership.

6. Conclusion

This paper contributes to the growing body of literature that analyses the emergence of adaptation across multiple levels of governance. While previous studies on this topic have paid less attention to the ways in which adaptation emerges across levels of governance, this paper illustrates the importance of vertical linkages in adaptation policy development. The study shows that interaction does not merely happen in a top down fashion in the way government steering regularly is conducted, but that sub-national actors can also influence the policy process on higher levels of governance from the bottom up (such as Swedish regional initiatives or local UK initiatives did). This study also confirms that planned adaptation can occur without specific steering or direction from the national level and may in this be supported by levels beyond the state, in these cases notably the EU.

The findings of this paper highlight the importance of organisational structure of different countries, and how that affects the development of adaptation policy. The paper show how different governance systems enable and constrain adaptation at different scales, demonstrating that a multilevel framework is a prerequisite for understanding the emergence of adaptation even in cases where this manifests as national adaptation policies (Edelenbos, this volume). This holds certain implications for the success of adaptation initiatives; for example, committed, centralised states may be able to raise the lowest common denominator on adaptation across, e.g., local authorities, and thereby create connectivity between levels on the issue. However, a centralised state with little focus on adaptation would most likely provide less room than a decentralised state for the local or regional level to develop

adaptation in the absence of state policy. These important implications for policy indicate that such multi-level studies are likely to constitute an increasingly important research topic in the future.

Acknowledgements
This paper summarises multi-level governance aspects of adaptation on national, region and local level more extensively described in the book Keskitalo, E. C. H. (2010, ed.) *Developing Adaptation Policy and Practice in Europe: Multi-Level Governance of Climate Change*. Springer, Berlin. The project EUR-ADAPT gratefully acknowledges funding from the Swedish Research Council.

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