A critical analysis of the UK Climate Impacts Programme's problematization of adaptation

By Elspeth Oppermann, BA, MA

A thesis submitted to Lancaster University in fulfilment of the requirements for the degree of Doctor of Philosophy

September 2012

ProQuest Number: 11003443

ProQuest 11003443

A critical analysis of the UK Climate Impacts Programme's problematization of adaptation

By Elspeth Oppermann, BA, MA

A thesis submitted to Lancaster University in fulfilment of the requirements for the degree of Doctor of Philosophy

This thesis is the author's own work and has not been submitted or published elsewhere.

September 2012

Abstract

This thesis critically analyses the problematization of adaptation to climate change that has emerged at the UK Climate Impacts Programme (UKCIP). It finds that its problematization is based on a techno-scientific ontology and epistemology that occludes social forms of knowledge and social contingency. Its political rationale accounts for adaptation as a planned, pre-emptive decision based on existing objectives. This problematization is supplemented by conceptual elements that recognize irreducible uncertainty and social capacity to change which are related to socio-contextual and socio-emergent accounts of adaptation. In articulating these supplementary elements as moments, UKCIP's problematization appears to have broadened, but the nature of this articulation also functions as a 'limit point' (Derrida 1976). Through rendering the contingency and constitution of UKCIP's problematization of adaptation visible, this research enables critical engagement with UKCIP's current discourse and practices.

The research builds on existing academic discourses of adaptation and the tools of analysis provided by a Foucaultian-based account of discourse. It operationalizes these at the level of conceptual and linguistic articulation using

techniques of analysis from critical discourse analysis, discourse analysis and discourse theory, including Laclau and Mouffes' taxonomy of discourse as constituted by the articulation of elements as moments (Laclau and Mouffe 2001). It also utilizes Derrida and Rancière's conceptions of the supplement (Derrida 1976, Rancière 2001) to analyse the effect of this articulation on conceptual inclusion/exclusion. The objectives contributing to this critical analysis are: First, to identify the contingency of emergence of UKCIP's discourse of adaptation; Second, to provide an account of the problematization at the core of this discourse in terms of its content and structure; Third, to explore how the problematization relates to other discourses of adaptation established in the wider literature and determine if, how, and with what implications, these are combined within UKCIP's problematization.

Table of Contents

List of Tables and Figures

Chapter 1

Chapter 3

Chapter 7

Chapter 1: Adaptation to Climate Change and the UK Climate Impacts Programme

"Environmental politics is very much about the politics of discourse, the presentation of 'problems' and of who should deal with the concerns so specified."
- Simon Dalby, Environmental Security (2002)

1.0 From a techno-scientific to socio-emergent account of adaptation to climate change

1.1 Introduction

The last 10,000 years was one of the most stable climatic periods in the planet's history, and in human history, enabling settled agricultural societies to emerge (Clark 2010). As a result, most cultures emerging within this period, including the powerful, industrial societies that emerged from them, inherently assumed that climate was stable. Between the 19th and 20th Centuries, western science encountered evidence of ice ages and global climatic shifts in geological time of hundreds of thousands of years. However, it was not until just over seventy years ago that climate change began to be understood as occurring within the time-scale of a human life as the result of that same industrialization. There is little reason to be surprised, therefore, that the climate change we now face is almost incomprehensible to our worldview. As such adaptation to climate change is also an adaptation to a sudden loss of the sense of ecological certainty, making it an extremely difficult process to engage with. Even though the graphs and images of climate change projections have become familiar sights in the national and international press (Olausson 2009) and form the crucial basis of the evidence and significance of climate change, we are nonetheless facing a colossal difficulty

in understanding and responding to the emergent complexity of the threat it poses across space and time.

This thesis tracks one attempt to resolve this aporia through the discourse of adaptation that has emerged at the United Kingdom Climate Impacts Programme (UKCIP). This first chapter will begin with a general review of the emergence of adaptation to climate change as a discourse, beginning with the 'discovery' of climate change itself, the shift from the exclusive focus on mitigating emissions to the inclusion of adaptation in the policy response. It discusses the different ways of accounting for the problem to which adaptation responds in terms of hazards, impacts and risks, and vulnerability, and the different accounts of adaptation as solution in terms of resilience, transition, and transformation. These practitioner and academic discourses are combined to establish three conceptual frames for the problematization of adaptation as techno-scientific, socio-contextual, and socio-emergent. These will be used later in the thesis to analyse the specific problematization of adaptation that has emerged at the UK Climate Impacts Programme (UKCIP).

Part two of this chapter will introduce UKCIP itself and review the academic literature that discusses its discourse. The need for a deeper investigation of UKCIP's conceptual account of adaptation is established, and the significance of this for the wider UK and international discourse of adaptation is also signalled. Part three concludes the chapter by developing the literature reviewed and the analytical position developed into a series of aims and objectives for the thesis in its discussion of UKCIP's problematization of adaptation.

1.2 Development of the climate change discourse: from mitigation to adaptation

Climate change discourse in its current form arose within the western scientific tradition. Its origins lie in 1824 when Jean-Baptiste Joseph Fourier was first able to account for the 'greenhouse effect' of gasses in the atmosphere allowing the cumulative warming of the planet through trapping thermal energy from the sun. In 1859 John Tyndall was able to provide the 'experimental basis' for measuring the greenhouse effect (Hulme 2009, p. 45). However, the decisive moment for climate change as an anthropogenic phenomenon came with the proposition of Svante August Arrhenius in 1896 that increasing concentrations of carbon dioxide as a result of industrial activity were causing a warming of the global climate. Then, in 1938 Arrhenius' theory was linked to observed changes in climate by Guy Stewart Callendar. Callendar's work gradually gained credence, in particular through the measurement of atmospheric concentrations of carbon dioxide from the late 1950s by Charles David Keeling. Improvements in computerized weather models enabled these increases to be linked to weather changes in the 1970s, which were brought together in 1975 in the form of Syukuro Manabe's General Circulation Model (Hulme 2009), proving the connection between weather events and concentrations of greenhouse gasses.

A series of heat waves and floods in Europe and the United States were linked to the findings of this model, providing the political incentive for action at the international level which resulted in the formation of the Intergovernmental Panel on Climate Change (IPCC) absorbed later under the United Nations Framework Convention on Climate Change (UNFCC). The IPCC was charged with assessing whether climate change was occurring and to what extent human actions were responsible. Whilst their First Assessment Report in 1990 was

inconclusive on the latter aspect, their Second Assessment Report in 1996 judged that there was some human influence, and their 2001 Third Assessment Report judged that most of contemporary climate change was due to anthropogenic emissions (Hulme 2009). Throughout these discursive developments was an increasingly weakening counter-discourse that climate change was a natural phenomenon, a position founded on evidence of solar flares and the historical concern with global cooling (Demeritt 2001, Shackley and Wynne 1995a). The battle over the veracity of climate change itself and whether it was linked to anthropogenic emissions overshadowed the discussion of what climate change would actually be like, and what could be done to deal with it (Schipper 2006).

By the time a global consensus was reached, the battle was so hard-won that any mention of adaptation appeared as detracting from the recognition of climate changes anthropogenic origins and responsibility for the mitigation of emissions (Schipper 2006). Thus when adaptation was first defined by the IPCC, it was simply as a "tightly defined, technical term" (Pelling 2011, p. 13) rather than as an extended concept, strategy or policy. This political context and semantic limitation helped render it subsidiary to mitigation as the solution to a climate change defined in terms of human responsibility for emissions.

Furthermore, the history of needing to prove the very existence of climate change meant that there was pressure to render adaptation as climate change-specific and thus as its own distinct field of study, funding and political engagement. This 'narrowing down' of climate change adaptation problems into the areas where they could be clearly linked to anthropogenic climate change tended to exclude wider socio-political accounts of vulnerability, capacity and

complexity (Pelling 2011). Where these concerns were included they were limited to the context of developing countries, where absence of socio-economic capacity was already identifiable as a limiting adaptation to existing climatic conditions (Schipper 2006).

This brief overview of the scientific and political history of climate change demonstrates how it clearly laid out a particular terrain within which the problematization of adaptation could form, embedding it in a particular scientific epistemology, limiting its political value in relation to mitigation, and focusing on specifically biophysical and technical aspects rather than social or political capacity and vulnerability, particularly in developed countries. As we shall see, both of these discursive positionings of adaptation as climate specific and as subsidiary to mitigation also occurred at the UK national level, with dramatic implications for the formation of adaptation discourse at UKCIP.

However, the assumptions built into adaptation as a result of the wider formation of climate change discourse have begun to be tested. First, the experience of severe weather events in Europe and North America, and of permanent climatic changes in areas of southern Australia, have revealed the difficulty that even developed countries face in dealing with these problems (Larsen 2003). Second, the emerging scientific consensus that climate change will occur even earlier and more severely than previously imagined, has created the awareness that even developed countries will also have to consider a serious adaptation response much sooner than anticipated (The World Bank and Potsdam Institute for Climate Impact Research and Climate Analytics 2012, Schipper 2006). This drove a gradual discursive shift, at both the international and UK domestic level, towards accepting adaptation. This emerged through the

argument that: climate change was already occurring and, particularly given the intertia of the climate system, adaptation would be necessary regardless of the success of the mitigation agenda (Select Bipartisan Committee 2006, Colls et al. 2005, Fussel 2007, Fussel and Klein 2006, Hulme 2009). This opened the door past the long-standing argument that mitigation and adaptation were incompatible to a new understanding that they could in fact be made to be complimentary, particularly if short-term adaptation decisions did not contribute to a rise in emissions (Burton et al. 2002, Reusswig 2010). As part of this discursive shift, adaptation entered the UK climate change discourse as a real policy object towards the end of the 1990s and early 2000s.

1.3 From linear certainty to complexity and uncertainty

Although no longer excluded per se, adaptation was still very much defined by its scientific origins, in particular by the Global Circulation Models whose forecasting knowledge had been so central to proving climate change's existence. These were capable of processing complex interactive rules and vast data sets representing the meteorological and hydrological systems that make up global climate patterns. Most epistemic development in this field has been focused on developing ever more complex models in order to try and improve their precision and if possible, also their accuracy (Dessai and Hulme 2004, Hulme and Dessai 2008, Dessai et al. 2008).

The colossal volume of data, its increasing precision, and the central position of the GCM-based projections in climate change discourse, created the sense that adaptation should necessarily be based on this prescient knowledge. In other words, this epistemic foundation meant that adaptation was assumed to

be planned and proactive, particularly in the industrialised 'first' world, (Fussel 2007, p. 271). In the UK, this planned approach was adopted because of assumed governmental capacity (Hulme and Dessai 2008, Hulme and Turnpenny 2004). However, it was also tied into the need to utilize information from the Hadley Centre, which was an integral part of the domestic and international climate change knowledge-production network, and thereby validate its enormous expense (Shackley and Wynne 1995a, Shackley and Wynne 1996, Dessai et al. 2009, Hulme and Dessai 2008, Hulme and Turnpenny 2004).

More fundamentally however, the assumption at the time was that adaptation policy could be based on such scientific knowledge. This was grounded in the deeply seated modernist worldview that sees nature and culture as "discrete entities" (Head 2010, p. 235), where 'nature' is objectively knowable. As such, a crucial relation was established between adaptation and a techno-scientific rationality that assumes the human capacity to know nature objectively, and therefore to predict and control nature and responses to nature sufficiently in order to deal with any problems arising from the human relation to its environment (Castree and Braun 2001). The UK was part of this techno-scientific planning mode, and depended on the production of scientific data to enable a technical management response (Pelling 2011, Hulme and Dessai 2008, Stevenson 2009, Fussel 2007). This epistemology and its associated governmental rationality of pre-planned policies produced an account of adaptation that assumed the identification of hazards, and later impacts, would be a sufficient basis to understand and enable adaptation. This 'black-box' account of adaptation saw climate change as predictable, based on statistical

averages and derivations generated an image of climate change as steady, incremental warming.

However, the techno-scientific account of the epistemology of climate change and its related rationality of adaptation was fundamentally challenged by several events. The first of these was the discovery of climate change 'tipping points' in paleoclimatology which provided evidence of dramatic step-changes in the climate occurring in less than one hundred years, suggested to be linked to the failure of thermohaline circulation such that ocean temperatures might suddenly cool or warm, quickly and dramatically affecting the climate in those regions (Fussel 2007, drawing on Hay and Mimura 2006, Shackley and Wynne 1996, Shackley and Wynne 1995a). As Hulme notes, these discoveries, particularly by Wallace Broekner in 1987, heralded the introduction of non-linear complexity language into climate science and modelling (Hulme 2009). This rejection of the representation of climate change as a smooth increase in global temperatures over time has led to the argument that the real significance of climate change adaptation is not the change in average weather but extreme events, which are predicted to increase in frequency and severity as climate change progresses (Hulme 2009).

Furthermore, recognition of the uncertainties inherent in climate modelling has increased in recent years, and new model input parameters and output formats have been introduced to better represent known uncertainties more clearly (Dessai and Hulme 2004, Hulme and Dessai 2008). In the UK this appeared clearly in the UK Climate Projections 2009 (Jenkins et al. 2009), and was linked to a renaming of these model outputs from 'projections' rather than 'scenarios' (Dessai et al. 2009), what was intended to signify the increased

difficulty of adopting assumptions of objective, prescient knowledge, and was intended to limit the tendency to interpret the models in a linear fashion. As we shall see towards the end of the next section, this move from linearity to a complexity and uncertainty-based epistemology of climate change had significant effects for the problematization of adaptation.

1.4 From hazards to impacts to risk as approaches to adaptation

The climate change scenario information was used initially to create an account of the biophysical hazards that would result from increased greenhouse gas concentrations, either in a direct form such as temperature, or in a more indirect but still biophysical account of impacts, including drought, flood and sea level rise. The clear link from scenarios to biophysical hazards meant that the hazards-based account of adaptation tended to adopt the gradual increases in temperature indicated by the climate scenarios (Fussel 2007). However, these accounts proved to be too generalized to be of use for policy, and as such there was pressure to make these more applicable to smaller time-scales and areas, through a more detailed representation of impacts. One solution to this problem was the downscaling of statistical climate information to local areas. Although localized data was helpful, it still did not automatically make that information into a meaningful adaptation assessment or strategy (Burton et al. 2002). As such, various methods for making sense of the data began to be devised, UKCIP's amongst them (McKenzie-Hedger, Connell and Bramwell 2006, Hulme and Dessai 2008).

The close association of risk with hazards and impacts, meant one of the ways climate change scenarios were drawn into adaptation policy was through various concepts of risk (Sellke and Renn 2010, p. 298), drawing in particular on

environmental risk management, a connection which will be explored further in Chapter 4 . Risk usefully opened up the question of the significance of climate change hazards, not in terms of their objective biophysical properties, but in terms of their relevance for the body trying to adapt. As such, climate impacts have relevance here only in so far as they pose a risk to something that is valued: "risks describe the potential effects that these hazards are likely to cause on specific targets such as buildings, ecosystems or human organisms and their related properties" (Sellke and Renn 2010, p. 298).

In this way, risk occupies a dual position between its statistical and scientific connection to the hazards approach on the one hand, and its ability to connect this into social behaviours, values, and structures on the other. However, in this formulation risk still assumes the characterization of adaptation in response to "an external threat" (Pelling 2011, p. 67) rather than the problem being the internal composition of the social unit or its objectives and their relation to the environment. As such, that linking effect does not take the 'internal' composition of the exposure unit itself as an object of intervention directly, and therefore tends to exclude its social constitution in its analysis. This also means that it does not in itself create a strategic account of adaptation, of the 'solution' to the problem, but is merely a technology that relates values to an account of threats.

Although risk provides a means of talking about uncertainty, it does still assume some principle of probability and calculability. When linked with modern western assumptions about the right to dominance of man over nature, and the distinction between man and nature, this generates the possibility of objective knowledge and pre-emptive responses (Hacking 2006, Hacking 1990).

At a fundamental level, this enables a planning rationale based on a linear strategic logic, albeit a more nuanced one. As such, risk still operates within a techno-scientific ontology of the possibility of pre-emptive planning, even if it moderates the concept of prescience this is based on with various forms of likelihood.

In sum, the closely connected hazards, impacts and risk accounts of adaptation all centre on the foundational principle that prescient knowledge is possible, and that therefore a planned, linear approach to managing a threat accounted for through risk is a feasible and sufficient solution. This purposive-instrumental rationality (Harvey 1990) creates a technical and managerial response to adaptation to climate change that combines with a climate science focus to produce what we will call here a techno-scientific problematization of adaptation (Sellke and Renn 2010, O'Brien et al. 2007, Pelling 2011, Pelling et al. 2008).

1.5 The vulnerability and capacity approach to adaptation

Since the early 2000s, there have been several critiques of the basic hazard, impacts and risk approaches to climate adaptation. All of these note that the preoccupation with applying climate science tends to ignore social, economic and political characteristics as contributing factors of the risk in itself (see, for example, Rettberg 2010). Such critics argue that these excluded social characteristics are significant for adaptation as they magnify or reduce climate impacts, or indeed act as unrelated sources of hazard in their own right. As such, they posit that adaptation should take into consideration the vulnerability exhibited by the system that is impacted (Adger, Lorenzoni and O'Brien 2009, Fussel and Klein 2006, O'Brien et al. 2007, Burton et al. 2002). The vulnerability

approach thus widens the ontology of adaptation to include the socio-contextual aspects of the problem that adaptation must deal with (Fussel 2007). Making the responding system visible has meant that its historical and current experience of vulnerability has become part of the account of the object of adaptation.

The spatial focus on the system had a knock-on effect on the temporal account of threat, in the sense that it lessened the distinction between existing climate variability and climate change, and between average change and extreme events, as all of these are combined from the perspective of the system (Fussel 2007, p. 271). The inclusion of an account of the social constitution of its current status shifts the temporal threat from the future to the present. Vulnerability thus places a very different onus on the space and time of adaptation as the threat becomes understood as here and now, rather than external and later. This drastically reduces the visibility of, and epistemic reliance on, climate-model projections. "This approach can produce useful results even in the absence of reliable impact projections [for example] by identifying low or no-regret options that are robust against a wide range of plausible climate developments" (Fussel 2007, p. 271). As such a vulnerability-based account of adaptation demonstrates a clear epistemological synergy with the reduced confidence in scenarios, or heightened appreciation of their uncertainty discussed in Section 1.3.

In sum, this different ontological basis recalibrates how the time of adaptation is conceptualized, moving it from an abstract future imagined as linear and incremental, to work from the basis of the present instead. For O'Brien et al. (2007) this shift arises because the marking of time and its relation to space is ontologically different, in the sense that it is a shift from an 'outcome,' or 'product' based-account to a 'context' and 'process' based account of

adaptation. In the latter, the specific connections within the system and their potential to respond become the focus. As such, the adaptation rationale shifts to improving 'adaptive capacity' of systems, rather than their material or discrete values or statuses.

1.6 Critical accounts of adaptation: beyond vulnerability

Later renditions of the vulnerability approach, particularly as human security, extend these questions beyond the basic capacities of social systems, to their basic values and objectives, to ask whether these themselves not only shape adaptation but also limit it. It is in order to draw out these onto-political aspects that Pelling notes that to understand climate change adaptation we need to have "a lens that can examine organizational behaviours and governance regimes, as well as the feelings, values and actions of individuals" (Pelling 2011, p. 163).

Indeed, rather than just being aware of social systems, a more profound take on the vulnerability argument extends the complex connectedness of social systems as both the subject and object of adaptation. This awareness of both the complexity and contingency of adaptation assumes that any system will also produce surprises. As such, whether techno-scientific or socio-contextual, a planned response will always be insufficient. Instead, this critical account of adaptation assumes irreducible ignorance (Dessai et al. 2009, Luhmann 1998) to be the ontological basis of its problematization of adaptation – not as something to be overcome as with the techno-scientific model, or assumed and measured against as with the vulnerability model, but rather as the condition within which to operate. Accordingly, this extends the 'socio-contextual' accounts historical awareness of capacity and replaces it with a concern for building that capacity directly in response to the real time emergence of the threat, such that the

system is not static but also emerges (Adey and Anderson 2011, McCormack and Schwanen 2011) in both time and space. This problematization will be summarized here as 'socio-emergence.' At its furthest extreme, this account deals with emergency responses only, both in the practical sense of the term and in the sense of existing in the 'state of emergency' as an exception to the existing political system or regime. However, where such exceptions or emergencies are planned for they become part of the system (Adey and Anderson 2011, Dillon 2002).

Ontologically and epistemologically, socio-emergence has a close connection with coevolution, which operates on the principle that "social and socio-ecological systems rules of culture and law are mutable" and as such, adaptation "is not an end point. It is a transitional and relational episode in history…" (Pelling 2011, p. 28) that constantly emerges in the context of irreducible uncertainty. Thus a socio-emergent problematization of adaptation is based on constant critical engagement with "beliefs and capacity" (Pelling 2011, p. 167). Figure 1.1 demonstrates the historical emergence of these different accounts of adaptation and the increased inclusion of socially based adaptive capacity and critique.

Figure 1.1: Different accounts of the problem to which adaptation responds

Hazards [techno-scientific]

Vulnerability [socio-contextual]

Capacity [socio-emergent]

Breadth of ontological inclusion

Development of discourse(s) over time
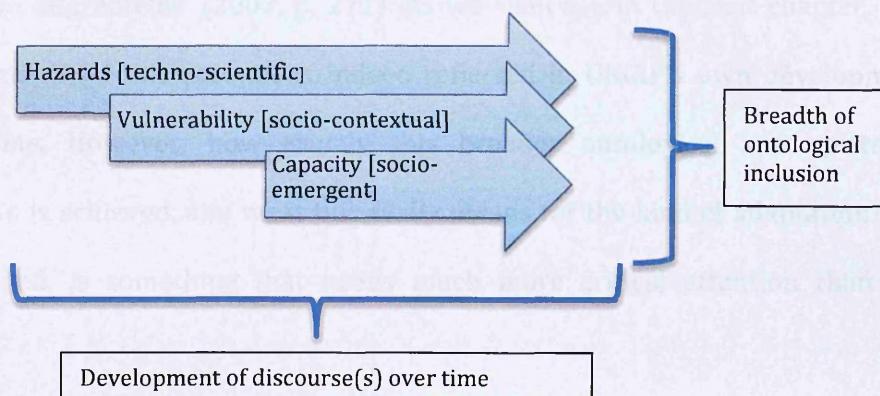
1.7 Where next? From different accounts of threat to different political rationales

of adaptation

The sections above have discussed how the last decade adaptation has been marked by two different accounts of adaptation, one hazards based, and one vulnerability based. The latter has more recently been developed further into a more forward looking capacity-based account of adaptation. We have briefly explored the differences between these different accounts, but the question remains as to how these are resolved in practice. Fussel has described this process as follows:

> "The evolution of [adaptation] assessments is characterized by a shift from science-driven assessments to policy-driven assessments, by increasing integration of climate change with non-climatic stressors to a system or sector, by finer spatial resolution, by increasing contributions of social scientists, by stronger involvement of stakeholders in the assessment, and by improved treatment of uncertainties" (Fussel 2007, p. 273)

Fussel notes that these approaches have come to be combined in many national government programmes, amongst them that of UKCIP. This is represented as evidence that these approaches 'should be regarded as complimentary not as exclusive alternatives' (2007, p. 271). As we shall see in the next chapter, at a superficial level this account is indeed reflected in UKCIP's own development over time. However, how exactly this broader ontological and epistemic inclusion is achieved, and what this really means for the kind of adaptation that is pursued, is something that needs much more critical attention than the

assumption that it is complementary, or that using elements of both is the same as giving full presence to the entire rationales of both problematizations.

The discussion of the different ontological and epistemic points that populate the problem or threat have given us some pointers, but Pelling adds the crucial insight that not only does the account of the problem matter, but so too does the "intention and action" (Pelling 2011, p. 170) that drive the form of the solution. Together, these ontological and epistemic elements and their articulation into rationales of intention and action constitute three 'ideal types' of adaptation problematization: resilience, transition and transformation. Each draw on overlapping modes of analytical development along a continuum from the functional persistence of the system to its emergence with increasing visibility of the social and capacity for critical learning in each subsequent 'type,' represented in Table 1.1 below through the dark coloured cells. This table replicates that in Pelling (2011, Table 1.1: Frameworks for the analysis of adaptation).

Table 1.1: Pelling's (2011) Frameworks for the analysis of adaptation

Analytical Frameworks	Resilience	Transition	Transformation
Functional Persistence	■		
Self-organisation	■	■	■
Social Learning	■	■	■
Regime Theory		■	■
Socio-technical Transitions		■	■
Social Contract			■
Human Security			■

The different analytical frameworks referred to in the table above operate as shorthand for particular ontological and epistemic inclusions and exclusions in the problematization of adaptation. Beyond these analytical perspectives,

Pelling demonstrates intention and action through their practical application in terms of 'goals,' 'scope' and 'policy focus'. However, he identifies significant tensions between these different types as a result of their fundamental intentions.

The first tension is between resilience and both transition and transformation, where resilience seeks 'functional persistence' of the social system in question, whilst transition and transformation allow this to change. Second, with regard to transition and transformation, the former does not seek fundamental social change, and as such can tend towards resilience, whereas transformation does examine and enable fundamental social change, which are brought into its purview by consideration of 'social contract' and 'human security's' consideration of governance systems. Let us go in to each of these types of adaptation in more detail now, and see in more detail how their basic intentions and actions, which we will call 'rationales' for now (this term will be established theoretically in the following two chapters) mark how each ideal type uses their constitutive ontological and epistemic material.

Resilience

Resilience describes a form of adaptation that seeks to ensure or restore an existing state. Pelling accounts for this type of adaptation in terms of three key characteristics of "functional persistence, self-organisation and social learning" (Pelling 2011, p. 55), but it is functional persistence that marks it out from the other forms of adaptation. In effect, this desire for stasis reduces the need for socially oriented analytical tools that allow it change its own institutions. This is not to say that this type of adaptation is not aware of its systemic imbrication with the environment or other institutions, but that analysis of its own objectives

is limited to that made absolutely necessary by the external threat. As such, a common feature of this type of adaptation is adaptive management, which alters minor aspects of its behaviour in order maintain the core functions of the system. This unwillingness to change internally places the onus on prophylactic security functions (Dillon 1996) that seek to control the threat, or change at the interface with an external threat, rather than change internally. As such the 'scope' of actions is limited to superficial changes "in technology, management practice and organization" such that 'policy focus' is exemplified by projects such as "resilient building practice [and the] use of new seed varieties" (Pelling 2011, p. 23).

'Self-organisation' demonstrates this problematization of securing resilience in an adaptive manner, based on the value of flat, non-hierarchical structures (Folke et al. 2002, Brockhaus and Kambire 2009, Pelling 2011, Pelling, Smith and Dearing 2004). This distinction would seem to pertain to the entry point of vulnerability into the overall problematization because it opens up the internal system to examination, as opposed to a prophylactic hazards-based approach which would not require this. This increased internal flexibility as a solution to the problem of climate change is what enables a crossover to the identification of social structure as the object of adaptation and source of threat in the other two rationales of adaptation.

Similarly, the final category of 'social learning' is defined by Pelling as "the capacity for new values, ideas or practices to be disseminated, popularized and become dominant" in the system in question (Pelling 2011, p. 59). It is easy to see that this characteristic must be present to some degree to allow a system's core function to be maintained in the context of changing external conditions.

However, as Pelling points out, at its most developed, it is precisely social-learning capacity which provides the possibility of more profound change; moving into a transition or even transformation mode through actively changing its core values and goals and enabling the shift from one systemic state to another. In fact, the case can be made that both social learning and self-organisation require the ability to communicate effectively with, and trust, other nodes in the system, allowing for feedback and acceptance of change. Crucially this replaces the understanding of unilateral information and power flows, and enables the principle of transformation and the capacity-based socio-emergent account of adaptation discussed in the previous section.

The overlap of these ontological and epistemic inclusions between the different accounts of adaptation begs the question of what range of fulfilment of these criteria exist at what Pelling terms the 'resilience' end of the scale, as it might be possible for a system to maintain functional persistence with little conscious development of self-organisation or social learning. The link here is an understanding of systems thinking that is not emergent, that is, of a complicated rather than complex (as emergent) form such as cybernetics, which is often linked to a positivist, techno-scientific ontology and epistemology. As Pelling notes, this resulted in a "reductive... scope for mathematical modelling of behaviour [that was] not able to incorporate the significance of competing values and power asymmetries in shaping action" (Pelling 2011, p. 40).

Transition

Pelling's second ideal type in the account of different modes of adaptation is 'transition.' Transition drops functional persistence as an overriding ideal and also begins to consider the contingency of some of the external connections of

the system and its internal norms of operation, as indicated through the 'persistence-free' inclusion of self-organization and social learning, and the new inclusion of 'regime theory' and 'socio-technical transitions' which open up the question of change at an institutional and political level.

The goal of this perspective is to 'realise [the] full potential' of a system within its existing political bounds, that is, without any fundamental change. For Pelling this means that the 'scope' of adaptation is limited to "change in practices of governance to secure procedural justice; this can in turn lead to incremental change in the governance system (Pelling 2011, p. 51). In practical terms then, the "policy focus" becomes ensuring the fulfilment of extant "legal responsibilities" and the "exercise of legal rights by citizens" (Pelling 2011, p. 51). This has a clear resonance with the vulnerability-based account discussed above, in particular with its rendition as a socio-contextual account of adaptation as limited by its social context rather than seeking to 'transgress' it (Dillon 1996, p. 6).

Transformation

By contrast, 'transformation' takes on these deeper onto-political questions in addition to the more practical aspects covered by transition, and as such offers the broadest account of adaptation and the most profound prospect of change. In Pelling's typology, these conceptual moves are signified through the analytical framework of the social contract, defined as revisiting the "balance of rights and responsibilities" and how these are ensured through power, force, culture, identity and knowledge (Pelling 2011, p. 172). He also lists human security as unique to this type of adaptation; it is significant for introducing to adaptation the question of individual rights and basic needs, but also operates conceptually

at a discourse, governance and cultural level that transgresses the usual political categories of nation-state, city or organization, and the concerns of the economy or rational economic man (Barnett and Adger 2007, O'Brien and Leichenko 2007, Tadjbaksh and Chenoy 2007).

Thus for Pelling transformation, via human security, has the potential to reconfigure fundamental structures. At a policy level, this means creating "new political discourses" that "redefine the basis for distributing security and opportunity in society and socio-ecological relationships" (Pelling 2011, p. 51). Implicit in this is the intention that these should at least be brought into question if transformation is to be made possible. This relates to the increased awareness of irreducible uncertainty and its related, nascent account of adaptation noted in the section 1.6 where capacity to adapt per se rather than specific states becomes the objective. As an abstract ideal this allows for constant transformation. As such, this problematization as a whole can be termed socio-emergent in that it questions the social system at a fundamental level, with emergence, or transformation as its continuous solution to the problem of climate change threat understood *through* the social body rather than as impacting *on* it (Anderson 2010, Anderson 2011).

Summary

The discourse of adaptation over the past decade has seen the emergence of a series of different problematizations of adaptation. The different accounts of the threat and response discussed above are summarized here and in Figure 1.2 below. Each problematization was connected to a contested epistemology. The first to emerge was based on a modernist scientific worldview in which

knowledge was accessible, objective, and could be rationalized. This sat well with a 'black-box' resilience rationale of adaptation where the current social system was not questioned, but material products and practices at the interface with the threat from nature were managed.

This problematization was undermined by the increasing awareness of uncertainty, 'tamed' by risk (Hacking 1990), but later combining with complexity to produce an account of ignorance beyond our techno-scientific capacity to know, let alone control. There was a parallel development of the ontology of threat, located first in biophysical hazards, then increasing in connection to the social through localizing impacts, and finally connected to the social system through risk. This began to shift in turn via vulnerability's account of the social aspects of the problem. Here a transition-based rationale came into play, allowing more technical but politically limited changes to secure the systems integrity. However, irreducible uncertainty linked with the growing awareness of capacity to produce a third problematization based on socio-emergence, with a transformational rationale. These connections between one problematization and the next are indicated by the distribution of elements in the diagram below.

Figure 1.2: Correlations between the account of threat and solution in the changing problematization of adaptation

Techno-scientific problematization

Socio-contextual problematization

Socio-emergent problematization

Hazards

Impacts | Vulnerability

Risk

irreducible uncertainty
Capacity

--> Resiliance [stasis]

-->Resiliance [stasis]

Or -->
Transition
[emergent
within limits]

--> Transformation
[emergent]
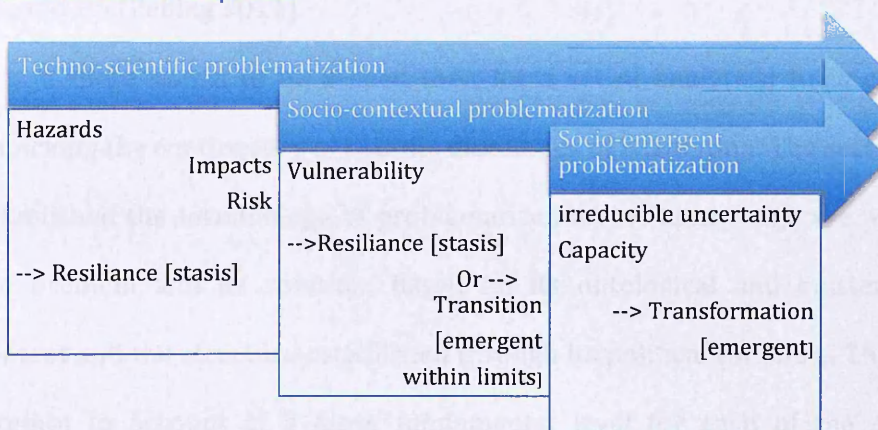
1.8 The problematization of adaptation

The question that arises from these different problematizations of adaptation is: why do they take the shape that they do? Pelling argues that the constituent academic discourses of adaptation are generally cumulative as they move from resilience to transformation and that they develop in the direction of "a lens that can examine organizational behaviour and governance regimes, as well as the feelings, values and actions of individuals" (Pelling 2011, p. 163). However, this does not explain why or how the move from one account to the next is made, as these frameworks do not themselves account for why that discourse is chosen by an actor or organization, or how these different academic discourses might be combined within that actor or organisation's specific discourse to produce a single rationale of 'intention and action' reflected in its goals, scope, and policy focus. It should also be noted that each of these analytical frames has their own ontological and epistemological specificities that do not necessarily sit well together. As such, although they might be generative of specific problematizations, they do not explain the particularity of specific problematizations themselves. In this context, Pelling in fact also calls for research into the thresholds that divide and ensure these different modes of adaptation (Pelling 2011).

There seems to be a need then for a set of analytical tools capable of unpicking the contingency of specific discourses of adaptation. The section above established the terminology of problematization, set up through the account of the problem and its solution, based on its ontological and epistemological content and the structure established through its political rationale. This was an attempt to account at a more fundamental level for each of the particular

discourses of adaptation, regardless of the analytical frames they might be associated with or influenced by. Chapter 2 grounds this ontics of discourse by establishing an analytical frame and terminology able to account for a specific problematization of adaptation in both its content and its contingency, and in doing so develops a means to explain how and why particular discourses of adaptation can move between the ideal types and general analysis frameworks outlined above. To do this, it draws on the linguistic tools of Critical Discourse Analysis, tied into a broadly Foucaultian analysis of the problematization of security in discourse (Dillon 1996, Campbell 1998, Foucault 1998, Hall 2001, Hansen 2006).

In sum then, this research recognizes the extant discourses of adaptation arising from hazards-, vulnerability- and capacity- based accounts of the threat of climate change, and being shaped into a particular problematization of security through an account of threat and the object and subject that adapts, linked together by a particular political rationale. In analysing this rationale, this research will draw on the three different 'ideal types' of adaptation identified by Pelling as resilience, transition or transformation. As these general approaches and ideal types cannot account for the actual form of a particular discourse of adaptation, this will need to be accounted for in terms of its discursive constitution.

In tying the mode of adaptation into its discursive construction, this thesis follows constructivist and post-structuralist accounts of discursive contingency in the fields of environmental policy (Oels 2005, Feindt and Oels 2005, Stevenson 2009), and climate change science (Shackley and Wynne 1995a, Lovbrand, Stripple and Wiman 2008, Shackley and Wynne 1996, Demeritt 2001, Demeritt

2006). Such approaches have already been applied directly to the governance of climate change, including through adaptation (O'Brien et al. 2007, Stevenson 2009, Bulkeley and Mol 2003, Okereke, Bulkeley and Schroeder 2009, Head 2010, Schipper 2006). Whilst these accounts do not necessarily use the term discourse or use it in the same way, all of them analyse the inclusion or exclusion of particular concepts in an account of climate change and a response to it, and note that this both constitutes and limits policy responses. It follows that an analysis of any given account of adaptation would need to be analysed in terms of how it is constituted and limited discursively. Beyond this broad theoretical angle, the variety of interpretations of adaptation discussed so far indicate just how enormous these exclusions can be and therefore how crucial for the inclusion of particular areas into adaptation policy. Thus making the problematization and its contingency clear is the first step to critical engagement with UKCIP's problematization of adaptation.

2.0 UKCIP's place in the Adaptation discourse

The divisions in adaptation discourse between techno-scientific, socio-contextual and socio-emergent approaches to adaptation all clearly give cause to question what any organization means when it uses the term. As such, it is necessary to determine what the content and structure of a particular discourse is, and where it is positioned in relation to these broader discourses. Official UK policy actors have had to contend with the different and changing accounts of adaptation outlined above in order to create their own policies and guidelines for adaptation. Central among these actors was the UK Climate Impacts Programme (UKCIP). This section introduces UKCIP and outlines the existing literature on its

function and its account of adaptation in particular. The final section of this chapter will then draw together the general accounts of adaptation, discourse and problematization established in Section 1 together with the specific case of UKCIP introduced here, to establish the research question and its constitutive aims and objectives that are explored in this thesis.

UKCIP was adopted as the case study organization because of the central position it held in the production and dissemination of adaptation discourse across the UK, and in particular for its role in creating the official account of adaptation in the UK. UKCIP was formed in 1997, charged by Government with providing advice and support to UK stakeholders, initially on how to interpret climate impacts, and later on how to adapt (UK Climate Impacts Programme 2004, Hulme and Turnpenny 2004, Willows and Connell 2003). The client for whom it performed this service was initially the Department for Environment, Transport and the Regions (DETR), which was formed in 2001 into the Department for Environment, Food and Rural Affairs (Defra).

UKCIP's initial role was to distribute the climate science information coming out of the Met Office and Hadley Centre. Since 2001, it began to develop its adaptation tools in concert with Defra and the Environment Agency (EA). As a result, the organisation was positioned at the nexus of all the official UK actors issuing public information on climate change and adaptation. Furthermore, even through UKCIP was itself a relatively small organization, it represented a national discourse, and reproduced this discourse through its interaction in both an advisory and facilitatory role with a variety of stakeholders from national regulatory bodies to regional governmental organisations to sectoral bodies and individual companies and local councils. As such, UKCIP operated through a

network that was rooted in multiple scales simultaneously (Hulme and Turnpenny 2004, McKenzie-Hedger et al. 2006, Turnpenny et al. 2005).

UKCIP's centrality in the discourse network extended beyond its direct functions, influencing the well-known Stern Review (Brown et al. 2011) within the UK, and internationally influencing the advice provided by the European Environment Agency, the Intergovernmental Panel on Climate Change (IPCC) (Colls et al. 2005) and the Australian Greenhouse Office approach to adaptation, amongst others (ESYS Consulting 2004, Brown et al. 2011). As a result, UKCIP can be considered as a significant actor in the production of adaptation discourse both domestically and internationally, a position which warrants further investigation into its problematization of adaptation. This centrality makes it an ideal point at which to explore how the specific problematization of adaptation that emerged in the UK was produced, and its potential to change. As a relatively small organization in itself, UKCIP is also an ideal place to observe the real and practical effects of its imbrication in power/knowledge relations on its problematization of adaptation.

UKCIP remained in operation on behalf of the Government until late 2011 when its role was gradually taken over by Defra and the EA. However, they have largely continued UKCIP's approach and its basic methodology has been the used as the basis of the National Adaptation Programme, (Defra 2012b, Defra 2012c, Defra Adapting to Climate Change Programme team 2012). This thesis thus considers UKCIP's role between its creation in 1997 up until the end of 2011, but focuses on the period between 2002 and 2009 when its adaptation discourse was being formulated and disseminated. This cut off point falls two years before 2011 and was determined by the active research period available. However,

Chapter 7 does include a discussion of UKCIP's discourse after that date and its significance for the development of the UK discourse on adaptation more broadly.

UKCIP's central role in the production of a discourse of adaptation from 2001 to 2011, is barely critically engaged with in academic literature. As such, an important and potentially powerful discourse has been constructed and implemented in a largely 'post-political' context (Swyngedouw 2010). Whilst it is not the objective here to question the efficacy and ethics of UKCIP's particular problematization, it is the intention to make clear the contingencies of its conceptual inclusions and exclusions. In sum, the basic research question here is: How is adaptation to climate change problematized in the discourse of UKCIP? The 'how' here is primarily a question of content, but entails some consideration of the process of conceptual inclusion or exclusion. Crucially, as UKCIP's account of discourse has itself emerged over the fifteen years of its operation, this question also entails a discussion of the contingency of this problematization, including the conceptual convergences and tensions that enabled its construction in the first place and its emergence over this period.

The existing academic literature on UKCIP, written in part by UKCIP staff, explicitly notes the difficulties that pertain to crossing between scientific knowledge and the form of knowledge needed in the policy arena. UKCIP is in fact generally acknowledged for 'bridging' this 'gap' by rendering scientific knowledge accessible and useable by stakeholders (McKenzie-Hedger et al. 2006, ESYS Consulting 2004, Gawith et al. 2008, Lorenzoni, Jones and Turnpenny 2007). Lorenzoni et al. characterize this function as that of a boundary organization, where UKCIP that acts as an "honest broker" (2007, p. 73) by

making the scientific information provided by the climate models available and accessible to wider society, and helping them to use it for the development of policy.

Whilst 'bridging the gap' and 'boundary organisation' imply that UKCIP resolves a conceptual and political divide, the question remains as to how exactly this is achieved and what effect it has on their discourse as a result. Lorenzoni et al. briefly note that boundary organizations help produce 'boundary objects' that shape the account of the social and scientific worlds (Lorenzoni et al. 2007). However, this is not investigated in terms of what those objects are or how they are imbricated in relations of power/knowledge. As such, the accolade of 'honest broker' implies a neutrality that is impossible in practice; All the knowledge and advice that UKCIP (re)produces on this 'border' arose from an extant and contingent set of power/knowledge relations, and passes through their own relations to both the scientific and stakeholder communities where it is interpreted in a similarly contingent manner depending on their internal make-up (Forsyth 2010). Whilst the concern of Lorenzoni et al. is to demonstrate the usefulness of this more decentralized approach for 'post-normal science' problems, they occlude the investigation of how this decentralized power/knowledge network really functions and what this means for the discourse and practices that are produced as a result (Eden, Donaldson and Walker 2006, Adger et al. 2009, Demeritt and Langdon 2004, Bulkeley and Mol 2003, Guston 1999, Star and Griesemer 1989).

Simply at a conceptual level, rendering climate science accessible and useable demands a series of interpretations and representations. We have seen in the first section that relationship between impacts and vulnerability was a new and

contested discourse during UKCIPs creation. If we combine this discursive tension with the situation of UKCIP in a discourse network that stretched across research institutions, academic discourses and governmental and public clients and stakeholders, it is clear that there is a need for a deeper analysis of how UKCIP's own specific problematization of adaptation was formed. This includes its conceptual content and how this was manifested in a series of 'boundary objects' such as the reports and case studies that it produced, as well as in its practices and the resulting practices of stakeholders.

In the context of the radically different accounts of adaptation, from the hazards based 'black-box' approach to the invasive potential of transformation (Whitehead, Jones and Pykett 2011), the particular problematization of adaptation produced through UKCIP clearly matters. Further, beyond simply making clear what its content is, the process of rendering the contingency of its content visible also helps open to a more critical ethical engagement with UKCIP's problematization of adaptation and its legacy.

3.0 Summary, aims and objectives

3.1 Summary of analytical basis of investigation

The lack of critique of UKCIP's discourse of adaptation, including its actual and potential development, calls for a deeper investigation of it at a conceptual and political level. The first part of this chapter explored the already established tensions in the problematization of adaptation between hazards-, vulnerability- and nascent capacity-based accounts of adaptation demonstrated by Burton et al. (2002), Fussel (Fussel 2007, Fussel and Klein 2006) O'Brien et al. (2007). It then

explored Pelling's three types of adaptation as resilience, transition and transformation, which demonstrate further tensions in the more involved accounts of the 'intention and action' of adaptation. These different approaches are conceptually linked and can be summarized respectively in terms of problematizations of adaptation as either techno-scientific, socio-contextual, or socio-emergent. These general problematizations and their constitutive elements and rationales will help guide the analysis of UKCIP's own discourse through highlighting both what it includes and excludes in its problematization and the discursive links it has to established analytical frameworks. The internal characteristics of each category, particularly those different forms of adaptation outlined by Pelling, will help identify elements in UKCIPs discourse and demonstrate the significance of those elements. In particular, whether or not the problematization countenances change to the fundamental nature of that which it seeks to protect, and to what degree, opens up the critical implications of how UKCIP problematizes adaptation at the level of the political (Rancière 2001).

The first section also identified briefly that problematization depends on an account of the threat or problem and its solution, bound together by a specific rationale. This structure's basic building blocks are its ontology and epistemology. It includes a subject that acts and an object that is acted on, although this may be one and the same, as exemplified by the social system in a socio-emergent account of adaptation. As such, the presence or absence of particular characteristics and the way they are articulated internally and with each other helps identify the even more fundamental ontological and epistemological premises from which each unique account of adaptation to climate change is constructed. Breaking these types down into these

fundamental conceptual elements is useful because it enables the analysis to observe how a specific problematization, such as that of UKCIP, might 'combine' 'ideal types' or move from one to the other over time. It creates space for an analysis of why and how this happens at a discursive level.

Table 1.2 below summarizes these various elements and their place in the three general problematizations of adaptation. It separates them into their ontological and epistemic foundations. These are created around two facets of ontology and epistemology, which are broadly conceived of in terms of time and space; broken down into subject and object to which pertain certain accounts of action and agency. All of these aspects are tied together with a particular political rationale that moves from certain elements that are characterized as a threat, to an account of the solution, creating as it does so a particular problematization of adaptation to climate change.

Table 1.2: Three problematizations of adaptation to climate change

Characteristic/element	Techno-scientific Problematization [Hazards/Resilience]		Socio-contextual Problematization [Vulnerability/Transition]		Socio-emergent Problematization [Capacity/Transformation]	
	Epistemology	Ontology	Epistemology	Ontology	Epistemology	Ontology
Time	Linear, prediction-sciences; global circulation models...	...knowledge of the future is accurate and precise, objective (prescient) and linear.	Understanding rather than accuracy; generated from social context...	...largely predictable future, but with sensitivity to the social basis of this future.	Communication of real time and emerging information...	...emergent, evental time to account for threat but also for emergent solution.
Space [subjects and objects]	Climate science, extended through risk calculus of the biophysical world and including effects on with 'exposure unit'...	...focus on biophysical, extending to physical products/processes; Exclusion of the social as object; Limited account of social as subject.	Study of social and political contexts; knowledge produced through communicative and social learning practices...	...social networks and contexts should be known.	Knowing through flexible, flat relations; Increased awareness reflexive knowledge processes collectively and individually...	...highly connective and contingent networks; focus on the internal social as well as socio-ecological relations, in current and potential forms.
Action/Agency	Seek increasingly accurate science of prediction, perform risk assessments, 'black-box' decisions (limited account of action)...	...kinetic relations: power assumed to be immediate and a property of named, discrete actors.	Collaborative knowledge sharing to account for threat, make decisions, and carry them out...	...network society, including social capital considerations. Social systems broadly considered.	Knowledge is collectively produced, and always changing,...	...ensuring communication and trust; Willingness to change and cooperate.
Political rationale	Adaptation is ensured through finding better knowledge...	...and deploying that knowledge: Planned, linear, kinetic; agency is assumed; strategy based on current knowledge.	Adaptation is based on improved communication amongst connected stakeholders for better account of threat and solution...	...and this enables engagement with the distributed nature of problems and enables broad-based buy in to the solutions.	Context of irreducible uncertainty means that sensory awareness and clear, real-time communication produce the necessary knowledge of threat....	...as well as the means to (re)establish flexible, flat, network, building trust to facilitate collective decisions, enable substantial risk taking/change, carry out action.

This discussion of the content of a problematization recalls Fussel's comment that many climate change adaptation programmes, including UKCIP's, combine a hazards- and vulnerability-based approach. The suggestion of the discussion so far is that this complementarity is far from natural and cannot be assumed; not only is it a historically contingent formation, but it would seem likely that it is difficult to maintain at a conceptual level given the conceptual differences and tensions identified above.

As such, this research seeks to problematize the assumption of complementarity through looking more deeply at how this development occurs at UKCIP. That is, through analysing how 'complimentary' these approaches are discursively, at a conceptual level as demonstrated through speech, writing, and communicative practices. As such, how such complementarity works when it does occur can be viewed more clearly if its content is examined within the framework of a discursive problematization: it can be unpicked in terms of the ontology and epistemology of the threat, subjects and objects and political rationale of the solution to that problem, and how elements from these basic frames are brought together can then be discussed in terms of their precise articulation. This should shed light on whether their complementary use is the same as conceptual coherence, and what effect this (in)coherence might have on the problematization's stability or potential for change.

3.2 Aims and objectives

On the basis of the discussion of the tensions between the different problematizations of adaptation above and the suggestion that UKCIP makes some of these complimentary, the aim of this research is to critically analyse UKCIP's problematization of adaptation to climate change.

The objectives contributing to this aim are:

- First, to situate problematization in terms of the contingency of its emergence, in order to enable more critical engagement with the conceptual content and form of this problematization.

- Second, to provide an account of UKCIP's problematization of adaptation in terms of its ontology and epistemology and how these are drawn together discursively through a political rationale.

- Third, to explore how the problematization relates to other discourses of adaptation established in the literature, and determine if, how, and with what implications these function in a complimentary manner within UKCIP's problematization.

3.3 Summary of thesis structure

This chapter has established three basic problematizations of adaptation from existing accounts against which to assess conceptual content of UKCIP's problematization of adaptation. The next chapter, Chapter 2, develops a theoretical account of discourse and its potential to change, while Chapter 3 establishes a methodology for turning these theoretical insights from adaptation research and discourse analysis into an analytical framework and toolbox for accounting for and unpicking UKCIP's own problematization of adaptation.

Chapter 4 provides an overview of UKCIP's discursive development, highlighting the power/knowledge relations that enabled the dominance of some accounts of adaptation over others and sets the groundwork for the account of UKCIP's problematization in the following two chapters. The first of these, Chapter 5, accounts for the epistemic basis of the problematization of adaptation in UKCIP's discourse, and identifies the presence of a core epistemology,

articulated together with supplementary elements. These resonate with the distinction between the techno-scientific and socio-contextual respectively. How these are rendered complementary in the discourse is examined, and the effect of this on their substantive meaning is analysed. Tensions in this articulation are explored. These become increasingly clear over time, particularly through naming the distinctiveness of a socio-contextual epistemology and pointing in turn to the possibility of a socio-emergent epistemology based on irreducible uncertainty.

Chapter 6 examines the ontological aspects of UKCIP's problematization of adaptation. Again, a core ontology is identified that resonates with the techo-scientific framing of adaptation. There are also supplementary moments which resonate with socio-contextual accounts of adaptation. The tensions between these, although linguistically resolved in UKCIP's key documents, become increasingly distinct over time, and in doing so hint at the possibility of an alternative and very different problematization of adaptation that is socio-emergent.

Chapter 7 considers the effect of these supplementary moments on UKCIP's problematization of adaptation and whether these are complimentary in the sense that they have made it more effective as a discourse through increased ontological and epistemic inclusion, or whether this has in fact weakened the substantiveness of its constitutive elements or the internal coherence of the problematization. It then discusses the coherence between these supplementary moments and their suggestion of a supplementary problematization that moves beyond a socio-contextual problematization to a socio-emergent problematization. Finally it discusses UKCIP's position on such an alternative

discourse, and the effect of UKCIP's departure from a government role for the presence of the supplementary problematization in the UK. Chapter 8 summarises the thesis as a whole in relation to the aims and objectives introduced here and considers the wider political implications of UKCIP's problematization of adaptation and the alternative problematization suggested by its supplementary moments.

Chapter 2: Discourse and Theory

'To analyse a discursive formation is to [weigh] the 'value' of statements, a value
that is not defined by their truth... but which characterizes their place, their
capacity for circulation and exchange, their possibility of transformation,
not only in the economy of discourse, but more generally in the administration of
scarce resources'

– Foucault, The Archaeology of Knowledge (1972).

'Politics is aesthetic in that it makes visible what had been excluded from a

perceptual field... it makes audible what used to be inaudible'

- (Rancière 2004, p. 226, quoted in Stamp 2009, pp. 11-12).

1.0 What is discourse, and why does it matter?

1.1 Introduction: Why discourse matters for policy analysis

As we have seen in the previous chapter, there are substantial debates over the
meaning of adaptation and its implications for practices, including policy. This
research seeks to address this question in the UK context, specifically in terms of
the discourse of the UK Climate Impacts Programme problematizes adaptation to
climate change.

This research situates itself within the mode of policy analysis that has
developed from the poststructuralist linguistic turn in the social sciences in the
1980's (Szerszynski and Urry 2010). This has taken policy and discourse analysis
radically beyond the 'transmission model' of communication, which assumes
language to directly represent reality, and reality to be merely represented by

language. Instead, the linguistic turn proceeds from the claim that we perceive and construct reality itself through a complex social process of meaning making.

Policy, as a specific practice of discourse, plays on the 'common-sense' assumption of a transmission model of communication. In fact, policy transforms this into an art, seeking to convince its audience of a particular truth in order to elicit a particular kind of response (Hansen 2006, Campbell 1998). In this way policy works through utilizing the malleability of discourse pointed out by poststructuralist approaches (Roe 1994).

This chapter seeks to establish the theoretical basis of this research and in to provide an account of the central analytical concepts it will use to unpick the content and contingency of the problematization of adaptation established in UKCIP's discourse. This chapter begins by discussing an ontology of discourse in in Section 1.2, and how this relates to the political in Section 1.3, and the ontology of the irreducibility of meaning in Section 1.4. It then discusses the role of power/knowledge in the contingency particular problematizations in Section 1.5. This contextual positioning is followed by an account of the content and structure of a problematization in Part 2, followed by an account of discursive change in Part 3. Part 4 draws together all of the aspects into a list of analytical concepts to deal with the content and contingency of the problematization of adaptation in UKCIP's discourse.

1.2 From language to discourse: from closed to open systems

Foundational to any discussion of policy or discourse is a conception of meaning, and its connection to language. The 'common sense' account of language is as a "transmission model of communication" (Reddy, 1979, quoted by Wertsch 2001), where language is seen as functioning as a 'conduit' that simply transferred

stable, complete meanings from speaker to listener or writer to reader, such that they were assumed to be spoken and understood in exactly the same way.

In laying bare the assumptions behind our use of language, Reddy provided leverage for critiques of extant language theory. Beginning in the 1920s with Wittgenstein, philosophers began to reject the idea of language as an accurate and consistent system of representation. Wittgenstein found instead that the meaning of a word arose from "its use in language" as "an ostensive definition can be variously interpreted in every case" (Potter 2001, pp. 40-41). He noted that this interpretation was a partially deliberate choice about the use of alternative understandings of words and phrases, such that language could be understood as a "toolkit" used in a "language game" (Potter 2001, p. 40). More fundamentally however, this capacity meant changes in language could fundamentally restructure worldviews, such that Wittgenstein noted that "the limits of my language are the limits of my world" (Johnstone 2008, p. 34).

This basic malleability of meaning was extended by John Austin from the role of the individual to the function of social context in shaping the use of language. He showed that the meaning of words and phrases depended on social or psychological 'felicity conditions' whereby they only were deemed to make sense if they fitted with the frame provided by language and social context (Potter 2001, p. 43). In this sense, meaning is relational: black is only black in the way we understand it because of the existence of the term blue; and the values (negative or positive) of that colour are shaped by the context in which it is spoken about. In this way, words have meaning only because of their relation to other utterances (Wetherell 2001b).

However, Austin did not follow up the element of deliberate manipulation that Wittgenstein introduced. It was Bakhtin who noted that there is always political. He noted that there is always a 'struggle' over what meaning is expressed and how between author and reader on the micro scale and between centrifugal and centripetal social forces on the macro scale (Maybin 2001). As such, the "meanings of words are derived not from fixed relationships between abstract signs, but from the accumulated dynamic social use of particular forms of language in different contexts and for different and sometimes conflicting purposes" (Maybin 2001). This allowed for language systems to be emergent, yet also to slow down and 'sediment' around particular uses of language within particular social contexts, such as institutions or generational groups. However, these different uses inevitably come into contact and 'struggle' again, as they "cohabit" social space, "supplementing and contradicting each other, and intersecting or becoming hybridised in various ways" (Maybin 2001).

1.3 Discourse and the Political

This contingent (re)production of meaning not only has fundamental political effects but it is itself the essence of the political. For Michel Foucault, whose account of knowledge is accutely sensitive to the question of power: knowledge is contingent on a 'struggle' or power-relation of some kind while at the same time knowledge also shapes power-relations. Discourse is thus productive of particular forms of life and rationalities of government as well as a product of these same political formations (Howarth 2000, Foucault 1977).

This applies at both the collective and individual level. In either case it is Foucault's contention that knowledge does not just manipulate or mislead the subject, but actively constitutes the subject as such (Foucault 1998). The power

of language to shape perception has been demonstrated from a variety of other theoretical perspectives. The ethnographical Sapir-Whorf hypothesis contends that the everyday 'language habits' of a group produces an understanding of the world or 'worldview' (Renkema 2004). Billig transfers this to an overtly psychological analysis and claims that conversation directly constitutes the unconscious (Billig 2001).

However these regularized systems of meaning are described, as language, discourse, or worldview, such accounts understand knowledge as contingent on power relations of some kind. As such, they do not represent a universal or objective 'truth.' The contingency of discourse means that they can be regulated and sedimented, or that they can emerge and change, with fundamental implications for the content and limits of what we 'know' and who we can 'be' as a result, including in our interaction with the wider social and material world (Hall 2001, Laclau and Mouffe 2001). As such, the form of discourse is political, both in its production and in what it seeks to produce both ontologically and institutionally.

Although Foucault avoids making any fundamental claim as to the basis of this contingency, the capacity to reform the social is linked in post structuralist and particularly in post-foundational political theory to an ontological 'lack' of an objective or coherent system of meaning. Instead, the 'overflowing' of possible meanings that constitute 'the real' or the 'divine' (Kate 2000, Marchart 2007). Drawing consecutively from Lacan and Laclau Howarth (2000) and Howarth and Glynos (2007) connect this ontology to Derrida's account of structural undecidability, and the thought of Heidegger, Foucault and Wittgenstein. In other

words, this is a "negative ontology" of "lack" that assumes the "radial contingency of social relations" (Glynos and Howarth 2007, p. 14).

Laclau's account of the institution of discourse takes it beyond being just "a theory of 'political signification' [to] a 'political theory' of signification" (Marchart 2007, p. 146). However, it is Rancière who perhaps offers the clearest explanation of this philosophical position and how it relates to an account of the political. Although he himself, like Foucault, might deny it was such, the lack of foundation becomes the foundation of the account for the political. Rather than drawing legitimacy from universal laws or telos, the political becomes not the account of what must or ought to be instituted, this impossibility of accounting in a commensurate way is the foundation of the properly political. The political is the act of institution of an account itself that will necessarily be partial (Rancière and Panagia 2000, Rancière 2001).

Rancière in fact wishes to distinguish himself from Foucault - believing the latter's account of power as 'everywhere' to mean that politics in Foucault's vision is therefore also 'everywhere' and thus substantively meaningless (Rancière and Panagia 2000). However , Foucault's determination that power and knowledge are imbricated and highly contingent assumes an account of the political that is without foundation, or perhaps more accurately, where the entire presence and function of a political act occurs in the constitution, removal or replacement of a foundation – either as an account of society or of a subject/self (Stamp 2009).

They also share, particularly in Foucault's later work, an understanding of the self as exceeding its subjectification where ethical comportment is to open the self to the exploration of excess in order to transgress existing power

relations (Foucault 1990, Foucault 1992, Stamp 2009). In Foucualt's account this is enabled through the 'virtuality' of power relations and the experimental playing out of potential against a limitless background (Stamp 2009), a term that resonates markedly with Rancière's term 'poetics.' Poetics accounts for the opening up of the extant order to fundamental change, where the rules of inclusion/exclusion change, which occurs in part through the discursive as a way of making the invisible visible and creating new orders of knowledge (Rancière and Panagia 2000). Here we see a relation to the political significance of articulating elements as moments into a discursive 'order.'

This foundation of foundationlessness, and the political moment as creation and change means that for Rancière equality cannot be *established* by the political moment or assured through a police order, but is instead the generative condition of the political. We are equal in that we are all able to be and become otherwise – not in a sense of numeric equality of likelihood, but in the sense that the presence of a particularity of order or subjectivity can only exist because it excludes, and that which it excludes is as valid ontologically or politically, separated from the real only by contingency rather than universal law. The excess thus adds to an order the conflicting logic of an equal claim to presence while the order's own logic seeks to exclude this 'originary equality' (Dillon 2005) by obscuring the visibility of excess.

Politics, for Rancière, occurs at the specific moments where these logics conflict (Rancière 2007b, Chambers 2010) as politics names the extant order as contingent and a 'fundamental miscount' (Chambers 2010, quoting Rancière, 1998, p. 7) while it should be understood, in contrast to modernist thinking, that all orders are necessarily miscounts of an incalculable and incommensurable

totality. It is this excess of established relations is what enables the political act of freedom at a performative level. Accordingly, Rancière notes that:

> "The principle of political interlocution is thus disagreement; that is, it is the discordant understanding of both the objects of reference and the speaking subjects. In order to enter into political exchange, it becomes necessary to invent the scene upon which spoken words may be audible, in which objects may be visible, and individuals themselves may be recognized. It is in this respect that we may speak of a *poetics of politics*"
> (Rancière and Panagia 2000, p. 116).

The political is thus the act of ontological institution, of creating a common account, even as this act is only possible because of the inherent impossibility of accounting. This ontology entails the inherent possibility, or even probability, that a 'flaw' or 'crack' will eventually reveal any social structure to be what it really is – contingent.

Here Rancière shows a marked similarity with the Foucaultian and wider discourse analysis mode by noting that accounting for the poetics of politics requires in turn a "*poetics of knowledge.* This means an operation on the objects of knowledge and on the modes of knowing that brings them to the level of a common language" (Rancière and Panagia 2000, p. 116). It is clear then that on this ontology the institution of a particular order of thought and associated social orders is the essence of the political, and that discourse, as the account itself and its means of communication, is fundamentally a political object as well as being performative of the political.

In this sense, the political appears to be the moment of disruption and/or institution. However, once established, the sedimentation this new order is

secured through what Rancière terms the 'police,' the established order (1998, 2001), no longer an expression of freedom through radical institution but an entrapment or curtailment of it though its specificity. However, this begs the question: why does society, or the subject, seek to formulate a set social system, and how? Lacan traces this back to a fear of the lack, and a desire for meaning as a way of feeling security, which he describes as enjoyment (*jouissance*). This is provided through "a narrative that covers-over or conceals the subject's lack by providing an image of fullness, wholeness, or harmony, on the one hand, while conjuring up threats and obstacles to its realization on the other" (Glynos and Howarth 2007, p. 130). In doing so, the narrative's prescriptions attach the subject to a particular social order, giving a place and identity to the subject within this order, and explaining the presence of the 'excess' of meaning in ways which exclude it and secure the extant order as somehow natural.

The key question in accounting for any particular discourse or order then is: what is included, what is excluded? There are two aspects to this: First, certain things are overtly or implicitly excluded. In doing so however, they are included as excluded (Howarth 2000). By contrast, the second form of exclusion covers that which is simply beyond a given discourse; that which has yet to be encountered or thought; or is simply excluded from accounting. In this context, it is again contingency that alerts us to moments of exclusion, if not necessarily to what is excluded (Howarth 2000). This makes clear that any analysis of discourse should cover not only what *is* said, but those contingent moments of inclusion or exclusion – whether happenstance or deliberate - including strategies for limiting or controlling what is cast as positive or negative and thereby instituting and policing the content and shape of a given order (Jäger 2001).

1.4 Discourse and materialities

Any discussion of the contingency of discourse immediately begs the question: how does this relate to the apparently "hard facts" of the material world as revealed to us through scientific endeavour, in this case, through climate science? Accordingly, it is necessary to establish the relationship between discourse and materiality. For Lacalu and Mouffe (2001, p. 107), "every object is constituted as an object of discourse, insofar as no object is given outside every discursive condition of emergence; and... that any distinction between what are usually called the linguistic and behavioural aspects of social practice... ought to find its place as a differentiation within the social production of meaning, which is structured under the form of discursive totalities." Here, practices are only at the level of the technology applied to the reality already constituted in discourse.

As discourses become institutionalized in practices, a system emerges that supports and effects a particular discourse and its (re)constitution of society and the subject. Foucault terms this emergent "net" a *dispositif* or an 'apparatus' (Jäger 2001, pp. 39-40). The concept of the *dispositif* combines both practices and discourse, including technologies for creating and implementing knowledge, and demonstrates the connection of discourse to the materiality of the practices involved on physical systems, such as identifying individual gases, or monitoring atmospheric content, to the structure and practices of institution like the Intergovernmental Panel on Climate Change; in turn these practices create and reinforce particular types of knowledge.

Foucault's account develops much further the function of materiality in the production of discourse and discursive effects. For Foucault, the imbrication of materiality and practices with knowledge means that discourses are not

abstracted from the reality they both construct and inhabit. As such, "their intrinsic technology, the necessities of their operation, the tactics they employ, the effects of power which underlie them and which they transmit – this, and not a system of representations is what determines the essential features of what they have to say" (Foucault 1998, pp. 68-69). This does not posit separate domains of materiality and practice beyond discourse, but rather the constitutive effects of the one on the other, rejecting the dominance of the linguistically produced reality.

This is expressed more clearly as: "power and knowledge directly imply one another... such that there is no power relations [sic] without the correlative constitution of a field of knowledge, nor any knowledge that does not presuppose and constitute at the same time power relations" (Foucault, 1977, p. 27). The differentiation between 'knowledge' and discourse is interesting, because here it seems that there is an 'extra-knowledge,' which is various forms of power which are nonetheless inextricably connected to it, but not as extra-discursive.

That this concern only highlights the inescapability of discourse as the means of 'access' to the real is highlighted when Foucault discusses his *'Rule of Immanence'* whereby power and knowledge are inextricably linked:

> "If sexuality was constituted as an area of investigation, this was only because relations of power had established it as a possible object; conversely if power was able to take it as a target, this was because techniques of knowledge and procedures of discourse were capable of investing it. Between techniques of knowledge and strategies of power, there is no exteriority, even if they have specific roles and are linked together on the basis of their difference" (Foucault 1998, p. 98).

This gives traction to the claim that Laclau and Mouffe and many others posit, that the materiality is mediated by language, not replaced by it (Campbell 1998, Jäger 2001, Hall 2001, Laclau and Mouffe 2001), under a semantic notion of discourse constructed as much by material technologies and material practices.

Arising from a completely different field of enquiry, Norgaard (1994) stresses how all the 'cultural' accounts discussed above are nonetheless situated within an ecological materiality, and both respond to and shape this ecology in a 'coevolutionary' manner. He too warns against the "blindspots" our particular ontology might provide for "other ways of knowing" (Norgaard 1994, p. 9-10) which here could be said applies to the lack of consideration of the physical environment in the production of knowledge. As we shall see, the (lack of) materiality of climate change is one of the key aspects in limiting the power of adaptation discourse through experiential identification, and the ways in which it is made to appear tangible enables certain discourses to become established. This view, which stresses that ecology and society are intrinsically related, extends beyond the 'subject' and the 'social' to show the effects of discourse on ecology, or the environment more broadly; human discourse exerts selective pressure on the environment, for example regarding it through a resources-driven logic, the environmental effects of which in turn exert pressure on extant discourses to account for new phenomena and effects (such as the coal-based industry and acid rain relationship). This adds another plane to the contingent emergence of discourse, and to the potential for on-going discursive change, particularly if, as Norgaard claims, "cultures, like gene pools... survive if they make the culture more fit" for its environment (Norgaard 1994, p. 88). The significance of the coevolutionary view is to bring to the fore the depth of

connection between discourse and environment in a complex emergence that not only demonstrates how profoundly culture affects ecology, but also how ecology effects culture, situating the contingency of discourse in terms of its origins and implications within and with nature within a broader set of materialities and power-relations than Foucault.

Traversing this intersection of culture and ecology in modernity are 'science' and 'policy.' Crucially these discourses have their own particular logics and modes, which Sheila Jasanoff terms 'co-production' (Jasanoff 1996), which enables the "simultaneous making of the natural and social worlds (Jasanoff 2010, p. 235). Here, policy draws on science for information and legitimation due to science's supposedly objective status, yet conversely, scientific content and results are shaped by particular policy environments or 'civic epistemologies' (Jasanoff 1987, Jasanoff 2010). These are productive and responsive to 'paradigms of control' and regulatory cultures (Jasanoff 2012a), demonstrating a fundamental dynamic of the "simultaneous production of knowledge and social order" (Jasanoff, 1996, p. 393). Jasanoff's account clearly echoes Foucault's, that "there is no power [relation] without the correlative constitution of a field of knowledge, nor any knowledge that does not presuppose and constitute at the same time power relations" (1977, p. 27). Jasanoff's critiques of the particular logics of the science/epistemology and policy/social order relationship are clearly relevant to the use of climate change science in the production and distribution of UKCIP's adaptation advice. Further, she highlights that these relations and distinctions between science and policy "are played out in the realm of language" through "discourse" (Jasanoff 1987, p. 199), and not only create a certain order but in doing so empower some ways of life -including

"policy options" - and actors whilst occluding others (Jasanoff 2012b, p. 137). Crucially, it is the apparent objectivity of science that in fact helps disguise this operation of power/knowledge and in doing so, disguises the political nature of its institution of 'social order' through the accepted account of the 'police' (to put this in Rancière's terms) which in the UK context is the supposed objectivity and neutrality of science (Hulme 2009).

Shackley and Wynne (Shackley and Wynne 1995a, 1995b, Wynne 2010) develop the co-production perspective directly in accounting specifically for the relationship between climate change science and policy in the UK. They demonstrate the inherence of culture and politics in science and science-based policy, and draw out the critical implications of obscuring its role: policy requires science to produce reliable, concrete evidence. They argue instead that this requires science to be something it is not, and call instead for a better acceptance and appreciation of uncertainty and as part of this an awareness of the way in which particular epistemologies and values are built into or excluded in scientific accounts of climate change and risk assessments based on these. This will be discussed further in Chapter 4 which explores the origins of UKCIP's discourse of adaptation, and in Chapter 5 which critically engages with UKCIP's account of risk. The obscuring of social values implicit in the 'translation' of science to policy (Wynne 2010) also obscures the need for engagement at the level of 'the political' discussed above, contributing to the stasis and rigidity of the social orders, or 'the police'. Chapters 6 and 7 discuss such effects and their implications for the kind of adaptation that is possible.

The broad foundations of the sociology of scientific knowledge laid by Norgaard, Jasanoff, Shackley and Wynne, offer extremely useful starting points

both theoretically and empirically for the discussion of UKCIP adaptation discourse. Here they have been situated in the more fundamental critiques of knowledge provided by Foucault, and related to the significance of articulation of discourse by Laclau and Mouffe, to highlight the function of the supplement as not only as discursive moment but as the political moment, as discussed through Rancière and Derrida. Together, they demonstrate the contingency of discourse and its associated 'forms of life' (Jasanoff, 1996), rendering the process of the formation and content of policy, including how it draws on science, as an essential object of study. The groundwork they have laid gives a good indication of particular kinds of relations to look out for, particularly given the epistemic framings at the national level (Jasanoff 2012a). However, they can also be given additional conceptual 'teeth' through a deeper engagement with theories of discourse, particularly at the linguistic level, as indicated by Laclau and Mouffes account of articulation. This will be discussed in the remainder of the chapter.

2.0 Ontics and Core Terms of Analysis

2.1 How to identify a discourse

If all meaning is constituted through discourse, an ontics for accounting for and making sense of the extant discursive field becomes necessary. There are many accounts of this field and its characteristics. Ernesto Laclau describes the whole of society, understood as discursively mediated, as an "argumentative texture" which Wetherell draws into a metaphor to describe every text as a smaller portion of this "fabric": "If we take a pen and make a circle on a piece of cloth then we have certainly created a boundary…but if we follow one thread from inside the circle our boundary becomes rather irrelevant since the thread

continues through the pen marks and onwards" (Wetherell 2001a, p. 389). This account of the discursive field as a complex weave resonates with Jager's claim that every text is in effect a 'discourse fragment,' never whole in itself nor wholly representing any single discourse (Jäger 2001). This view echoes Kristeva's account of the fundamental *intertextuality* that marks all texts (Hansen 2006). As a result, the conceptualization of the 'limits' of any text, let alone discourse, are problematic, making the identification of 'a' discourse necessarily a relational practice.

Any discourse's necessary connection to the wider discursive field also presents a problem where it is necessary to 'isolate' a discourse for the purposes of analysis. One definition that takes on board this dual tension between emergence and sedimentation is Foucault's account of a discursive formation, which refers to a particular discourse as a 'regularity in dispersion.' This is picked up by Laclau and Mouffe. They interpret the term dispersion as signifying the evidence of a 'point of reference' around with other terms are ordered, or connected. They interpret the term 'regularity' as a relatively set 'ensemble of differential positions… [which] constitutes a configuration, which in certain contexts of exteriority can be signified as a totality' (Laclau and Mouffe 2001). 'Regularity in dispersion' then, is the working definition of discourse here, useful not only for accounting for discourse, but also for discursive change because, as Howarth and Glynos put it, 'it allows us simultaneously to hold on to the idea of a pattern and an open-endedness.' (Glynos and Howarth 2007)

Howath and Glynos attempt to identify this configuration through the concept of "judgment" as a "situated ability" where a subject – a category that includes the analyst - posits the content or limits of a discourse by drawing on a

necessarily "a contingent and contestable framework" (Glynos and Howarth 2007, p. 184) such as the one described here. For them, this is deeply related to the issue of naming discourses, as a "(re)description," which through "rhetorical displacement or re-aggregation has precisely the function of emancipating a name from its univocal conceptual attachments," or the objects to which the discourse in question describes, but which the act of analytical naming helps to open to question (Glynos and Howarth 2007, p. 187, quoting Laclau, 2005, p. 109). In this way, an external point of view that is able to 'see' the discourse as a singularity through the use of judgement, establishes it as a discourse and provides an account of its contents through naming (Glynos and Howarth 2007).

The discussion in Chapter 1 of the emergence of adaptation as a new discourse, and of UKCIP's centrality in the wider discourse of adaptation in the UK acted as the first part of such the naming and justification of a discourse, this will be extended to a specific time period in Chapter 3, dependent on key discursive events in establishing this discourse, and the time period in which the research was conducted. In this way, for the purposes of accounting for the specific form of a discourse, which is always emergent, is necessary not only a 'cut' in discursive space, but also a 'synchronic cut' isolating one 'stage' of the discourse's development in time, in a way that justifies overtly the significance of that selection.

2.2 How do discourses create limits and meaning?

How exactly discourses create limits and establish meaning by what they include and exclude needs further exploration. As judgment and justification should demonstrate, the 'limit' of a discourse may be very much responsive to its own account of the limit, that is, of 'what' the discourse itself includes and what it

exteriorizes, explicitly or implicitly. Discourses function as systems of representation by placing objects in relation to one another. There are several explanations of how they do this, all of which centre on the creation of some kind of rationale, either at the macro-level of a narrative (Gergen 2001, Roe 1994), or at the micro level of rhetorical structure of sentences and phrases (Fairclough 2000, Johnstone 2008, Wodak and Meyer 2001). What is so critical in the production of such a story is that it requires a level of coherence that demands the connection, the (re)interpretation or exclusion of certain elements. Nietzsche expresses this in terms of the account of an ideal life as corresponding to a story in the sense that all the things that happen relate coherently to all the other elements (Gergen 2001). This links back to Lacan's account of the fear of the lack (and thus the fearfulness of the excess that indicates the real) discussed in the ontology section above.

As such, for discourses to exist in a regularized fashion, there must be logics "which produce effects of totality capable of constructing the limits, and thus constituting the formation" (Laclau and Mouffe, 1985:145-6). Kenneth Gergen (2001) notes a series of ideals and techniques through which this is achieved, including: establishing a valued endpoint; selecting events relevant to the endpoint, and thereby excluding those that do not fit; the ordering of events particularly to show causal linkages, and claims about causal linkages.

Such narratives play an active role in stabilizing policy discourses as well, particularly in the face of uncertainty, which might be understood as the encounter with the real. In fact, Roe calls for policy narratives to be explicitly considered regardless of the technical content of a policy itself as "these stories... often resist change or modification even in the presence of contradicting

empirical data, because they continue to underwrite and stabilize the assumptions for decision making in the face of high uncertainty, complexity, and polarization" (Roe 1994, p. 2).

Foucault's own account of this organizing capacity of discourse moved beyond assumptions to interventions in the subject and practices, and indeed in the account of reality itself. Foucault's final offering in his analysis of the emergence of truths was as a discursive 'problematization:'

> "Problematization doesn't mean the representation of a pre-existent object, nor the creation through discourse of an object that doesn't exist. It denotes the set of discursive or nondiscursive practices that makes something enter the play of the true and false and constitutes it as an object for thought (whether under the form of moral reflections, scientific knowledge... political analysis, or the like)" (Flynn 2005, pp. 26-27 quoting Foucault, translation from Dits et Écrits, p. 670)

Problematization thus refers to the specific content and meaning of a discourse; in doing so, it makes certain ontological and epistemological assumptions and places them together in such a way that they constitute a problem, thus generating a particular type or range of solutions. As such 'problematization' entails a basic problem-solution rationale. The particular rationale that arises from this structures particular fields of intervention which bring certain subjects and objects under its purview and calls for them to behave in a particular way, becoming institutionalized and sedimented through a variety of practices, established terminologies, and objects such as policy papers and educational materials (Flynn 2005, Foucault 1998).

This is not to say that a problematization's specific contents do not change over time, it will either retain a core referent that it problematizes differently, or will retain the same structure of problematization, replacing the core referent in order to maintain a particular rationale. Campbell gives the example of the communist threat being replaced by the war on drugs whilst retaining the same problematization in the discourse of the US Department of State (Campbell 1998), whereas changing problematizations of sexuality show how the same issues were understood differently by church and medical institutions (Foucault 1998). This recalls the account of discourse as "regularity in dispersion," as circulating in a general pattern, rather than a completely stable structure.

The centrality of the rationale in this discussion of the problematization so far indicates the need for a conceptual terminology to explore how exactly this functions. We have seen already the principles of narrative structure and inclusion/exclusion are key aspects. However, their basic conceptual operation is developed by Laclau and Mouffe's account of articulation (Laclau and Mouffe 2001):

> "...we will call **articulation** any practice establishing a relation among elements such that their identity is modified as a result of the articulatory practice. The structured totality resulting from the articulatory practice, we will call **discourse**. The differential positions, insofar as they appear articulated within a discourse, we will call **moments**. By contrast, we will call **element** any difference that is not discursively articulated" (Laclau and Mouffe 2001, p. 105).

This conceptualization sees discourse as the articulation of elements - which might be terms, concepts, or identities. When these are articulated, or connected

through some conceptual relation, they become moments of a larger whole thereby establishing them with a relationally constituted meaning. Although they use 'discourse,' their determination of this as a "structured totality" is used as leave here to return instead to Foucault's account of the problematization that structures the discourse.

Howarth and Glynos divide the ontological content and functions established by their connecting rationale according to three different kinds of logic: social logics, political logics, and fantasmatic logics, and utilize these as their core analytical devices (2007). There seems to be a close relation between Foucault's use the imbrication of discourse and its effects and their account of a social logic, as well as between his use of 'rationale' and 'problematization' and the political logics identified by Howarth and Glynos. As such, the original Foucaultian terms will be used here.

However, Fantasmatic logics represent the real addition of a Howarth and Glynos' Lacanian-based account of discourse, as it creates an explanation for why political and social logics in question are able to be accepted by the subject (2007). After all, why should the subject seek to identify in any particular social order, and how is it possibly that identity might change? Lacan traces this back to the lack, or rather, to the fear of the lack and a desire for meaning. This desire for closure is resolved in Lacan's account of enjoyment (*jouissance*) mentioned earlier. A fantasmatic logic responds to this, by producing "a narrative that covers-over or conceals the subject's lack by providing an image of fullness, [or] while conjuring up threats and obstacles to its realization" which explain the absence of fullness (Glynos and Howarth 2007, p. 143). The enjoyment, as either participation in or desire for this apparent wholeness "hooks the subject... to a

given practice or order, or a promised future practice or order, thus conferring identity" (Glynos and Howarth 2007, p. 130). As such, fantasmatic logics account for one way in which a discourse appeals to and shapes an existing subject.

The account of the fantasmatic offers an interesting supplement to Foucault's account of subjectivity as produced through disciplinary power and disciplinary power/knowledge. The two are not necessarily exclusionary, both assume a lack, but do not necessarily agree on the subject's autonomous desire to fill it. For Foucault, the greater project is to break down the cover (see, for example, Foucault 2001). Furthermore the fantasmatic appeals to the extant subject, perhaps particularly when they are challenged by events that signal the excess of the real. Therefore 'fantasmatic logic' will be used where this kind of appeal is in operation, although judgement is withheld as to whether the fantasmatic desire itself is ontologically prior to the constitution of the subject.

Whilst problematization and critical logics of explanation provide analytical capacity, they provide limited substantive capacity in terms of accounting for precisely how they themselves are constituted. As such, there is little traction on the actual discourse beyond trusting the non-explicit interpretation of the analyst. Returning to Laclau and Mouffe, problematizations are an articulation of specific elements as moments, the overall arrangement of which is constituted by a political rationale. However, these elements can be further broken down into whether they are principally ontological or epistemic. As such, the term 'ontological moment' describes any of the specific elements of foundational assumptions brought within the problematization and giving meaning by how they are placed in relation to other elements. 'Epistemological

moment' refers to claims as to how knowledge can be gained and applied to reality, covering both the element included the manner of its articulation.

The actual articulation is enacted through linguistic operations of reasoning. The role of narrative structure, rhetoric and other linguistic techniques is thus inherent to how a rationale can appear rational, and thus successfully cover over the irreducibility of meaning. Whether these are macro or micro, the problematization is constantly (re)articulated through such techniques. These will be discussed in detail in the Methodology presented in Chapter 3.

In sum, 'discourse' describes a regularity in dispersion, centred on a problematization. This problematization might focus on a particular referent, although this can change. This referent is the prominent moment in a rationale that articulates particular ontological subjects and objects with certain and epistemological assumptions, functions and practices. The rationale itself is established through conceptual connections established through linguistic techniques, and other meaning-making functions such as symbolic acts and physical practices. This enables the rationale to establish an apparently cohesive, and hence limited, account of life.

3.0 How does discourse change?

This ontics of discourse, built on an ontology of the irreducibility of meaning and the contingency of discourse itself, clearly makes space for the possibility of change when an excess is presented that cannot be fully accounted for within the existing order of discourse, or where the contingency of the order becomes

apparent, revealing excluded elements that exceed it, or where certain aspects of an extant discourse are utilized by excluded elements, disrupting the integrity of its account of the social order (Rancière and Panagia 2000).

However, unless agency is given to the surplus of meaning per se, it is clear that further discussion is needed to see how discourses actually emerge and change, and what ontics describes this process. This also raises significant questions, such as: how does what is said now affect or effect discursive futures? What power/knowledge relations give an indication of the possible routes of emergence, and those routes that might be in the process of being shut down? What are the potential effects and ethics of the analyst's intervention in this?

From the discussion in the previous section, there appear to be two starting points for approaching these questions about discursive change. The first might be termed a context-based approach, as seen in Foucault's later work, which tends to make discourse and discursive change visible in terms of the operations of power including technologies of knowledge. The second approach analyses on the semiotic content of the discourse, drawing primarily on Foucault's account of a problematization of discourse and Laclau and Mouffe's account of articulation.

This research attempts to remain sensitive to both power/knowledge and its manifestation and operation through the conceptual content of a discourse, particularly at a linguistic level. The latter is explored because the main basis of the study organisation, UKCIP, predominantly replicated its in a linguistic form through verbal and written content, as well as through epistemic tools, the justification for which was presented linguistically. Furthermore, the relatively short lifespan of UKCIP's discourse on adaptation, which is less than a decade,

and the limitation of the penetration of its problematization of adaptation into the practices of stakeholders in 2009, places the main weight of the analysis in terms of the conceptual content of UKCIP's discourse internally, rather than viewing discourse in terms of the effective production of subjects outside of UKCIP. The rest of this section will now briefly examine the contextual power aspects of discursive change that will situate the semiotic analysis. It will then go on to consider the content based aspects of discursive change in more detail as the mainstay of the analysis, building on Howarth and Glynos' account of logics, and drawing in particular on Derrida's account of 'the supplement' (Derrida 1976).

3.1 Contextual power/knowledge and discursive change

Much discourse analysis has tended to explain change through connecting it to the competing discourses of different political or social groups with established identities and agendas (Wodak and Meyer 2001). However, Foucault's account of the multiplicity of power-relations cautions against such a simplistic imaginary of the relation between power and knowledge: "we must not imagine a world of discourse divided between accepted discourse and excluded discourse, or between the dominant discourse and the dominated one; but as a multiplicity of discursive elements that can come into play in various strategies" (Foucault 1998, p. 92). The inherent interconnection of power and knowledge means that discourse itself should be conceived as made up of a "series of discontinuous segments whose tactical function is neither uniform nor stable" (Foucault 1998, pp. 100-101). This description of power/knowledge opens up the spaces in which discursive change can occur.

This diffuse understanding of discourse and power/knowledge is related to Foucault's account of power itself. On this view, power is not exercised by one person or thing over another, but rather is formed by the nature of the relation between the two (Foucault 1994). As such "resistance is never in a position of exteriority in relation to power," but also defines the terms of the relation (Foucault 1998, p. 95). Each are also given particular capacities as a result of the wider set of relations in which they are positioned, so that "there is a plurality of resistances, each of them a special case" (Foucault 1998, p. 96) with the result that the landscape of power relations is constantly changing. As a result, the discourses that are imbricated with these relations are also emergent.

Nonetheless, relatively sedimented discourses and their constitutive relations do come into being. Foucault encourages us to accept this as the contingent result of the complex emergence of power and resistances. Rather than looking "for the headquarters that presides over [power's] rationality," we should for the "tactics that are often quite explicit at the restricted level where they are inscribed" and observe if and how these localized tactics are "becoming connected to one another, attracting and propagating one another, but finding their base of support and their condition elsewhere, end by forming comprehensive systems" (Foucault 1998, pp. 92-3). The formation of such comprehensive systems can be self-reinforcing, creating a vortex of normative discursive practices that draw variations back into its central problematization and discursive describing of the content and limits of being (Foucault 1998).

However, it also seems that small resistances within power/knowledge relations can occur to the point that allows for a new crystallisation to be formed: "it is doubtless the strategic codification of these points of resistance that makes

a revolution possible" (Foucault 1998, p. 94). Whilst Foucault it talking primarily about power-relations here, the relation between power and knowledge means this would enable, encourage and result from the codification in discourse of such a resistance. This process of codification resonates with Laclau and Mouffes account of articulation, and places it in the context of social change.

Foucault's mode of investigation into the imbrication of power and knowledge, and the resulting, contingent, development of discourse, is through genealogy. The genealogical approach "focuses on the 'ignoble beginnings' and the contingent fabrications of historical phenomena," which allows him to radically historicize discourses and the sets of power-relations which they are connected to (Foucault 1998, p. 96). In effect this looks at articulation, although on a macro-scale of the coming and going of different elements and rationales made apparent by the passage of time (Foucault 1998, Hall 2001). Foucault suggests four 'cautionary prescriptions' for a genealogical methodology (Howarth 2000) that sketch out the relations between discourse and power in terms of general strategies and micro tactics, all of which demonstrate ways of tracking discursive change in terms of the contingency of its current content and its potential to change.

The first of these prescriptions is the *'Rule of Immanence'* of power and knowledge. This states that all objects of knowledge are produced through power relations. Yet those same power-relations are only possible because of the existence of a particular knowledge. Thus "between techniques of knowledge and strategies of power, there is no exteriority." As such, neither can act as the causal starting point in the analysis of discourse. Rather, analysis starts from "local centres" of this power/knowledge imbrication, which entails an "incessant back-

and-forth movement of forms of subjugation and schemas of knowledge" (Foucault 1998, p. 98). An example of a 'local centre' is the body of the child, which is the subject of a series of power-relations that (re)produce particular discourses and practices of nursing, educating, and mothering, amongst others.

The second 'prescription' for analysing discourse follows from the account of power as diffuse. This is the rule *'of continual variations'* which specifies that: 'We must not look for who has the power... and who is deprived of it...We must seek rather the pattern of the modifications which the relationships of force imply by the very nature of their process' (Foucault 1998). There are two aspects to this. First, we should not seek to name who has power and who doesn't, but rather to observe how the effect of something on someone constitutes a power relation. From this comes the second aspect: as there is no foundation determining who has power and who does not, these relations and patterns of relations also change continuously, if perhaps mostly incrementally. As such, immanence and emergence are necessarily objects of investigation under conditions where power, and its reflection in discourse, is diffuse and unstable.

Although this inherent instability is an ontological condition, it does not follow that power is in practice always 'unstable.' Foucault observes in his third rule of *'double conditioning'* that there is:

"[no] "local centre," no "pattern of transformation" could function [as such] if, through a series of sequences, it did not eventually enter into an over-all strategy. And inversely, no strategy could achieve comprehensive effects if it did not gain support from precise and tenuous relations serving... as its prop and anchor point" (Foucault 1998, pp. 99-100).

This is exemplified by 'the father' who is not the representative of the state, nor the state representative of the father. However, both try to draw the other into their mode of operation, sometimes acting contrary to the other, sometimes attempting to co-opt them in their current form (Foucault 1998, p. 100) for example the father altering his tactics to draw on the public discourse of the state, or the state absorbing the particular tactics of fathers to shape and gain support for its discourse. There is a clear resonance here with the earlier debate on the dual explanation of the fantasmatic logic discussed earlier.

The fourth and final rule, developing from the ontology of the diffusion of power, continual variations and double conditioning, is the 'tactical polyvalence of discourses,' whereby:

> "we must not imagine a world where discourse is divided between accepted discourse and excluded discourse, or between the dominant discourse and the dominated one; but as a multiplicity of discursive elements that can come into play in various strategies. [...] It is this distribution that we must reconstruct, with the things said and those concealed, the enunciations required and those forbidden... with the variants and different effects – according to who is speaking[,]... context[,]...[and] shifts and reutilizations of identical formulas for contrary objectives that it also includes" (Foucault 1998, p. 100).

This polyvalence means that "there can exist different and even contradictory discourses within the same strategy [of power]; they can, on the contrary, circulate without changing their form from one strategy to another, opposing strategy" (Foucault 1998, p. 102).

There is a distinction made here between discourses and strategies, and earlier between 'discursive elements' and the strategies that seem to take the place of 'a' discourse. The focus on discourse's partial insulation from power, provided by its ability to be played *between* tactics and strategy, enables discourse to both adapt in small steps, and maintain its general form even while being attached to a completely different strategy. There are clear resonances here with the account of discourse as '*regularity in dispersion*' discussed in the previous section. It is for this reason that problematization is used as it accounts for a precise formation of the structure of the discourse at any one time.

This points to the importance of the specific 'content' of the problematization and how this is given meaning by its rationale. However, this polyvalence also means discourse itself is a tool for discursive change, particularly if disassembled into its component elements. These descriptions of discourse demonstrate the link between Foucault's power-oriented account of discourse and a content-oriented account: first as partly insulated from strategies of power, and secondly as a substantive starting point of resistance or change. As such, whilst discourses exist as a product of power relations, including power/knowledge, they are also productive in themselves, and as such are worthy objects of investigation. The precise way in which this can be pursued will be considered in detail under the 'content-based' ontics of discursive change that follow below.

3.2 From 'context' to 'content'-based accounts of discursive change and the function of the supplement

Whilst Foucault allows an account of discursive change through his sensitivity to

the diffusion of power, Discourse Theory as advanced by Laclau and Mouffe, and followed by Howarth and Glynos, is sensitive to the diffusion, and indeed 'profusion,' of meaning. This ontology makes explicit allowance for discursive change, as "...all discourse is subverted by a field of discursivity which overflows it, the transition from 'elements' to 'moments' can never be complete" (Glynos and Howarth 2007). More explicitly, the practice of articulation means that all meanings that are 'fixed' necessarily introduce and link to wider and alternative meanings or combinations of meaning that undermines this fixity, recalling Kristeva's account of intertextuality (Hansen 2006).

Bakhtin explains these connections and reinterpretations in terms of interpersonal interactions: "The internally persuasive word is half-our and half-someone else's [allowing] dialogic interanimation [and awakening] new and independent words... The semantic structure of an internally persuasive discourse is not *finite,* it is *open*; in each of the new contexts that dialogise it, this discourse is able to reveal ever new *ways to mean*" (Wertsch 2001 quoting Bakhtin, 1981, p. 227). As such, an account of discourse that focuses on content in terms of systems of meaning is also able to explain discursive change.

Although the section above discusses Foucault's account of discursive change mainly in terms of power, it has hinted at two processes through which discursive 'content' might change. The first is the movement of different discourses as a whole to and from different strategies of power, that is, where a particular articulation of elements is attached to a different political rationale. The second is the strategic codification of points of resistance, which in Laclau and Mouffe's terms might be characterized as the rearticulation of particular 'discursive elements' from extant discourses into a new one.

Howarth and Glynos' account of logics of critical explanation demonstrate in detail how this articulation can be observed in extant discourses. However, they also give some indications of how this approach might help explain discursive change. This centres around the re-articulation of the original elements and ones that were previously excluded, into a "counter-logic" (Glynos and Howarth 2007, p. 187). Whilst it is of course possible that these counter-logics or re-articulations of discourse are externally generated by additional or subaltern groups, Glynos and Howarth maintain that counter-logics can also be "immanent," or "exist in the incipient form – in the self-interpretations of [actors]" (Glynos and Howarth 2007, p. 187). This argument is adopted for this research, however as Howarth and Glynos' use of logics has not been adopted here, their basic principles of articulation into a rationale is used as the justification to instead use the terms alternative rationale and alternative problematization.

This raises the question of: how does the content or structure of a particular discourse allow for the emergence of a alternative problematization, and how does this relate to self-interpretations as the (re)articulation of that discourse? Although it is not used by these authors, Derrida's account of 'the supplement' adds depth to their understanding of 'immanence' and 'incipience' of alternative rationales. It begins with the addition of a new element from the excess as a 'supplement' that when articulated into an existing problematization extends its breadth. In doing so, the supplement acts to maintain the integrity of the discourse through helping to mask a place where the extant discourse struggles to 'cover over' the 'lack' (Derrida 1976).

However, this very 'outsideness' of the term added as a supplement means that it also effects the second sense of Derrida's supplement – the ability to supplant the prior and primary term and the shape of the problematization as a whole, as its addition also necessarily reveals the conceptual limitations and discursive contingency of that order which existed before. In this way, the supplement "comes from without to affect the integrity of the subject" (Derrida 1976, p. 163). This dual function challenges the 'natural' order yet does so by positing a new account of the 'natural' which allows for the myth of a fundament to continue, with all the functions this serves of founding a particular social or governmental order, and for the (re)constitution of the subject, enabling the supplement to in fact serve a policing role (Chow 1999). In this way, the paradoxical function of the supplement is both a strength and a weakness, making it is useful to regimes of power, just as it is useful to those seeking to change such a regime. Put simply, the supplement both "opens and limits visibility" (Derrida 1976, p. 153).

Laclau and Mouffe's account of articulation adds some precision to how the supplement comes to occupy this ambiguous position. The supplement is an element that is adopted from, or resonates with, a fundamentally different discourse or problematization that does not match ontologically, epistemologically or politically with the original. It is because of this that it can be understood as 'dangerous' to the original (Derrida 1976, p. 163) even as it tries to add value to it. As such, to remain as a supplement it has to be articulated in a way that obscures these inconsistencies if it is to remain an apparently innocuous addition, merely extending the 'cover' of the original problematization, rather than threatening it.

The nature of this articulation determines when the supplement appears as "a subaltern instance" (Derrida 1976, p. 151), that is, being marked as an addition, or a superfluous, minor, or subsidiary point, whilst the core term or problematization is still characterised as natural, full, or ideal. In this sense, the supplement is included in a way that uses but also denies it its full presence within the original discourse. Thus it is crucial to note not only the supplementary term, but the way it is maintained as supplementary. As such the form of articulation that holds the supplement as subsidiary will be termed 'supplementary moments,' drawing on Laclau and Mouffe's account of the articulation of elements as moments. Crucially, this manner of articulation is what ensures the conceptual differences the supplement introduce remain indistinct and inert, thereby leaving the core problematization intact.

A further way of understanding the reinforcing role of the supplement comes with what Derrida describes as 'limit-points' that ensure a text appears as coherent, maintaining its integrity, or re-establishing it against the threat of rupture of the real by masking the lack. Such limit points are created through the "privileging of certain conceptual oppositions and logics, and the repression of others" (Derrida 1976, p. 145). Such limit points occur in the articulation of the supplement in order to limit its potential to supplant an existing rationale, problematization, or discourse. Therefore the strength as well as the type of articulation into the existing problematization accounts for the level of impact that the supplement has, and its potential to act as a gateway to discursive change.

Another form of limit point is where an element is "constitutively excluded in the construction of an identity or regime [which nonetheless] render

that identity vulnerable to being subverted and eventually transformed' (Howarth 2000). This recalls Agamben's inclusion through exclusion (Agamben 1998), or the overt 'othering' of an extant term as beyond the problematization, where although it is named, it is designated as 'bad' or undesirable and therefore beyond the 'natural' order or the 'good' life (Hansen 2006, Laclau and Mouffe 2001).

If the presence of the supplementary term and the nature of the supplementary moment is made clear, they highlight the contingency of the core problematization, and in this way provide points of departure immanent to the text for actual extension or change. This is why Derrida refers to the supplement as dangerous: the inherent power of the supplement is that it reveals the original term is somehow lacking, and the supplement steps in as a source of replacement, in Derrida's example when Nature becomes the supplement of art and society (Derrida 1976).

This does not, of course, mean that change will occur. Laclau and Mouffe warn against believing "that our problem may be reduced... to one of determining the points of rupture and their possible modes of articulation" (Glynos and Howarth 2007) as not all of these will develop into full discursive change. Rather, as already discussed, such change is connected to how mutually reinforcing power/knowledge relations are, which has important implications for understanding the transition from a supplementary moment to a supplementary rationale or problematization as a whole.

Crucially it is this irruption that is significant. Returning to Rancière's account of the political, we see that the supplement is significant because it is inherently political insofar as it remains 'dangerous' to the extant order. It is not

simply an element floating around in abstract potentiality, but the point of friction or encounter between the excess and order. Rancière extends the theorization of the supplement to not merely an instance of the other or excess, but rather as making visible the 'void' between order and excess, between the 'human' and the 'divine.' The specific supplement is then only a function of the excess which will always ensure there is always "a supplement to all social (ac)counts and an exception to all logics of domination" (Rancière 2001, p. 6).

In sum, "[political] struggle is not a conflict between well-defined interest groups; it is an opposition of logics that count the parties and parts of the community in different ways" (Rancière 2001, p. 7). Here the established logic is the *'police'* and the interrupting account is *'politics'* as a verb, rather than a noun: "Politics is specifically opposed to the police. The police is a 'partition of the sensible'... whose principle is the absence of a void and of a supplement (Rancière 2001, p. 7)."

The significance of this for 'policy' as effected by our case study of UKCIP advice and technical approaches is indicated by the etymological relation of 'policy' to 'police:' policy is a: "'way of management, government, administration,'" originating "from Old French *policie* (14c.), from Greek *politeia* 'state, administration, government, citizenship,' from *polites* 'citizen,'" (Harper 2012b) and where 'police' similarly is: "essentially the same word as policy... from Middle French *police* (late 15c.), from Latin *politia* 'civil administration,' from Greek *polis* 'city'" (Harper 2012a). For Rancière, this order of the polis is the onto-political ordering of life, and is instituted through an 'order of discourse' (Chambers 2010, p. 196). This polic(y)ing is clearly a form of the police, an

account of the solidification of an order, of those allowed to participate and those partitioned-off.

Like Derrida, Rancière examines writing as the supplement to speech in Plato, but notes that it is not just its presence as such but its adoption by the supplementary population for use outside of their allocated space and role that makes it political, undermining the existing order and allowing the *demos* to become scandalous, or in Derrida's terms, 'dangerous' when it utilizes 'excess of words' provided indelibly by writing (Chambers 2010). Whether he likes it or not, Rancière's account of the political nicely draws together the ontological account of the supplement and the power/knowledge realtions analysis of Foucault, to reveal the political significance of discourse and its groundedness in actual relations.

The supplement operates as an element of excess that becomes visible in the political moment. Insofar as it disrupts or supplants the existing logic or order, the coming to presence of the supplement is the enactment of equality as freedom and the moment of the political in Rancière's account, which he in fact calls the 'supplementary part' or 'the part of those who have no-part' (Rancière 2001): "Politics is a specific rupture in the logic of *arche* [order/accounting of the real]. It does not simply presuppose the rupture of the 'normal' distribution of positions between the one who exercised power and the one subject to it. It also requires a rupture in the idea that there are dispositions 'proper' to such classifications" (Rancière 2001, p. 3). This is the crucial distinction between a consensus driven, stakeholder-engagement and a radical rethinking of the order of thins implied by function of the supplement. The police accounts for the other function of Derrida's supplement – its capacity to be subsumed into an order or

logic – "the police that is, in turn, always attempting [the supplement's] disappearance either by crudely denying it, or by subsuming that logic into its own" (Rancière 2001, p. 6). The police in this way act to ensure the limit of intelligibility, of meaning - achieved in part through accounting for value. Consensus, therefore is achieved through policing of one form or another, and is not the operation of the political, but is rather "the reduction of politics to the police" (Rancière 2001, p. 10).

Rancière explores the excluded nature of the supplement as policed and produced as an exteriority by the order of 'normal' discourse. Going back to the Aristotle's account of the order of the city, the poor are taken to have speech that cannot be recognised as such – because the fact that they speak and the things that they want are unintelligible to the existing order, the white noise of their utterances are *'blaberon'* (Rancière 2004, Hewlett 2007). Rancière "thus considers words not as mere superstructural manifestations of something deeper and more significant, but items of significance in themselves, real political acts" (Hewlett 2007, p. 98) both in terms of the speaker staking the claim to be heard and the content of their speech. The demand to be heard is thus an insurrectional event that has to penetrate this barrier of (politico-ontological) intelligibility if it is to be truly political in the sense of effecting real change.

This raises the question of how this apparently 'Other' supplement can effect change on an extant order, and brings us full circle back to Foucault's more detailed investigations of conceptual change and power relations. The interactions of multiple conflicting discourses as 'surfaces of friction' around 'local objects' and the intersection these have in a given subject (Foucault 1998, Foucault 2001) are two ways of accounting for discursive change. This may cause

a 'dislocatory event' that disrupts the limits of what is held to be true, and the constitution of the subject or fantasmatic identification (Heidegger 1962, Lacan 2006: 693). If we return to Lacan's account this "dislocation signifies the presence of 'the real' in the symbolic order, which can be characterized as a moment when a sense emerges, however localized or diffuse this may be, that 'things are not quite right,'" (Laclau and Mouffe 2001, p. 131).

The significance of the dislocatory event for discourse is that this desire for presence, or awareness of the incoherence, causes the 'chain of signification,' as people seek to cover over the lack (Derrida 1976, p. 66). In this regard the lack itself is constitutive rather than merely permissive. That is, the irreducibility of meaning effects a situation in which no identity or subject can ever be fully constituted, such that all logics, even fantasmatic ones, are open to rejection, alteration, or change. Thus, dislocatory events thus provoke genuinely political practices through calling for the formation of new political articulations and rationales, as subjects seek to again cover over the 'spaces' opened up by the disruption of the extant (discursive) order (Glynos and Howarth 2007). Similarly, the ethical comportment to the self, and the encounter with excess also provokes the production for new discursive articulations and parallel new power relations (Foucault 1990, Foucault 1992, Hall 2001). This '(re)covering over' that follows is achieved either by rearticulating these new elements either into a transformed version of the problematization, or by adopting a new discourse.

This account of the supplement as supplementary moments, and their articulation into the original or an alternative problematization provides some pointers as to how to investigate the limit points of a discourse, and the need to explore how open its avenues of change are. Through naming the supplement, it

also points to discursive change arising either at the level of single objects or terms, or through specific power/knowledge connections to alternative problematizations and discourses, thus giving an indication of how the extant problematization might change.

3.3 Contingency and the role of critique

If, discourse produces truth, as has been argued above, this has major implications for the ethics of critique. The formation of any discourse represents the exclusion of the real, and the more hegemonic the discourse, the less the ability of individuals to act politically in the (re)constitution of the discourse and how they identify through these acts. This prompts a mode of 'ethical critique' that avoids rearticulating the discourse into a particular form but instead seeks to make these power/knowledge relations overt (Glynos and Howarth 2007). In doing so, it opens up space for the political by making it clearer what a discourse does, including what avenues of being it opens up and closes down (Rancière 2007a, Rancière 2004). By doing so the discourse becomes not only more visible but more accessible as a field of political intervention (Foucault 1998, Rancière and Panagia 2000, Foucault 2001, Hall 2001, Glynos and Howarth 2007).

However, there is also the possibility of engaging with a 'normative critique' which supports a particular discourse. This might be the discourse in its extant form or a counter-discourse (Glynos and Howarth 2007). A normative critique approach has been adopted by many Critical Discourse Analysts in the attempt to equalize the hegemonic power of the dominant discourse and associated dominant group (Wodak and Meyer 2001). However, as discussed above, this would constitute a political act and an attempt to suture the void. As such only an ethical approach is taken here. Nonetheless, it is sometimes difficult to avoid

being perceived to adopt a normative approach, in as much as naming the supplement and counter-logics to demonstrate the moments of articulation that police the original discourse has the effect of helping reify these and in doing so appears to support a particular alternative. It is here the Howarth and Glynos' (2007) determination that the counter-logic arise from the self-interpretation of subjects of a discourse becomes significant if the researchers role is to remain as 'ethical' as possible and as such it is necessary to demonstrate is origins within the case study material.

Accordingly, this research uses supplementary moments and their suggested logics to reveal the contingency of the extant discourse for the purposes of ethical critique. However, it is also concerned to use very generic terms in the identification of these supplements in order to avoid linking them falsely or prematurely to a discourse that does not arise from the subjects themselves. For this reason, broad terms like 'the social' and 'social' and 'social organisation' are used in Chapters 5 and 6 to demonstrate supplementary elements that although present are only weakly defined and not clearly linked to a particular alternative discourse.

However, supplementary moments are nonetheless significant; the substantive occlusion of the elements they signify is as much an act of power as that which is included, and therefore where the actual articulation to each other or to external discourses is clear, these are explored further in Chapter 7. Again, this is ethical in Howarth and Glynos' sense of not being an external imposition, but rather arising in an 'immanent' manner from the existing form of the discourse and its extant supplements (Sabia 2010).

4.0 Conclusion

This chapter has sought to establish the theoretical basis on which to account for UKCIP's discourse of adaptation to climate change in terms of its content and its contingency. In doing so, it has established core terms of analysis. The most essential of these is the account of discourse in its specific structure as a problematization. This is understood as made up of different conceptual elements, which, once they are articulated into the problematization are referred to as moments. These moments may be ontological or epistemic in nature, and the problematization as a whole is likely to revolve around one of these, called the core referent.

The nature of articulation within a problematization is as significant as what is articulated, as it is through being placed in relation that these elements are given a much more precise meaning. As such, being included, or included as excluded is significant, as is the sequence and value placed on the element through the manner of its articulation as a moment. Articulation can work through various forms, including linguistic, narrative and rhetorical, and through established routines, rituals and procedures of practices. Together, these form a specific political rationale, or argument that institutes a particular account of reality, but does so through establishing a rationale of problem and solution. The linguistic means to give traction to this articulation of the problematization are established in Chapter 3.

This content and its articulation are contingent upon power-relations. Foucault's four 'rules' of power/knowledge are used as pointers here to help uncover the contingency of a problematization. The first of these is the rule of immanence, whereby power and knowledge imply one another. As neither are

prior, a particular discursive formation can be investigated through a 'local centre' as an entry point to this imbrication of power and knowledge. For this research UKCIP as an institution is one such focal point, and an even more 'local centre' lies in the creation and use of a particular report. Accordingly UKCIP as a whole and a more precise focus on this report are used to ground the investigation of the contingency of its problematization of adaptation. This process will be discussed further in the following chapter on methodology.

This contingency of discourse is marked by continual variations, such that discourse is constantly being re-articulated, modulating perhaps only slightly but always with potential to change. This opens the door for double conditioning, the use of the same problematization for different objectives, which in Lacanian terms can be accounted for as a fantasmatic logic, the appeal of a discourse to an extant subjectivity, or the desire to be made subject. However, this can run in the opposite direction in the sense that the same subjects and strategies of power can appeal to very different discourses for the same ends: signifying the 'tactical polyvalence of discourses.' This also appears in a more minor fashion through the appearance of supplementary moments, and perhaps a supplementary rationale that extends the reach of an existing problematization. However, the contingency of discourse on power relations and the excess of all discourse by the real means that these supplements are inherently 'dangerous' as they can act as moments of discursive emergence. The real may also appear as a dislocatory event, disrupting a problematization and prompting efforts to resolve this aporia, which may be resolved through the articulation of a supplement into the core problematization.

The inherent possibility of discursive change, marked in actuality by supplementary moments, recalls the objective to account for how different problematizations of adaptation might merge together in practice and whether these are really 'complementary', particularly given the inherent possibility of the supplementary moment to form the basis of an alternative problematization given the lack of foundation of the original. To this end, it is the objective of this thesis to follow an ethical mode of critique: demonstrating the content and contingency of the extant discourse and where its limits lie as a result, while also exploring its existing supplementary moments and their potential links to alternative discourses in order to recognize the political nature of the (re)articulation of UKCIP's problematization of adaptation to climate change.

Chapter 3: Methodology

1.0 From theory to methodology

1.1 Introduction

The previous chapter identified discourse as the object of analysis for this research, and made a practical distinction for analytical purposes between the conceptual content of the discourse and its context of contingency through power/knowledge relations. Within this twin focus on content and contextual contingency were established several core terms of analysis. Specifically, it established the discursive problematization as the key analytical frame, composed of particular ontological and epistemic moments produced through articulation, where this nature of this articulation as a whole forms a political rationale. The fundamental contingency of discourse is also taken to mean that discourses as a whole and their specific problematizations can be re-articulated to create supplementary rationales, and even supplementary problematizations which may graduate to becoming independent, alternative problematizations.

In order to operationalize this theoretical approach as a methodology, this chapter will first outline the selection of UKCIP itself as the object of research in the remainder of Part 1.0. Part 2 will describe the techniques and processes that were used to collect different discursive material that was representative of UKCIP's discourse of adaptation. Part 3.0 will describe the linguistic basis of the discourse analysis approach to UKCIP's problematization of adaptation. In each section, the link between this practical methodology and the core terms of

analysis will be explained, to show how this approach helps provide traction for the theoretical analysis of UKCIP's discourse and its potential to change. Finally, Part 4.0 will concluded the chapter, and note the limitations of the methodology in accounting for UKCIPs discourse of adaptation, and the significance of this.

The explanation of the theoretical basis in the previous chapter and its practical application here are necessary in order to demonstrate how the 'judgements' and 'naming' of UKCIP's discourse, and in particular it's problematization of adaptation, were reached (Glynos and Howarth 2007). In doing so, it responds to the discussion of the 'lack,' and the ultimate contingency of meaning, not by claiming all discourse and thus its analysis is invalid, but rather by recognising that as objectivity is not possible, it is necessary to communicate openly and clearly the "choices and strategies" that have been made (Hansen 2006, p. xix) in identifying a discourse for analysis.

1.2 Selection of UKCIP

Through a review of academic and policy literature and of government structure, Chapter 1 established that UKCIP was the core organisation in the production of official adaptation discourse in the UK during the research period. It is recognized that this wider discourse network necessarily places limitations on UKCIP's discourse, not only in terms of content but also in terms of "the degree of stability [the] official discourse enjoys within the wider political and public sphere" (Hansen 2006, p. 72). As such, where possible these connections have been pointed to in the literature review in Chapter 1, but will also be considered in Chapter 4 in particular, and in the 'postscript' in Chapter 7. However, as the institutional context of this discourse was not the primary object of research,

these concerns are only raised where they add to a consideration of the conceptual content of the problematization.

This is not to say then that UKCIP was the only organisation that influenced the discourse of adaptation in the UK, but that it exercised a strategic role in the consolidation and production of that discourse through its position at the centre of a governmental-scientific network, and as the disseminating node between that network and the public. As it is UKCIP's discursive 'products' and practices that do this work, an 'intra-discursive' analysis of UKCIP's discourse, rather than the wider power/knowledge relations which play into this, is a valid approach in accounting for its actual problematization of adaptation.

The first chapter also established that UKCIP's discourse and position in the UK discourse-network on adaptation was not explicitly or heavily politicized. While no discourse exists independently of power/knowledge relations, the general lack of discursive contestation that this revealed also made it appropriate to focus on UKCIP's internally produced discourse as the 'official discourse' of adaptation (Hansen 2006). This entailed a methodology that focuses on its intra-discursive constitution.

However, it is important to note that the decision to focus on UKCIP was made in early 2008. Half way through the primary research period, on the 26th of November 2008, the Climate Change Act was introduced, which broadened responsibility for adaptation within the UK to the Climate Change Committee, specifically through the Adaptation Sub-Committee, which has powers to demand risk assessments and adaptation actions be carried out. At the time the complete role of these bodies was yet to be fully established, and as such could not form part of the research. Thus, UKCIP remained at the time as the core

provider of adaptation advice within the UK, a role which continued until 2011. Since then, it emerged that much of the adaptation procedure produced by UKCIP would be taken-over by the Environment Agency and the Department for Environment, Food and Rural Affairs (Defra 2012b, Environment Agency 2012, Defra 2012c). The implications of this for adaptation discourse in the UK are discussed further in Chapter 7, but for now it is sufficient to note that much of UKCIP's discourse, specifically its technical approaches and practices, are continued under this new institutional basis. As such, the research and findings carried out here still have significance for the discourse as it moves forward, but the real validity of the research is for the period of 2002 to 2009, the period actively covered by the research, as will be discussed further in the remainder of this chapter.

The choice of the UK as the country for the exploration of official discourses of adaptation was logistical, as the country where the doctorate was based. However, it was also a necessity that arose from the theory of discourse analysis, in that it relies on a 'native' understanding of linguistic use in order to interpret the discourse in a relatively common fashion including (Hansen 2006). Here it should also be noted that, as discussed in Chapter 2, there are limits to this ability for any individual to interpret a discursive statement completely as it was intended by the author, particularly within different fields of research (Maybin 2001). This is at once a strength and a weakness, rendering UKCIP's technical discourse somewhat 'strange' to a social scientist and in doing so making the analysis of its language both more difficult to grasp as well as more critical as it is not taken as 'natural.' In part this issue of the validity of the analyst's interpretation is addressed in this Chapter through the triangulation of

several techniques, and through making judgments as overt as possible such that their own contingency is open to critique. This section has described the choice of 'including' UKCIP and excluding other organizations from the analysis of the discourse of adaptation in the UK. The next two sections will cover the choices of inclusion and exclusion within UKCIP's discourse.

1.3 Data selection within UKCIP's discourse

The first methodological approach to working at this interface of power/knowledge draws on the Foucaultian method of identifying a 'local centre,' described in Chapter 2. In a sense, UKCIP as an organization is itself a local centre, where its account of adaptation is the focus of power/knowledge relations. This also enables us to address the often neglected question of the mechanisms of intra-discursive change through making visible tensions and change over time and across social space *within* one discourse group.

However, more specifically this research focuses on the creation, and also the changing interpretation and use in practice, of a particular technical report. This report, *'Climate adaptation: risk, uncertainty and decision-making'* (Willows and Connell 2003) was selected because it established UKCIP's first account of adaptation, and also because it formed the foundation of its later responses, before finally being adopted as the basis of adaptation for the 'post-UKCIP' adaptation regime (Environment Agency 2012). As such, the report acts as a hard and fast starting point against which to measure change, and thus as a 'local centre' of discourse production.

As the basis of UKCIP's approach, the report was also used as a 'local centre' in its varying use and interpretation across the 'social space' of the organization (Hansen 2006). For Foucault, the local centre was in principle

something at which practices were directed, so strictly speaking a more accurate application of this concept would have been the adaptation policy of the stakeholders with which UKCIP interacted. However, as this research is about UKCIP's 'common denominator' discourse, regardless of the particular stakeholder, analysing this variety of very lengthy interventions and interactions would be too time consuming. As such, UKCP's official basis of these interactions, in the form of the 2003 report, is a useful centre-point in the analysis. The variety then of discourse in social space is addressed by the range of observations of UKCIP practices with stakeholders together with interviews with UKCIP staff carried out across the organization in the first half of 2009.

The report also functions as one temporally fixed discourse moment, enabling temporal comparison of discursive change. As adaptation only became a part of UKCIP's official discourse in 2003 with the publication of the report, the core period under consideration is 2003-2009, with the end date established by the end of the time available for practical research. As such, the report's starting point is compared also to the interviews and observations in 2009 operating as comparative discursive moments through which to identify discursive change over time. However, during the writing-up period, from late-2009 to 2012 it became clear that significant discursive changes were taking place, and as such these are included in brief form in the discussion in Chapter 7 and traced back to the discursive tensions highlighted in the main body of this thesis.

The decision to track both change over time and across social space is because using both approaches gives the clearest indication of any concrete changes and immanent tensions to the problematization of adaptation. Looking at 'intra-discursive' constitution and change over a relatively short period of time

requires a high-resolution analysis, able to observe micro-changes in the discourse content and problematization structure. The capacity to do this lies in a detailed analysis of documents and practices, where small changes are most visible through looking at linguistic and conceptual construction of discourses.

However, this in turn requires a balance to be struck between a detailed focus on smaller amounts of material, and a broader, more superficial reading of all of UKCIP's work. The necessity of keeping the data used to a manageable size meant a judgment needed to be made as to what discursive moments, objects and subjects, best represented the discourse's problematization (Titscher et al. 2000), which could be determined for example, through being commonly referenced (Hansen 2006). Significant here were not only those moment that represented its' content but also those that represented its contingency. As such, texts, practices and subjects that created or solidified or altered its problematization of adaptation were selected (Foucault 1998). In this case, UKCIP, like any organization, has an enormous range of written and spoken discourse events from which an account of its discourse can be drawn. The justification for the selection of specific examples is given in the following section on 'archival' research, including the selection of the 2003 technical report, and other documents that significantly altered the problematization of adaptation it represented. This is followed by a section that accounts for the selection of observations of UKCIP practices, and interviews with the core authors of the 2003 report and a range of UKCIP staff in 2009.

Different types of discursive event also have varied effects on a discourse as a whole. The breadth of data collection methods and the selection of the specific range of discourse events is an attempt to recognize the principles of

'tactical polyvalence' 'continual variations' and 'double conditioning' (Foucault 1998) on the formation of UKCIP's discourse through looking at the different use of the discourse as it is applied or represented in different contexts by different people. For example, the discourse produced by written texts may not be fully replicated in verbal discursive practices, and may also change at a different speed. Internal discourse may be more fragmented and change more quickly that that presented to the public. These different modes of event in UKCIP's discursive production affect each other and as discussed in the previous chapter, such differences demonstrate a richness of potentiality. As such, the exploration of the problematization does not seek to obscure or reify their contribution, but rather to reveal more clearly what content they bring and what work they do in the (re)presentation of adaptation.

To develop the insights these different kinds of data bring to the understanding of the problematization of adaptation, they have been used "actively" to provoke deeper level of conceptual analysis (Holstein and Gubrium 1995). Key UKCIP texts have been 'triangulated' with observations of UKCIP's practices, and with interviews of UKCIP staff about their practices and their understanding of adaptation discourse. The objective was to use each event and event type as a mirror to the knowledge gained in the others, so that they could be used provocatively to guide questioning and reflection on the discourse, such that a deeper quality of explanation emerges from each source, and a much more nuanced understanding of the discourse as whole arises. This enabled critical purchase on the contingency of the conceptual content of UKCIP's problematization of adaptation. This section will now discuss each of these different types of discourse event, the specific events chosen for analysis, and

how these contribute to an 'active' engagement with the material in question. The first type, 'archival' or document-based analysis, is discussed below.

2.0 Basic methodologies of research and analysis

2.1 'Archival' research and the genealogical method

One way of observing a discourse's change over time is through 'archival' research, based on Foucault's techniques for engaging with the historical contingency of knowledge is primarily through 'genealogy.' This "focuses on the 'ignoble beginnings' and the contingent fabrications of historical phenomena," allowing him to historicize knowledge in terms of its production and change over time (Howarth 2000, p. 71). Although accounting for this historical production and change is not the objective of this research per se, this process helps make clear 'what' was included and what excluded and the effect that this had on the problematization of adaptation.

Given the short time span of UKCIP's discourse of adaptation this genealogy can be best tracked through versions of policy documents and interviews about their creation, followed up by interviews and observations about their use in contemporary practice.

In selecting the material for analysis, it was considered that although UKCIP provide an archive of organization-specific adaptation attempts, it is their own reports show their central, and common account of adaptation most clearly, even if this might change in specific interactions with stakeholders. As a reference literature these documents also permeate beyond these direct encounters and form UKCIP's public discourse as it is seen by a number of

consultancies that utilise the material (ESYS Consulting 2004), although they, again, may not completely reproduce it. The discourse as presented in UKCIP's policy-type documents is thus also the most stable public representation of UKICP's problematization of adaptation, and as such was a basis of expectation amongst stakeholders as to how the topic would be addressed, as well as being the likely foundation for how UKCIP staff represented adaptation in practice. Such documents therefore seemed the appropriate starting place for analysis. Of particular importance was the first piece of 'archive' type text selected was the 2003 UKCIP Technical Report on 'Climate adaptation: risk, uncertainty and decision-making' (Willows and Connell 2003). As discussed above, this was selected because it was the first document to establish UKCIP's account of adaptation, and continued as the foundation of its approach in late 2008-2009 when the research period began.

The genealogical technique was utilized through reading this report together with a draft version (Willows et al. 2003b) in order to identify any differences between the two in terms of what they included and excluded, any changes in the manner of their articulation. These differences made clearer the nature of the final problematization disseminated to the public, and also revealed some of the areas where articulation was weaker or more fragmented or had been a more difficult process, demonstrating areas of the problematization that were likely to be less stable, and more open to supplementary elements. These aspects were compared and analysed in greater detail using linguistics-based discourse analysis techniques, which is described in detail in Part 3 of this chapter.

The power/knowledge relations that produced these differences can be analysed in several ways. First, there are obvious institutional relations that shape a discourse's formation. These might be the influence of departmental or government objectives, political norms, as well structural and economic aspects such as budget allowances and external legal influences from bodies such as the European Climate Change Programme or the United Nations Framework Convention on Climate Change (Campbell 1998, Roe 1994, Stevenson 2009). Other power/knowledge relations might arise from public opinion polls and media attention to a particular issue (Fairclough 2000, Hansen 2006). It is important to note that these are not being analysed as 'causal mechanisms,' but instead to shed light on the particularity of the problematization in question, what it really includes, how it really works, and what practices it calls for.

The contingency of the problematization can also be unpicked through smaller indicators of genealogical origins from within the discourse event. This is evidenced through the referencing, either overtly or implicitly, of other texts or sources of authority. This 'intertextuality' is easily demonstrated through bibliographic references for example, or through the use of specific concepts or terminology that draw on other texts (Hansen 2006, Fairclough 2010). Crucially, all intertextual elements, although articulated as moments within the problematization, are also connected – in so far as this relation is clear – to their prior origin and its discursive situation. These thus serve either to anchor the problematization in a wider discursive formation, which may give it increased stability if it is very similar to the particular problematization. However, where the intertextual elements are supplements, this connection to an external

discourse may weaken their articulation into the problematization, and weaken the structure of the problematization as a whole.

Beyond these investigations of documents through discourse analysis, a broader survey of UKCIP documents was conducted in order to situate the problematization more clearly in terms of the breadth of UKCIP practices, and any change over time. Some of these documents were also 'tools' for adaptation produced by UKCIP. These have gone through several iterations, so the versions used here were those current for mid-2009, although several have changed since. All of these documents and tools are listed in the table below, with a short explanation as to their particular significance and relation to each other as part of the genealogical method. Where no specific discourse analysis techniques were used, they are marked as 'basic review,' used for providing contextual, power-relation information about the discourse rather than the specific form of the problematization.

Table 3.1: UKCIP documents and related articles used for Analysis

Document	Significance	Methodological tools
UKCIP Technical Report – Review Draft (Willows et al. 2003b)	• Unfinished version of founding document of UKCIP's problematization • Demonstrates areas that were difficult to resolve or 'articulate,' and contingency of inclusion/exclusion	• Genealogical archival research (Comparison with final version) • Discourse analysis (linguistics-based) • Findings used 'actively' in interview questions (see below)
UKCIP Technical Report 2003 *Climate Adaptation: Risk, uncertainty, and decision-making* (Willows and Connell 2003)	• First official account of adaptation for UKCIP • Basis of UKCIP's online tool: Adaptation Wizard launched in 2008 • Remained overall basis although supplemented with more sector specific material (see below) • Supplemented in particular with the LCLIP approach (see below)	• Genealogical archival research (Comparison with draft version) • Discourse analysis (linguistics-based) • Tensions demonstrated through comparison used 'actively' in interviews with report's key authors.

Document	Significance	Methodological tools
A Changing Climate for Business: business planning for the impacts of climate change (Metcalfe, Jenkinson and Johnstone 2009)	• Applies approach more specifically to businesses, comparison across social space of discourse • Published in 2009, offers a temporal comparison of discursive change, linked to BACLIAT (Business Areas Climate Assessment Tool)	• Basic review • Minor discourse analysis • Comparison with 2003 document over space and time
A local climate impacts profile: how to do an LCLIP (UK Climate Impacts Programme 2009)	• Makes organizational response the focus of analysis, introduces more substantiated supplementary rationale • Published in 2009, offers a temporal comparison of discursive change	• Basic review, • Minor discourse analysis • Comparison with 2003 document over space and time
Socio-economic Scenarios for climate change impact assessment: a guide to their use in the UK climate impacts programme	Use for conceptual content of UKCIP's discourse. The 'absence' of use particularly with regard to adaptation (rather than impacts) matters enormously for how 'adaptation' is problematized.	• Basic review • Minor discourse analysis • Combined with interview and observations data for analysis
Critical Review of the application of the UKCIP socioeconomic scenarios: lessons learnt and future directions (Hughes, Tomei and Ekins 2009)	Power/knowledge analysis of conceptual contingency: this provides an explanatory account of why the socio-economic scenarios were side-lined, and enables a deeper understanding of the discourse of adaptation through this exclusion of conceptual content and how this was justified.	• Basic review • Combined with interview and observations data for analysis
Review of UKCIP: final report (ESYS Consulting 2004)	* Indicates institutional responsibilities and connections, including to the Hadley Centre and to stakeholders	• Basic review
Attributes of Well-Adapting Organisations (Lonsdale et al. 2010)	• Significant moment, representing a supplementary problematization of adaptation in terms of organizational capacity, implications for UKCIP problematization as a whole need to be considered • Temporal comparison 2010 to 2003 • 'Social space' comparison: effect of specific staff member	• Conceptual background: used to discuss the extent of discursive change and its implications • Basic analysis, limited use of discourse analysis techniques
Managing adaptation: Linking Theory and Practice (Brown et al. 2011)	• Significant moment, introduces a supplementary rationale in UKCIP's problematization of adaptation • Temporal comparison 2011 to 2010 and 2003	• Conceptual background: used to discuss the extent of discursive change and its implications • Basic analysis, limited use of discourse analysis techniques

However, reliance on the analysis of policy-type documents is prevented by several factors. First, there is the general problem associated with the policy text genre that there is an "inverse relation between the degree of formality and the degree of sharpness" of its conceptual content (Hansen 2006, p. 85). As a technical report, some aspects of its content were extremely clear, although its political rationale and political ontology were less so. This combined with the genre-related modes of appearing comprehensive and neutral to make it difficult to identify the problematization that is actually practiced. In order to account for and analyse UKCIP's problematization of adaptation, it was therefore necessary to 'triangulate' the problematization as presented in the report with interviews and observations of UKCIP's contemporary staff, as discussed earlier in the chapter.

2.2 Observation of UKCIP-stakeholder practices

The observation of UKCIP workshops with stakeholders was necessary to account for its changing problematization across space and to verify connections to the report's initial problematization in 2003. The major concern here, given the focus on UKCIP's problematization, was to look at how they sought to establish an account of adaptation. As such it was the initial encounters with stakeholders that were the essential 'moments' to observe before the problematization emerged through interaction with stakeholders. The case studies were selected accordingly to cover UKCIP's engagement with stakeholders in their initial stages.

There were a very limited number of stakeholder projects within the observation research period, which was late-2008 to mid-2009. Stakeholder meetings were postponed and changed frequently, and there were several

months between meetings, resulting in a small number of events analysed. In the end, one stakeholder meeting and one professional organization presentation were actually observed, whilst an audio recording of one more stakeholder meetings was provided by UKCIP for my analysis. The stakeholder meeting observed was in fact the second meeting, but the process was still in its early stages with UKCIP still leading proceedings. Notes and minutes as well as materials produced and power-point presentations were analysed from all events. To redress the limited number of observation sessions, the discourse that appeared at the meetings was then followed up 'actively' in interviews with the staff that presented at them. See Appendix 1 for more detail. As agreed, the companies involved have not been identified.

Whilst there is necessarily some basic ethnographic interpretation to the observations of stakeholder meetings in terms of social interactions, the primary focus was on 'words' spoken or written as the primary means of communication and as the focus of analysis. As such, field notes taken during these meetings were limited, and they were not filmed, but were instead audio-recorded. However, power/knowledge sensitive notes about the visual and inter-personal interaction were kept where these clearly affected the meaning that was being produced. The transcripts of these events were analysed using discourse analysis and coded according to the conceptual elements they added to the core terms of analysis. See Part 3 of this chapter for more detail.

2.3 Interviews with UKCIP staff and report authors

Although the research question focused on UKCIP's official discourse, it was thought that in order to gain an understanding of the contingency of what was produced a more reflexive account of the discourses emergence, rather than just

snapshots of what was produced, would need to be undertaken. Interviews were the only way to gain access to this information in any quantity. The interviews also allowed an opportunity to 'actively' use data already collected to gain a deeper understanding of the concepts and rationales that created their problematization of adaptation and any variations in this.

There were two sets of interviews with different specific objectives. The first set had the objective of getting to grips with the content and contingency of the 2003 technical report. A short informal meeting with one of the key contributors identified two primary authors. As they were responsible for the actual linguistic articulation of the final document, they were likely to be a good source of understanding the conceptual contingency of the actual articulation of the various elements as moments for the final problematization, so they were sought for interview.

The second set provided a temporal comparison to the first, through focusing on the contemporary UKCIP staff involved in (re)producing its discourse on a day-to-day basis. Those asked for interview were initially determined by the need to follow up the UKCIP staff involved with the stakeholder meetings that had been available for observation. Beyond this, it was made sure that the two sides of the knowledge transfer team were covered: Business and Local Authorities as these represented UKCIP's most direct interventions into society in the wider (re)production of its discourse.

In addition, the Technical Director of the Science Team was also interviewed, with the intention of contrasting his views with those of the Director of Knowledge Transfer, who had a different background arising from business partnerships, as a deliberate way of surveying the breadth of

organizational practice. However, the latter was unavailable. In the meantime, UKCIP's internal openness was an advantage in overcoming this obstacle, as I was pointed to a new member of the organization who brought an alternative account of adaptation to the table, and who was later the key author of the most substantial formalization of the supplementary problematization to arise at UKCIP to date (Lonsdale et al. 2010). For a schedule of interviews and their value to the research, please see Appendix 2, which contains a summary of the interviews carried out and their significance for the analysis of UKCIP's problematization of adaptation.

The interviews with participants were semi-structured, and carried out after their consent was given to being recorded. There were very few instances where interviewees explicitly asked for certain comments to remain anonymous. However, a condition of the pre-interview agreement was that the transcripts be approved before publication. As no approvals were received, I cannot publish these names and so interviewee names and quotes are anonymous in the final version of this thesis, except where explicit verbal instruction was received that the material was publishable. This should not be taken as a reflection of the sensitivity of the interviews, rather that approving them was probably a low priority for busy individuals, particularly as the research model did not provide any clear or immediate benefit to the organisation.

To discuss how the interviews themselves were conducted, the theoretical concern with power/knowledge discussed in the previous chapter was seen as just as pertinent to the practices of interviews and meetings as it was to the production of documents. One entry point to this is the positionality of the interviewer and their role in shaping both 'what' is said and 'how' it comes to be

said, (Holstein and Gubrium 1995). Positionality here accounts for the elements of identity that mark a participants perception or how they are perceived by others, such as class, race, gender, age. Crucially it is the relation between participants within these categories that structures their 'positionality,' which is demonstrated in part through their behaviour toward one another (Chacko 2004). It should be noted that the dominant account of interviews, were the interviewer needs to access the 'pure' thought of the interviewee, assumes the transmission account of language and discourse (Holstein and Gubrium 1995, p. 3) that was rejected in the previous chapter. Following from the analysis presented there, the interview is understood here as an inevitably productive process.

Certain positionality comes into play even before the interview starts. The background of the interviewer and respective participants, their perceived or actual identity, be it of race or gender, class, or level of education among others, all play a part in how the researcher and the 'researched' interpret the objectives of each other, and the meaning of particular questions and answers. Positionality also shapes the level of comfort or discomfort felt in revealing particular information, and willingness to cooperate (Chacko 2004). In the case of the interviews my positionality was of course dependent on the individual being interviewed, as it is a relational property. In most instances, I was interpreted as an 'academic' and an 'outsider' while the interviewees occupied the identity of 'professional' and 'insider.' This was clearest among those longest in their posts and more senior in the organisation. On one occasion this resulted in the presentation of an official 'line' of representation that made power-knowledge

considerations difficult to assess, although this was balanced out by the other interviews which were more open.

By contrast, on another couple of occasions my positionality as a perceived neutral outsider and also as someone who presented the opportunity to 'set the record straight' played into some responses. It should be stressed that as there was no intention on my part to provide a 'correct' version of adaptation in this research, these cases were in fact very useful; the identification of moments of contention helped to open up the contingency of the discourse's production and to identify inclusions and exclusions in the formation of the discourse.

Of course, such utilisation of the researcher and deliberate self-presentation usually happens both consciously and subconsciously, and may have happened in many smaller, more subtle instances throughout all of the interviews, but my own positionality as an actual outsider limited my perception of these moments. As all accounts are partial to some extent, and indeed the is no 'objective' single truth to the origins of any discourse, there is no solution for this itself, but there are certain methods that can be used to make these moments clearer.

Primarily, this was addressed by deliberately utilizing the productive process of the interview that arises from alternative positionalities and concerns can be utilized as an 'active' component in the practice of the interview itself (Holstein and Gubrium 1995). In this case, the 'active' approach was used first slightly implicitly and then more explicitly during the interviews. For the 2003 report authors, the indirect approach was to ask them to tell the story of how the report came into being. In the case of UKCIP staff members, they were asked how

they would present adaptation to stakeholders now, how their thinking about adaptation arose, and whether it had changed over time. This chronological narrative format used to get respondents to position themselves more reflexively with regard to the conceptual content of their discourse of adaptation. Accordingly, the introduction to the interview deliberately primed respondents for what I was interested in, in terms of language and content regarding adaptation. In this sense I tried to "[challenge] the respondent to produce a coherent … narrative out of a designated, limited stock of mutually relevant resources" (Holstein and Gubrium 1995).

However, there is an important distinction here between this and the second, more explicit; although these questions asked for a particular *type* of answer, they did not intend to limit the conceptual content of that answer, although of course this may have happened to some extent. By contrast, the second approach asked directly why adaptation was spoken about in a *particular* way, why certain concepts were included and others excluded. These questions came later in the interview in order to avoid prejudicing the individual's own narrative content. This dual approach produced an account of the content of adaptation, and of the power/knowledge context through which it was (re)produced.

In practice the second more 'active' approach resulted in questions to interviewees about what they meant by 'adaptation' and how this word related to, for example 'resilience.' At this time, the analytical frame of adaptation used was somewhat different than that now presented in Chapter 1, owing to advances in the literature in the intervening period. Nonetheless, although some different concepts were used, such as 'emergence' and 'complex adaptive

systems' these still enabled a more focused conceptual discussion that made clear how strongly certain concepts were included or excluded from UKCIPS' problematization of adaptation. This approach fits most closely with Holstein and Gubrium's account of the active interviewer as one who "...intentionally, concertedly provokes responses by indicating – even suggesting – narrative positions, resources, orientations, and precedents for the respondent to engage in addressing the research questions under consideration" (Holstein and Gubrium 1995).

One resource for this kind of interviewing was the repetition of some questions across all interviews: this enabled chronological comparisons of the basic problematization of adaptation between the historical position of the 2003 report authors and contemporary UKCIP staff; and synchronic comparison across the 'social space' of the organisation. These differences were used to inform 'active' interviewing questions. A similar process was carried out using particular moments from the 2003 Technical Report. An example here is the 2003 report's inclusion of the term 'decision-maker' as the subject of adaptation, which revealed striking differences between the 2003 imaginary and its use in 2009, which provoked further questions of contemporary staff as to where this understanding came from, and what effect the change of 'subject' was having on the meaning of adaptation itself. However, not all provocations are intentional or controlled. Relative experience, academic and professional background shaped what kind of interpretative narrative the respondents produced as well as how they interpreted my questions, and how I interpreted their answers at the time.

Since then a clearer understanding of the particular production of meaning during the interviews was aided by further reading of the topics in

question to provide a broader understanding of possible meanings. Further, the interview transcripts were revisited several months later in order to approach these with a more neutral interpretation. This was aided in part by informing that interpretation with linguistic analysis techniques and noting the process of coproduction of meaning as the interview progressed (Doyle 2012). In this sense the practice of revisiting this process and doing so intentionally and critically was itself a practice of reflexivity (Doyle 2012).

Not feeding back findings to participants was perhaps unfortunate. In part this occurred because of taking a year out from the PhD project and therefore feeling that too long a gap had been left for the results to be seen as useful to the organisation. However, it was also simply not part of the research strategy, in part because I was concerned it would reduce the independence of the research findings if an opening was given to contest them, of if I felt compelled to frame them in a 'policy useful' manner that glossed over arbitrary moments of formation. Of course, this could have been dealt with as part of the research model and not engaging with it further was simply an oversight resulting from inexperience of ways to negotiate these issues.

However, the absence of feedback was corrected to some extent through a reflective and comparative component that was already built into the research model. This was enabled through the active use of differences between the report and current practice and noting differences among contemporary staff, as well as the utilization of subsequent UKCIP documents for comparative purposes (see Chapter 7 for the latter). It is felt that although these don't necessarily address how comfortable an individual might be with my interpretation of their discourse, the comparative use of multiple sources goes some way to ensuring a

broad account of the discourse as a whole and multiple opportunities for actively reflexive analysis (Doyle 2012).

It should be noted that my access to UKCIP took some time to procure. Attempting to set up interviews independently had no effect, but eventually I was able to name-drop an academic associated with the orgnaisation institutionally which opened the door to the first interview, which then snowballed once I was physically in the office and was referred from person to person. I also gained access to one of the report authors coincidentally as institutionally related to Lancaster University. I do not have reason to believe either of these connections had any effect on the content of the interviews, they simply increased the willingness of the interviewees to make time to be interviewed on the general principle that it was good practice to make time for those connected into wider existing institutional relations.

At the forefront of my consideration was the theoretical positionality I considered myself to have or be perceived as having. The selection of the research question itself automatically implies a particular interest on the part of the researcher (Chacko 2004, Hoogendoorn and Visser 2012), in this case in the contingency of discourse which therefore rejects the assumption that it is a purely rational and objective approach to adaptation. I was concerned this might be offensive to the report authors but in fact it was clear that they, better than anyone, recognized and admitted this contingency, which was extremely helpful in enabling a discussion of the production of the discourse.

A second aspect this was that my initial research topic had focussed on organisational approaches to adaptation and a specific interest in complex adaptive systems. When I observed this was somewhat lacking in UKCIP's initial

approach to adaptation this both piqued my interest as to why this was the case, yet it also made me anxious that I might read into their work the presence of this approach when it was not in fact there, as it was the topic I would prefer to research rather than risk-based scientific approaches.

The only solution at the time appeared to be to remain as conscious as possible of whether this was affecting my judgement, and to actively use discourse analysis techniques in the analysis of the interviews by separating out where my questions had pulled out particular framings of responses. My confidence in keeping a balance was only finally resolved by the indirect approval of my analysis which came from UKCIP itself in the form of new documents that more or less validated my findings, which are discussed in Chapter 7. To be clear, I do not think that these outputs had anything to do with my interviews acting as an intervention – the research for those documents had already been approved when I undertook the interviews and was performed by people far more knowledgeable about the supplementary elements than I was.

Third, I experienced a clear sense of what might be termed temporal or generational positionality (Hoogendoorn and Visser 2012). Many interviewees had begun work in the field while anthropogenic climate change was still a very contentious issue, and worked daily with people for whom it remained a contentious issue. As a result of my personal inexperience of this period and generation or opinion, I did not appreciate the significance of this context as a continuing political driver of UKCIP's discourse at the time of interview. Although I have faithfully reported this as a power-knowledge context to the production of the report and the focus in UKCIP's contemporary work on demonstrating climate change, at the time of the interviews I missed the opportunity to

investigate this context and its influence on the contemporary discourse more fully.

This clearly demonstrates that positionality translates into the ethical question of the validity of the research and whether it solely reflected the interviewer-author's own positionality. I have done my best to recognize my existing biases and redress this through active reflexivity such as referral to later documents, or in the case of active interviewing, to use my interests deliberately to open up contingency, carefully taking my effect on the interviewee into account through discourse analysis techniques. I have also recognised where I failed to identify temporal biases in time and proffer instead the caveat that this may have been an oversight in one aspect of the power-knowledge context, however as UKCIP's discourse per se was characterised using linguistic discourse analysis techniques, while its power/knowledge origins have been occluded, I do not think its effects have.

2.4 Combined analysis of data and coding of discourse analysis

The results of the final discourse analysis of the combined material from the documents, observations and interviews were then initially coded in terms of the two core aspects of 'contextual' power/knowledge and conceptual content, which was then divided according to the ontology and epistemology, subdivided into accounts of space and time, in providing moments that described the 'threat' and 'solution' of adaptation, an analysis which included how these were articulated. The conceptual content was then coded in further detail through an iterative process of seeing how these particular moments were replicated, modulated or changed in each of these discourse events. It became clear that some of the

elements were articulated less strongly, although they became more central in later UKCIP discourse events. This generated the need for a theoretical and conceptual means to talk about this function, which led to the adoption of Derrida's account of the supplement, which was discussed in Chapter 2.

The transcripts and document material and analysis were then copied and pasted according to these 'codes' as the combined effect of their conceptual content and the manner of their articulation, which was further subdivided into core and supplementary moments. The original wording was kept, and the extracts were listed with reference to their original interview and place in that interview, so that their full articulated 'meaning-in-context' was not lost. Placed together in this way, it was easier to see the breadth and depth of UKCIP's discourse and of the problematization that structured this over space and time. It also revealed how it was riddled with supplementary moments which when viewed separately from their articulation into the problematization demonstrated a shared alternative conceptual resonance.

By triangulating both content and contingency through the analysis of these varied discourse events as a cross section of UKCIP's discourse in time and space, it was possible to derive a fuller and more complex account of the constitution of UKCIP's problematization of adaptation. The diagram below summarises this process. Part 3 of this chapter will then give details on how linguistic techniques were used to produce the discourse analysis material so that it could be coded in relation to the core terms of analysis.

Figure 3.1: Data Selection and Analysis flow chart
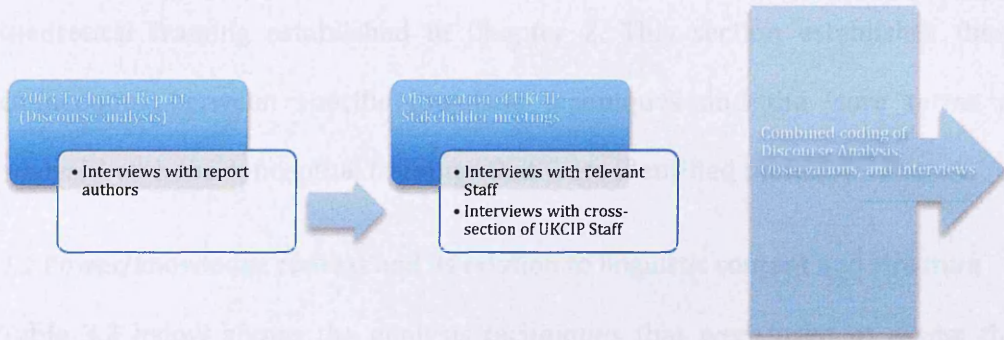
3.0 Linguistics-based discourse analysis

3.1 Introduction

The analysis of these various types of discourse 'events' draws on the linguistic, rhetorical and narrative analysis techniques common to Critical Discourse Analysis (Wodak and Meyer 2001, Fairclough 2010), Discourse Analysis (Titscher et al. 2000, Johnstone 2008) and Discourse Theory (Wetherell, Taylor and Yates 2001). The linguistic analysis techniques cover overall structures down to individual word choice. They were used to draw out the conceptual content or 'meaning' of these discourse events, not in a quantitative but rather in a qualitative, semantic, sense that is linked to the fundamental idea of meaning being established through articulation, *as discussed in Chapter Two.*

It should be noted here that although 'discourse analysis' is the term often used to speak about these techniques in general, this research makes a distinction between the use of these techniques at the level of discourse events, and the theoretical framing associated with these various schools of Discourse

Analysis and Critical Discourse Analysis, and has instead connected these linguistic techniques common to all forms of discourse analysis into the theoretical framing established in Chapter 2. This section establishes these connections between specific linguistic techniques and the 'core terms of analysis' with the conceptual framings that were identified there.

3.2 Power/knowledge context and its relation to linguistic content and structure

Table 3.2 below shows the analysis techniques that were used to assess the power/knowledge components of the core terms of analysis. These are expressed in the form of questions, with indications of which terms of analysis are most relevant, and examples of answers given to demonstrate connections in detail in order to demonstrate their significance to the theoretical framing of the problematization. In the consideration of context, the most pertinent of these were the power/knowledge aspects: the rules of 'immanence,' 'continual variations,' 'double conditioning,' and the 'tactical polyvalence of discourses.'

Table 3.2: Macro-level power/knowledge 'context' and relation to core terms of analysis

Linguistic Questions for Analysis:	Core terms of analysis:	Relation of linguistic questions to core terms of analysis; implications for problematization
Who is 'responsible' for the discourse event, overtly and implicitly? • Where does it sit institutionally? • On whose *authority* is it written/spoken? • Who is the actual *'author'*?	*Immanence* [of power to the production of knowledge and vice versa] *Tactical polyvalence of discourses* [The ability of a discourses to be co-opted by different political rationales, or several rationales to operate within the same discourse] *Continual variations* [power/knowledge relations, hence discourse itself are continually (re)articulated]	The authority and the author/speaker directly, indirectly, overtly or implicitly responsible for the production of a discourse event will have an influence on the conceptual content and form. This demonstrates the **immanence** of power to knowledge production. What is overt/implicit **indicates tactical polyvalence**, and the combination of the two is related to the function of the **supplementary moment** as connecting an implicit rationale to an overt one. Awareness of the potential for **continual variations** in the power/knowledge 'context' of discourse, enables a sensitivity to the possibility of a change every time a discourse is (re)articulated.

Linguistic Questions for Analysis:	Core terms of analysis:	Relation of linguistic questions to core terms of analysis; implications for problematization
Were there particular *events* that triggered the reproblematization of a discourse?	***Dislocatory events*** [Introduction of unexplainable phenomena, disrupting the discourse, and **(fantasmatic) identification**]	A material or discursive event that disrupts the validity and coherence of an extant problematization; its characteristics may also influence the subjects chosen to 'cover over' the resurgence of the real, which affects in turn the rearticulation of the problematization
What *function* is the discursive event meant to achieve? Consider its: • Overt/stated function • Implicit function. → What *audience* is the discourse event aimed at, and who does it actually reach? • What effect does that have on meaning? • Is that audience likely to interpret the meaning differently/in a particular way? • Is there an Unintentional or marginalized audience?	***Double conditioning*** [of particular relations to overall strategies and vice versa; where locked in produce *hegemonic discourse, where disrupted enable discursive change (Laclau and Mouffe 2001)]* ***Tactical polyvalence*** ***Continual variations***	Authors are only one part of the equation. The subjects they are aiming to affect and the way they are aiming to affect them structures the particular construction of a discourse, in terms of genre and mode as well as content, with key implications for meaning. This **double conditioning** works both ways: Policy often uses a persuasive, authoritative mode to mask more dubious, unpopular functions, but it may also include popular functions to enable other agendas, linking here to tactical polyvalence. Considering difference between overt and implicit function helps identify if a discourse is being used tactically to suit another problematization and how. Consider role of power/knowledge variations; might the discourse event be continually being shaped by both 'author' and 'audience' depending on their particular (and changing) relations?
What are the other power/knowledge influences on the discourse event? Consider its: *interdiscursivity intertextuality*	***Double conditioning*** ***Tactical polyvalence*** ***Continual variations***	Consider whether this discourse event fits with/disputes existing discourses, what indications intertextuality or overt interdiscursivity might mean for content and limits of its problematization?

3.3 Macro-level Conceptual Articulation

Beyond the general origins of discourse events, macro-level power/knowledge relations help identify macro-level conceptual structures and content. 'Medium' and 'genre' and their constituent 'modes' such as a persuasive or educative mode

are the most immediately evident, structuring the kinds of truth claims and the ways such claims are made. Recognizing the norms of a medium or genre helps to identify the problematization's methods of articulation and the ontological and epistemic claims it is likely to assume and appeal to. Such recognition also draws attention to any deviations in the specific discourse event in question, which may highlight significant conceptual inclusions or exclusions, enabling a clearer understanding of the actual problematization and the status of its articulated elements. Ways of identifying genre, mode and medium are given in the first section of Table 3.3, below.

Once these aspects are established, the problematization can then be discussed in more detail. Macro-level semantics and rhetorical structure are the two central ways in which this problematization is established. First, the 'macro-semantics' or major themes and meanings give an overview of its basic articulation through the inclusion of particular concepts. This includes named objects and subjects. At this level, the referent around which the discourse is centred should appear, although it may not be immediately clear which of these core elements forms the referent.

Beyond this basic level of inclusion and exclusion, rhetorical structure plays a key role in articulating these concepts in a way that provides a particular problematization of a topic, through a political rationale. This depends in part on medium and genre. The possible forms of macro-level semantics and macro-level rhetorical structure are described in the second two sections of Table 3.3, below.

Table 3.3: Macro-level Conceptual Articulation

Linguistic Questions for Analysis	Core terms of analysis:	Relation of linguistic questions to core terms of analysis; implications for problematization
What genre (including its subsidiary characteristics) is demonstrated, and how does this effect meaning? Genre was determined by the consideration of the purpose of the discourse event combined with the following characteristics: Medium: what typical materiality, layout/typography/images and image-use? In a text, this would refer to titles, headings, subheadings (Jäger 2001), but is appropriate also to other 'instrumentalities,' such as website design, or locations of people in a room, which accord different meanings to a particular order or mode of presentation. Speech acts: what type - such as statements, commands, promises, and in what order/structure? (Mode) Lexis: what kind of vocabulary is in evidence here? (Mode) Syntax: what kind of grammatical patterns? For example: complex noun phrases, passive tense. (Mode) Key: what tone – serious/joking; does this shift? Norms of interpretation?	*Political* rationale [a rationale or explanation that calls for a particular account of the social] *Fantasmatic logic* [accounts for how a discourse shapes the subject through appealing to their sense of the lack and need for enjoyment or security of self/relates to the dislocatory event] *Articulation* *Elements* [a concept, such as an idea, topic, or subject (identity), but this becomes a *moment* when it is established as such through the discourse in question] Particular *practices*, such as the use of assessment tools, may also have a ritual function (similar to a genre), and enable a fantasmatic logic	Genre is a norm of representation, often associated with a general type of rationale and a related fantasmatic logic. For example, 'the sermon' as a genre might present a commandment or morale rule, provide a story or 'parable' that acts as evidence of the rule. This formula is a social norm, but it also institutes a political logic and responds to the fantasmatic 'lack' of rules to live by. Consider what kind of knowledge the genre and mode (identified through lexis, syntax, key and medium amongst others) claim as truth, and what effect this has on the epistemology and ontology included in the problematization, the kinds of subjects and objects most likely to be addressed. All of the linguistic techniques listed in the first column represent some form of articulation, significant for the problematization; Consider the difference between a 'joke' and 'mission statement' with the same elements, but articulated into very different kinds of moments – that is with very different meaning as a result, and together creating a very different rationale.

Linguistic Questions for Analysis	Core terms of analysis:	Relation of linguistic questions to core terms of analysis; implications for problematization
Macro-level semantics What topics/ major themes addressed by the article? Which 'subjects' are said to personify the discourse? What obvious practices are spoken of or enacted? Are there any obvious supplementary elements/moments?	*Elements* *Moments* *Ontology* and *epistemology* [a theoretical understanding of these moments as producing a particular account of reality and how to know it] *Supplementary moment* [a term that is loosely articulated to the discourse in question, or articulated in a subsidiary form, or references an alternative problematization]	Identify the major *elements* and their constitution as *moments* through articulation The '*referent*' as the core element around which the discourse is built (revealed through articulation) Basic account of moments in terms of *ontology and epistemology* Look for indicators of wholeness or purity in the original term, and indicators of an element articulated as a lesser, exceptional or additional moment in the problematization
Macro-level rhetorical structure Plots (Johnstone 2008): What is the basic plot? • More specifically, is this a scenario it has a beginning, middle and end. • However, if it has premises and conclusions, it is an argument. (Roe 1994) Are there any obvious supplementary moments?	*Referent* [the core concept around which the discourse is built, particularly as the 'problem' to which it aims to 'solve'] *Problematization*: the structure of a discourse as constituted around a core rationale, whereby a topic is set up as a problem in a particular way, such that it calls for a solution, and tends to shape the manner of the solution by its very articulation of the problem. *Supplementary moment*	The plot or narrative are a form of articulation that positions elements (positive or negative, essential or peripheral, present or absent, first or second) affecting their meaning and that of he problematization. The particular form of the narrative – through its plot and whether this is a scenario or argument - enables this articulation to occur in the way that it does, and calls for different epistemic types of content in particular, problematizing the epistemic and ontological content differently as a result. If this articulation seems awkward or flimsy, or moves from one mode to another, then this may indicate the articulation of supplementary elements that are supplementary moments because they do not fit into the problematization very comfortably, either by exceeding or undermining it. Look for indicators that something is a supplement *because* it is characterized as 'additional' or 'exceptional' to replace a natural ideal of deficit.

3.4 Micro-level articulation

The problematization presented in a particular discourse event, such as a 'whole' speech or document is also affected by articulation at the micro-level. The major claims dealt with in the macro-semantics section above are supported, nuanced, or even undermined by these smaller linguistic operations. These are the semantic inclusions/exclusions and rhetorical structures that occur at the level of the paragraph or sentence. Table 3.4 below demonstrates this, proceeding from micro-level semantics or 'content' to micro-level expressions of 'context' based power/knowledge in order to get to grips with the production of meaning at the micro-level within a particular discourse event. The meanings established here should in general reflect the overall problematization, as they help form it, but it is also here that supplementary meanings are most likely to be articulated, as they remain small enough to remain as supplements, even though at this level they may not only broaden but also undermine the problematization.

Table 3.4: Micro-level conceptual articulation

Linguistic Questions for Analysis: micro-level semantics	Relation of linguistic questions to core terms of analysis; implications for the problematization
Identify what terms are central to the problematization and are connected to adaptation	*Elements/moments,* specifically in terms of whether/how these are **ontological** or *epistemological* in nature
• Within document - overt definitions, e.g. in the glossary • At sentence level – what terms are coupled together • At word level - are they nouns, verbs, adjectives? Singular or plural nouns? Definite or indefinite? Mass noun or count noun?	These 'terms' are *elements.* They import not only concepts but a related ontology and epistemology to the discourse. Consider for example: - human action and society - values/ideals - knowledge/technology Are there possible conceptual tensions? If there are elements which do not seem to 'fit' these may be *supplementary moments* – but this depends on how well and frequently they are articulated into the discourse. Are these conceptual combinations obvious? Are the terms put together logically compatible? If so, is this because they conform to an already entrenched discourse? If not, are they made to seem logical through the way in which they articulated?
Linguistic Questions for Analysis: *Micro-level rhetorical structure*	**Relation of linguistic questions to core terms of analysis; implications for the problematization**
Mode: Key, Syntax, Lexis **Local meaning and coherence**: Be aware of this when looking at the terms used, as their relationships as structured within clauses or sentences alters their meaning (Dijk 2001) Including: **Persuasion:** (Renkema 2004) which is created through, for example: • **Exemplarity:** use of just one example to make a universal point (Roe 1994) from within sentences to entire case studies (Dijk 2001). • **Strategic ambiguity:** as deliberate vagueness, or gloss that makes it easier to move a term to an illogical or otherwise awkward articulation and logic • **Presupposition**: that which must be assumed for a claim to make sense, such as the presence of particular subjects or objects and qualities, without explicitly accounting for or justifying their presence • **implicature**: the implication of shared	*Articulation* All rhetorical techniques enable a specific form of articulation. Together create a rationale which structures the problematization as a whole. Rhetorical structure is a general term for this and works precisely to obscure the lack, to obscure contingency, by making an argument appear certain, necessary, or better. In observing the operation of rhetorical techniques, it is possible to draw out the role of the supplement as that which articulation works to control/limit in its extent and in its connections to alternative problematizations,

knowledge or a concept without explicitly noting it (Johnstone 2008)
- **Modification:** where the meaning is modified so as to appear less offensive or extreme (Renkema 2004) through techniques such as:
  - o **hedging strategies:** words or phrases that indirectly remove certainty from a claim, such as 'may' 'possibly' 'perhaps'
  - o **euphemisms:** words that soften harder ones – e.g. *'disincentive* instead of *penalize'*

- **deictics** (deictic expressions) and anaphora - e.g. 'this' which includes in an 'assumed' way without specifying overtly and therefore making it accusable
- **Active/passive tense:** what effect on meaning?
- **(in)transitive verbs?** - highlight effect rather than agency?
- **nominalization** - removes agency from a verb/adj/adv. by making a noun

Visual articulation, through:
layout/typography/images such as:
- Lists, grammatical parallelism, ordering of titles, headings, subheadings (Jäger 2001), which accord different meanings a particular order and significance
- Other visual elements like images or graphs (Jäger 2001), website design, or locations of people in a room, which accord different meanings (including people) a particular order and significance.

Binary oppositions in particular are indicative of a political logic of equivalence (mutually exclusive terms or ways of being).

Binary oppositions: are certain terms presented as opposites of each other? What does this do for their meaning, and for the meaning of terms associated with them? (Wetherell et al. 2001)
Metaphors
- *catachreses*: fairly overt metaphors - 'floods of refugees' (Jäger 2001)
- *Cognitive Metaphor*: where there are subtle ontological or epistemological correspondences to the use of terms, e.g. words like 'establish' together with 'policy' - imply longevity/solidity but not flexibility) (johnstone, 2008, p. 46)

Euphemism/Dysphemism: relative terms that appear to have tangible meaning, for example 'luxury' (Johnstone 2008). Note, there are levels of syntax, phonology and morphology – that are simply too detailed to look at for a project on this scale to do with overall discourse and not particular instances. These are not used here. Instead, the replicable elements and modes of articulation that cross from different kinds of discourse events and are easily reproduced are used as indicators of discourse per se.	
Specific techniques – micro-level power/knowledge relations	**Implications for meaning**
Intertextuality and **interdiscursivity** (Johnstone 2008): do specific ideas, phrases or terms link to other discourses or discourse events? Is this: **overt, e.g. direct referencing** **implicit? through use of the same ideas, phrases, terms**	*Supplementary moments* – are indicated by intertextuality and interdiscursivity, as well as the polyvalence of discourses. Consider what meanings are enabled or excluded by articulation through these techniques? For example, are these excluded as 'counter-narratives' or 'non-stories?' (Roe 1994, Wetherell 2001a). Consider what this reveals about the contingency of the meanings included/excluded? Consider what this means for the stability of the problematization? *Supplementary moments:* if poorly articulated to the core problematization, these signify an additional but also a replacement concept, that undermines the necessity of the core problematization, and signifies the possibility of a *supplementary problematization*

3.5 Practical Application

The tables discussed above were condensed into two 'crib sheets' that were used for the analysis. The first of these listed the macro aspects included in the tables above on power/knowledge context, genre and medium and rhetorical structure and semantic content. This was answered systematically for the documents which were first analysed as a whole, and then in terms of their subsidiary sections, before these were broken down and the micro-level analysis applied. This last stage in particular made use of a crib-sheet based on the tables above in

order to prompt the analysis of the myriad of techniques used in the document's discursive construction, which are otherwise often so subtle or so familiar that it can be difficult to notice the 'work' that they 'do' meaning.

Both macro and an overview of the micro aspects were then written up in a report, with particular attention paid to how these levels fitted together. This included being summarized in a table that demonstrated the core rhetorical moves that established the articulation of the problematization on a macro-scale and replicated more frequently on a micro-scale, a list of included and excluded terms or concepts, and a list of key moments of tension within the document over this inclusion/exclusion, which functioned as supplementary moments. In the case of the 2003 Technical Report, this summary formed the basis of the questions raised in the interviews with the report's core authors. This has been discussed in more detail in the interview section 2.3, above.

However, for each document analysed, it became clear that there was so much detail that it would need to be condensed to the most pertinent theoretical aspects. The collection of data revealed a striking fluidity of discourse formation over time, and as such, there was a reflexive movement between theory and the analysis, resulting in an increased exploration of accounts of conceptual change within a discourse, and arriving at Derrida's 'supplement' as an explanation of this process that resonated with the articulatory basis of discourse theory used here. The analysis was then re-assessed on this basis. Although initially accounted for slightly differently as 'moments of fragmentation,' the theoretical questions asked in the interviews linked well with the final terms of analysis, and did a better job of accounting for how they could maintain their position in the core problematization while also providing it with additional flexibility.

4.0 Conclusion

This chapter has laid out the basic methodological approach followed for this thesis. It builds from a discourse analysis of texts and triangulates these with speech and a small amount of observation. Although how UKCIP presents its discourse has been justified as the 'common element' here, it remains the case that practices of adaptation assessment represent a more substantial account of this problematization. As such, the validity of the narrow window that was observed is open to challenge. Some of these same organisations have since produced publicly available reports. With more time and space to review this, these would offer excellent starting points to observe how much the problematization of adaptation developed in practice. If used comparatively, different stakeholder final reports would give a good assessment of just how flexibly adopted UKCIP's problematization is, and thus give a better indication of its significance in shaping wider UK adaptation discourse and policy.

Similarly, the later developments at UKCIP represented in the 2010 and 2011 documents are very significant, further research could have been done on these. The emergence of the vulnerability based Local Climate Impacts Profile (LCLIP) was the biggest shift during the research period. This represents the biggest gap in this analysis. With more time, this would have been considered in much more depth. Efforts are made to draw out its significance in the subsequent chapters, but they lack a linguistically-based discourse analysis, and the appearance and adoption of the LCLIP approach was not picked up on in time for the interviews, and therefore not investigated further, which was an oversight that was unable to be corrected due to the small window in which the interviews

could be undertaken. Nonetheless some aspects of its additional approach were mentioned in the interviews and have been considered here.

Although the specific techniques are many, discourse analysis at the linguistic level centres around questions about the semantic meanings (ontologies and epistemologies) that are included/excluded, and the way in which these are articulated to a rationale, constituting a problematization. This articulation is enabled through many linguistic forms, including genre and mode and rhetorical structure, all of which also have the effect of enabling but also introducing particular meanings. If certain conceptual inclusions are only loosely articulated into the discourse, they suggest these terms as supplementary moments, particularly if they establish clear intertextuality or interdiscursivity with alternative discourses. The questions of analysis about these linguistic forms, particularly as described here in terms of their links to the core terms of analysis, demonstrate how the discursive event (re)produces a particular problematization. As such, these questions were followed through for each discourse event analysed as part of this research, with greater detail for the foundational 2003 report, and the problematization and its emergence was derived from through the triangulation of document, interview and observation material.

Chapter 4: A genealogy of UKCIP's discourse: from scientific knowledge to risk

"I think the issue ... with anything like this [is] there's so many things you could draw in to it, there's so many ways it could go..."
- Interviewee H, 2009, p. 6

"The play of substitution fills and marks a determined lack."
- Derrida, 1976, p. 157

1.0 Introduction

UKCIP's discourse of adaptation has developed over time. This chapter describes the dominant ways in which it has accounted for adaptation between 1997 and 2003, using a basic genealogical approach that accounts for the major shifts in its problematization of adaptation through a sensitivity to power/knowledge. As discussed in the Chapters 2 and 3 on theory and methodology, this research stems from the contingency of discourse in two senses. This chapter discusses one of these, the power/knowledge as a representation of its 'contextual' origin, such as the institutional and theoretical heritage of a particular discourse, demonstrating the immanence of power and knowledge; the gradual addition and subtraction of new voices, pressures and knowledges that cause continual variations in the (re)production of the discourse; the double-conditioning of local relations of power/knowledge to bigger strategies and vice versa; and the tactical polyvalence of discourse where elements can sit somewhat discordantly within the same discourse, and can be rearticulated to form a new discourse. In regard to these characteristics of power/knowledge, this chapter looks at the particularity of the timing and combination of actors and institutions involved in

the production of UKCIP's discourse up until, and including, the production of the 2003 technical report. Within this contingency, it considers the conceptual content of the discourse thus produced.

Following this theoretical approach, the first section, 2.0, begins with the first problematization in UKCIPs discourse, which was not about adaptation to climate change per se, but identifying climate change impacts. This is significant because it demonstrates how adaptation discourse was shaped by the prior problematizations centring on scientific knowledge as a means of knowing climate change. This combined with an uncomfortable fit with qualitative socio-economic approaches to foresight, with the result that scientific means of knowing trumped social means, and a focus on the biophysical trumped the focus on the social, as is discussed in 3.0. Section 4.0 discusses the shift from accounting for impacts to discussing 'what to do' about them as the point at which adaptation was introduced to the discourse, whilst section 5.0 discusses the reasons why this took the precise form of a 'risk based approach.' The penultimate section considers the establishment of limits for others forms of knowledge in 6.0, and the final section and conclusion, 7.0, discusses how the initial framing of climate change in terms of biophysical impacts has remained a foundational part of UKCIP's discourse, and is linked into a powerful dispositive (or institutionalized strategy of power/knowledge effects) and as such has retained a central part in the discourse. The discussion of the power/knowledge origins of the discourse provides the context for a more in-depth discussion of the conceptual content of UKCIP's discourse of adaptation from 2003, which is explored in Chapters 5 and 6.

2.0 'Climate Impacts' and knowing through science, 1997-2003

The immanence of power and knowledge can be observed at a basic level in the call by the UK Government for an organization to provide policy support for climate change. This was born out of the developing consensus at scientific and governmental levels both nationally and internationally that, not only did climate change exist, but that given the inertia in the climate system from greenhouse gases already in the atmosphere climate impacts would occur regardless of the success of the mitigation agenda (Interviewee H 2009, UKCIP Interviewee F 2009). The discursive and institutional context fundamentally structured the discourse that arose in response to the call to tender, as both UKCIP and the UK Government were operating within the terms of a global debate which was dominated by the role of the IPCC and the particular climate science of Global Circulation Models and the climate change scenarios these produced.

This married well with the deeply entrenched practice of western governments to base policies on the science of nature. For almost two hundred years, the right to enact policy had been linked to the supposed objectivity of scientific knowledge, using it as the authority on which governments can intervene on behalf of their populations (Foucault 2008). This central norm of western liberal government produces the cyclical effect of creating a need to 'know' in order to act, driving a search for the creation of appropriate and expedient knowledges for policy (Hansen 2006). As such, a claim to knowledge must be established in order to establish a claim to policy intervention. In turn, the more scientific and objective this information can be held to be, the greater the validity of the policy. In the UK, this is a particularly pronounced cycle, with little room for doubt of the science or litigation over its validity, as there is in the

United States, for example (Jasanoff 2010, Jasanoff 2012a). In turn, this knowledge-policy intervention link within the UK is perhaps most pronounced in environmental policy, being the 'original' domain of science (Castree and Braun 2001). Climate change as a particular area of expertise is no exception (Szerszynski 2010, Shackley and Wynne 1995a, Wynne 2010). As a result, since the 1970's the focus in the UK has been on getting the science of climate "right" as the basis for policy making (Dessai et al. 2009, Shackley and Wynne 1996, Shackley and Wynne 1995b).

However, the global debate over the very existence of climate change – driven in the main by climate change scepticism in the US - translated into a heavier investment in UK climate science, entrenching Global Circulation Models as a foundation for policy. As a result, any policy on climate change, including in the UK, had to jump through the hoop of scientific proof existence of the phenomenon before policy could move on to deciding what to do about it.

The discursive focus on climate models was thus institutionalized in UK government policy prior to the creation of the UK Climate Impacts Programme in 1997. This model-based discourse of climate change was deeply rooted in the UK scientific and policy community and climate models were seen as the primary means of identifying climate change and understanding it. Accordingly, national climate change scenarios were produced in 1991 and 1996 by the Climate Change Impacts Review Group (CCIRG) , a role which was taken on by UKCIP after 1997 (Hulme and Dessai 2008). This placed scientific knowledge at the heart of the UK climate change discourse, whose own climate science institutions – such as the Hadley Centre - were amongst the primary contributors to global

scientific knowledge (Shackley and Wynne 1995a, Hulme and Dessai 2008, Hulme and Turnpenny 2004).

In fact, the centrality of climate modelling to the discourse of climate change became so established that it was not just the scientific community that reproduced it. UKCIP was requested by Government to produce such scenarios, and even a decade after the original publication of UKCIP's first scenarios, there is still "an expectation [by stakeholders] that in the science, the climate information... will be more exact" (UKCIP Interviewee D 2009, pp. 8-9). As such, it is clear that government bodies and businesses also assume climate models are the way to understand climate change as a biophysical phenomenon. This may be partly due to the dominance of the models in the global discourse discussed above, but also undoubtedly arises from the established, if not foundational discourse of liberal government which calls on science to establish its claim to authority and desire for control, by providing a modern basis of certainty and order (Foucault 2008).

It is no surprise then that UKCIP's initial remit followed this fundamental vein of reasoning that it must produce an account of climate change as a biophysical phenomenon, and that the content of its initial discourse reflected the imbrication of these scientific-governmental power/knowledge relations. In the context of a scenario driven epistemology of climate change, preparing for climate change meant providing information about the potential biophysical impacts of climate change in the UK. The limited work at that time on national or local level impacts at that point meant UKCIP saw its primary role as raising awareness of climate change impacts: "basically what stakeholders wanted to know was 'what's the climate [going to] be like where we are'" (Interviewee H

2009, p. 2). As a result, from 1997 and certainly 1998, "there was much more of an emphasis on the climate data, [so] the first product that UKCIP had was the UKCIP '98 Climate Change Scenarios" (Interviewee H 2009, p. 2). In this way it was clear that scientific knowledge of biophysical climate impacts was the core referent: *not* having this knowledge was the problem, such that getting or creating such knowledge was how climate change was problematized, creating a political rationale focussed on creating and disseminating climate change impacts information.

These foundations meant that UKCIP was required not only to demonstrate the 'proof' of climate change to support its policy role, but to demonstrate the specifics of the climate change impacts that would occur as a result. However, the persistence of the climate change debate in the public arena and the relatively recent scientific consensus on the existence of climate change meant that the focus on producing knowledge about biophysical climate change was also demanded by a political context where climate change was such a divisive and distrusted issue. As UKCIP staff often noted in interviews, "our job really is to work at the grassroots level and raise awareness of [climate change]… [and] get [stakeholders] to realize that actually this is an issue [relative to them]" (UKCIP Interviewee F 2009, p. 17).

To do this, UKCIP produced a series of scenarios and a highly detailed imaginary of the biophysical climate change threat. The first was UKCIP'98, followed by UKCIP'02 and the probabilistic version of these as the UK Climate Projections UKCP'09, with the next set of scenarios to be delivered after 2012 once UKCIP's government work programme is finished, called UKCP 'next' (Hulme and Dessai 2008). These scenario and projection packages have been

represented in a variety of forms as tables, charts, graphs, maps, and descriptions of climatic changes. The high resolution detail makes these scenarios appear much more 'real' than they really are (Hulme and Dessai 2008) and tends to obscure as a result the basic uncertainties by making the scenarios so tangible and malleable that they can be integrated with policies and technologies. The latest rendition of the scenarios, UKCP'09 included a 'weather generator' which was able to give precise (rather than accurate) results (Dessai and Hulme 2004) that were available daily and hourly for 5 kilometres squared areas. These results were statistically derived from the climate change scenarios' 25 kilometres squared projections (Defra 2012a). This wealth of representative artefacts functions in the same manner as Benedict Anderson's 'census, map, museum' to create not an imagined community, but an imaginary of climate change as not only real, but as having a particular reality (Anderson 2006).

The precise imaginary cements knowledge about biophysical impacts as the central referent of the problematization of climate change and in doing so makes it the focus and the foundation of the responses that follow. This means a focus on trying to provide "accurate and precise climate predictions at a range of geographical and temporal scales as a key element of decision-making related to climate adaptation....[such that] prediction becomes indispensable and indeed a prerequisite for, effective adaptation decision-making" (Dessai et al. 2009, p. 67). Thus the UK Climate Impacts Programme, as its name implies, focused entirely on producing an account of what the impacts of climate change, at a biophysical level, might be. As we shall see, this science-policy relationship shaped UKCIP's entire problematization of adaptation to climate change.

The corollary effect of the focus on biophysical knowledge was that the policy application was more assumed than developed at UKCIP's end of the policy-nexus, 'black-boxing' what was to be done with this knowledge. This also arose because the UK was not so clearly at the geographical front-line of actually occurring impacts as, for example, Bangladesh or many Pacific island states. Furthermore, the UK's status as a developed country was seen to remove it from the need for the vulnerability approaches to adaptation utilized in developing countries. These approaches focused on adaptive capacity including social networks and social capital, rather than relying heavily on technological approaches (Fussel 2007, Fussel and Klein 2006, O'Brien and Leichenko 2007, Schipper 2006).

The combined effect of the focus on scenarios and impacts and the occlusion of explicit discussions of adaptation because the dominant discourse had rendered it taboo (Schipper 2006), led to a discourse that heavily focused on impacts, and left a blank space for adaptation as the 'what happens next,' even though the very existence of the impacts was presumably based on the rationale that it would somehow enable adaptation. Moreover, this meant that an implicit account of adaptation was produced where 'knowing' the effects of climate change was assumed to be a sufficient basis for policy responses, that is, adaptation. This makes sense within a techno-scientific world-view where empirical knowledge is assumed to provide the certainty on which to act (Dessai et al. 2009). This problematization was easily maintained within scientific circles, but this assumption fell down very quickly in the face of attempts to practically apply this knowledge, as became clear in UKCIP's work. This increasingly visible gap called for the discourse to evolve. There was also another driver to the

emergence of adaptation discourse. Various UKCIP staff (Interviewee H 2009, UKCIP Interviewee F 2009), as well as secondary researchers (Hulme and Turnpenny 2004), have also asserted that it was the nature of climate knowledge itself – its inherent uncertainties – that triggered the need for adaptation advice.

Nonetheless, the move to focussing on adaptation took some time because adaptation was still impolitic. This was reflected in UKCIP's development: "when UKCIP was first set up it was ... very much looking at the impacts of climate change, and we weren't working on adaptation as such, [as] talk about adaptation was seen as being very defeatist [regarding the mitigation agenda]" (UKCIP Interviewee F 2009, p. 1). Practical applications, finding ways to deal with uncertainty, and accepting the need to engage with adaptation explicitly, all called for a more explicit account of adaptation itself, resulting in a recalibration of UKCIP's problematization of climate change in terms of adaptation, rather than scientific accounts of biophyscial impacts.

3.0 Limit points: the inclusion and exclusion of the social

Crucially for the development of the discourse, the production of this information was tied to a mandate that it be useful to the stakeholder, helping them to understand the science of climate change and apply it in practice (McKenzie-Hedger et al. 2006, Lorenzoni et al. 2007) The stakeholder focus was also influenced by the founders of UKCIP in 1997, who drew in particular on the Canadian 'Mackenzie Basin Impact Study,' an integrated impact assessment published in the same year. The study placed stakeholders in partnerships with government in order to generate appropriate adaptation strategies (UKCIP

Interviewee F 2009, Interviewee H 2009, Cohen 1997). As we shall see, UKCIP's adoption of this approach places it in direct power/knowledge relations with other 'stakeholder' actors. These relations enable variation and modification in what it problematizes as part of climate change and how. It also introduces a social 'subject,' of discourse in addition to the biophysical subject in the ontology of the threat. The polyvalence of the way in which this subject is used does not appear until the 2003 technical report, but it makes its entry in 1997.

Some social elements of UKCIP's climate change discourse were initially introduced through their Socio-economic Scenarios (SES) (UK Climate Impacts Programme 2000). The SES were created in 1999, with the objective of sketching out possible socio-economic futures within which the response to climate change would occur, and thereby giving "some kind of insight into how the society would deal with those changes, and also how vulnerable different types of society would be" (UKCIP Interviewee F 2009, p. 6). Thus very early in UKCIP's lifespan the concept was introduced of the social, including the economic, began shaping the understanding of climate change as a problem, through giving stakeholders a chance to understand what constraints they might face in trying to respond to the biophysical impacts.

Both forms of scenarios, scientific and socio-economic, painted a range of possible futures that enabled stakeholders to position themselves in terms of a critical reflection on the possible vulnerability of their property, goods and processes. In this sense, both scenarios were part of the same discourse, and were in fact characterized as complementary tools for assessing climate impacts, with the socio-economic scenarios providing a characterization of the context within which climate impacts might occur (UKCIP Interviewee F 2009, p. 5).

However, the different scenario sets arose from very different epistemic and ontological bases. Initially, this led to epistemic tensions that meant the two scenarios acted as limit points for each other, in that socio-economic scenarios resisted the quantification drive associated with the climate scenarios, and in doing so introduced a qualitative element to the imaginary of climate change impacts. But this created tension over the apparent validity and utility of the socio-economic scenarios seen from the dominant, quantitative, techno-scientific perspective. As a result, there was pressure from the then DETR (Department of Environment, Transport and the Regions) to recondition the way in which the socio-economic scenarios were used, so that they could be brought into the core techno-scientific discourse. In their own terms, this was to "have a set of... numbers on socio-economic things that people could plug into their models... The difficulty was that the people who actually produced the scenarios felt really uncomfortable with any of those numbers" (UKCIP Interviewee F 2009, p. 5) as the scenarios were created as 'descriptive,' rather than as precise likelihoods. These origins meant it was possible for the producers of the SES and UKCIP to diverge in how they used the socio-economic scenarios.

It seems that the dominance of the techno-scientific world-view that married so well with the scenarios began to affect how the SES were judged. "[One] of the key criticisms of the scenarios was... the idea was that we would have a national set of scenarios and people would scale down for use in their region. And the problem [was] for things to have meaning in a particular region they need to come from that region, and of course the more regionalized they become, the less one can compare them, because the less true they are to the national set" (UKCIP Interviewee F 2009, p. 6). This demonstrates a tension

between having an objective, universal scenario set that could be scaled down to the regions, and a bottom-up, emergent scenario set based on regional particularities. Moreover, this tension was maintained because of the fact that UKCIP was charged with ensuring the comparability of regional scenarios so that a national picture could be pieced together (Hughes et al. 2009, Gawith et al. 2008). This sits more easily with a scientific knowledge model, in which the future is accounted for as a 'product' against which the actions of the stakeholder are assessed and defined, whereas the SES understands the future as arising from the processes in which the stakeholder is engaged.

One staff member implied that this same tension was also replicated between some users and those who produced the scenarios: "people just found them a bit airy-fairy and a bit woolly, and 'they're just kind of descriptions of possible futures, but it doesn't necessarily tell me what to do, and how to do it'" (UKCIP Interviewee F 2009, p. 6). The critical review of the SES conducted in 2009 partly attributed this to the writing of the scenarios themselves. Interestingly, whilst both scientific and socio-economic scenarios were 'just' scenarios, they were assessed in very different terms – the scientific scenarios were assumed to have more validity on account of having greater precision, whereas neither could claim much degree of accuracy (Hughes et al. 2009). The difference was that for the SES this was overt, and part of the methodology, rather than assuming it could eventually be minimised (UK Climate Impacts Programme 2000). As a result, the SES were side-lined in the 'evidence-based policy' problematization because this limited their usefulness for 'future-proofing' adaptation policy. This demonstrates that the dominant ontology was

objective, product-based knowledge, making it hard for stakeholders to utilize the more explorative approach of the socio-economic scenarios.

This fundamental duality of values associated with the physical and social sciences was demonstrated by the fact that, whilst the climate scenarios also offered a range of possible scenarios, they did not receive the same kind of response. "People… find it easier to accept the climate bit of it in some ways, because they're being given maps and data and numbers – and they go 'oh yeah, I can see what it looks like' and then if you've got a socio-economic scenario that's a kind of 'everyone will be really selfish and [they] can't really understand what that's going to mean…" (Interviewee H 2009, pp. 21-22). In part this was encouraged by the statistical downscaling provided by the climate scenarios and the highly detailed technical data, whereas the SES were criticized for not being 'disaggregated enough' or precise enough, and putting the onus on users to do this work of imagination, rather than providing it as has been the case with the climate scenarios (Hughes et al. 2009).

It also seemed that this conceptual blockage was linked to a linear understanding of time and development. "What we found with the socio-economic scenarios was that, when we tried to use them, let's say with a local authority planner, we used say 'ok, if you make a decision about your plan… the world could unfold in all these different ways' –the local authority planner would actually say 'no, I know what the world's going to look like, we've decided we're going to build this many houses here, and our economy is going to grow like that' –and they had their own view of how the future was going to pan out. And trying to introduce to them a completely different set of futures, um, they couldn't relate to them" (Interviewee H 2009, p. 21). The 2009 critique linked this response to

the lack of detailed SES scenario data and to the absence of a grounding time-line or story development that helped transport the stakeholder from the present to the potential future, making it more believable (Hughes et al. 2009). Despite this, the decision was made not to change the scenarios, in stark contrast to the vast amount of investment in the UKCP09 scenarios and associated tools. As such, the failure of the socio-economic scenarios could also be seen as arising because of the lack of institutional support for its approach, particularly in order to redress the lack of familiarity amongst stakeholders in terms of how to use the scenarios. Of course the whole principle of the socio-economic scenarios was that they broaden horizons by being different to the present day. Therefore social identification is necessarily difficult (Glynos and Howarth 2007, Laclau and Mouffe 2001). However, to work, they must be made imaginable, in the same way that immense effort has been put into climate change scenarios to make them imaginable through the tangible graphs, maps, and descriptions applied to the potential impacts scenarios.

It should be noted also that UKCIP staff appeared to be generally ill at ease with the SES – the vast majority of staff had a background in physical sciences and environmental management, which was observed in all interviews with UKCIP staff bar one recent recruit. This was also observed in the 2004 review of UKCIP (ESYS Consulting 2004). One further critique by the 2009 SES report concerns the lack of consideration of agency and interaction of different relationships of governance and stakeholders within the scenarios and thus the lack of 'integrated planning and preparation' being considered in the resulting impacts assessments and adaptation policy assessment (Hughes et al. 2009). This

lack of consideration continues through the 2003 technical report and into UKCIP practice through to 2009.

This lack of balance in the provision of expertise, and tools for making the social-economic scenarios accessible, imaginable and explorable had very significant results, as "there was a ...fairly poor uptake on the scenarios because very few of the studies actually had the right expertise to be able to know what to do with them" (UKCIP Interviewee F 2009, p. 6). This was particularly clear where the scenarios might have made the jump from product to process based forms of knowledge. UKCIP Interviewee F noted that UKCIP staff probably provided "insufficient guidance for people" so they "used them in the beginning of the process to see how things might change, but very few studies actually [were] going back to that later [stage]" such that they were used to shape 'inputs,' but not 'outputs' of the studies (UKCIP Interviewee F 2009, p. 6).

There was not as much investment, culturally and materially, in socio-economic scenarios, or improving capacity building for social knowledge production. Ultimately this epistemic tension began to undermine the validity of the SES, and contributed to their general lack of use by UKCIP staff or stakeholders (UK Climate Impacts Programme 2000). That failure became particularly significant as the same superficial attempt to re-render qualitative social knowledge in quantitative terms was repeated later in the 2003 document. The need to connect the two effectively was highlighted after some time, in 2008 and 2009 (UKCIP Interviewee F 2009, Hughes et al. 2009, UKCIP Interviewee E 2009).

However, as we shall see in Chapter 7, this tension was never worked out within UKCIP's problematization of climate change or climate change adaptation.

Instead, epistemic tension between using the SES as they were intended and the clearly dominant scientific and product based epistemology was resolved in favour of the later, and in practice resulted in the abandonment of the socio-economic scenarios, as their real epistemic power was sapped by placing them in an inappropriate conceptual context. There are crucial links here to critiques of 'impact assessment' modes of adaptation which focus on providing information on the climate but not on adaptive capacity (Pelling 2011, Burton et al. 2002), and are related in turn to the modernist division between nature and culture, and the associated account of climate change as somehow external to society (Head 2010, Castree and Braun 2001, Fussel and Klein 2006). As we shall see, the failure of the socio-economic scenarios presaged the absence of an explicit engagement with the social, for example through a vulnerability-approach, in UKCIP's subsequent development of an explicit account of adaptation.

4.0 The shift from impacts to adaptation

Fussel and Klein (2006) have discussed the shift from impact assessments which are science-driven, biophysical accounts of climate change to vulnerability-based assessments which increase the visibility of non-climatic stressors. This section discusses the way in which UKCIP's climate change discourse began to shift away from seeing adaptation as being implicitly contained in any response, towards the belief that adaptation itself required a far more explicit account of the threat through scientific knowledge, specifically as climate change scenarios. There appear to be two reasons why this shift occurred, and adaptation became an increasingly explicit focus of UKCIP's discourse.

First, UKCIP's engagement with stakeholders initially meant that having raised awareness of how climate change might affect stakeholders, UKCIP "then [found itself] leaving it up to [the stakeholders] to think about what they wanted to do" (UKCIP Interviewee F 2009, p. 1). However, "as soon as ...people found that they were impacted they wanted to know 'well, what do we do?' [...] So our agenda quickly broadened to start to address with stakeholders, at their request, to try and understand adaptation and how they deal with the impacts" (UKCIP Interviewee D 2009, p. 2). As a result, UKCIP "realised... there was more to it than just giving [stakeholders] climate data, you had to show them how to use it appropriately" (UKCIP Interviewee F 2009, p. 1). This caused a change in UKCIP's definition of its role from "understanding how climate might change to what sort of impact that might have... [to taking] on board the idea of engaging with stakeholders, in order to start them down that process of adaptation shall we say, and that tends to be much more the focus now" (UKCIP Interviewee A 2009, pp. 12-13).

The second reason for the shift to adaptation was that it became a legitimate object of discourse at the international level, when it was recognized as necessary because of climate change inertia. This released it from the accusation of defeatism that had plagued adaptation in the context of the UNFCCC negotiations on mitigation (Fussel 2007, Fussel and Klein 2006). In addition, UKCIP also maintained that mitigation and adaptation need not be mutually exclusive activities (UKCIP Interviewee F 2009). As such, adaptation was introduced into discourses of climate change as a legitimate and necessary activity and the adaptation report was requested in 2001 as a result (Willows and Connell 2003).

Having accepted the reproblematization of climate change where adaptation is the response to climate change impacts information, the precise nature of the account of adaptation had to be formulated. The next section focuses on how UKCIP responded to this, namely through the 'risk framework' of the 2003 technical report *Climate Adaptation: risk, uncertainty and decision-making* (Willows and Connell 2003) that is the focus of the next section.

5.0 The 2003 'Technical Report' and the 'risk-based approach'

In the previous section, it was established that there was a shift from simply providing climate impacts information to the recognition of a need for substantive guidance on how to use this to produce an adaptation strategy. The climate scenarios that UKCIP had previously used, and indeed the socio-economic scenarios, insofar as they were meaningfully incorporated, were not trumped but rather made useable through an over-arching framework. As one of the report's authors put it "... we realised actually there was more to it than just giving them climate data, you had to show them how to use it appropriately which is where the risk framework came in" (UKCIP Interviewee F 2009, p. 4).

However, the call for the risk framework itself did not arise from the stakeholders, but rather from discussion between UKCIP and the government department that commissioned it (Willows and Connell 2003, Interviewee H 2009), the Department of the Environment, Transport and the Regions (DETR), which later became the Department for Environment, Food and Rural Affairs (Defra). It seems that in the first instance, a large part of the drive for a risk-based approach arose from the general conceptual role that risk had begun to

take in governance circles and became part of UKCIP's discourse through an institutional power/knowledge relation as "part of the brief... and that goes with the wider government agenda to improve risk-based decision-making" (Interviewee C 2009, p. 3). Indeed, this approach was specifically represented through the Cabinet Office's Strategy Unit report in 2002 (Cabinet Office Strategy Unit 2002) which is noted in UKCIP's 2003 technical report as a key reason for their adopting that approach. However, the risk approach has a significant precedent environmental risk assessment, represented specifically through another key background document: *Guidelines for Environmental Risk Assessment and Management*, published in 2000 by DETR, the parent department of UKCIP and the Environment Agency in which the primary author was employed. This document, and its role in providing conceptual heritage, is directly referenced on pages 46 and 47 of the risk framework, in the background section to 'Risk and Uncertainty'. It was seen as connected to a hazards approach (Interviewee H 2009) and specifically notes the DETR's use of tiered approaches and conceptual models for the process of risk assessment, which fundamentally shape the risk framework's own approach, as we shall see in chapter 5.

It is worth noting here that the move to risk did not emerge from the international climate change discourse itself. Rather, it was the application of an existing epistemology and a form of governance to a new problem. The following quote is repeated in full to demonstrate this confluence of the problem with a particular trend of knowledge making, underlined for emphasis:

"In terms of their approach it was... *definitely* about the notion of risk-based decision-making was growing in terms of its importance within the environment agency, and within Defra. And there were quite a lot of

reasons for that: evidence-based policy, risk-based decision making [...] And so, what we were trying to do is we were trying to say 'OK, there is this strange thing called climate change, and then there is this move towards risk-based decision making, let's bring those two things together, and let's try and make climate change –what used to be called 'climate change impact assessment,' let's make it –let's talk about 'risk assessment.' And so, it's changing the emphasis..." (Interviewee C 2009, p. 4)

A previous institutional product of this conceptual trend was the Environment Agency's *National Centre for Risk Analysis and Options Appraisal*, the "brand new sparkly centre" to which the work of writing the report for UKCIP was sent at the time (Interviewee C 2009, p. 3). So as it was a figure at the Centre who became the report's lead author it was clear that "there must have been some discussion at some level, at which it was agreed that the Agency would provide expertise in risk to UKCIP and to Defra to do something in this area," although the author was unable to shed light on "exactly where" that decision was made (Interviewee C 2009, p. 3). However, this flowed from the consensus at the time that the "paradigm for making uncertain decisions is risk based, so it was about trying to make it clear that climate change was an issue that had to be addressed in a risk based way" (Interviewee C 2009, p. 4).

Of course, the institutional situation of the technical report meant that the expertise was certainly in risk-based approaches. Placing the author as "effectively managing the project" where "most of the resourcing came from... my time – and some of the other people in the agency, [as well as] from UKCIP...." (Interviewee C 2009, p. 1) of course created a balance of expertise that shaped

the conceptual content of the report that emerged. As the main UKCIP author on the report noted, the EA thus provided "the main brain behind this report" and the "genesis of the thinking and the intellectual capacity really came from [there]" (Interviewee H 2009, p. 5).

In the interviews, it appeared that there wasn't really an alternative 'paradigm' that might have been considered by the authors. Risk simply was seen as the 'rational,' and 'scientific' approach that provided the necessary evidence base for policy. There was no identification of risk as avoiding process, or vulnerability concerns, as discussed in Chapter 2. When asked in interview whether risk would be 'enough' to deal with climate change, there was little suggestion of an acceptable alternative or supplement, which as we shall see, varied quite dramatically with those actually working in in UKCIP in 2009. This may have been the result of unclear interview techniques failing to distinguish between a risk approach and its association with outcome based knowledge to the exclusion of process based knowledge. However, one author proffered no supplementary mode, and the other seemed naturally to assume the only alternative to a risk-based approach was an 'irrational' or 'faith-based decision' (Interviewee C 2009).

The establishment of evidence in order to create certainty for policy can be approached through various different forms, but when it comes to the use of science, the very powerful imbrication of modern western epistemology and ontology comes into play. In the context of UKCIP, the rendition of 'policy' through a Technical Report as a genre both represents and recreates this fundamental alliance that draws on scientific knowledge from 'official' and 'peer-reviewed' sources and studies in order to use this authority to make its own

policy discourse also authoritative. Moreover, such entextualisation of authority has dispositive effects, in that policy, as a likewise normatively 'authoritative' voice gives credence to the institutions on which it draws, creating a cycle of validity (Hansen 2006). That the appeal to science was assumed to be the only means of accessing knowledge and authority is made clear in the following quote:

> "The report needed to have credibility with the... climate change community, the science community, so it ... had to have a *rational* approach to decision-making [...] we live in a highly technical, northern European, country that prizes engineers [...] so you couldn't write a report that... didn't have a sort of scientifically justified approach to decision making." (Interviewee C 2009, p. 4)

This quote sets up risk within a modernist, techno-scientific framing, creating a political rationale engineered solutions, and outcome based knowledge. Indeed, the overt reference to the preference for engineered solutions perhaps can be taken at a more fundamental conceptual level as shorthand for the dominant epistemology of the problematization in the report. What matters here is not so much the power-relations that defined the project brief or landed it with this particular centre, but that the resulting discourse was contingent upon this, and thus the techno-scientific, risk-based approach can be seen as a contingent conceptualization of adaptation, which otherwise may have been very different, or at least broader.

Initially this research was investigated under the assumption the *Climate Adaptation: risk, uncertainty and decision-making* document was about adaptation, and would have adaptation as its core referent. However, this

demonstrates that at the conceptual level adaptation was tagged onto the need emerging from the scenarios and impact assessments, of 'what to do next.' Thus we see that the pre-adaptation rationale of knowing scientifically was really the basis of the meaning of adaptation as it developed at UKCIP, with risk becoming the central means of knowing possible impacts. The links between risk as a means of knowing impacts and what to do about them as a form of adaptation are forged in the document, but they do not emerge out of a deeper consideration of any normative or strategic analysis of the concept of adaptation as a distinct entity. In fact, one publicly available draft of the document created in the later stages of the framework's development, had adaptation as its title on the first page, but in all the 'header' sections of the document was referred to as "Guidance on handling risk and uncertainty in decision-making for climate change" (Willows et al. 2003b). Even as an editorial slight of hand, this demonstrates the conceptual origins of the document came straight out of a risk management agenda, where this pre-formed problematization was coupled to adaptaiton, rather than adaptation itself being the core referent, developed in its own right, and generating a risk approach as a result. This weak origin of adaptation seems to result in the weak positioning of the concept of adaptation and its definition in the final report, which will be discussed in the following two chapters.

There are two key moments to the articulation of adaptation that results. First is the centrality of impacts and scenarios to adaptation. Indeed, adaptation is here premised on their use. Second, these impacts and scenarios are rendered useable and amenable to adaptation through a 'risk framework,' placing risk as the key referent of adaptation. In this respect, it is also significant that the

document is then almost exclusively referred to as 'the risk-framework' by UKCIP staff in interviews, making it very clear that this is its fundamental approach to adaptation.

6.0 Ontology and its limit points: scenarios, space and agency

The brief for writing the 2003 Technical Report clearly asked for a risk-based approach, but what the object of risk-based knowledge was taken to be, and who the actors were, and what agency they had, also started to structure the problematization. One element that did shape UKCIP and Defra's problematization of adaptation was the demand that the report create a tool useful to UKCIP's stakeholders. This was a very open demand, and there was a long period of problem-formation between the authors of the report. The result was not reducible to the environment agency's expertise at the outset of the project. As one key report author noted:

> "...it would have been quite easy to have simply gone to the academic literature and ... to the climate change science community, and draw on what they wanted, but Defra I think, perhaps in their wisdom actually, I mean it was –they didn't know what they wanted, but what they said was 'we want something that will be useful to all decision makers in the UK'[...] and that was quite a challenge but I did take that very much to heart" (Interviewee C 2009, p. 2).

> Defra's brief said who the report should be written for, and also gave a mode for its discourse: "Defra did say they didn't want anything quantitative with numbers [...] I think this was partly their sort of focus on SMEs, farmers, so

they wanted something that was accessible" (Interviewee C 2009, p. 4). It is clear however that the characteristics of these actors themselves did not really shape the problematization of climate change adaptation, but rather its mode of delivery:

> "I think they wanted something that was practical and not theoretical, um, so although we talk about quantitative risk assessment and we y'know reference some of the methodologies that one would use, we took the [...] tiered approach where you start with sort of very qualitative, much more judgmental approaches and then you go on to sort of quantitative, detailed modelling of –it depends on how big a decision it is, and whether you've got the information, all those sorts of things" (Interviewee C 2009, p. 4).

As such the problematization's epistemology was still very much based on a risk approach, which as we shall see focuses on the decisions to be made but in doing so tends to obscure the social aspects of the actors who are actually doing the decision-making. However, this reservation of a named space for the decision-maker nonetheless ensures a problematization of climate change from their perspective or capacity as actors. As such it creates a 'social' space for the problematization of climate change. What constituted a 'decision-maker' as understood by the report authors will be discussed in more detail in Chapter 6.

This entry point into the consideration of the social might have significantly shaped the degree of overt engagement with the social but for two factors. First the perceived lack of clarity in the problem definition at UKCIP and Defra's end left the substantive conceptualization of the project open to largely

scientific-based influence. However, this did not result in a simple co-option of existing knowledge to a new application.

> "[It] was [a] very poorly framed as a problem, so [...] there was a sort of period of almost four years where we tried to understand what it was that was required by Defra, by UKCIP, um, who it was for, and it –then what it would look like. ... so it was quite ... a difficult process" (Interviewee C 2009, p. 1).

Nonetheless there was an absence of input at the user-based, process based and social end of the equation.

This absence of the social was compounded by a second factor, which was the limited engagement of the risk-management consultancy in the particularities of risk management in a climate change context. As one author noted "they thought it was all a bit theoretical and, and too in the future [...] so they weren't terribly engaged," resulting in a "[very poor] review of the climate adaptation literature, and analysing its risk based context" (Interviewee C 2009, p. 1). This was the only point at which social expertise of any kind was deployed, and the lack of real engagement here by the specialists brought in to deal with the actual risk-management processes clearly limited how much it played a role in the final document.

However, this was in part a symptom of a more fundamental reservation at the leadership of the project within UKCIP, which was also seeking to act within a political and discursive context in which it was still felt necessary to make a case for climate impacts themselves. As such, "...one of the things we got criticized ... for [was] because we emphasised that [...] social attitudes will change and economics will change and all these things actually might be more

important for what you're trying to achieve than climate change. *That* was seen as –as sort of down-playing the importance of climate [and therefore as] a real black mark" (Interviewee C 2009, p. 26). As the quote indicates, this was a bone of contention in the development of the report. The key report authors felt strongly this was a necessary contextualisation of the problem, "from day one, there was this recognition that, and again it was IPCC driven, that ... it's not just climate that's changing but everything else is changing as well," (Interviewee H 2009, p. 20). In this way, the political agenda to ensure that climate change was recognized as a 'real' risk meant not only that other sources of risk were occluded, and this exclusion fundamentally shaped the conceptualization of adaptation itself by limiting the account of the situatedness of climate impacts, and therefore the nature of the threat to which adaptation responded.

An indication of this was that the Socio-economic Scenarios were left tangential to the report, and their epistemology and ontology were not utilized or integrated into its core problematization. The contradiction within the following statement makes this clear: "you can't think about [climate risk] without thinking about [other sources of risk]," but this "didn't really change our view of how we should write this framework. This framework was [...] trying to draw on the best knowledge about risk-based decision-making. It wasn't worrying itself about what society might look like in the future" (Interviewee H 2009, p. 20).

The problematization of climate adaptation was thus clearly divorced from an analysis of the social as part of the object of knowledge. In this sense the SES limited the account of the social to an outcome. Yet in representing the social in a supposedly sufficient that was determined to be largely irrelevant to the problematization of climate change responses, the SES acted as a limit point that

prevented further investigation into how 'the social' might affect the problematization of climate change. This affected in turn the discursive terrain from which the problematization of adaptation was formed.

7.0 Epistemology: Knowing and Time

The corollary question to 'what' and 'who' were understood to be adapting to climate change is 'why' and 'how' such adaptation is presumed to take place. How both 'why' and 'how' are perceived in the report deeply structure the framing of risk knowledge as both a problem and solution. As discussed above, the role of the 'stakeholder' as a decision-maker was crucial, but the kinds of decision they might make had a particular imaginary. This is demonstrated by the following quotes, where planning, particularly for long term decisions, was of foremost concern to the authors:

> "I think we were clear... that the people who need to concern themselves about climate change are people building things that are [going to] exist for a long time, people who are in planning and in theory therefore are influencing those long-term decisions, so it's really aimed at people who are making long term decisions, that if you make them wrongly then you've backed yourself into a corner." (Interviewee H 2009, p. 12)

> "...a short term decision would start today. I would describe a long term decision as being... twenty years or longer." (Interviewee H 2009, p. 12)

In answer to a question regarding climate shocks such as rapid sea level rise, it became clear that the planning element was essential:

> "Well, there would be adaptation, because sea level rise, and London would be flooded, and people would have to move houses, and the economy would collapse, asset prices would collapse and there'd be a shortage of money [short laugh] just like today. Um, but that we'd be managing in a responsive mode, rather than adapting. It wouldn't be proactive adaptation it would be forced adaptation." (Interviewee C 2009, p. 23)

This posits an absolutely critical distinction between 'responsive mode' and 'adapting.' Although the author also categorizes responsive mode as 'forced adaptation, as opposed to 'proactive adaptation,' the exclusion of this kind of scenario from shaping the report made it clear that the climate science was seen as allowing for proactive adaptation, which formed the substantive understanding of what adaptation was. In other words, adaptation was problematized as a planned, long-term decision, where the emphasis was on understanding biophysical climate risk preemptively.

8.0 Conclusion

This chapter has demonstrated some of the ways in which particular institutional, political, and educational relations were immanent to the kind of discourse about climate change that was produced. As part of this, this chapter has traced the major developments in UKCIP's discourse that led to the decision to problematize adaptation more directly, specifically in terms of risk assessment

and risk management. However, it has also shown the strong basis of the discourse in an institutional, educational and cultural basis that assumed the primacy of a techno-scientific and specifically risk-management approach.

This coupled with the political necessity of justifying UKCIP's existence and the cause of climate change to a still dubious public, to set the scene for the 2003 technical report accounting for climate impacts in terms of biophysical effects, and therefore only responding to the social in a very limited fashion. In fact, even as UKCIP's agenda has moved on to a more in-depth engagement with adaptation itself, the sense of a need to make a 'case' for climate change is still a central part of their presentation of climate change as a problem, which requires the use of climate change scenarios to provide an account of climate change impacts. However, as we shall see in the next chapter, this is now connected to a broader problematization of climate change adaptation, although the latter still assumes the use of climate scenarios.

The failure of the Socio-Economic Scenarios to make an impact on UKCIP's discourse of adaptation either alone or within the 2003 report also meant that 'the social' as an object and subject remained largely excluded from UKCIP's problematization of adaptation. As such, it is clear that this genealogy of adaptation which arose from the biophysical impact scenarios shaped the imaginary of what might be included in UKCIP's 2003 account of adaptation itself, particularly in terms of the inclusion of a product oriented scientific account and the exclusion of a process based social account of climate change as a problem.

The power/knowledge relations traced here created a particular conceptual topography for the problematization of adaption that was crystalized

in 2003 through the 'risk framework.' That topography emerges along two key axes of analysis which will be picked up in the next two chapters. Both connect to the fact that the core epistemology of the problematization is risk-based. The first axis is epistemological: it accounts for the understanding of time and knowledge, or how actions and decisions are made in the context of uncertainty, which as we see here has its origins in prescient and preemptive environmental management, which is discussed next in Chapter 5. The second is ontological: it considers the overt account of the social, biophysical and material elements articulated into the problematization in Chapter 6. As both the following chapters will demonstrate, the introduction of the risk-based approach introduces contextual social aspects to both the ontological and epistemic bases. This results in the presence of supplementary moments that expand the problematization of adaptation beyond its impacts origins, but also threaten its coherence at a conceptual level.

Chapter 5: The epistemology of the "risk-framework" and the Problematization of Adaptation

1.0 Introduction

The previous chapter discussed the development of a need to provide guidance on what to do with climate change scenario and impacts information, and the simultaneous normalization of adaptation as a legitimate goal at an international level. Together, these prompted UKCIP to develop its own explicit approach to adaptation to climate change. However, this same genealogy foregrounded scientific knowledge of the biophysical impacts of climate change, and excluded or subsumed social forms of knowing into a quantitative, scientific epistemology, that coupled with a modernist ontology of individualist, rational man. As we shall see, the dominance of the techno-scientific frame echoes through the UKCIP's problematization of adaptation.

This chapter and the next seek to establish an account of that problematization between 2003 and 2009. They identify a problematization of adaptation, as risk-based decision-making that is centred on a techno-scientific ontology and epistemology. However, this is found to have a series of supplementary moments, which add to, but also disrupt, its conceptual cohesion. This chapter discusses the epistemology of the 'core' techno-scientific problematization. It focuses on the relationship between knowing and time, and knowing and uncertainty, to identify how this shapes the political rationale of adaptation. It also discusses several epistemic supplementary moments, which

generally arise from more qualitative and socially oriented forms of knowledge, and their implications for the stability of the articulation of the political rationale. Chapter 6 will follow the same structure of core and supplement with regard to the ontological moments in the problematization. Chapter 7 will then discuss in depth the actual and potential development of these supplementary moments.

This analysis of UKCIP's problematization of adaptation uses as its basis the technical report, *Climate Adaptation: risk, uncertainty and decision-making* (Willows and Connell 2003). As explained in Chapter 3, this report framed UKCIP's approach from 2003 until 2009, when the interviews and observations were carried out. Material from the discourse analysis of this report and the interviews and observations is used illustratively: focusing in particular on moments that best represent central and frequently reiterated articulations, either as connections or limit points. Power/knowledge relations will also be discussed where they make these conceptual configurations or alterations in those configurations clearer. In the sections that follow, UKCIP's specific discourse will first be related in emic terms, using its own phrasing, which will then be unpicked using discourse analysis techniques in order to account in etic terms for its problematization of adaptation.

2.0 The (re)problematization of adaptation: first steps

2.1 Genre, macro-structure and Policy narrative: the establishment of the problematization of adaptation

Before looking into UKCIP's 2003 report in detail, an overview of how it functions as both a policy document and technical report will help to identify

how it is able to effect a problematization of adaptation. At the level of practice, policies simply provide a mode of being, and so must provide a clear account of how to act and behave if they are to be easily adopted (Roe 1994, pp. 62-63). However, this mode of being itself, and the creation of interventions on its behalf, must somehow be made convincing. Some of this is overt, appealing to extant identities of the subject (Glynos and Howarth 2007, Laclau and Mouffe 2001). But this meaning in itself is established through its specific linguistic configuration, the articulation of rhetorical structure, ranging from appeals to external authorities to minute operations such as presuppositions or exemplarity.

Each genre has its own specific "modalities of authority" that draw on particular on "knowledge, power and narrative techniques" (Hansen 2006). This section will cover the initial rhetorical moves that establish a core articulation between adaptation, climate change, and uncertainty with risk and decision-making. This demonstrates that these connections are not objective realities simply revealed by science, but through the contingent power/knowledge relations established in chapter 4 and re-enacted and resolved here in linguistic practices that articulate these different concepts and bodies of knowledge into a single account of adaptation to climate change.

UKCIP's 2003 technical report has some hallmarks of a policy paper, particularly in its introductory sections of the Forewords, the Executive Summary, and the 'Context' section (See Willows and Connell 2003, pp. V-VIII; p. 3). Policy documents tend to utilize a persuasive mode, which is not surprising if we consider that a policy is almost by definition an active intervention into the ordering of life designed to change the status quo or maintain it against

perceived threats (Roe 1994, Hansen 2006). The very act of policy-making in-itself already assumes contestation over the form of life and this requires it in some way to justify its existence or its intervention. As such, the linguistic techniques used in policy pronouncements and papers not only articulate certain elements, but do this in a manner that establishes a form of justification, either through rhetorical structure through including elements in an order that supports their claim, or through utilizing emotive language that appeals at a basic level to fear or hope but also to 'discomfort' and the desire for 'comfort' to generate fantasmatic identification with its descriptions (Glynos and Howarth 2007, Hansen 2006).

Several fundamental articulations in the opening pages of the 2003 report create a basic problematization of adaptation by connecting the concepts, or 'elements,' of climate change to uncertainty; uncertainty to risk; and risk to decision-making. This chain of articulations ultimately links climate change and decision-making to provide a particular problematization of adaptation that entails a particular epistemology and ontology. The clearest of these moments occurs in the title of the report itself, which is "Climate Adaptation: risk, uncertainty and decision-making." Here, the colon has a syntactic descriptive function, where the list that follows it indicates the elements in its set thare equivalent to the first term, 'adaptation'. This implies that the concepts of 'risk' and 'uncertainty' and 'decision-making' as constituting in full the concept of 'Climate Adaptation' and of climate adaptation as reducible, or limited to, those terms.

Two more substantive narrative accounts follow this basic articulatory moment: the foreword and the introductory section labelled 'Context'. The

foreword explicitly confers approval and authority on the report as a whole, from Barbara Young as the head of the Environment Agency, who implies the account of adaptation is sufficient and appropriate by referring to its actionability for policy and planning, in a manner that emulates existing approaches and successes of the Environment Agency, thereby conferring validity and reliability to the new report. This is replicated in terms of academic authority through the foreword provided by Saleemul Huq and Ian Burton (Willows and Connell 2003, foreword), both scholars of environment with development and meteorological science respectively, with connections to the IPCC. As such they appeal to scientists and government alike and serve to reinforce the validity of the each with the other.

A more substantive problematization of adaptation appears first in the 'Context' section. This appears in an initial statement that there is certainty that climate change is happening, but that "the exact extent and nature of changes in our climate remains uncertain" (Willows and Connell 2003, p. 3). This is immediately followed by the claim that "[c]limate therefore represents a changing source of risk. Climate adaptation is about recognizing these altered risks, and taking decisions..." The use of the word 'therefore' links the commonly accepted claim that climate change is a source of uncertainty to the presupposition that climate is a source of risk. In doing so it implies that climate uncertainty is necessarily and fully accounted for by the trope of 'risk'. This authoritative use of 'therefore' works to obscure the fact that this presupposition is not actually justified in the document, making risk appear as the natural and sufficient way to understand the uncertainty of climate change. Furthermore, characterizing climate change only in terms of uncertainty means that risk also

appears as sufficient, which would not be the case where climate change to be characterized also in terms of losses that would require consideration of environmental justice, for example.

The authoritative mode continues for the rest of the sentence: "Climate adaptation is about recognizing these altered risks, and taking decisions that allow the likely impacts to be reduced or managed, and the opportunities to be exploited" (*ibid.,* p. 3) The word 'recognising' implies that this knowledge is objective, established, and easy to access and interpret, requiring only to be recognised, rather than uncovered, developed, or produced. The use of the comma and word 'and' in "and taking decisions" link this clear account of risk as the problem with an apparently simple follow-on step to 'decisions' as the solution. The simplicity of this transition from problem to solution, coupled with "likely impacts" and the terms 'reduced' and 'managed,' which are at once both ameliorative of the level of threat and technical, all imply that the risks are knowable. This impression is also set up by the phrase 'altered risks,' which implies minimal and therefore accessible knowledge about the risks.

Several techniques of policy genre facilitate the persuasive power of the discourse thus produced. First, these representations use a lexis or word choice that is non-technical, making it easily accessible, coupled with an authoritative mode to produce an easily absorbed and convincing account. This is also effected at a rhetorical level through the articulation of the epistemology of risk with practices of decision-making through the construction of a chronological narrative that justifies these in terms of the past/problem as increased uncertainty, the present/solution as the application of risk and decisions as ensuring a particular future/resolution through the success of these measures

(Wodak and Meyer 2001, Roe 1994). Implicit in this is the promise of outcomes that are accounted for or identified with as 'good' or 'just,' whereas not following the technical advice in the report implicitly entails negative outcomes. This situates the reader by articulating them "with a particular temporal identity through themes of repetition, progress, transformation, backwardness or development" (Hansen 2006, p. 7); positioning of the reader within a narrative of the problem of climate change uncertainty being resolved through basing decisions on risk analysis.

In all of this, adaptation is simply articulated in at the sentence level, with no deeper analysis of: what does it mean to adapt or be adaptable? It should be noted here that in the draft version of the report (Willows et al. 2003b), the articulation of risk and decision-making as the core referents of the problematization is even clearer; the report is headed "Guidance on Decision-Making" with no reference to adaptation. In part, the policy genre and narrative work so effectively in establishing a narrative of adaptation because they allow 'risk' and 'decisions' to function as a nominalization. That is, the varied and complex technical process represented by each term is covered by a proper noun, allowing it to be precisely represented whilst also remaining implicit or vague in meaning (Fairclough 2000, pp. 162-3). This enables an authoritative mode that allows the narrative to appear full and accurate because of, rather than despite, the lack of substantive explanation.

That the foundational narrative appears internally cohesive, yet is also relatively simple and easy to remember combines with the fact that it is established so early in the document that it obscures the possibility of a critical reading As such, it positions the reader as more likely to accept the

problematization that is based on this narrative (Johnstone 2008) even before they engage with the technical detail of the Report and the actual practices it describes. Crucially, this makes the technical detail that follows not only easier to accept as valid, even where these articulations may be awkward or incomplete. It also avoids questions about the exclusion of particular content, because the entire frame and limit of what is relevant has already been established. In this way, policy narratives are able to "underwrite and stabilize the assumptions for decision making in the face of high uncertainty, complexity, and polarization" (Roe 1994, p. 2) to the point that even though they may be "[recognizably] representationally inaccurate" they can "still persist, indeed thrive" (Roe 1994, pp. 50-1).

Once these situating and justificatory aspects are established, the report places itself in two major sections. The first, "Part 1" is most clearly a technical report in the sense of creating a precise sequence of procedures and list of techniques enabling the direct intervention into the ordering of life. In keeping with it genre, it has less reliance on narrative positioning or emotive language, but more recourse to 'scientized' and 'rationalized' facts and models, which provide authority for the practices described. This section combines this with an educative mode, which at a structural level takes the place of the narrative. This is particularly visible in the use of visual cues such as 'summary boxes' of "Key Questions for Decision-makers," see for example, (Willows and Connell 2003, p. 13). Indeed one of the core authors of the report noted that: "The whole point/a big point of how the report was written was to make it accessible – this means there was a need for concise ideas – so: boxes" (Interviewee H 2009, p. 3).

However, this also performs far more fundamental onto-political work. In Fairclough's interpretation of a UK Government consultation, he notes that the use of these summary boxes appear to be 'reader-friendly' but by the same measure necessarily enact "strong unilateral control of the text" (Fairclough 2000, p. 136). Their similarity with the visual lay out of educational textbooks "construct the author... as the knowledgeable teacher, and the reader as the learner," and also bear a similarity to advertising layouts that have the function of reinforcing a message in a clear but also "promotional" manner (Fairclough 2000, p. 137). This presentational device helps the report to institute its problematization without having to justify its account of reality, and to direct its audience by appearing educative rather than invasive or controlling.

There are also icons in Part 1 that link to Part 2, and serve "as links to deeper theory because [the report] had to be 'robust'" (Interviewee H 2009, p. 6). This is because "Part 2," covers all of the bases of the technical report in a more academic fashion. Here a more educative mode is assumed, but it is often combined with a more explorative approach that creates greater epistemic openness. This means that the justification of part one is signalled but deferred through these icons; rather than building up to a concrete assessment with a research report first and recommendations arising from that, we instead see a higher degree of epistemic confidence and less detail at the beginning of the document, replaced gradually by a higher degree of detail and less epistemic and ontological confidence, or rather, greater epistemic openness, towards the end. This positioning and balance helps ensure that the problematization of adaptation appears to be very solid and straightforward, with the academic account itself appearing supplementary (in a subsidiary sense), appearing as an

additional but not essential background report to Part 1. Interestingly, in the draft version (Willows et al. 2003b), the order was the reverse, but was changed by UKCIP management in order to ensure the report functioned as the straightforward guide requested by stakeholders (Interviewee C 2009, Interviewee H 2009), which results in a much more closed problematization.

To summarise, in emic terms the narrative that has established the core problematization of climate change adaptation is this: Climate Change is a threat, characterized by uncertainty; Uncertainty is knowable through risk, and so we need to understand climate change in terms of risk; This knowledge will enable us to make the best decisions about what to do in response. Central to this core problematization is an epistemology of climate change impacts based on risk, and an ontology that assumes these risks can be known and acted upon. This entails a political rationale and resultant practices built on trying to identify risk in order to make decisions. Adaptation is decision-making based on this assessment of risk, although how that assessment is made, and how decisions can be based on it is only gradually revealed throughout the document, leaving the substantive meaning of adaptation appearing precise, but remaining unclear. As we shall see, this apparently straight-forward narrative enables the problematization to be sustained despite subsequent interruptive elements, and makes it easier for these to be articulated as supplementary moments rather than changing the problematization itself. The precise formation of this problematization will now be discussed in terms of its epistemology, and the supplementary moments that disrupt the core problematization established by the narrative discussed here.

3.0 The risk-based epistemology and its effects on the problematization of adaptation

3.1 Overview of the risk-framework process

The Report and its approach, the "risk-framework," as it is commonly referred to (UKCIP Interviewee F 2009), describes UKCIP's account of adaptation. As discussed in the previous chapter, one of the core reasons for the establishment of the risk-framework was to provide a clear guide to utilizing the climate change scenario information. This links to UKCIP's definition of adaptation itself, which is defined in the glossary as: "Climate Adaptation. The process or outcome of a process that leads to a reduction in harm or risk of harm, or realization of benefits associated with climate variability and climate change." (Willows and Connell 2003, p. 111). In the main body of the report, this process of utilizing the scenarios to achieve a good outcome is established through 8 'stages' (Willows and Connell 2003). These are:

1) Identify problem and objectives

2) Establish decision-making criteria

3) Assess risk

    a. Tier 1: Preliminary climate change risk assessment,

    b. Tier 2 and Tier 3: Qualitative and quantitative climate change risk assessment

4) Identify options

5) Appraise options

6) Make decision

7) Implement decision

8) Monitor, evaluate and review

In UKCIP's practices observed during 2009, the framework and its stages were introduced verbally as follows. First, potential changes in the climate were described, and the actual UKCIP'02 scenarios were used, or a verbal overview of them was given, in terms of headline messages of most likely scenarios (Stakeholder B Observation 2009a, Stakeholder A Observation 2009). Second, from the imaginary of climate change produced by these scenario summaries, possible impacts on the organization were brainstormed, based on their understanding of how their organisation was vulnerable to the described changes, which was in part derived from past experience. Where past weather differed from projections of climate change in terms of extremity, frequency or type (for example, drought rather than flood, or more extreme or frequent events), this was pointed out by UKCIP, and the events that resulted from the original event were used as a basis to understand how the organization might be impacted by the new scenario.

Third, this "impact" was then given a rating in terms of likelihood. Likelihood was based on the degree of certainty associated with the climatic scenarios and implicitly the exposure of a given unit. Fourth, magnitude was assessed according to the level of damage expected, and as a result the level of impact this would have on the organization more broadly. What this impact was measured against varied for each organisation, being in part determined by its objectives and its basic operation. On this basis, the fifth step was to rank the impacts with the highest overall magnitude and likelihood, and from this to begin devising a plan as to how to proceed.

3.2 Risk and Scenarios: the resolution or occlusion of uncertainty?

The uncertainty of climate change that was established as the threat by the narrative is resolved in several ways. As one long-serving UKCIP staff member put it, "there was a kind of a shift from climate impacts, [in] quite a deterministic sense, to thinking about climate risks, and trying to deal with uncertainty in that way" (UKCIP Interviewee F 2009, p. 2). The risk-based problematization applies these scenarios to the organization more concretely, building their biophysical uncertainty into a wider but situated understanding of the organisation's degree of exposure to particular biophysical changes. In doing so, this appears to resolve uncertainty by lessening its visibility by being combined into a larger matrix. As the Report notes in Stage 3, "[risk] assessments, including estimates of probability, will be contingent on the particular scenario or scenarios upon which they are based" (Willows and Connell 2003, p. 27). As such, in using risk technology as the basis of this process, the framework manages to obscure the fundamental question of the uncertainty of the scenarios by making them part of a wider calculus, yet a calculus nonetheless based on those same scenarios.

The result of this is not only occludes the epistemic but also the political question of how to deal with uncertainty. Rather than focusing on questions of the scenarios' reliability, the practical nature of the risk framework crucially moves stakeholders away from the problem of "can we trust the science completely" to "what if we can trust it a little bit?" (UKCIP Interviewee F 2009, p. 12). It should be noted that this issue is somewhat implicit. In effect, the scenarios are, although uncertain in their precise outcomes, assumed at the very least to accurately represent the range of possible climate change. In fact, the narrative described in the previous section helps gloss over the lack of discussion

of the validity of scenarios as it paints the scenarios above as actually quite accurate, making the claim that the science can be trusted and that incorporating it into the risk framework is sufficient for this.

The epistemology of risk not only defines the 'problem' to which adaptation must respond, but also the 'solution.' From the previous section, it is clear that risk and risk-technologies also help ascertain on which impact one should act and when by providing a calculus of relative risk, depending on its magnitude and likelihood. "The objective of these assessments is to help… identify where adaptation to climate may be required, the adaptation options that could best accommodate the expected impacts of climate change, and the uncertainty associated with those impacts" (Willows and Connell 2003, p. 70). However, the epistemic use of the scenarios has other fantasmatic effects. In marrying scenarios to a utilizable account of risk intimately connected to the stakeholder, this rendition of adaptation discourse creates a particular vision of the future in order to push for action in the present. In Ben Anderson's terms, this enables 'anticipatory action' because it creates a geography in the present in the name of the future (see (Anderson 2010) for a detailed exploration of these logics). In fantasmatic terms, this tangible future enables stakeholders to relate to the future and hence more likely to act on it in the present. As such, the risk framework provides an epistemic 'hook' from the scenarios to the present, and as such helps enable adaptation to occur at all, whilst of course also governing its form.

As discussed in the previous section, linguistic techniques in the opening 'context' section are used to establish risk as the means of dealing with uncertainty. Linguistic techniques continue to be used to reinforce this narrative,

including on the frequent occasions when the agenda to accurately represent risk in academic terms actually undermines the validity of this narrative and hence the core problematization.

For example, the key supposition in the introduction is that climate change is uncertain and therefore necessarily understood in terms of risk. However, risk is later defined as probability without exact location and timing, whereas uncertainty is defined as not knowing probability or consequence (Willows and Connell 2003, p. 44; p. 49). This definition directly contrasts with the key supposition if climate change is assumed to be uncertain. Furthermore, in the introduction to Part 2, climate change is initially categorized as being mostly characterized by uncertainty as the lack of probability. As such, the articulation of risk and uncertainty functions through obscuring the definitional contradiction probability and uncertainty, which is possible in part because these definitions come in the second, 'academic' rather than 'practical' part of the document. This distance means that they do not appear to undermine the narrative, and hence the problematization of adaptation, even though they clearly contradict it.

The report also utilizes rhetorical and other linguistic techniques to more directly bring uncertainty within an account of risk. In the first instance, this is achieved by distinguishing between risk itself and uncertainty, by stating that "uncertainty" is "the result of a lack of knowledge of either the probability of an event, or its consequences," which is contrasted to "good knowledge of both the probability of an event or its consequences" (*ibid.*, p.50) where only the latter enables accurate characterization of risk. These definitions place risk as distinct from uncertainty, and indeed almost as its opposite. In fact, the Report makes

this explicit when it notes that "Uncertainty describes the quality of our knowledge concerning risk" (*ibid.*, p. 43). This creates an equivalence (Laclau and Mouffe 2001) between uncertainty and risk, defining them as the opposite of each other: the implication is that a perfect account of risk is the opposite of uncertainty, rendering risk-based knowledge as an epistemic ideal, whilst also implying that it sufficiently and completely reduces uncertainty.

However, this representation is not an accurate account of the wider use of risk, nor of its technical usage in the document. It would be more accurate to say that risk describes our knowledge of uncertainty, but saying this in reverse has the effect that, even as it uses risk as a concept to demonstrate uncertainty, it makes it appear to provide certainty, and therefore creates it as an ideal form of knowledge. This also enables risk to be assimilated into modernity's desire for and assumption that science provides the 'evidence' and certainty on which to based policy.

This operation can be seen in the verbal discourse of UKCIP staff in the statement below. The use of risk and uncertainty in the first and second sentences demonstrates the interchangeability of these terms, and thus the implication that they are equivalent, and thus that risk successfully accounts for uncertainty:

> "[We] came to realize that in trying to engage organizations...that the risk approach was quite a useful way in, because people are used to dealing with risk. [...] you deal with uncertainty every day, and actually you can handle that fine, so just think about climate change as one other sort of uncertainty that you need to factor into your thinking" (UKCIP Interviewee F 2009, pp. 1-2).

The general appeal to risk management is also connected to the articulation of uncertainty and risk in the opening narrative that establishes risk was sufficient for dealing with uncertainty. This is possible because 'risk' is used here as an abstract noun that makes it appear as if was a sufficient technology. This works effectively because the word 'risk' is also a synonym for uncertainty itself, so that claiming stakeholders already deal with risk implies they already know how to deal with (or have the capacity to deal with) the uncertainty of climate change.

These multiple ways of making risk 'cover over' uncertainty makes it the epistemic focus of adaptation knowledge. This combination of uncertainty as the basic threat and risk as the means of knowing that threat creates a rationale where the greater the threat, the greater the pressure to quantify its risk. This happens in "Stage 3 - Tier 3: Detailed quantitative risk assessment" where there is an understanding that the level or complexity and accuracy 'progress' as the transition is made from qualitative to quantitative assessment (Willows and Connell 2003, p. 18). In the final stage, "Monitor, evaluate and review" it is stated that "[quantified] targets and indicators against which to monitor the performance of a decision should be developed" (*ibid.*, p. 39) In sum, either scientifically or linguistically, this problematization of adaptation places risk as the core epistemic means to deal with uncertainty.

3.3 The fantasmatic function of risk, and implications for the problematization of adaptation

In UKCIP's internal narrative about the report's development, the risk-framework formed the solution to the problem that impacts-research "wasn't

necessarily informing any decision-making "[because] it didn't necessarily relate to what decision makers needed to know" (UKCIP Interviewee F 2009, p. 9). As discussed in Chapter 4, this was a problem not just epistemically, but because the Government's liberal agenda of responsibilisation relied on the effectiveness of UKCIP's discourse in attracting stakeholders and providing a useable procedure so that they were able to act to make themselves more adapted to climate change. As such, the problem being resolved by the report was as much one of political governance as it was epistemic.

At the time the report was published, it was felt that making the risk approach accessible or desirable was a difficult task. One of the minor solutions to this was to explicitly reference the institutional authority of the Cabinet Office, and stating that the use of risk is "set as a priority by the UK Government" (Willows and Connell 2003, p. V). This appeals to government-based readers not only as a legitimatation of the approach but also as a call to action.

However, the fantasmatic mode of articulation operates at a more fundamental level. The practical and 'rational' approach to climate change adaptation, and a procedural paper trail provided by the report not only enable but also justify decisions as legitimate (Interviewee C 2009). In effect, this provides a resolution to the political uncertainty that accompanies climate change uncertainty for both the Government and governance, and for the 'stakeholders' themselves in their own operations.

As time went on, the increasing normalization of risk as a generalized episteme in government and business led to the risk framework sitting more and more comfortably with the existing epistemology of users. In fact, by the time the research interviews were conducted in 2009, the risk framework was presented

to stakeholders as something they 'already did' in order to make it more attractive by appearing less difficult to engage with and use, as the comments below make clear:

> "I usually try and suggest [adaptation is] a matter of managing risk [...] and you know the senior management and the politicians are already engaged with that notion of risk. [...] I do think that that's been moderately effective in sort of getting people... sort of aware of adaptation" (UKCIP Interviewee A 2009, p. 4).

The characterization of risk as 'something you do already,' albeit on a more or less technical level, was seen by UKCIP as a very effective move in a context where people had felt paralyzed to act because of the degree of uncertainty associated with climate change (Interviewee H 2009, UKCIP Interviewee F 2009). This fantasmatic appeal of risk can be said to function because stakeholders are positioned as subjects of risk in the report's problematization, and produced as subjects of risk in a wider governance context.

The fantasmatic mode and governance function of the risk-framework challenges the limited investigation of the "boundary objects" of UKCIP presented in (Lorenzoni et al. 2007). This flexible use of risk, and its solidification in the 2003 report, can be discussed in terms of the flexible application of standardized methodologies based on mutable "border objects" to create "allies" in the production of scientific knowledge (Star and Griesemer 1989). However, Star and Griesemer's also note the political effects of this: actors, in their beliefs and practices, must be "disciplined" although within limits, in order to get them to engage usefully in the process, but without overwhelming them (1989, p. 407). Interestingly, they point out that one way of doing this is to use a methodology

that replaces the question of 'why' certain procedures are followed and certain goals sought, with the question of 'how' to achieve these objectives. This is strikingly similar to the effect of the structure of the final version of the 2003 report, that relegated the 'why' to Part 2, and established the problematization with an account of 'how' in Part 1.

Star and Griesemer also note that these methods were able to act then as a "'lingua franca' between amateurs and professionals" (1989, p. 407) enabling the expansion of knowledge, but also, it should be added, the creation of particular kinds of subjects and the expansion of governance. These effects, regardless of whether they were explicitly conceptualized in such political terms, are shared by the UKCIP risk-framework: it effects a disciplinary function on the language and practices of UKCIP staff and stakeholders, and in doing so invests them in its particular problematization of adaptation without having to justify this through an argument-based articulation.

The flexibility of application softens the awareness of political intervention both discursively and in practice and makes it more likely to be accepted. For Star and Griesemer, as well as for Foucault, this would be not so much a demonstration of an 'honest broker' (Lorenzoni et al. 2007, p. 73) as the demonstration of a practical, results-focussed one, sensitive to power relations rather than inert to them. For example, the willingness on UKCIP's part to accept different approaches to risk includes encouraging stakeholders to use their existing risk assessment procedures if they have them. (Stakeholder B Observation 2009a, Stakeholder A Observation 2009). See for example, "Key questions for decision-makers at Stage 2" (Willows and Connell 2003, p. 16). This appears as an extension of the status quo, but it opens the door for a much

wider application of risk and for a broader range of risk technologies for organisations to use in this endeavour (Willows and Connell 2003. See, for example, p. 25, and Appendix 3: Summary of tools and techniques, pp. 121-138).

However, the discursive flexibility that ensures greater 'buy-in' to the risk-framework also leaves it open to the politics of the stakeholder, and leads to a politics of "tinkering around the edges" (UKCIP Interviewee F 2009, p. 16). In fact, this is a recurring topic where the relation of risk assessment to objectives or values is concerned. This will be explored further in Chapter 6, which deals with the ontology of the problematization and its relation to the political rationale.

3.4 Always future never now: epistemological time

The Report's problematization of adaptation as risk-based decision-making establishes a temporal account of adaptation through the articulation of these two terms. This is clearly expressed in the report: "[climate] adaptation is about recognizing these altered risks, and taking decisions that allow the likely impacts to be reduced or managed, and the opportunities to be exploited" (Willows and Connell 2003, p. 3). Importantly, this establishes but also limits adaptation practices to focusing on future, "likely impacts". This is rooted in the definition and use of 'risk' itself as always referring to the chance of a future outcome (Sellke and Renn 2010, Hacking 2006). This problematizes adaptation as based on predictive knowledge. That this creates an outcome and objectives-based problematization is particularly clear in the glossary definition of climate adaptation. This is defined as: "The process or outcome of a process that leads to

a reduction in harm or risk of harm, or realization of benefits associated with climate variability and climate change" (Willows and Connell 2003, p. 111).

This definition's wording makes two things apparent. First, that adaptation – either as process or as outcome - must 'lead to' a successful result, either as a reduction of actually occurring harm, or the risk of harm, or as actually occurring benefits. The blurriness here between adaptation occurring in the present or pre-emptive adaptation for the future is compounded by slippage in the common use of the word 'risk' itself, as both a synonym for a 'threat' per se, and as a probabilistic account of the likelihood of that threat occurring in the future (Hacking 2006). However, the coupling of 'leads to' and 'reduction in harm or risk of harm' implies that adaptation is, however, defined as successfully reducing harm pre-emptively. Likewise, both the 'process' and the process 'outcome' are linked to the phrase 'leads to.' The linking of all of these terms to 'leads to' implies that adaptation is based on the provision of a prescient knowledge of, and intervention on behalf of, future outcomes.

This means that adaptation here is characterized more as a noun, as an outcome is a state of being. The verb form of adaptation, adapting, is left defined in terms of outcome, and thus essentially empty. Thus the focus on outcomes works to exclude a substantive account of adaptation as a process. In other words, because the outcome is the primary object of knowledge, the process or capacity that achieves this is seen as incidental, rather than central, to adaptation. This only makes sense if it is assumed that knowledge of outcomes produces a single, rational, politics and practice of adaptation, or that knowledge of such outcomes is the only legitimate basis of action.

The focus on outcome-based knowledge leads to a mode of adaptation that relies on pre-emptive knowledge and responses, obfuscating the significance or nature of the present, the ontological implications of which will be discussed in Chapter 6. The political limit point that this establishes is made clear when UKCIP's definition above is compared to the contemporaneous definition of the IPCC. The IPCC definition of adaptation that was current at the time was:

> "Adjustment in natural or human systems in response to actual or expected climatic *stimuli* or their effects, which moderates harm or exploits beneficial opportunities. Various types of adaptation can be distinguished, including anticipatory and reactive adaptation, private and public adaptation, and autonomous and planned adaptation:
>
> - ***Anticipatory Adaptation***—Adaptation that takes place before impacts of climate change are observed. Also referred to as proactive adaptation.
>
> - ***Autonomous Adaptation***—Adaptation that does not constitute a conscious response to climatic stimuli but is triggered by ecological changes in natural systems and by market or welfare changes in human systems. Also referred to as spontaneous adaptation.
>
> - ***Planned Adaptation***—Adaptation that is the result of a deliberate policy decision, based on an awareness that conditions have changed or are about to change and that action is required to return to, maintain, or achieve a desired state.

- ***Private Adaptation***—Adaptation that is initiated and implemented by individuals, households or private companies. Private adaptation is usually in the actor's rational self-interest.

- ***Public Adaptation***—Adaptation that is initiated and implemented by governments at all levels. Public adaptation is usually directed at collective needs.

- ***Reactive Adaptation***—Adaptation that takes place after impacts of climate change have been observed.

See also *adaptation assessment, adaptation benefits, adaptation costs, adaptive capacity,* and *maladaptation."* (Intergovernmental Panel on Climate Change 2001, p. 982)

Despite the claim that the report's account was based on that of the IPCC (Interviewee H 2009, p. 11), these definitions are clearly very different. UKCIP's definition, particularly as borne out in the central narrative that establishes their problematization, is much more limited, approximating only the 'anticipatory' and 'planned' adaptations in the IPCC definition, but occluding the 'autonomous' and 'reactive' adaptation, which are listed in the IPCC account. Second, it obfuscates the public/private distinction and related self-interest and collective-interest distinction raised in the IPCC definition. These occlusions allow UKCIP to avoid their political content, which offer very different problematizations of adaptation. However, avoiding these issues also enables it to sidestep the need to justify its own account. It is certainly not the argument here that UKCIP should necessarily have followed the IPCC definition exactly, particularly as some of the kinds of adaptation it described might be mutually exclusive. However, observing

the difference highlights the content and contingency of UKCIP's problematization.

UKCIP's definition more clearly places the 'outcome' at the centre of the problematization, even though, as we have seen, they use the term 'process' in their definition. Levina and Tirpak (2006) also note this change, and point out the implication that "[expectations] from adaptation as an outcome might be much higher than expectations from it as a process" (Levina and Tirpak 2006, p. 7), in terms of its ability to deliver concrete goals.

Avoiding an account of the present in adapting to climate change, and leaving the specific 'products' of adaptation open (alleviation of harm, risk of harm, or benefit) provides a gap that begs to be filled by a substantive account of each of these terms and how to achieve those results. The mention of "risk of harm" helps the entrance of the UKCIP risk- framework, as it provides an account of how to enable adaptation, in a manner that fits with their outcome-oriented definition. Risk is thus established as the fundamental epistemology of adaptation.

3.5 Epistemology and political rationale: Discrete, pre-emptive decisions and linear time?

The impacts problematization was shaped by the time frames of climate change scenarios as a future period averaged over thirty years. In creating a risk-framework that utilizes climate scenarios, it seemed natural to adopt the existing epistemic-temporal frame. As we have seen, the risk epistemology also works entails a problematization of adaptation that is pre-emptive, for the future (or range of futures) that can be 'seen' from the current moment of time. As one

UKCIP staff member explained: "So there's a number of different time scales on which you operate, some of which are quite long, and obviously it's the longer ones which are – will be more important when we come to look at the future climate and its impacts" (Stakeholder A Observation 2009, p. 1).

This pre-emptive, long-term focus makes certain objects and subjects appear as the focus of the problematization. A clear example here is one of the report author's description of her imaginary of the relation between decision-making and time: "And so I have in my head the fact that [...] industrial assets tend to have a kind of twenty five year life time, and I describe that as a long term decision" (Interviewee H 2009, p. 13). Another representation of this was the main author's example that "[roads] have to be designed not to melt when its too hot, and not to break up when its too cold [...] But of course if you're rebuilding every five or six years then you can probably change [...] gradually. If they're lasting thirty years, then you need to think about [making that decision now]" (Interviewee C 2009, p. 7). These examples demonstrate the fundamental assumption that given the long time-scales of climate change, that large infrequent decisions matter the most, placing the focus on objects that have a long life span.

In these and nearly all the examples given in the interviews, the use of physical infrastructure generates a particular imaginary of where adaptation applies: when a road is laid, or a building or bridge is built. This is particularly because these examples are not only temporally but physically inflexible objects, for which decisions are necessarily not only pre-emptive, but also discrete. This arises from the epistemology of risk itself as requiring the identification of discrete objects or defined events against which to create an assessment: Sellke

and Renn describe these as "specific targets;" "risks describe the potential effects that these hazards are likely to cause on specific targets such as buildings, ecosystems or human organisms and their related properties" (2010, p. 298).

In part, it seems that this pre-emptive rationale also arose from the desire to make the scenarios useful to stakeholders. The main report author was concerned to note that the approach taken in the report was not based on science driving adaptation decisions, but rather, because decisions were being made that needed to take the science into account: "we saw [adaptation as] a need to alter a decision to take account of changing climate risk" (Interviewee C 2009, p. 7). Although this is very different from operating from a deterministic account of climate change impacts, it is still a somewhat circular argument, in that whilst it purports to operate from the 'decision' view-point, this is only in question because of scientifically established 'changes' in climate 'risks,' and whether these are taken into account depends on the level of threat established by the climate change scenarios, marked in part by the time frames these introduce. Nonetheless, the concern with existing decision timetables means that the temporality of adaptation is not decided by knowledge about climate change, at least in the first instance, but rather by existing schedules. This combines with a very limited account of the actual implementation, monitoring and review of decisions in the report to produce a sense that adaptation is not responsive to actual climate change, but whether initiated by climate science or existing decision time-tables, remains essentially as a pre-emptive rationale.

This discrete and linear account of time occludes an emergent, socio-contextual account of the problem and thus occludes emergence in response to actual change in its account of a rationale for adaptation. One staff member noted

that this established a political rationale that focussed on actual decisions rather than as the capacity to make or implement decisions as a result of the epistemic origins of the risk approach:

"[the risk framework] was probably written in a particular kind of manner, because that does effectively come out of the types of methodology that the Environment Agency and others use when they have to make big decisions. About, sizing a flood defence, or renewing the Thames Barrier or stuff like that, so in fact, even though it is […] a strongly process based methodology, then its actually framed […] with the assumption that [at some point] you will make a decision" (UKCIP Interviewee A 2009, p. 17).

Within the 2003 document, one way in which this temporally discrete account of the decision is established is through the distinction between "Stage 7: Implement decision" and Stage 8: Monitor, evaluate and review. It is easy to understand that this helps break down the steps of applying an adaptation strategy, but this distinction also introduces an ontological account of linear time, or at best cyclical time, rather than emergent time determined by events. This account is associated with the decision being rendered as 'discrete.' The lack of detail in "Stage 7: Implement decision" is perhaps the most important indicator of this. In fact, the account of this stage, together with an account of "Stage 8: Monitor, evaluate and review" lasts just more than one page (Willows and Connell 2003, pp. 39-40). By contrast, "Stage 3: Assess risk" is divided into three subsidiary "tiers" and lasts for 12 pages (*ibid.*, pp. 18-29).

This lack of focus is replicated at the micro-scale. In Stage 7 there is a warning paragraph that implementation may be difficult if "the option is technically or managerially complex, [or] is not subject to agreement with stakeholder groups…" (*ibid.*, p. 39). However, despite recognizing this, there are no "key questions" or "tools" to aid in the conceptualization of these risks and how to deal with them, even though such guidelines accompany all the previous assessment based stages. What description there is of implementation focuses on ensuring the communication to the public of the assessment itself in order that the decision appears justified. This makes clear that the process of adapting in the rationale seems to be focussed on the risk assessment process itself and the relatively discrete moment of decision.

The imaginary of adaptation as discrete moments is also established through the word choice of 'the' decision, and the focus on 'decisions' as the cumulative metric of adaptation. The effect of this as an ontological category will be discussed further in the following chapter, but in epistemic terms this is important because it limits the ability to look within the "interval of decision" that accounts for the creation and implementation of the decision itself, and how it unfolds as an emergent sequence of accounting for and intervening in the development of the event and its gradual, also emergent, resolution (Adey and Anderson 2011).

Crucially, in late 2005, UKCIP staff noted that "much activity so far" had focussed on assessing risk, and that this "partly reflects the evolving role of UKCIP" (Harman, Gawith and Colley 2005, p. 254). In other words, their own change from impacts to adaptation discussed in Chapter 4, and the fact that stakeholder cases were in their early stages meant there had been limited

pressure to develop the later stages of the report. Interestingly, they indeed note that the last two stages in their framework, to 'develop and implement a climate adaptation strategy' and 'monitor and review' had yet to receive much attention. The new collocation of adaptation and strategy, rather than adaptation and decision, is particularly interesting here. The distinction between strategy and tactics implies adaptation strategy deals with an overarching objective made up of interlinked, and indeed contingent, subsidiary decisions. However, this is still not developed in the 2005 review; the final stage that it lists, "Monitor and review," calls for reviews of decisions when new climate information is provided, and stresses UKCIP's role in ensuring new information is distributed. As such, it reinforces the core problematization based on objective, predictive knowledge and linked to pre-emptive, discrete decisions.

The pre-emptive decision mode is somewhat supplemented by the political ideal of building adaptation measures into the existing decisions and timetables of the stakeholder. Although this is discussed as combining with the limited focus on the implementation and monitoring stages to reinforce the epistemic and ontological assumption of a pre-emptive decision, it nonetheless places the knowledges that produce these timetables as prior to the use of scientific knowledge, a dual function that recalls Foucault's rules of the double conditioning of strategies, and the openness of this ambiguity to polyvalence. Connected to this existing decision structure is a supplementary moment, in the political rationale, as the needs of stakeholders existing processes are established as epistemically and morally prior to the adaptation knowledge arising from climate science. This drastically limits the political effects of scenario-based knowledge by preventing it from reshaping an existing political structure and

strategy. However, this preservation of the validity of existing decision timelines actually works against increasing their visibility by accepting them. In doing so, it occludes the question of whether these are still appropriate in the context of climate change. The result is that there is almost no questioning of whether the frequency and dispersal of decisions makes sense under the 'changing risk' presented by climate change.

In sum, the concept of decision-making as it is used in most of the report reflects that classical decision theory, where "decision making is forward looking, formulating alternative courses of action extending into the future, and selecting among alternatives by expectations about how things turn out" (Dessai et al. 2009, p. 65, quoting Lasswell and Kaplan, 1950). The centrality of climate scenarios coupled with the technology of risk, ensures predictive knowledge is the basis of adaptation as a pre-emptive practice. In combination with the acceptance of existing decision schedules, this results in an occlusion of political engagement with how decisions are made or implemented, their frequency, the "interval of decision" or its emergence.

4.0 Supplementary moments: uncertainty and emergence

4.1 From scenarios to variability, and outcomes to vulnerability?

The section above has already demonstrated some significant points of tensions, where supplements are articulated as moments of the 'core' problematization based on pre-emptive risk-based decision-making. Further examples of these supplementary moments have more far-reaching implications for the problematization's epistemological basis, particularly with regard to the meaning

of uncertainty that the risk narrative worked so hard to resolve. For example, the report authors do nuance the account of climate change from being just a thirty-year average, producing the need for long-term prediction and related long-term decisions by including current variability. The origin of this lay in the shift from considering climate change impacts to considering the risk to the stakeholder, "which then brings in natural climate variability as well [...] and then we thought [including variability] probably doesn't actually change [the risk framework] massively, [...] [as] you experience [all climate events in the same way]" (Interviewee H 2009, p. 12) It seems this was likely the reason that the report title and definition of adaptation are referred to as 'climate adaptation' rather than 'climate change adaptation' (Willows and Connell 2003, p. 111). The merger of the orientation to future climate impacts and current vulnerability resulted in the inclusion of "short term decisions, but ones which are climatically sensitive..." (Interviewee H 2009, p. 12). However, the focus on climate limits the wider focus on vulnerability, allowing the problematization of adaptation as based on climate science to maintain its priority, even if it is modulated according to exposure.

Nonetheless, the statement that both climate and weather are experienced in the same way by the stakeholder, points to a shift to seeing the social experience as an acceptable form of knowledge in addition to that of climate science. This is intimated in the document in the sense of identifying "exposure units" and "receptors" (Willows and Connell 2003, p. 14). Yet both terms imply that the main threat lies outside of the stakeholder, limiting the degree of focus on its internal system and reinstating the core problematization.

The social nature of the stakeholder unit as the subject that knows, and implicitly then as the object of knowledge, is picked up much more through the

Local Climate Impacts Profile (LCLIP) tool for assessing current vulnerability, which, by the time of the observations in 2009, was somewhat integrated into the use of the "risk-framework" as a technique used together with the climate scenarios to assess the level of risk. Vulnerability as a concept has a limited mention in the 2003 document, and where it does occur is premised on the identification of particular scenarios and is determined through being articulated to specific risk (Willows and Connell 2003, p. 49; p. 70). By contrast, the LCLIP approach asks participants to imagine climate impacts through drawing on experiences of weather variability and extremes and extrapolating from this potential vulnerability to longer term or more frequent changes as a result of climate change (Stakeholder B Observation 2009a, Stakeholder B Observation 2009b, Stakeholder A Observation 2009). Interestingly the version of the Adaptation Wizard 2.0 introduced in January 2008, a year prior to the observations, makes vulnerability as a concept much more explicit, breaking down the framework originally established by the risk document into 5 steps, of which Step 2 asks "am I vulnerable to the current climate?" This is followed by step 3: "how will I be affected by climate change." Adaptation Wizard 3.0 in 2010 reinforced the move to vulnerability even further, rephrasing these two questions to: "assess vulnerability to the current climate," and "assess vulnerability to future climate change" (UK Climate Impacts Programme 2010).

Indicative of this shift, one staff member interviewed noted that, rather than take the risk framework at face value: "[I] would be more fuzzy in terms of [the] way I'd think about it in terms of capacity building in an institution because you do make decisions, but those decisions will very often not be one-off ones. Um, and sometimes we don't make that particularly sort of specific – and maybe

we should do" (UKCIP Interviewee A 2009, pp.17-18). It seems clear then that the supplementary notion of a needing to know the social system, implicit in the 2003 report, became increasingly prominent. This seems to have been linked to a vulnerability-based account of adaptation between 2008 and 2010, resulting in the gradual re-problematization of adaptation away from the use of risk as the core referent and towards the use of vulnerability.

The increased visibility of the 'social' character of the organisation will be discussed further in the next chapter on ontology. This increased visibility of social forms of knowledge raises the questions of whether the focus on scenarios and forecasts will shift, and whether this will move the time of knowing away from a predictive mode and its related pre-emptive rationale of discrete decision-making. As will be discussed in Chapter 7, this supplementary epistemology has a 'dangerous' potential to undermine the wider rationale and problematization of adaptation established in 2003: it shifts to projecting system vulnerability forward, rather than future impacts backwards as the basis of the account of threat, making the internal system and its characteristics the focus of the solution rather than trying to account for externally created impacts.

4.2 Robustness: recognising the limited validity of outcome-oriented knowledge?

The second major supplementary moment occurs in the concept of robustness. In a substantive sense, robustness is defined as "The ability of a system to continue to perform satisfactorily under load" (Willows and Connell 2003, p. 117). However, the validity of this in epistemic terms is more clearly expressed in the report's glossary definition of "Robustness analysis" which:

"may be used to help determine the robustness of the answers within an options appraisal to possible uncertainties as to the values of key

sensitive variables and parameters (as identified from the **sensitivity analysis**). It identifies the extent to which the decision-maker might be exposed to potential costs and errors if some uncertain eventualities regarding those parameters should arise in future. Robustness analysis is sometimes used to investigate the impact on the decision of a 'reasonable' range of input values for the key parameters identified by the sensitivity analysis, or a range of values that are considered plausible." (*ibid.*, pp. 134-5)

Under 'sensitivity analysis' it notes that "[where there is sensitivity] seek alternative and better options, which could better accommodate uncertainties regarding these variables (see **Robustness analysis**)" (*ibid.*, p. 136). So robustness is determined by a decision that is able to accommodate uncertainties, although those uncertainties are limited to a range that is 'considered plausible' in its account of the future, on the basis of current knowledge.

"...the whole approach is about understanding more about the decision and how it might pan out, [...] it's about understanding ... the range of future possibilities and how a commitment to a certain approach might give you problems in the future which might be avoided if you put in −had a more flexible option" (Interviewee C 2009, p. 5).

The difference between the quotes from the 2003 report and from the interviews in 2009 demonstrates an increasingly heuristic rather than precise interpretation of the scenarios. Heuristic use fits with the interpretation of robust decision-making as when "non-predictive information from climate models can also help decision-makers identify and assess actions that may

reduce their vulnerabilities to future climate change" (Dessai et al. 2009, p. 73). This clearly nuances the core epistemology based on prediction that has been demonstrated above. However, in supplementing the predictive model based on the scenarios, they also enable it to continue by justifying its basic components and limiting the exploration of climate change to the boundaries it sets.

The tension between the supplementary account of scenarios as an explorative heuristic and the core account of the reliability of climate scenarios is repeated in the report's multiple references to "maladaptation" and adaptation "mistakes" (Willows and Connell 2003, p. 23). This language gives the impression that there is a 'right' decision. When asked about this, one of the core authors affirmed this basic position, but clarified that a 'right decision' was one that was "robust in the face of those uncertainties [...] whether it will be proved to be right or wrong ... it's the best decision you can make at the time given this uncertain knowledge, but knowledge that is pointing in some directions more strongly than others" (Interviewee H 2009, p. 13). 'Some directions more strongly than others' returns the problematization to an underlying reliance on scientific predictive knowledge, and accepts fallibility in order to ensure pre-emptive decisions can be made.

Moreover, when pre-emptive decisions are connected to the imaginary of physical infrastructure projects that pervades UKCIP's discourse, particularly in the early years, the almost literally concrete nature of these decisions does allow an imaginary of adaptation as located in pre-emptive discrete decisions and thus as being finitely 'right' or 'wrong.' In reference to building reservoirs, and other major works, one author noted that:

"[To] my knowledge [nobody] has actually made any decisions that actually are the difficult choices, where there's a trade-off between doing too much [and] over-adapting, [or] doing too little..." (Interviewee C 2009, p. 10).

In the context of the interview, this quote referred to major physical infrastructure such as building reservoirs and the Thames Barrier. The concept of "under-adaptation and "over-adaptation," which occur in the report (Willows and Connell 2003, p. 11) are clearly based on this understanding. They are defined as "consequences of poor decisions." Under-adaptation is said to occur where "insufficient weight is attached to the need for adaptation. This may tend to lead to under-adaptation." The terminology here of 'consequence' and 'lead to' places these concepts in an imaginary of knowledge as "outcomes" and imply the prescient knowability of climate change effects in principle, an epistemic assumption which is strengthened by the focus on pre-emptive decisions within the report.

This prescient and pre-emptive function of robust decisions renders them as optimum decisions, in the sense that they must be appropriate for the range of possible outcomes. In this sense they soften but nonetheless remain within the modernist, techno-scientific framing of adaptation. Dessai et al. (2009) critique this use of climate scenarios and probabilistic scenarios as the basis of knowledge for decision-making where this leads to optimum decision-making that seeks to ensure optimum utility. Although this is not explicitly UKCIP's intention, the dominance of prescient knowledge in the 2003 report means that conceptualisation underlies their discourse. However, as discussed above, the increased presence of vulnerability means that this position was changing by

2008 towards a more socio-contextual account of knowledge.

The conceptual tension in the report that marks 'robust decisions' as supplementary moments appears in the fact that robust decisions are distinguished from, rather that contained within, the concept of 'avoiding maladaptation' or 'ensuring headroom.' Maladaptation is defined as the "[actions] taken that reduce the options or ability of decision-makers now or in the future to manage the impacts of climate change. Such actions are sometimes described as reducing climate headroom" (Willows and Connell 2003, Table 1, p. 11). This implies an emergent form of knowledge and resultant rationale of ensuring headroom, whereas robust decisions are seen as finite actions.

This distinction is reinforced by the fact that 'maladaptation' appears as the final, distinct, category in a list that includes 'under-adaptation' and 'over-adaptation' with their implications of prescient knowledge as independent categories in a table entitled "Maladaptation and other climate change decision errors" (*ibid.,* p. 11) . These distinctions and the use of the word 'other' means that the tensions between predictive and emergent knowledge are not resolved into a single rationale in the problematization of adaptation.

4.3 'No regret' decisions

A similar kind of supplementary moment of emergent knowledge/time and resultant rationale appears in the concept of 'no regret' or 'low regret' options (Willows and Connell 2003, p. 30). In Stage 4 it is stated that no and low regret options "should" be identified "at the outset" (*ibid.,* p.40). In the 2003 Report's glossary, no regret options are defined as:

"Adaptation options (or measures) that would be justified under all plausible future scenarios... A no regret option could be one that is determined to be worthwhile now (in that it would yield immediate economic and environmental benefits which exceed its cost), and continue to be worthwhile irrespective of the nature of future climate. (See also Limited or low regret options.)" (*ibid.*, p.40).

Low regrets is presented as a slightly softer version of no-regrets, which operates on the basis that "if you're making a decision now [...] then maybe tweaks in the design [which] you can make are quite low cost that will build in capacity" (Interviewee H 2009, p. 15). In terms of being appropriate for all "plausible future scenarios," no regrets decisions on the one hand rely on the predictive knowledge of scenarios to determine the limits and characteristics of future climate events, but on the other hand imply a strategic approach that allows for emergence. In relation to the latter, the value of these options is that they are non-constraining decisions that improve the adaptation of the organization with very little cost to present or future selves. This could be interpreted as building general capacity in recognition of an epistemology of irreducible uncertainty, rather than seeking an optimum option for a defined range of scenarios, as is the case with 'robust' decisions. However, the absence of the concept of capacity here and throughout the document is testament to how limited this implicit account of socio-contextual knowledge and rationale is. Further, the focus on the external climate may render invisible particular no-regret options, particularly where these relate to social characteristics. This will be discussed in more detail in the next Chapter on ontology.

The focus on 'low hanging fruit' or immediate and easy benefits that don't reduce and perhaps even build future capacity arose for several reasons. One was that there was a concern that people simply would be paralysed by uncertainty into being unable to make any decisions at all. 'No regrets' were good at dealing with this uncertainty in a positive way (Interviewee H 2009, p. 14). This indicates a power/knowledge and fantasmatic explanation for the quite a strong emphasis on these kinds of options within the report as arising because robust decisions resolve the uncertainty of decision-makers about the validity of decision-making itself: "because it's basically something [the stakeholder] should be doing now anyway because it will help [them] deal with current climate variability..." (Interviewee H 2009, p. 14). Robust decisions, where these are characterized as low regret, no regret or low-hanging fruit, also avail themselves of a fantasmatic appeal to current identity, by making adaptation 'easy' through targeting the options do not represent any significant changes or cost in implementing. There is a power/knowledge element to this for UKCIP too, as in appealing to stakeholders it is better able to encourage take-up.

However, this has a significant impact on the problematization's rationale, making the central question: how do we fit adaptation to our existing agenda, rather than the things that might be essential for adaptation to substantial risks, or for improving adaptive capacity. This rearticulates this supplementary moment to the core problematization's concern with existing decision-structures and limited change. This makes it clear that in practice although these supplementary moments allow the entrance of a slightly more socio-contextual account, they are still tied into political rationale of "tinkering at the edges" (UKCIP Interviewee F 2009, p. 16). This limits the pressure to engage with a

more emergent account of knowledge and a political rationale that takes this on board in a transformational sense, as discussed in Chapter 1. The role of 'existing objectives' and the problem of 'tinkering at the edges' will be discussed in much more detail in Chapter 6 on the ontology of adaptation, and the effect of these limits in Chapter 7.

4.4 Adaptive Management and reiterative decision-making

All of the supplements discussed so far are in a limited fashion responsive to the problem of irreducible uncertainty. In the report, the most explicit moment that deals with this occurs in the concept of 'adaptive management.' Adaptive management is understood as "the process of making the best decision at each decision point, and reviewing the performance of previous decisions" (Willows and Connell 2003, p. 30). The process of changing existing decisions to incorporate climate change is reinforced here by the sudden appearance of the phrase "at each decision point." This adds a new temporal division *within* the epistemic unit of 'the decision,' allowing for a new ontology of the "interval of decision" pointing to a heightened inclusion of the irreducible uncertainty in the means of knowing and acting (Adey and Anderson 2011). However, no explanation or epistemology is introduced for knowing these 'intra-decision' points.

Nonetheless, adaptive management as a more emergent, less-linear approach is supported by the report's statement that: "the emphasis of this framework on adaptive management strategy supported by post-decision monitoring and appraisal is essentially a defence against uncertainty, recognizing that for many aspects of climate change adaptation, uncertainty will be

significant" (*ibid.*, p. 53). This problematization of adaptation to climate change is in stark contrast to the account of risk and uncertainty in the opening narrative. Here it is again clear that, instead of climate impacts being the threat, the uncertainty about those impacts is itself the threat. The resulting problematization, if this is drawn out, is that adaptation here is not the actual decisions that are made, but is rather the adaptive process of making decisions. As a result, instead of focusing on decisions as outcomes, the object and subject of adaptation becomes the process of making, implementing and changing decisions.

However, the brevity of the 'Monitoring and Review Stage' detracts from the significance of this supplementary rationale. Monitoring is stated to be useful for the "detection of trends which require a new problem to be resolved and the decision-making process to be initiated...and [can be used for] supporting emergency and other rapid adaptation responses" (*ibid.*, p. 39). These represent a supplementary political logic that is responsive to irreducible uncertainty, through knowledge approaching real time or surveillance modes of knowing. However, there are no tools or questions listed here to give any indication of how to practically build this into the account of adaptation, undermining their conceptual contribution. In fact the terms "new problem" and "initiated" create the understanding that rather than seeing the same decision as emergent this iteration is imagined as being a different problem. This reinstates a pre-emptive rather than responsive imaginary, although it may be cyclical rather than simply linear. In a similar way, the colocation of 'rapid adaptation' that follows implies this understanding is different from 'normal adaptation', again reinstating the

core problematization of adaptation as pre-emptive over a much longer time frame, and occluding a fuller investigation of the supplement.

A further supplementary moment resonates with this supplementary rationale, and contributes to the flexibility not only to the type of decision but also its temporality. One of the five "Key questions for Stage 4" asks:

> "Can the options be defined in a flexible manner to allow for sources of uncertainty? E.G. can adaptation options be identified that could be increased at a later date, or implemented separately or in combination or in sequence to provide flexible levels of response to risk?" (*ibid.*, p. 31).

No direct explanation of this is given in the page dedicated to the explanation of these questions, and it is certainly not part of the narrative about adaptation. As such, by omission of further articulation, this idea remains as a supplemental moment of the core problematization.

However, a substantive rationale of adaptation which fits with the supplementary moment above appears in the report's claim that: "[the] adaptive management process] should be directed towards an overall strategic objective. In all cases an objective must be to keep open possible future options, that is, avoid decisions that constrain future options for adaptation" (*ibid.*, p. 30). The phrasing "must be" implies that it is central to successful adaptation. Yet very little focus is given to explaining this, undercutting the strength of this statement and its place in the problematization. This statement is further mitigated in its imperative mode by the use of "*an* objective," which makes it unclear what the relative importance of this objective is, as opposed to any others the organisation might have. Furthermore, 'Stage 5: Appraising options', barely considers the value of keeping options open (*ibid.*, pp. 32-35).

When asked about the significance of these moments one of the key authors replied: "there is no sense that we are saying 'this is more important than anything else you're doing' [...] It's meant to be 'when you're doing what you're doing, think about these things, and integrate them into what you're doing" (Interviewee H 2009, p. 15). The second reply was: "No, I think we're sort of saying you should have –you should give that [idea] more weight or this is something you really ought to think about and um, rather than rushing in to you know, some very inflexible decision..." (Interviewee C 2009, p. 14). Whilst there is still a variation here, both authors agree that it shouldn't imperatively change the existing objectives of an organisation. It seems likely that there was a political tension here between the desire to push this idea conceptually, but concern at making too high a demand. The result of walking this line is the appearance of these supplementary moments as supplements, in the crucial area of political rationale of the problematization of adaptation, and it leads to a lack of investigation of the problematization into how to realize these ideas, thus limiting the account of adaptation even as it opens it up.

5.0 Supplementary moments: social knowledges

5.1 Socio-Economic Scenarios

The tension between quantitative and qualitative forms of knowledge is a recurring theme in UKCIP's problematization of climate change. As discussed in the previous chapter one social mode of knowing occurred through the use of the Socio-Economic Scenarios but it was subsumed into the epistemology of a scientific approach through the tendency to quantify its results, and prioritize

climate-scenario based knowledge. In Hulme and Dessai's (2008) terms, the statistical use of the SES epistemology undermined its intended heuristic function, and made its epistemic mode quantitative and hence product-based rather than qualitative and hence process-based. These same epistemic tensions are repeated as supplements within the 2003 document.

The first point to discuss then is the general exclusion of qualitative, social forms of knowledge. Whilst there are references to qualitative risk and scenario techniques, these are not built into the overall methodology of the framework. The key authors were aware of this occlusion at the time, but the need for a guideline that was calculable, easily replicable, and ultimately held stakeholders responsible created a drive for a 'rational' and broadly quantifiable response. As Interviewee H put it:

> "[One author] used to quite casually say to me when we were working on this, was, 'well of course this framework assumes that decision makers are rational, and clearly they're not,' and so we –that was always a kind of underlying unsaid comment –well, it does get mentioned in [the 2003 document], but it doesn't really get much air time, and there is obviously loads of literature on, on actually how decisions are made, so this is very very rational, how you 'should do it', but er [laughs] real life 'ain't like that'" (Interviewee H 2009, p. 20).

This is a remarkable statement. It recognizes a whole area of knowledge about the nature of decision-making as a process that is central to the approach but not included at all in the document. In failing to discuss the notion of 'rationality,' it excludes the area of knowledge to do with the social or organisational norms and assumptions on which adaptation strategies are formulated, including the

previously mentioned issue of whether they are collective or self-interested. It furthermore excludes an investigation of the social structures and norms that aid adaptation, however this is conceived. This will be discussed in further detail in Chapter 6 as this epistemic occlusion is in part based on the ontology at the core of the report's problematization.

The exception to this is the limited appearance of the Socio-Economic Scenarios within the report, which were not explicitly marked in Part 1 in the account of risk assessment, and receiving only half a page in the account of the role of scenarios in risk assessment in Part 2 (Willows and Connell 2003, see section 3.7, p. 85), as opposed to the five and a half pages on climate scenarios and their various statistical supplements. This balance is reproduced in their limited use in UKCIP practices and stakeholder take-up as confirmed through the interviews (UKCIP Interviewee E 2009, Interviewee H 2009, UKCIP Interviewee F 2009). This confirms the supplementary function of the SES, and limits the extent to which they can trigger any examination of the stakeholder's own social relations and capacities that animate its adaptation decisions and responses.

5.2 Social-knowledge based "tools"

Despite the limited use of the Socio-Economic Scenarios, the 2003 report makes several attempts to include other social forms of knowledge. Crucially, these are tied in as supplements to the core problematization's techno-scientific epistemology through being introduced as alternative means of accounting for risk. One key articulation of these elements occurs is in the concept of 'risk assessment.' Risk assessment is defined as involving:

"either quantitative or qualitative techniques and information to describe the nature of the probability component of the risk... Qualitative techniques are particularly useful in circumstances where we lack knowledge of the probabilities" (Willows and Connell 2003, p. 44).

Here, the clouding of the different meanings of risk as both statistical probability and a more general account of threat enables this definition of risk to meet its "truth condition." In etic terms, this claim could be represented as: the use of non-probabilistic information to provide information for probabilistic assessment where probabilistic information is lacking. This re-articulation of qualitative knowledge into probabilistic knowledge does not make it more accurate. It simply makes it fit, for example, through equating of subjective descriptions to numerical probabilities and the 'pedigree scores' given to qualitative descriptions of risk so that their 'reliability' can be factored into a quantified risk assessment (*ibid.*, p. 26). The assigning numerical values obfuscates the lack of probabilistic accuracy, and at the same time simplifies the depth of descriptive and relational knowledge present in the original qualitative form. The epistemic difficulty this poses is overtly recognized later, in Part 2, which assumes a more open mode: "[it] is generally...best for the risk assessor to present outcomes in terms appropriate to the receptor, using multiple attributes where necessary" (*ibid.*, pp. 45-6). However, this would disrupt the political rationale of calculability and clarity in Part 1, and raises the prospect of a very different epistemic approach which is easier to leave unresolved in the 'additional' nature of Part 2, exemplified by the more open, educative mode it assumes.

The use of qualitative knowledge to 'cover over' the gaps in quantitative knowledge is repeated in the assertion that limits to risk might be as vague as "worst- and best-case scenarios" and that "[these] bounds should reflect the extent of our uncertainty of the risk." (*ibid.*, p. 45). As discussed above, this allows scenarios to function in a heuristic manner, rather than offering precise alternatives and limits (let alone accurate ones), according to the epistemic norms of the techno-scientific core problematization. However, again we see the unwillingness to accept social knowledges on their own terms. In this particular case, it is suggested that the uncertainty of scenarios can be masked by expert judgement, but the uncertainty which arises from subjectivity as a result can be given a value by "canvassing the expert judgment of a larger sample of people with similar expertise" (*ibid.*, p. 45). This demonstrates an attempt to use quantitative epistemology to assess a qualitative one, and misses the deeper uses of these opinions in a heuristic sense. The lack of development leaves entire swathes of tacit and implicit knowledge un-recognized and un-tapped, and filters out elements of those knowledges that are not easily adapted, meaning that only a shadow of these epistemic elements remains while they are articulated as supplements, preventing them from re-shaping the core problematization.

In 2003, this mode of approach is intimated in a very basic supplementary form as a way of gaining an image of the type of threat itself, rather than accounting for its degree or precise nature. This occurs for example in a list of tools that include: 'brainstorming,' 'consultation exercises,' 'focus groups,' and the 'Analysis of Interconnected Decision Areas' (AIDA), amongst others. These are modes of knowing whose objective is to establish the core normative and

social aspects of the decision-making process, from identifying objectives, 'risk assessment endpoints' or thresholds, and the 'exposure units' or systems at risk (*ibid.*, see pp. 17-18, for example). However, these social modes of knowing which form the account of the system are not explained in any detail in terms of why they are useful for ensuring an accurate knowledge of the system, although it is nonetheless made clear that they are necessary for knowing the system that responds and for avoiding knock-on effects, which will be discussed in more detail in Chapter 6.

Crucially, in the 2003 report, these tools are used in Stages 1 to 5 but when combined with the pre-emptive mode of knowledge that arises from the scientific framing, this limits the degree to which they shape the problematization. As such, they are not deployed in stages 6, 7 or 8, which cover making, implementing, and monitoring and reviewing the decision. See "Summary of tools and techniques" (Willows and Connell 2003, pp. 123-4). And yet, it seems fairly clear that the social forms a major part of knowing how these unfold (Adey and Anderson 2011, Anderson 2010, Pelling et al. 2008). This raises the question: how are decisions actually agreed and made as a social process? How are they communicated during their formation, as well as in their emergent implementation? How is monitoring communicated, valued and assessed? The failure to integrate these particular knowledge techniques throughout the adaptation process means that they remain as supplementary moments, and through their exclusion help maintain the sense of linearity that ensures the prescient, pre-emptive rationale of the problematization.

One crucial aspect of these supplementary forms of knowledge is the 'tacit' and social rather than technical organizational knowledge that enables a stakeholder's organization or institution to function, and make decisions. In the observations of stakeholder meetings, this knowledge is drawn on during the brainstorming exercises at the beginning of the risk assessment, prior to any detailed quantification, in order to produce an account of the likelihood of a particular impact on the organization occurring. So if, for example, the scenarios predicted the general increase in hot weather during summer months and a radically increased incidence of heat waves, the impact on the organization might be air-conditioning failure and the need to close offices. The likelihood of this occurring was established through tacit knowledge of the system's vulnerabilities according to past experiences of failure, and the likelihood of these environmental conditions as established by the scenarios.

This demonstrates a significant difference between the place of this supplementary moment in 2003 and the increasing role of social forms of knowledge through the practice of the collective assessment of vulnerability demonstrated in the stakeholder workshops that were observed in 2009, as part of the LCLIP approach. The place of this form of assessment at the beginning of the process demonstrates that the risk assessment was heavily dependent on what the individuals present had actually experienced, or knew – tacitly or otherwise – to be areas of vulnerability.

However, the dominance of the core epistemology is (re)established in the utilisation of these forms of knowledge as products, rather than as processes, in the later stages of assessment. This meant that, despite how crucial they are to the effective functioning of the risk assessment and decision making process (and

potentially implementation and monitoring and review stages as well), their exclusion from the problematization means that building the capacity to create and act on these forms of knowledge is also occluded.

This section has argued that different forms of social knowledge within the document and in UKCIP's practices act as supplements to the core epistemology. This reduction of the full visibility and validity of social modes of knowing limits their exploration for a rationale of adaptation and account of adaptation practices. They are, particularly in the early years, articulated 'subsidiary' supplementary moments that add to the core, techno-scientific problematization based on risk, by providing additional sources of quasi-quantifiable risk, and additional means for imagining potential impacts. In this way they are able to 'cover over' the irreducible uncertainty of climate change itself and the inability of risk to be truly probabilistic, whilst leaving the core problematization apparently intact. However, their increasing presence implicitly threatens to supplant the core problematization because they imply recognition of the limits of prescient knowledge and preemptive decisions, as well as revealing the inability of techno-science to account for the range of social practices that have a bearing on adaptation strategies and practices. The implications of this will be discussed further in Chapter 7.

6.0 Conclusion

In this chapter I have argued that the 2003 document is premised on the objective of making scientific knowledge useable by stakeholders, and does this primarily through the use of risk-based technologies. It argues for a

problematization of adaptation that sees the lack of reliable climate change knowledge on which to base a planned decision as the problem. It resolves this by on the one hand noting the usefulness of climate change scenarios and their reliability, and on the other hand by resolving the lack of certainty produced by uncertain climate change (and implicitly by uncertain climate science) through the use of risk. This is established in an authoritative narrative form that effects the exclusion of uncertainty and the validity of its approach first by creating a narrative and syntactic equivalence between uncertainty and risk, such that risk is held to account for uncertainty in full, and second by relegating more nuanced and limited accounts of risk's real ability to do this to Part 2 of the report. This particular 'covering over' of the lack is sustained throughout the report through the articulation as supplementary moments of any alternative accounts of uncertainty and its resolution.

Knowing through risk as part of the solution assumes a rationale of seeking risk-based knowledge as the first order of business, but is articulated to the concept of 'the decision' and 'decision-making' as the account of political action. This is also established in the opening narrative, and enabled through the theoretical association of 'risk' and 'decision.' Accounting for the practice of adaptation as 'a decision,' and linking this to the necessity of defining objects and scenarios in risk analysis, limits the account of adapting to an essentially discrete moment both in space and time.

This shift changes the object of knowledge from the actual climate and abstract environmental impacts to the direct impacts of the climate and climate change on the stakeholder. It is given epistemic meaning through risk's role in dealing with the inherent uncertainty of these scenarios. As such, climate change

scenarios still remain the core means of knowing climate change, but are mediated through risk to reproblematize the impacts from the point of view of the individual stakeholder. In part this pre-emptive, planned rationale arises from the long term mode of the scenarios, and the historical origin of environmental management with regard to long-term physical infrastructure. Together, these elements and their particular articulation in moments produces a techno-scientific prescient epistemology and pre-emptive political rationale within the problematization of adaptation.

There are supplementary moments to all of these conceptual points, however. These occur in the concepts of 'robust' and no-regret decisions, which open up the possibility of an emergent account of time and of political rationale. However, the understanding of linear time with pre-emptive, planned decisions is more fundamentally disrupted by the concepts of "flexible decisions" and "keeping options open" and "avoiding knock-on effects." These create a political logic that responds to the assumption of irreducible uncertainty that is not held to be resolved through risk.

However, even though these approaches are articulated into the core problematization because they are not explored in any depth. The result is that, although these decisions are smarter and more flexible, they are used to reinforce the assumption that adaptation is essentially based on prescient knowledge and pre-emptive decisions. Similarly, the failure to develop a more integrated account of implementation, monitoring and review, and the reluctance to intervene in the timetables of decision already extant in stakeholder organisations, serves to reinforce this pre-emptive, non-flexible relation between the times of decision and the process of adaptation.

As such, the articulation of social forms of knowledge as supplementary moments only expands the problematization so far; their articulation as supplements means they are also limit points that leave the systemic capacities which enable the production of this knowledge, and especially its possibilities in the implementation of decisions implicit, rather than explicit. The exclusion of social forms of knowledge means that decisions are also understood as discrete in space, which will be discussed in more detail in the next chapter.

However, the interviews and observations in particular demonstrate some developments and intensifications of these moments, particularly in the increasing use of vulnerability in the problematization of adaptation. However, during the active research window the fundamental configuration of systemic knowledge and awareness remained subsidiary to outcome-based risk as the primary problematization of adaptation as its techniques were directed at supplementing the risk approach.

This subsidiarity is ensured linguistically in several ways. In the report, qualitative knowledge is represented as a sub-optimal proxy for probabilistic risk where no quantitative data is available, or where quantitative data is too costly or time consuming to provide. Second, although social means of knowing offer a way of accounting for the nature of the system at risk – its qualities and capacities, outcomes are nonetheless prioritized. Crucially, this means that while collective knowledge-making and other social forms of knowledge have come to be utilized in the opening stages of UKCIP's approach to adaptation, they are limited and non-explicit in the later stages of making a decision, implementation, monitoring and review.

However, when taken out of their linguistic articulation to the core, the supplementary moments also present epistemic elements that rupture its cohesion by prompting alternative ways of knowing and responding to the irreducible uncertainty through shifting the object of knowledge from climate and technological risk as outcome to socio-contextual knowledge and capacity. This potential to supplant the core problematization will be discussed further in Chapter 7.

In sum, the problematization of adaptation is tied to an epistemology based on outcomes, making its political rationale one of pre-emptive and discrete decisions, rather than capacity and emergence, likening it to the techno-scientific, linear model of adaptation presented in Chapter 1. The next chapter will discuss the ontology of UKCIP's problematization in more detail, and develop the effects of prioritizing discrete and pre-emptive decisions rather than emergent systems or processes for the account of the subject and object of adaptation, and the account of action or agency that this entails.

Chapter 6: Ontology and its supplements: space, actors and agency

"I don't think we ever really bottomed [...] that one out really, [if] some

people lose out but society as a whole has gained, then is it a bad decision?"

Interviewee C 2009, p. 4

1.0 Introduction

The previous chapter identified the way in which the application to climate change of a techno-scientific mode of knowledge, particularly as risk, produced a particular relationship between knowledge, time, and action. This predictive and objective epistemology structured how climate change was imagined as a threat, with the result that the political rationale, or strategy, of adaptation tended to premise its assessment and response on scientific or quantitative knowledge of the 'external' biophysical threat. This predictive knowledge was then used preemptively in planned adaptation. The epistemology at the base of this rationale, and the pre-emptive, decision based rationale itself, respond to and reinforce a particular ontology of the subjects and objects of adaptation and how they are assumed to be able to act or have agency, adding the final layer to the political rationale of the problematization. As with any discourse, these are particular: what is rendered visible makes other aspects invisible, resulting in the projection of certain strategies and the occlusion of others.

This chapter will examine how these ontological moments are articulated at the macro and micro level, observing basic inclusions/exclusions enabled by

power/knowledge relations and the smaller linguistic operations that justify these. It breaks these ontological moments down into their place in the problematization. First, observing how the 'time' of adaptation established in the last chapter generates a particular moment and 'space' of adaptation, in Part 2. Then it goes on to consider how scenarios generated an imaginary of the threat of climate change as biophysical and external, and how this helps constitute an account of the objects that need to adapt in Part 3. Part 4 considers the account of the subjects that 'do' this adaptation, which in Part 5 is developed into the account of agency implicit in UKCIP's discourse, and the implication of this for its political rationale. The second half of the chapter, Parts 6, 7 and 8, demonstrate a range of supplementary moments to this ontology, both in terms of time and space, and the very different imaginary of subjects and their agency as a result. Each section also demonstrates how these supplementary ontological elements are (re)articulated to the core problematization so that it remains in place. The next Chapter will explore how all of the supplementary moments – both epistemic and ontological - together suggest a supplementary problematization of adaptation as a whole.

2.0 The time of adaptation: Future, outcome-based account of threat

The previous chapter on epistemology discussed how a techno-scientific account imagined knowledge as a product, rather than as an emergent process, and discussed the imaginary of action this produced as similarly product based. This is an ontological as well as epistemic account, and serves to locate the time and nature of adaptation in planned, pre-emptive decisions. A representative

statement from UKCIP in their meetings with stakeholders would be: "I was making the case for a planned approach to this" (UKCIP Interviewee E 2009, p. 1) which tends to combine with a negative account of a 'reactive' adaptation response, such as this: "one of the things that is a slight concern from our perspective is that there's a tendency to be very reactive, which is often not the most cost-effective way of dealing with things" (UKCIP Staff Member in Stakeholder B Observation 2009a, p. 11).

UKCIP is clearly representing an ontology of adaptation as planned. In the last quote, this is established in particular through distinguishing adaptation from a reactive response. 'Reactive' adaptation is articulated in negative terms with 'concern' and 'not...cost effective,' which although it positively situates a planned approach and justifies it, also works to occlude reactive or real-time responses, and establishes planning as the core ontological account of adaptation's political rationale.

This in turn links back to the temporal framing established by the scenarios discussed in the previous chapter. The fact that these account for climate change in 30 year time-spans means that resilience or real-time approaches, as "virtually by definition, wouldn't be looking at the impacts of climate change, because over a five year period you can't make any reasonable expectation of change" (UKCIP Interviewee A 2009, p. 5). As such, the combination of the time frame established epistemologically and the concern to ensure adaptation is acted on pre-emptively combine to limit the temporal location of adaptation, excluding the event itself.

Critically, this prevents any explicit imaginary of adaptation action and agency as occurring at the time of the event, or emerging as the event unfolds. As a key staff member noted: "I don't really use the term resilience much. I think

more in terms of sensitivity […] or how robust one is" (UKCIP Interviewee F 2009, p. 18). This reflects a common assumption in all of the interviews that robustness and resilience were equated in the sense that they were seen as preconditions for adaptation, and as inherent, fixed measures of vulnerability (for example, Interviewee H 2009, p. 18). As such, they were not investigated in terms of how they related to the temporal unfolding of climate change in relation to specific phenomena or events.

As we shall see, this limited window of action drastically reduces the amount of discursive investment in the subjects and structures that enable adaptation to happen. However, another reason for the limited account of the subject is because of the focus on climate change itself as an externally generated threat. This will be discussed further in the following section.

3.0 The space of adaptation

3.1 Account of the threat in the problematization of adaptation

The climate change scenarios played a major role in constructing and limiting the 'time' of adaptation through their account of the threat of climate change. One of the clearest examples of this ontology occurs in the maps produced of climate change scenarios in the report. These are highly detailed images and graphs of prospective climates. So it is perhaps unsurprising that "[stakeholders] find it easier to accept the climate [scenarios part] of it in some ways, because they're being given maps and data and numbers – and they go 'oh yeah, I can see what it looks like'" (Interviewee H 2009, p.21). The physical representation of these possible effects helps bring them to presence in the present (Anderson 2010).

This tangibility makes them part of the ontological reality in which decision-makers operate. It should be noted that this clear imaginary was subsequently made much more complex by UKCP'09, the climate projections that were published at the end of the research period. Although these were intended to demonstrate uncertainty more effectively, they did this by providing more rather than less data in the form of images and statistical data sets, and increasing the tangibility of climate change through detailed tools, such as the Weather Generator, for example (Defra 2012a). As such, the demonstration of uncertainty was prevented from appearing as an ontological condition of ' irreducible ignorance' (Luhmann 1998) because if anything the information was more precise in nature even if it was not more accurate (Dessai et al. 2009).

Climate impacts scenarios thereby appear to bring the excess or the 'divine' into the 'profane' through the act or representing it, or 'naming' it in Rancière's terms (Rancière 2007b, Rancière 2001). However as these events haven't actually 'happened' it glosses over the void or the gap in our ability to fully know irreducible uncertainty. This raises the temporal question of when is adaptation said to happen? Is adaptation the actual response to the event when it happens, or is it the response to the 'event' before it happens, and which really, never happens? These are colossal differences in the problematization of social order. Transformation in not seeking to account for the excess is able to emerge with it at the event horizon, whereas a problematization based on pre-emptive knowledge prepares at a self-imposed event horizon in lieu of an actual event, leaving the event itself beyond the purview of adaptation, and remaining at that point of 'coping.' As such not merely the social response but the knowledge to which that responds is a key part of the account of adaptation.

By contrast, as described in the previous chapter, there was simply not as much visceral substance given to the socio-economic scenarios, and they received far less practical guidance to their use from UKCIP staff. This meant that these, and alternative social imaginaries were much less tangible than their biophysical counterparts, and being less easily adopted were less used. In fact, by the time of the research, they received no reference whatsoever in any of the opening presentations observed or recorded (Stakeholder A Observation 2009, Stakeholder B Observation 2009a, Stakeholder B Observation 2009b). The significance of this is that it removes from consideration the whole raft of social being as significant either in accounting for external sources of threat.

However, it should be noted that by the time of the observations, climate impacts were being accounted for in terms of 'indirect impacts' on the stakeholder (Stakeholder B Observation 2009, p. 8). This imaginary of the location of the problem to which adaptation responds clearly steps away from a purely biophysical threat and intimates that it plays out through systemic connections of which the organization is part, locating the threat in the nature of those connections. However, the phrasing, "indirect impacts," nonetheless reinstates 'impacts' and the connection to the techno-scientific core.

When the most organization-focused UKCIP staff member was asked about whether she felt constrained by UKCIP's climate change remit, she commented "maybe that is one of our messages: that you cannot separate [climate change from other risks], it is not useful to separate it" (UKCIP Interviewee B 2009, p. 6). The same member went on to note "sometimes I think... we have [the] perception that [scientific information] is more influential than it actually is [...] You know, we produce these scientific scenarios –

projections, and I think it would be useful to have a better understanding of the decision-making processes..." (*ibid.*, p. 7). These different renditions of climate change's place in the account of the threat to which adaptation responds makes it clear that far from being resolved, the tension identified by the original report authors was being given increased verbal recognition in stakeholder meetings and internally at UKCIP, and as such was becoming more central rather than supplementary. The question that this raises is at what point does this alter the starting point of adaptation from climate change impacts to an internally-generated account of wider threat, or indeed start instead from an internal account of vulnerability and capacity.

3.2 Location of adaptation: at the edge of the internal system

The ontology of the climate change threat as originating externally and as a properly long-term concern had significant implications for the imaginary of what was at risk; it led to a focus on physical objects that were directly related to the biophysical environment, such as major infrastructure. In their representation of adaptation, UKCIP staff and report authors tend to have such examples as their first recourse: Interviewee H gave the example of building a bridge, Interviewee C of the Thames Barrier, and Interviewee F of building a reservoir (Interviewee H 2009, UKCIP Interviewee F 2009, Interviewee C 2009). This may also be due to the environmental management origin of the discourse discussed in the previous chapter, or it may be that these represent simple examples to quickly communicate the concept of adaptation. Regardless of reason or origin, these articulate the objects of adaptation in a very 'object' like

form, as physical, quantifiable, and external as 'products', rather than as social, qualitative, or internal characteristics as 'processes.'

Although the infrastructural objects that are acted on are external products of the stakeholder system, the recalibration of the threat itself from external climate to the risk to the organization means that the location of adaptation happens at the interface of the stakeholder system and these external events:

> "[One] of the challenges we had was whether [the report] should just be about using the UKCIP climate forecasts [...] we said absolutely not, so, um, what we said was you're better to understand what level of climate risk you can tolerate, what level of rainfall, you know is... is sufficient to cause harm that's actually important to you, [...] Ah so you know you plan for –to manage your risk, so understand the risk evaluate it" (Interviewee C 2009, pp. 25-26).

This quote makes clear that adaptation is to external events, taking the possible changes in climate as a starting point, identifying impacts on the system, and deciding what level of event is actually significant before designing a response to those specifically identified threats, rather than seeking generalized capacity. This articulation presents an ontology in which the location of the threat is a combination of the nature of the stakeholder where it interfaces with biophysical climate change.

However, this ontology is characterized in terms of the elements most valid for the risk-based epistemology. Stage 2 Part B of the report characterizes social space through the technical terminology of 'exposure units' 'receptors' and 'risk assessment endpoints' (Willows and Connell 2003, pp. 14-15). However,

there is no terminology or narrative that requires an account of the internal system in terms of the connections that create those units, or the flows and dependencies internally that create these points as significant in the first place.

In this way, the system is assumed to be static, external points are considered but their contingency on the internal nature of the system is not part of the analysis. The depth of the imaginary of the social body that adapts is somewhat limited as a result, and excluded from being a core object of adaptation knowledge itself. The result is that, although there is a transition from the focus on explicitly environmental systems to the interface of the stakeholder and environment via risk, there is little consideration of non-physical relations with climate change, and in particular of the internal relations of social or organisational systems. Rather, the products of these systems, in their most tangible forms, seem to be the focus of attention.

A further side to this exclusion appears not only in the description of the threat but in the resultant political rationale and account of the solution. This is apparent in the lack of exploration of the social infrastructure that enables a decision, and the contrasting focus on the technology of decision analysis in the report. Asked whether, in terms of scenarios, "the knowledge that you're gaining about the decision making process is more to do with the internal system or the responses to the external system?" Interviewee C responded:

> "Well I think it's both. I mean I –scenarios are always more about trying to identify the things you don't have control of, so they're around the externalities. [...] I always make quite a clear distinction between [...] scenarios [...] and the things that you can do about [them] which are effectively the options that you could control. [...] It's not black and white,

but it's a useful way of sort of structuring decision problems" (Interviewee C 2009, pp. 5-6).

This account clearly locates the threat outside of the social system that responds, and in doing so assumes that climate change adaptation happens at the interface of the stakeholder system and the external system. As such, the 'options' of response tend to assume internal stasis, and in doing so exclude this as a location of adaptation.

3.3 The social as external threat and condition

Although it was largely excluded in the account of the 'internal' subject, the social does appear as an external threat in a limited form. In the report this occurs in several ways, but occurs first when climate change is listed as one of multiple threats, and that these "non-climate risks" should also be taken into account (Willows and Connell 2003, pp. VI-VII; p. 17). As discussed in Chapter 4, the significance of this statement is curtailed in the report itself in order to present a strong case for climate change adaptation at all. It seems that in practice this did not fall away as climate change became more accepted. In one 2009 observation of a stakeholder meeting, one UKCIP staff member reflected on this ontology of threat as: "climate change is one of those drivers, and we're looking at this [adaptation] in the context of everything else [...] so it's a case of almost mainstreaming the idea of climate change within all the other challenges" (UKCIP Interviewee E in Stakeholder A Observation 2009, p. 13).

However, as one report author noted, "taking account of non-climate factors and their interaction with climate factors [is] in there, [but] nothing's mandatory" (Interviewee H 2009, p. 21). This is understating the case slightly.

Although included, the lack of conceptual integration of social sources of threat into the problematization means that 'other threats' are only included insofar as the stakeholder organization is aware of them or prioritizes them, rather than developing an explicit method of linking the two together, leaving social sources of threat as subsidiary supplementary moments in UKCIP's problematization. This certainly seems to resonate with the occlusion of social forms of knowledge (Willows and Connell 2003, p. 50) in understanding these as threats, and ultimately for the rationale and solution, as discussed in chapter 5.

In a sense, this limited presence of the social is a hangover from the previous problematization, which was founded on determining biophysical scenarios and spreading the message that they were a threat. However, while the focus on climate appeared a natural continuation of the previous problematization, it was also a deliberate political strategy aimed at addressing the core threat to which that problematization responded: lack of knowledge and acceptance of climate change itself, rather than precisely how to adapt to it. There was a tension in the production of the report over how this balance between climate and non-climate factors should be represented. Whilst the main authors of the report were keen to present non-climate factors as potentially more important that climate factors, it was felt by some at UKCIP that this would undermine the climate change agenda itself.

Moreover, external social threats were often represented as social 'impacts.' UKCIP asked people to consider not only "[impacts on] buildings [but also] more intangible things like impacts on people's lives, in the context of perhaps some changing expectations" (UKCIP Interviewee E in Stakeholder A Observation 2009, p. 2). The word 'impacts' here seems to echo the previous

problematization, and brings with it the sense that the threat is external; after all, the impact occurs "on" something, rather than 'through' or 'with' it, with the implication that the thing impacted is inert or lacks agency. This heritage and articulation helps keep the investigation of the social, although included, at a superficial and therefore supplementary level, rather than seeing climate change as emerging through its interaction with the social body, and the social body as itself also emergent and contingent.

The reasons for the weak inclusion of the social do not fall entirely to the report or UKCIP practice. UKCIP found that stakeholders themselves "struggled" to accept and use the Socio-Economic Scenarios effectively, and "find it easier to accept the climate bit" (Interviewee H 2009, p. 21). In part, this was because of the degree of quantification and precision that accompanied the Climate scenarios, as discussed earlier. The ontological result is the lack of characterization and attention paid to the social context of the organization and therefore little exploration of its relationally established and enabled agency, or the socially contingent nature of their objectives.

However, there also appears to be a power/knowledge origin in the liberal episteme in which UKCIP's ontology is couched, which allows for 'the social' to be legitimately collapsed into the economic. This appears in the report at several points, for example: "A no regret option could be one that is determined to be worthwhile now (in that it would yield immediate economic and environmental benefits which exceed its cost)..." (Willows and Connell 2003, p. 114). Here the entire account of the social can only be said to be represented in terms of economic benefit, if it can be said to be represented at all. Thus by direct occlusion and through using the economic as proxy for the social, there is a

general exclusion of the real characteristics of the socio-contextual aspects of the organization and the account of threat or solution that therefore structures the problematization of adaptation. However, as we shall see in the second part of this chapter, this account is nuanced by several supplementary moments, which intimate the significance of the internal capacity of the organization, as well as the systemic capacity of the wider sector or region in which it is situated.

4.0 The subjects of adaptation or the subjects that adapt?

So far, we have seen that the object of adaptation is generally represented as occurring through decisions that result in changes to physical, often infrastructural objects. This raises the question of who enacts these decisions, and more generally how the subject is accounted for in this problematization of adaptation. Unsurprisingly perhaps, the term 'decision-makers' is essentially the only term used to describe subjects of any kind. This arose directly from Defra's brief for the report, which was somewhat vague in terms of the actors that should be targeted, but did use the term 'decision-makers' was a key pronoun to describe such actors (Interviewee C 2009). As that author explained, the assumptions about what constituted such a decision-maker also arose in part from Defra's brief: "[We] tried to explore what ['decision-maker'] meant, and ...I remember [Defra] saying [...] they wanted [the report] to be relevant to individual farmers, to small-medium enterprises" (Interviewee C 2009, p. 2).

Despite this brief, and also because of UKCIP's experience with regional climate change partnerships, the report authors drew out of Defra's particular concerns that: "...effectively [the report should be useful] to anybody who was

making a decision that might be er, influenced by climate change [...] so in developing the guidance we saw it as having to be relevant to a broad range of decision-makers in the public and private sector, and then to policy makers nationally but also thinking about what individual people might [need]" (Interviewee C 2009, p. 2).

This breadth meant that the use of this term in the report seems to have been left deliberately vague, although it is associated occasionally in the text with policy-makers and top management, and occasionally policy advisors to these positions (Willows and Connell 2003, p.V) The implicit imaginary of a decision-maker that enables these particular accounts was influenced by the existing stakeholders already working with UKCIP at the time the report was written. These were Regional Climate Change Partnerships, who were made up of Regional Assemblies, Local Authorities and regional power and water companies, amongst others (Interviewee H 2009).

The account of the subjects that adapt was also influenced by Defra's concern with its own stakeholders at the time, including farmers in particular, to whom Defra had lost a major political battle with previously over insurance/farming losses, and against whom it was keen to insulate itself from responsibility for failed adaptation to climate change (Interviewee C 2009). These historically specific connections seem to have combined with a wider sense within Government that they couldn't afford to be "responsible" and therefore needed to make these individual entities responsible for the impacts and resultant costs of climate change (UKCIP Interviewee F 2009, p. 8). This seems to have structured the exclusive focus on the stakeholder-based decision-

maker, as this deliberately moves the subject who adapts from Government or a centralized bureaucratic system to the responsibilization of disaggregated extant socio-economic entities.

The imaginary of the individual farmer on the one hand and the sectoral and regional partnership networks on the other may also account for the origin of the tension between the discrete account of the subject in the report and its more network-based account in practice, which will be discussed more in Part 7 of this chapter. This immediate origin of this latter approach was in the MacKenzie River basin study (Cohen 1997) that UKCIP's bid was based on (Interviewee H 2009). However, partnerships were also constituted as subjects in the Foucaultian sense by neoliberal governance through the 'corporate' responsibility that occurred at the height of New Labour's 'third way' approach to governance as a 'partnership' of government and 'stakeholders' (Fairclough 2000, p. 141).

The adoption of the identity of the adapting subject must work through either an appeal to extant identity or through the creation of this identity. Crucially for Defra, the shift in responsibility is cast as in the best interests and rational self-interest of the decision-maker (in the report) or stakeholder (in UKCIP's practice), a subject position which is produced, at least in part, by UKCIPs own discourse. The first way this occurs is through the overt way in which the report is addressed to "decision-makers" in the foreword discussed in Chapter 5, and the way in which this assumes itself to speak for them through the educative mode it assumes. Placing the reader in the subject position of a 'decision-maker' through addressing them as such, encourages them to apply the concerns the report identifies to themselves (Fairclough 2001), including the

scenario information, to themselves, and in becoming the threatened subject, they are placed within the narrative that seeks its resolution through the risk-framework. This is even more visually dramatic in UKCIP's meetings with stakeholders, where graphs and tables and images demonstrate the effects of climate change for the local area in which the stakeholder is located.

In sum, moving responsibility to stakeholders through providing them with information was a very logical step within a liberal problematization of governance. The report and UKCIP's later practices and publications demonstrate increasingly focused and specific renditions of this problematization. This 'top down' account was matched from the bottom up (as in all successful enactments of liberal governmentality) by 'stakeholders' accepting themselves as such, accepting the account of the problem and their positioning within that problem, and therefore asking for themselves 'what do we actually do and what does this mean for us' once biophysical scenarios were understood. In this sense, stakeholders, however defined, are the subject that seeks knowledge – subject here in the linguistic sense of the actors that do the work (Fairclough 2010), yet also 'subject-to' a particular form of governance (Foucault 2009). In sum, the 'decision-makers' and 'stakeholders' appear as the subjects of adaptation, implicitly discursively constituted and in turn acting on their own process implicitly, in order to act overtly on objects that tend to be physical or processes and products at the interface of the stakeholder's operations and biophysical climate change.

In seeking to marry Defra's individualist brief with this longer-term and systemic view, the liberal norms in which the report was couched usefully occluded this tension through limiting the need to account for this complicated

array of subjects in any substantive way: 'this is *really* a challenge that UKCIP has always faced is that it has *such* a broad set of people that it aiming to reach out to, um, and it's trying to be all things to all men in many ways" (Interviewee H 2009, p. 10)

The authors avoided the question of actors to some extent by "…[approaching it through] the question, what decisions need to be made about what, where would you need to take about –think about climate change, and when will you. So we very much took it from the decision making view-point, not from the science view point" (Interviewee C 2009, p. 2). Here it seems that decision-*making* rather than decision-makers becomes the key focus of who in fact is a decision-maker. As such the whole identity of users is left somewhat obscure.

The discrete nature of the decision in time that was discussed in Chapter 5 seems to entail a discrete account of the subject in space. This happens in several ways. First, the requirement to identify future objectives and outcomes for the organization assumes and thus creates a 'solidification' or centralization of space through the need to define this objective in advance through both defining the objective per se and thus describing the nature of the organization and its limit, and through the determination of the 'decision-maker' required to act on this risk. Second, this solidification of the subject is projected forward in time. This assumes the validity of a projection from current values to a future state, a practice which also helps to ensure the longevity of the current state, at least in terms of political rationale. This results in the essentialization of the subject in space and time.

The general assumption that the decision is discrete in time means that the emergence of the decision is occluded, is both temporal and (socially) spatial. This implies an imaginary of a single, and presumably isolated, decision-maker. The term 'decision-maker' itself implies that this is a position occupied by a single person and moreover that this is an exclusive or executive function. Consider, for example, the very different account that would emerge from the term 'decision-making body' or 'body that makes decisions.' These examples would much better represent a socio-contextual connection of decision-making in both space, and, in the latter example, time. As a result, the core pronoun that permeates the appeal to, and account of, the subject quietly but continuously reinforces an imaginary of the subject as discrete, centralized in time and space. In doing so it occludes an understanding of agency as fragmented and contingent, and thus also occludes the making and enacting of decisions themselves as contingent and emergent.

5.0 The means of adaptation: the centralization of agency

5.1 'The decision' and the centralization of agency in time and space

Taking such a liberal approach to the subject, together with the epistemic focus on 'the decision' resulted in a particular kind of political rationale. As a result, adaptation as presented in the report is based on: "Do I need to modify the decision I'm going to make to take account of climate change" which is "slightly different to what comes out of the climate change community which is 'how do I adapt to climate change" (Interviewee C 2009, p. 3).

As such, UKCIP's object of adaptation is extant decisions, and how they relate to climate change. This means that the decision is ontologically prior to adaptation, and is based on existing objectives rather than objectives that might arise from the threat of climate change impacts and uncertainty. This shows that UKCIP's problematization of adaptation is based on the extant structure of the stakeholder, and therefore in terms of climate change, a series of disaggregated adjustments, which is very different to the more comprehensive and strategic socio-contextual to socio-emergent problematizations of adaptation discussed in Chapter 1.

Further, the imaginary of the acts that constitute or demonstrate agency seem to be located primarily in the decision itself, or in the act of making a decision. Thus primacy is given to the decision as a product, rather than the process through which it is made. This is with the major caveat of course of the process that occurs through following the report itself. However, that is a generally technical process, leaving excluded from the overt problematization the account of power and agency that goes into creating that process of assessment and decision, although as we shall see, in practice they become more apparent.

In sum the account of agency only appears in the concept of *decision-making*, and this in effect makes it appear that agency only occurs either through following the risk framework, or through the act of decision itself, by a discrete actor at a discrete moment of pre-emptive decision. The ontology and epistemology of pre-emptive decisions leads to the exclusion of emergent responses, short-term responses and actual applications of a decision in the account of adaptation. The exclusion of agency here is clear from the limited

concern for the process of monitoring and review in the report. It also occludes an understanding of how, organizationally, decisions are made and what effect this might have on the problematization of adaptation in terms of capacity.

When asked about the extent to which the reports' authors had an imaginary of adaptive capacity, and how to secure it, Interviewee H responded that "probably not at a societal level I wouldn't have said we did [...] I would have had in mind *myself*, probably a couple of key UKCIP stakeholders, and they would have been probably somebody writing, yeah, a regional policy document, [...] probably someone more at the project level like a water resources planner" (Interviewee H 2009, pp. 11-12). This doesn't exclude adaptive capacity from being included in such policies, but it does demonstrate that social adaptive capacity, nationally or institutionally, is not an objective of adaptation. This occlusion applies to both the account of threat and of its solution, as there is no substantive account of what an adaptive society might look like, or what strategic rationale its capacities might enable.

5.2 The objective of adaptation: 'your own objectives'

The primacy of the decision and the exclusion of critical engagement with socially-based adaptive capacity is linked to the political priority given to existing objectives of the decision-maker. In the report, decisions are distinguished between 'climate adaptation decisions' and 'climate-influenced decisions' where the former might be "informed or constrained" by a specific adaptation policy, whereas in the latter "climate adaptation may be peripheral to the decision-makers initial objectives" but still pose a risk that requires these to be altered so that "modified objectives that can be achieved" (Willows and Connell 2003, p.

14). This reflects the limited effect of climate established as "altering" decisions in the opening narrative. This again clearly places existing objectives as ontologically and politically prior, in the sense that adaptation is generally represented as a 'constraint,' which has a negative connotation, on their ideal form.

Further, in disaggregating decision-types, this also limits the system-wide account that considering adaptation as a primary objective might entail. This leads to a politics of 'tweaking at the edges' where adaptation is related to very specific and limited existing decisions. This crucially occludes a focus on the preliminary or intermediary step of ensuring adaptation capacity in the core problematizaion.

The report explicitly notes on several occasions that the risk approach is based on the objectives of the decision-maker (Willows and Connell 2003, p. 10). This results from and reinforces a liberal, laissez-faire ethics, and has a key strategic impact on the problematization of adaptation, as it allows its primary objectives to be determined by not only the existing objectives of the stakeholder organization, but also the internal structure that gives rise to these objectives, and carries them out. This aspect is also explicitly noted when the report accepts institutional 'constraints,' as a reality of the adaptation process. Crucially, it characterizes these positively, although perhaps somewhat euphemistically, as giving "focus" to decision-making (Willows and Connell 2003, p. 14). In practice, this meant that UKCIP could provide technical assistance, but certainly could not tell a stakeholder how to run their organization even though this might radically curtail its ability to make 'good' adaptation decisions.

This is not to say that this liberal unwillingness to account for the nature of the social directly meant that there were no effects on social practices or political objectives. On the one hand, UKCIP certainly fail to intervene in organizational structure and practices directly, although there are some minor exceptions which are discussed in the second part of this chapter on supplementary moments. However, as discussed earlier, they also employed that characteristic of liberal power that Foucault called disciplinary power/knowledge, functioning sometimes through a biopolitical governance (Foucault 2008, Foucault 2009), where engagement with the risk approach, whilst appearing to enable you to act in your own interest, also shapes how you act in a particular way.

One of the ways liberal responsibilization took effect was through the fantasmatic appeal of risk can be said to function because stakeholders are in fact already subjects of risk. Within this, as the report is at pains to point out, stakeholders are able to choose between being more or less 'risky' subjects, as long as they perform a detailed assessment, and make some kind of climate-aware risk based decision. Engaging with the risk assessment, even with no commitment as to how they should respond to this, situates the stakeholder into a discourse of threat for which UKCIP is able to offer the very colourful, detailed and impressive climate scenarios.

This enters the stakeholder into a power-relation that is rational on the surface but which also contains fantasmatic appeals to their sense of responsibility and fear of uncertainty or of climate events. Although the report notably plays down the threat of climate change, it is still represented as a threat. The use of terms like 'no regrets' (Willows and Connell 2003, p. 30) is not only a

rational account but also an emotive metaphor that establishes a sense of responsibility for adapting to climate change 'properly' in order to avoid negative consequences. Of course, what constitutes 'properly' is the approach established in the report. As a result, the problematization is given traction because it is connected to identities at the fantasmatic level. This also helps shield the problematization from dislocatory events, increasing its longevity. However, as discussed above, appealing to extant objectives appeals to extant identity, and in doing so drastically limits the possibility that the organization emerges, and occludes transformation from the problematization of adaptation.

6.0 Supplementary moments: Emergent time

6.1 Non-constraining adaptation decisions and emergent time

The previous chapter discussed how the risk framework re-problematizes climate change adaptation through considering the threat from the perspective of the stakeholders. Accordingly, a social entity, rather than a biophysical one, begins to take centre stage, despite the fact that there is little exploration of the social as an object of knowledge. This opens up the possibility that the stakeholder becomes not only the subject but also the object of adaptation. Indeed, beyond this basic conceptual opening, this section now goes on to discuss several supplementary ethical and strategic moments noted in the report which imply an ontology of the subject as systemic, or networked, contingent and emergent, and importantly connect to the supplementary epistemology discussed in Chapter 5 of irreducible uncertainty.

In the report, the basic concept of 'non-constraining' adaptation decisions occurs under several titles, including as 'keeping options open'. The latter term in particular reflects this principle in relation to time. As discussed in Chapter 5 this appears as: "an objective must be to keep open possible future options" (Willows and Connell 2003, p. 30). However, as discussed there, it is is unclear is how much strategic weight this articulation intends to provide, and whether this trumps other, extant objectives. When asked about this, the core authors had slightly different responses. From a more theoretical view, Interviewee C replied:

> "I think we're sort of saying you should have –you should give that more weight or this is something you really ought to think about and um, rather than rushing in to you know, some very inflexible decision… [it's better to have a cheaper,] low tech solution which […] is very flexible –its why we have caravan sites next to rivers – in the end you can move the people and if caravans get washed away they don't cost very much" (2009, p.14).

However, these epistemic moments and political rationales have certain ontological implications, as the other author's comment makes clear: "So it would be more adjustments to the way that they would make their decision than um, y'know over-taking anything else in terms of its importance" (Interviewee H 2009, p. 15). Such changes to how decisions are made, so that they remain open, implicitly entails different decision-making structures and procedures as well as 'objectives' and values that accept irreducible uncertainty.

However, while it remains articulated to the rationale of decisions, 'keeping options open' functions as a conceptual limit-point. On the one hand, it recognizes the limitations of the decision-making approach in its need to select a

particular course of action, and on the other hand, it reinstates the discrete, product focus of the risk-framework by calling them 'options.'

Another example occurs in Stage 2, where it states that in order to complete a risk assessment, stakeholders must establish decision-making criteria which "should reflect uncertainty about the future and future climate, and will be influenced by the organisation's decision-making culture and attitude to risk" (Willows and Connell 2003, p. 14). However, 'should' is applied to the strategic ideal of the report authors whilst 'will' applies to the extant culture of the organization. This is at once a realistic assessment of UKCIP's lack of power to structure stakeholder organizational norms, as well as an attempt to impress the need to pursue a robust approach. However, as there is no further attempt to ensure this or build it into the core narrative, it remains as a supplement, subsidiary to the core ontology of individual objectives taking ethical and strategic precedence over systemic capacity to deal with irreducible uncertainty through emergence.

Accepting existing time scales of decision is similarly ambiguous. On the one hand, if predictive knowledge is taken for granted it makes sense that stakeholders 'work backwards' from a predicted threshold or event and build adaptation in to their existing schedule, as was suggested in one stakeholder meeting (Stakeholder A Observation 2009, p. 3). However, without perfect knowledge and when thresholds simply do not fit the existing schedule, then this would be a case of severe maladaptation. There was an interesting exchange to this effect in the same meeting, with a stakeholder asking "when these [climate impacts] kick in might be a different time scale again, mightn't it?" (Stakeholder A Observation 2009, p. 3). Crucially it was glossed over by UKCIP staff to reinstate

the pre-emptive, long-term, existing schedule mode. The discussion itself is clearly a necessary one, and neither answer is right or wrong, but the unwillingness to consider changing decision schedules points to how entrenched respect for existing decisions is in UKCIP's discourse, and solidifies the exclusion of responses to emergent accounts of the event.

This returns us to the question of organizational change in terms of whether organizational structures and frequencies of decision need to be altered to successfully adapt. UKCIP's fear of scaring of stakeholders prevents them from investing in the investigation of this question within their problematization of adaptation. To the extent that it is explicitly discussed, it appears in terms of adaptive management and reiterative decision-making, discussed in the following section.

6.2 Adaptive Management, reiterative decision-making, monitoring and emergent time

One of the core modes that the report suggests using to deal with irreducible uncertainty is 'Adaptive Management.' This is described substantively as simply revisiting decisions at regular intervals, (Willows and Connell 2003, p. 30). However, the fixation with long-term decisions and the long-time frames of climate change together undermined the validity and focus on adaptive management, as any post-project appraisal had a limited value for climate adaptation because of the long return period of the projects, and the fact that the events would already happen by the time the learning could be done. As Interviewee C noted in a different context, it wouldn't make sense to create a choice of options "and then evaluate which one works best in fifty years-time and

then [decide] we'll go for that [option]" (2009, p. 20). As such, the validity of review and learning is undermined by the principle of preemptive, long-term decisions at the heart of the core problematization of adaptation.

The concept of reiterative decision-making also has an ambiguous position in the document. It does not appear at all in the opening narrative of adaptation, which we have discussed in Chapter 5, although it does appear in the summary of the report, and gives the impression that at best it installs a review process working in periods of at least 5 years. Nonetheless, the understanding of decisions as iterative implies a supplementary account of the subject because it entails an organizational structure that is able to achieve this. Although implicit, this is a significant conceptual move that begins to re-problematize adaptation in terms of the stakeholder as both subject and object of adaptation, and as a particular kind of subject, capable of revisiting decisions and changing track, as such the nature of the subject and its processes also become the object of adaptation.

This challenges the core ontology discussed in the first half of the chapter that existing decision-making timelines and structures remain valid for adaptation. As UKCIP gained greater experience of stakeholder practice it became clear that this was sometimes a completely untenable position. From the perspective of a decision maker that was 'too short' instead of 'too long,' one staff member recalled, "one of the [...] issues that we used to explore in many workshops were what are the drivers and barriers to local authority action. And I think, most of them did not sit well with adaptation work because they're typically short term in as much as they tend to have one or three year budgetary

cycles, they've got a four year electoral cycle, [and so] typically planning horizons are fairly short" (UKCIP Interviewee A 2009, p. 2).

The response of UKCIP was to work with local government to produce National Indicator 188 which rendered adaptation in terms of a 'process-based indicator' as opposed to targets, which rewarded local authorities for taking steps down a much longer road than their usual time horizons, and which rewarded them within the 'target culture' and political structure that had become so pervasive under New Labour (UKCIP Interviewee A 2009, p. 9).

However, within UKCIP's own direct discourse, what keeps reiterative decision-making as a supplementary moment is that although it assumes decisions should be revisable it does not assume any need to increase the frequency of decisions or build structures to enable this, in response to increased uncertainty in general, or the likelihood of increased changeability. Furthermore, as decisions are 'pre-emptive' it does not consider the structure or process necessary to emerge within the event itself (Adey and Anderson 2011) as an object of adaptation strategy. This is related to the marked absence of considering monitoring and real-time sensing and responding. The following section will discuss this in more detail.

As a new staff member noted, "[UKCIP] do the first bits [of adaptation] very well, you know, the raising awareness, beginning to get an understanding of what that means for an organization" however, they are unsure whether they should do "the real change management stuff [...] that's the kind of conversations we're having at the moment" (UKCIP Interviewee B 2009, p. 2). As such this demonstrates the beginning of a shift and the clear adoption of more emergent

terms and disciplines, but in a nascent stage, without reworking the core problematization, although with increased visibility.

There is a very brief mention of monitoring in Stage 8 (Willows and Connell 2003, p. 39). This is exclusively tied to monitoring environmental and physical effects, but not linked to social or systemic capacity to similarly emerge. In all uses then, the dominance of the techno-scientific, linear, physically focused problematization trumps knowledge and means of knowing that are emergent, and contingent rather than predictive and pre-emptive. This is particularly interesting given that the assertion which excluded the social as an object of knowledge was based on the claim that it was too hard to predict. As such, it is clear that the core epistemology of predictive knowledge is so entrenched that even where concepts like adaptive management and monitoring are included, they are very limited and occlude the detailed engagement with organizational change or organizational management associated with them ❘ and therefore limit the social not only as a subject that adapts but also as the object that adapts too. This enables a conservative form of socio-contextual adaptation whose political rationale is really one of resilience, and excludes a socio-contextual to socio-emergent problematization whose rationale of adaptation is transformative.

7.0 Supplementary moments: Emergent 'external' space

7.1 Non-constraining adaptation decisions and emergent space

The concern with systemic capacity raised by emergent time is matched by a concern with ensuring non-constraining decisions in space, within and between stakeholder organisations. Interviewee C's account of the origin and significance of avoiding adaptation-constraining decisions also demonstrated this

supplementary ontology, but was articulated in a similarly loose fashion. When asked why avoiding such decisions was essential, Interviewee C responded:

"I think we saw it as being good for society as a whole. [...] I always had in the back of my mind [that] if you're a developer, building houses in the flood plain, you don't really care what's [going to] happen in fifty years-time, a hundred years-time to those houses [...] so then who's interested in the [long-term]? [...] [In] the end does it matter in eighty years-time that the houses are worth nothing because they're being flooded every three years [...] – but it matters to the people who happen to be in them at the time, but if there's been a net benefit to society over the whole period, does it matter to society as a whole? And I don't think we ever really bottomed [...] that one out really [...] it depends on the criteria you're using to make all those judgments" (2009, p. 12).

This raises not only a question of the overarching political strategy of adaptation over time but also its relation to a communitarian or individualist ethos. Interviewee C goes on to note that the objective of the report was to enable individual stakeholders to assess their risk (2009, p. 13), and as such, it seems that the brief of the report acted as a limit point for the investigation of this topic, which echoes out into UKCIP practice, leaving this crucial question of temporal and spatial strategic objectives as a supplement.

Interestingly, the origin of these partnership forms was in part simply normative, arising from established modes of liberal governance, rather than rather than from the account of climate impacts as a product of irreducible uncertainty. As Interviewee H recalled, decisions "wasn't really coming from climate change [but instead from] how you make a good decision, that a good

decision needs to have the buy-in of those that are involved, and that are affected by it, so that sort of stakeholder emphasis that we put in" (Interviewee H 2009, p. 16).

However, non-constraining decisions do "have a kind of a climate change dimension because [...] adaptation actions that people take will also affect other people, and [...] because the issue of climate change is so invasive, and is so cross-sectoral [...] all of these interactions will be changing because of climate change, then that really means that it is really important that you think about those interactions as part of your adaptation planning" (Interviewee H 2009, p. 17). All of these aspects reflect an ontology of the social and physical world as a complex system.

This was tied in to an ontology of a complex social system through the concern with the individual stakeholder: "it was about trying to help people identify where other people's decisions were affecting their ability to deliver their objectives and that was really what we meant by an adaptation constraining decision" (Interviewee C 2009, p. 13). This is a liberal ontology in a Foucaultian sense: how can the myriad of individual concerns be asked to self-govern so that they can function smoothly as a population? Were there specific strategies built into the problematization of adaptation as a result? When asked about this, Interviewee C responded:

> "I think it goes back to the government issue [of who has responsibility for overseeing adaptation]. I mean we recognised that decisions are, you know, taken in... constrained blocks, whether by individuals or by institutions, and of course we have stakeholder engagement and dialogue which is about sort of reconciling those things, but in the end they're not

all reconcilable, so the best thing you can –you know you've got to be aware that it's a risk to you to try and influence it. But that influence is quite complicated [so at least] one needs to be better informed, and part of that was about better understanding where other decision makers were affecting your ability to manage your responsibility to deliver climate change adaptation in the future..." (2009, p. 13).

As such, it is clear that the report does establish a basic political logic that deals with a systemic ontology of knowing and building the trust necessary for such non-constraining decisions. However it characterizes these as merely adding complexity, rather than as foundational to the problem of adaptation or its political rationale.

7.2 External, sectoral networks

In the report, there are multiple references to external networks, including techniques for identifying these. "Whatever mechanism is chosen, it should involve a full range of stakeholders, including the decision-makers effecting or affected by the decision (see IEMA, 2002)" (Willows and Connell 2003, p. 19).

Crucially, Interviewee H notes "I wouldn't have said any of that [partnership activity] was driven by a specific tool [such as the risk framework], that was much more driven by the general activity of UKCIP" (2009, p. 9). Similarly, at the end of the research period, Interviewee F noted that "working in partnership is fundamental to UKCIP's approach" (2009, p. 7). The complexity of what this means in practice had been explored through the Regional Climate Change Partnerships that were established prior to the 2003 report, which were deliberately cross-sectoral in their approach, based on the formation of UKCIP in

1997 largely on the model of the stakeholder based 'MacKenzie River Basin study' in Canada (Interviewee H 2009; UKCIP Interviewee F 2009). As Interviewee H noted, "From day one at UKCIP the thinking was that we needed to be looking at integrated assessments of climate risks... I mean one of the first studies that got going under the programme called REGIS was deliberately an integrated assessment. So, the knowledge of cross sectoral issues was *very firmly* there from the word go and then it kind of spilt through here mostly in terms of talking about adaptation constraining decisions..." (2009, p. 18).

However, the organizational approach of the regional Climate Change Partnerships also addressed the 'solution' part of the problematization of adaptation in terms of social networks by implicitly creating a body capable of cross-stakeholder communication and knowledge production, and collective decision-making. Here the operation of UKCIP itself functioned in a facilitatory role to enable these networks to form and communicate.

The partnership model that was developed in the Regional Climate Change Partnerships was used elsewhere, for example in sectoral or Business Partnerships, as "it's a model for bringing people together, them understanding each other's needs, understanding or articulating their needs, and from time to time bring other people to actually hear those messages as a unified voice, which is obviously a partnership activity," and of course "negotiating" a combined approach too (UKCIP Interviewee G 2009, pp. 13-14).

As such, the partnership established the need for external links and coordination, and effected changes internally in as much as communicating to and coordinating with the partnership placed certain demands on the internal aspects of an organization. Local Authorities also tended to function in terms of

strategic partnerships (UKCIP Interviewee B 2009). In its latest manifestation, in a submission to the Climate Change Act's risk assessment function, UKCIP was clear that this required decision-making communities as a 'sustainable' way of adaptation, crucial to making tenable decisions (UKCIP Interviewee D 2009, p. 15). Within this they were concerned that stakeholders get "the right communities together," based on UKCIP's "principles of good adaption" getting those involved who are "interested and affected" (UKCIP Interviewee D 2009, p. 15). While UKCIP pose these questions, they can't impose them, but also recognize or assume that stakeholders tend to have this knowledge anyway. As such, there has been a fairly organic emergence of partnerships into affecting UKCIPs general mode of working and its principles of good adaptation which implicitly enable capacity. However, they still seem to fall shy of making capacity an explicit corner stone of adaptation. When asked about this, one author replied:

> "did anyone recognise that they needed to kind of change their organisational structure [?] certainly not to use [the risk framework]... [but] the much bigger picture about 'how is climate adaptation work being taken forward in the UK' [...] started with these regional groups [...] and as the groups got more complex and active they recognised that if they were actually going to make progress, they needed a coordinator of the group and a full time post in order to do that. So, that's when, if you like, organisational change started happening..." (Interviewee H 2009, p. 9)

However, UKCIP didn't work this into a particular account of the discourse of adaptation. One UKCIP staff member and former coordinator for the

South East Climate Change Partnership pointed out their lack of 'governance' at a substantive level: "[from] to 2001 to 2007... there wasn't a very strong understanding of adaptation. [Because] UKCIP was focusing more in the early days on understanding the impacts. And kind of leaving the next question to people to make up their [own] minds on [...] I can remember sort of a lot of head scratching really, at meetings at the Partnership [...] what kind of response is always quite difficult because, there weren't any examples" (UKCIP Interviewee G 2009, p. 6). Thus, while there is no denying that the interconnectedness of different stakeholders and their capacity to adapt as a result within and across sectors is picked up in the report in several ways, these are not developed, and are certainly not articulated closely with the concept of adaptation, either as a practice to reduce 'maladaptation' or respond to irreducible uncertainty.

An example of this limited account of the social aspects of adaptation occurs in the definition of 'system' and 'threshold' in the glossary – whilst these are included in the implicit account of the social, there is no definition or practice that works to recognize this explicitly. In the definition of 'system', the language is very scientific (Willows and Connell 2003, p. 111). The lack of an imaginary of social power and action means the report falls far short of providing a meaningful account of how to make the social elements of a system adaptive.

The exception is a comment in the report that "some tools are useful for identifying other decisions that could be affected by the decision under consideration (i.e. potential knock-on effects)" (*ibid.*, p. 13). It should be said that systemic considerations such as the number of decision-makers and 'knock-on effects' are noted in the brief 'Tools and Techniques section that follows, but this is limited to a couple of short sentences and a list of tools in Table 5. This is very

different to the level of detail provided in the section that follows on 'Stage 3: risk assessment', which has twelve pages dedicated to outlining the stage as opposed to an average of 3 to 4 pages per stage, with only half a page for stages 7 and 8. Furthermore, 'Knock-on' effects is a cognitive metaphor, conjuring up the image of rows of dominos falling, representing the 'kinetic' linear effects rather than 'chemical' emergence implied by complex power-relations.

The tool that most clearly responds to this latter imaginary this is AIDA the Analysis of Interconnected Decision Areas (*ibid.*, p. 13); this produces an image where connections are substantial. However, this receives no description in the main parts of the document and as such has no tangible effect on the problematization. In sum, whilst there is a sensitivity to network impacts, this is imagined as linked but still discrete areas.

The 'outsideness' of adaptation is also established through the title of the first sub-section, 'constraints,' refers to constraints on decision-making are listed in institutional terms, as criteria established through legislation or regulation by bodies that oversee the organisation or as the criteria of decision-making used by stakeholders. Crucially, awareness of these linkages is introduced in negative terms as a 'constraint,' and decision-makers need to be aware of these in order to make appropriate decisions, including the implication that they should question their appropriateness if they feel overly constrained by them. (*ibid.*, p. 14). What each of these moments, knock-on effects, AIDA, and 'constraints' do is establish systemic relations as negative limits, rather than as substantial and constitutive connections that enable action and change, and therefore adaptation as a process itself. This reinstates the basic modern linear ontology of the techno-scientific

problematization of agency, even as it draws on a socio-contextual ontology – or perhaps merely taxonomy - of the subject.

8.0 Supplementary moments: Emergent 'internal' space

8.1 Non-constraining adaptation decisions and internal emergent space

The non-constraining adaptation decisions discussed above, and the emergent time of events also resonate with an ideal of networked, emergent social space as an internal characteristic of a stakeholder organization. However, this does not occur even slightly within the report. Here the ontology of the discrete decision-maker discussed in the first half of this chapter seems so entrenched that the internal characteristics and complexities of the stakeholder body is simply occluded.

Changing one's existing objectives was also not mentioned in UKCIP's opening presentations to stakeholders in the observations. Whilst "altering" decisions as expressed in the report is far more acceptable and easily adoptable and therefore more politically and rhetorically astute, it was nonetheless recognized by some UKCIP staff during the interview that altering may simply not be sufficient. In stark contrast to the report and the official line, one member noted that "to be adaptive you also have to question whether...the original objective, the original business, is actually the appropriate one, and it might need to change, which is where the organizational change comes in" (UKCIP Interviewee G 2009, p. 17). Here, it seems that the internal ability to adapt entered UKCIP's discourse through the term 'organizational change,' which seemed in the interviews to be closely related to the addition of a new member of

staff whose focus this was, but who was not employed to work on that approach to climate change at the time. As such, the new conceptualization seemed to be seeping through indirectly, but was being taken up into discussion because it resonated with UKCIP experience. Although as we shall see in Chapter 7, by 2010 this had begun to be codified in a UKCIP report submitted to the Adaptation Sub-Committee (Lonsdale et al. 2010).

In all, a concern with internal social networks would imply an account of adaptation in terms of capacity, and as capacity to deal with irreducible uncertainty. However, whilst there is a definition of adaptive capacity in the glossary, this is not linked to the definition of climate adaptation itself, and furthermore capacity barely appears in the report's main sections or in the observations.

8.2 The current vulnerability approach

However, while capacity was not of explicit concern, understanding adaptation in terms of vulnerability was opening the door to making the stakeholder system the object as well as subject of adaptation and as such it was beginning to bring into focus its systemic capacity of communication, decision-making and action. As Interviewee F noted:

> "there have been a number of changes, methodologically in thinking in the whole field, and I think the whole issue of vulnerability is one that I think has come to the fore far more now, [...] if you have a vulnerability approach and look at people's current vulnerability which is kind of what UKCIP is endorsing, really, we're saying 'have a look at your current vulnerability and think how that might be affected, and also look at your

current level of adaptive capacity, think how well you can deal with these issues" (Stakeholder B Observation 2009a).

This signaled a shift from adaptation problematized as 'the' Adaptation (of a discrete moment of decision) to Adaptation as practice and as process, making *how* adaptation is done, rather than *what* decision is made, the potential focus. Such comments imply a nascent systems-based ontology that recognizes the specificity and contingency of each stakeholder system both externally and internally.

In particular, this occurs through the connection of the risk framework to the LCLIP approach, as discussed in Chapter 5. This experiential imaginary works from the perspective of the stakeholder, and engages their experience of trying to respond to a problem, as well as the climate event that may have initiated the problem. This moves the ontology of the problem from an external/future object-based event to an internal, present, experience-based process. In using Local Climate Impacts Profile (LCLIP) as a way of establishing current vulnerability 'plus' climate change through the risk framework, the subject as object is brought into the ontology of adaptation in a far more substantial way than occurs in the report.

The vulnerability approach, in tapping into recent experience, brought a much greater depth of understanding of the social contingency and system-awareness crucial to understanding not only the multiple, non-linear effects of climate, but also the complexities and contingencies of response, and the capacities needed to help ensure adaptation. As such, this introduces a much more substantial, experiential account of the internal system as UKCIP engages with stakeholders in the course of following through the risk approach. In

conjunction with the development of the location of the problem, there was also a realization that knowledge of the problem was likewise not necessarily concentrated in information about the climate but along the networks that caused/perceived/responded to the problem.

However, in practice, this was commonly discursively represented in this way: "if you've got a good understanding of how your current operations relate to the weather and the areas in which it's sensitive [...] you've got a much better chance of then being able to look at information about the future and having some sense of how that might affect you" (UKCIP staff member, Stakeholder B Observation 2009; p. 5; see also UKCIP Interviewee E in Stakeholder A Observation 2009, p. 1). This ties a present vulnerability account to the predictive, preemptive core problematization of adaptation, utilizing systemic capacity to account for the threat, but not necessarily developing it into a strategic account of the solution.

8.3 Networked space: internal characteristics of an adaptive organisation

If the stakeholder system becomes in part the object of adaptation, then the question is whether particular characteristics of this are problematized as beneficial for adaptation. There are a series of examples where such supplementary moments occur: 'Key Questions for decision-makers at Stage 2' (Willows and Connell 2003, p. 16). As a whole, this section comes closest to the question of 'strategy' that might be implicit in a generic account of adaptation or adaptive capacity. This is a text box that covers the "rules for making the decision, given the uncertainty in climate change" which includes "the decision-making culture of the organization," how "open and explicit" this is, the role of

"different stakeholders" and "'consensual' over 'demonstrably rational'" choices; whether the decision might "constrain" adaptation elsewhere, noting that it would then be ideal to include these stakeholders in the process at this stage; the validity of any existing strategic decisions about climate change given climate change uncertainty (Willows and Connell 2003, p. 16). All of these are colossal, politically fundamental issues that radically shape the overall adaptation strategy of an organisation, and thus its account of adaptation as such. However, in avoiding dealing with these questions in detail, specifically in terms of any processual guidance, is a testament to UKCIP's evasion of these issues in its core problematization of adaptation.

As is highlighted in the 2005 internal review, risk assessment, or Stage 3, formed the core of their practice prior to 2005, and steps 6-8 which focus on making and implementing and reviewing decisions, remained largely under-investigated (Harman et al. 2005, p. 254). Implicitly, both risk assessment and adaptive management lead to good decisions through learning and education about the system as an object of knowledge, but this is not investigated at all, and as such it's clear that there's been little thought put into organizational learning and change up until 2009 in the report or in UKCIP practices.

When discussed with the key report authors, the major limit to the inclusion of these concerns was noted as: "the problem for us was that none of these problems are specific to climate change adaptation, [so our concern] was getting the balance between the focus on climate adaptation and [...] the more general business of making good decisions" (Interviewee C 2009, p. 20). It is clear that this balance was resolved by 'signalling' several issues, but not investigating them at all, and certainly *not* integrating them in a thorough way. This explains

their presence as supplementary moments, but as such also has the effect of limiting their validity and impact on the problematization of adaptation as a whole.

However, there is a different level of engagement with the internal nature of the organization in the report and in practice. In the observations of UKCIP-stakeholder engagements, it was clear that UKCIP staff deliberately set up meetings in order to encourage a wide variety of decision-makers within an organization to participate in a 'flat' way, in order to maximize the information available to all of them.

All the stakeholder meetings observed or recorded functioned through the use of a kind of open brainstorming session of a "steering group" of top management. In a sense, this is the internal reflection of the partnership approach – ideal is to generate shared objectives, clarifying the same objectives (Interviewee F, Stakeholder B Observation 2009, p. 3). This overtly is to ensure that the risk assessment is as precise as possible, and to allow for priorities to be set, but this process is essential in achieving that, and as such is an implicit aspect of the problematization, but without focus. Although increasingly overt in UKCIP practices: "the key question is to make sure that we've got all those people involved in the process" (*ibid.*, p. 4). This is linked rhetorically to the need to identify drivers and barriers to adaptation work (*ibid.*, p. 9), implying an awareness that the actors involved play a key role in ensuring the capacity to adapt, thus an implicit *social systems* awareness as the basis of the problematization of adaptation as a practice.

The wide representation of operational heads to get a sense of how the organization works as a whole, functions through the practice of the actual

meeting itself, the sitting and communicating together. As one staff member stated to a stakeholder steering group "there's a really wide range of different things included in this [risk assessment], and that's partly why we've got this range of people around the table so hopefully you've all got some experience and knowledge to bring to it" (UKCIP Interviewee E in Stakeholder A Observation 2009, p. 2). Similarly, Interviewee F notes that "it would be great if [each business area representative] could each [complete the assessment] with a little sub-group within their own organization" (Stakeholder B Observation 2009b, p. 1). This higher-resolution social information that was created through the vulnerability approach coupled with these practices to create a broad and detailed picture of organizational complexity and contingency. Although not explicit, this enables better communication and understanding of adaptation as a social problem.

Chances to make this explicit were not taken up. While the Business and Climate Change Assessment Tool, BACLIAT (Metcalfe et al. 2009) approach does break down a business into key areas of logistics, people, premises and finance, the internal organizational aspects of these areas and how they relate to each other or can be communicated to each other are hardly acknowledged or invested in, evidenced in the lack of terminology or tools staff have to describe these parts of the process. This means that although these comments are present and the meeting format jumpstarts the process, the values based on the systems ontology behind them, are not enabled to work effectively to elicit information and ensure communication. As such, it is assumed that the information brought to and expressed in the meeting is objective, accurate and comprehensive,

without understanding the power/knowledge effects of the meeting and its participants and context.

Another supplementary aspect of these collective exercises is that a collective account of the problem is produced. For UKCIP, this is represented as generally being about ensuring accuracy, although it recognizes complexity as the reason for inaccuracy. As Interviewee F put it, "some of the more interesting and challenging impacts or consequences [which are] the indirect ones[,] you'll probably only pick up working in consultation with other people" (2009, p. 7). This is couched as a means to an end in UKCIP's discourse, in terms of enabling an accurate sharing of knowledge for the risk assessment. As such, UKCIP asks for a broad spectrum of decision-makers within an organization. For example, asking for existing 'steering groups' and is concerned with how broadly based these are (Interviewee F in Stakeholder B Observation 2009b, p. 2).

A supplementary value of this is that when individuals move out of the group, they have the common understanding of what it is they are trying to achieve, and a stake in that collective enterprise (Stakeholder B Observer 2009b, p. 2). This builds trust and collective endeavour, essential to building and maintaining systemic adaptive capacity (Adey and Anderson 2011). Moreover, this search for clear and common goals is something that can often be drawn out more effectively in an informal, verbal, collective process, such as that established by UKCIP's stakeholder meeting format during the risk-assessments observed.

This appeared to be a largely implicit ethos of adaptation management, and seemingly resulted from the practice of UKCIP engagement with stakeholder organizations over time. However, it may also have been a reflection of the

difference between official and unofficial forms of communication. Where UKCIP was unwilling to put an organization off by appearing too invasive, but, having got an organization to 'bite' was then prepared to advise in a more unofficial way that as many components of the organization as possible be present in order to ensure better information sharing, collective decision-making and hence better decision-making.

This implies a supplementary ontology of the subject and its agency as systemically enabled, which is very far removed from that of discrete decision-makers making a decision at a discrete moment in time. Here, adaptation agency is seen as a distributed property of numerous actors in a network and their relations with one another which therefore need to be coordinated for a good decision to be made. A frequent offshoot of problematizing in this way is that the complexities of implementation become part of the decision-making and decision-option itself in a much greater level of detail. This was observed particularly clearly in one of the stakeholder meetings (Stakeholder B Observation 2009a, Stakeholder B Observation 2009b). This moves the systemic ontology from the account of the problem to the account of the solution, and makes the subject also the object in the problematization of adaptation.

In the interviews, it was clear that there was also a formal distinction made at UKCIP between adaptation actions and capacity building. In Part 1 of the report, when mentioned, capacity building had been tied to knowledge-sharing, largely in the form of one-way dissemination of knowledge about climate change from UKCIP to stakeholders, although it does receive a more substantive review in Part 2 (Willows and Connell 2003, p. 70). However, when pushed about the difference between process and capacity, the same interviewee noted: "I do see

the main thing about adaptation as being primarily as it were an institutional capacity building issue to [...] engage in that process rather than [do] particular things. Crucially when questioned about how this related to the risk document, which could be read as reiterative but nonetheless quite piecemeal, it was agreed that "I think I [...] would be more fuzzy [...] about it in terms of capacity building in an institution because you do make decisions, but those decisions will very often not be one off ones. Um, and sometimes we don't make that particularly sort of specific [...] and maybe we should do." (UKCIP Interviewee A 2009, pp. 16-18)

However, the concern for who is involved in internal networks discussed above intimates a growing concern with the way in which agency within an organization functions to produce capacity. What is interesting however is that this was beginning to manifest as an awareness at UKCIP that internal agency and structures and culture mattered to adaptation. Despite the non-intervention policy, it was suggested that "if there are any significant things where the solutions seem to be outside your influence then it becomes more about working with the right people, and finding the points at which you do have influence" (UKCIP Interviewee E in Stakeholder A Observation 2009, p. 6). This was followed by the comment: "that might not change where [the risk] appears [...] but it would change what you can do [about it]" (UKCIP Interviewee G, Stakeholder A Observation 2009, p. 6). Crucially, both of these quotes demonstrate not only an awareness of the need to utilize and alter internal relations to ensure capacity, but the fact that the risk assessment does not provide the answers to where or how to do this, despite the necessity of these actions for adaptation to be carried out.

UKCIP's questions to 'Stakeholder B' participants demonstrates a particular concern with this, partly arising from the nature of the stakeholder itself: "what are the features [or] characteristics of your organization that have allowed so many actions and so many responses to happen so quickly?" (Interviewee F in Stakeholder B Observation 2009, p. 10); "you're [...] a very responsive organization that can deal quickly with things that happen to you, and you've got a pretty good handle on what you need to do to respond to these weather events, one would hope that that would give you quite good capacity to respond to the impacts of climate change" (*ibid.*, p. 10). This is the first time in either the observations or interviews that the words 'responsive' and 'capacity' surface independently and where they are also linked to climate change, albeit via weather events. As such, it is the first time that the nature of agency, and implicitly, how to ensure or produce that, becomes an object in the problematization of adaptation, rather than seeing it simply as a characteristic of the subject that either enables or constrains adaptation as a precondition.

As such, it seems clear that capacity has been limited by the report's risk-based problematization of adaptation as discrete in space and time. However, although it is being imagined more broadly by UKCIP staff, and implicitly underpins how they assume the process to function, capacity is it is far from being overtly recognized, much less the core referent of the problematization of adaptation itself.

This tension over the flexibility in decision-making structures was demonstrated across the organization and seems to be best summed up here by the head of the Science Team:

"if you look at some of the barriers to adaptation, they are often [...] related to the organizational structure [...] There are a lot of people who believe that one of the barriers that we have to adapting well is the fact that our policy and our decision-making frameworks are insufficient to deal with [...] the rate that we're going to have to change [at]. [This arises because] the expectation is that policy is structured as if we're in a static environment and the need [to] change the way we evaluate that and the nature of that policy [...] because it's not flexible enough [...]" (UKCIP Interviewee D 2009, p. 5).

This clearly suggests that UKCIP was beginning to grapple with institutional, organizational structure and capacity issues by 2009, but that it had yet to establish this in their problematization directly, and codify this in policy and their tools. Where this had become part of its discourse, it seemed to be limited to the account of the threat, but not necessarily worked through into the political rationale, with a substantive account of capacity as established through trust, communications and flexibility as the solution.

Again, this hesitation in intervention is related to the same liberal principles and government remit that structured UKCIP's role: "We cannot do more than identify when we're working with people [...] some of the barriers [...] to try and help them to understand [their] existence, [but] we don't consider it our job to say, 'ok, you've got to eliminate that barrier,' they have to decide [that]" (UKCIP Interviewee D 2009, p. 5). This awareness of a role in organizational change but tension in its extent was thus clearly coming to the surface in 2009. If the links are followed between organizational accounts of the threat established in terms of vulnerability, and the need for flexibility in time

and space indicated by non-adaptation constraining ideals which crucially is understood to entail an account of capacity as the solution, this begins to posit to the possibility of a supplementary problematization of adaptation in terms of organizational capacity.

9.0 Conclusion

The ontology that is produced in the report, and which to a large extent remained in the core problematization up until 2009 demonstrated a generally centralized, discrete account of the social in time and space, although with clear awareness of the stakeholder as located within a wider system. The climate science based origin of the problematization of adaptation had clear implications for the ontology of agency in relation to time. The 30-year forecast of the scenarios generated a norm of pre-emptive responses, or 'planned adaptation' as the ideal form of adaptation, particularly when this emerged out of an environmental management origin that focused on ecosystems and major physical infrastructure.

However, although this mode was dominant it clearly is in tension with the supplementary epistemology based on irreducible uncertainty and calls for an emergent mode of adaptive management and non-constraining decisions. What is interesting is that there is almost no substantive account of the subject to enable this at an ontological level in the report. The interviews make clear that after the report there is the emergence of an account of adaptation as a process, signaling a shift from adaptation problematized as 'the' moment of decision to adaptation as practice and as process; in other words, *how* adaptation is done,

rather than *what* decision is made, starts to become the focus, particularly in the Local Authority field under the remit of National Indicator-188, and in the practice of risk assessment through the LCLIP vulnerability-based approach.

To understand why temporal emergence remains as a supplementary moment, the account of the subject and agency as it appears in the report and in the wider UKCIP discourse needs to be considered. In the report, subject and agency are made fairly discrete in several ways. First, through the limited investigation of what constitutes a 'decision-maker' and how decisions are made and implemented. Here risk-based decision-making is seen as a science rather than a social phenomenon, and as such ignores its embeddedness in social practices, which provide normative meaning or values.

Second, through the general exclusion of the social as an object of knowledge, particularly as an emergent object of knowledge. That is, the social is seen as a static or unknowable variable to be added into the equation, rather than structuring the form of the equation itself. Third, the subject and agency are left discrete though the classical liberal norms of non-intervention and UKCIP's desire to appeal to stakeholders by being non-invasive. Together, these mean that the internal nature of the stakeholder system, and to some extent its external imbrication in other networks, is not officially investigated. Crucially, the result is that although the decision maker and the stakeholder organization are overtly the 'subject' of adaptation in the sense of acting on it or for it, they are not brought into the core problematization as a 'problem' or object of adaptation themselves. The result is that the problematization of adaptation tends to be located at the surface of the stakeholder system, and limited to direct

engagement with physical impacts and objects, such as floods and flood defences, or flood damage to infrastructure, buildings or goods.

However, by the time of the interviews and observations these supplementary moments implied in non-constraining decisions and keeping options open clearly were being extended, most importantly to the account of the internal characteristics of the stakeholder organisations. This intimated consideration of organizational capacity to account for both threat and capacity for organizational change to account for the political rationale and solution.

In sum, there is clearly a very stable presence of supplementary moments here that if anything increases in visibility over the research period. If taken together, these supplementary moments of the emergence of time as a product of (social) networks, and the emergent nature of these networks themselves, clearly offer the foundations for a very different problematization of adaptation based on irreducible uncertainty and emergence, where capacity and communication of the social as both subject and object of adaptation become the central strategic objectives. This is particularly so if they are taken together with the supplementary epistemic moments noted in Chapter 5. This supplementary problematization as a whole, and its implications, will be explored next, in Chapter 7.

Chapter 7: The complementary or dangerous supplement? UKCIP's emerging problematization of adaptation

"Uncertainty is the only certainty there is, and knowing how to live with insecurity

is the only security." ~John Allen Paulos

1.0 Introduction

This chapter draws together the analysis of UKCIP's discourse of adaptation that was established in the last three chapters and develops an account of the significance of the supplementary moments for the core problematization of adaptation. First, the following section, 2.0 summarizes the findings so far and frames them in terms of the general problematizations established in Chapter 1. Section 3.0 then uses the discourse theory and analysis introduced in Chapter 2 to develop an account of whether UKCIP's combination of a hazards and vulnerability approach is in fact complementary as Fussel suggests (2007, p. 270). Section 4 develops the implications of the 'dangerous supplement's' inherent potential to create a supplementary problematization and challenge UKCIP's problematization as a whole. It then discusses the political implications of this and the potential for the emergence of a supplementary problematization at UKCIP in 2009. Finally, Section 5 discusses the effect of the continued occlusion of the supplementary problematization on the wider UK discourse of adaptation, particularly in light of the fact that UKCIP no longer delivers the official government adaptation programme. As such, it questions whether the lessons learnt by UKCIP on the need to supplement its problematization might

become lessons lost to the wider UK discourse, and what the implications of this are for adaptation in UK. Section 6 then summarizes this chapter.

2.0 Summary of thesis argument in preceding chapters

2.1 The relation of UKCIP's problematization to established adaptation frames

To return to the theoretical approach defined in Chapter 2, adaptation, like anything else, is a mirage of reason (Derrida 1976). There is no accounting, no presence to find and define, no single name that would account for adaptation. So in defining adaptation, one begins the chain of signification that constitutes the meaning of the sign 'adaptation.' While this thesis has moved beyond the concept of a 'sign' to the broader concept of a 'problematization' the point remains the same: what in UKCIP's problematization is seen to constitute 'nature' or an account of the essential 'truth' of this sign 'adaptation.'

This account of the 'truth' has been called the 'core problematization' here. Once this is identified, it is possible to distinguish what functions as the 'supplement.' It is important to note that the presence of the supplement allows the core problematization to retain validity when its own content cannot do the work the sign is meant to do, thus enabling the continued validity of the concept (Derrida 1976) or problematization. As discussed in Chapter 2 the supplement only remains as such so long as it is articulated as subsidiary to the core, through being referred to, for example, as temporary, exceptional, additional or even as included through being overtly excluded. If it is not maintained as subsidiary or excluded completely, the supplement's presence undermines the purity and validity of the core, threatening to supplant it.

The core and supplementary moments are more easily identified in their conceptual distinctiveness through the use of the theoretical framings of adaptation that were established in Chapter 1. These were divided into three basic accounts. The first was 'techno-scientific', deriving from a hazards and impacts-based approaches that identify biophysical environmental threats, which was based on objective scientific knowledge and physical objects of concern (Burton et al. 2002, Fussel 2007, Fussel and Klein 2006, O'Brien et al. 2007), with a political rationale that was resilient in the sense of seeking functional persistence (Pelling 2011).

The second was called 'socio-contextual' and drew on the wider social and economic sources of threat identified by a vulnerability-based account (Eriksen and O'Brien 2007, O'Brien et al. 2007), and found its solution and political rationale in the improvements to existing systems enabled through 'transition' (Pelling 2011). The third account, called here a 'socio-emergent' account has received the least engagement to date. It takes as its source of threat not the limits to the existing system or the known biophysical threats, but instead the system itself as the source that constitutes and mediates all threat. As such, its political rationale functions on an ontology that explores and demands the willingness and capacity of the system to change itself fundamentally, and works to constitute the potential for 'transformation' (Pelling 2011) or emergence from one system state to another.

The preceding chapters have identified UKCIP's 'core' problematization as clearly based on a techno-scientific problematization. In the account of the threat to which the political rationale responds the focus on scenarios demonstrates a hazards and then impacts-based ontology, which includes the stakeholder only

insofar as they directly interface with these events. This is established epistemically through the risk-approach, exemplified through terms such as 'receptors' and 'risk-assessment endpoints.'

With such an outcome-oriented ontology and epistemology, much of the focus of adaptation action comes in the form of the risk assessment itself. However this assessment is geared towards inclusion in the existing decisions that need to be made by the organisation. As such, the political rationale of this problematization is the alteration of existing decisions to take account of scientific information. Crucially the making of this decision is assumed to be discrete in space and time, owing to the exclusion of the consideration of the complexity and contingency of social formation. The decision made has as its objective the unexamined existing objectives of decision-maker as the representative of the stakeholder, and is fundamentally conservative, fitting the 'functional persistence' account of resilience discussed by Pelling (2011, p. 55).

This framing was represented by one UKCIP staff member as follows: "we tended to treat adaptation as a fairly kind of value neutral activity, i.e. as a sort of mechanistic – well, [...] systematic approach to evaluating risks an responding to them, and we have tried as it were, to steer clear of the implications of it [...] we have said that [...] effectively, that adaptation doesn't have objectives in itself [...] adaptation is to enable you to achieve your existing objectives, or perhaps your on-going and changing objectives..." (UKCIP Interviewee A 2009, p. 7). This clearly demonstrates a conservative political rationale of resilience in the sense of maintaining existing values, occluding any deeper consideration of the value ethically or in terms of pure efficacy.

In some senses, UKCIP could be said to barely fit into the resilience model of climate change, particularly at the level of the individual organization. While there was some concern for connections to other organisations, this was largely understood in a kinetic sense, represented through the cognitive metaphor of 'knock-on effects.' Here again, the problem is represented as an outcome rather than a process. As such, there was limited conceptual room given to these relations as multi-directional, constitutive flows of power and knowledge.

The occlusion of these elements was even more marked internally, where there was limited cognizance of the social relations that constituted the stakeholder organization itself, meaning that the basic 'systems thinking' approach of "social learning and self-organisation" was a side effect of the risk assessment, rather than integrated or central objective, and thus not included within the core problematization (Pelling 2011, p. 55). In fact, Pelling's summation of the contribution of cybernetics to adaptation effectively sums up the core problematization exhibited by UKCIP: "Analysis of adaptation was trapped at the level of information access, transmission and decision-making apparatuses. Deeper social relations of production and power were not included" (Pelling 2011, p. 27).

However, this core problematization was supplemented by a series of moments that effectively introduced elements of a socio-contextual problematization. Specifically, these included the articulation of a vulnerability-based epistemic mode to the risk assessment, through the use of the Local Climate Impacts Profile. This used socio-systemic information for the assessment of risks. However, it was only used in conjunction with scenarios in order to aid their imaginary and not vice versa.

Nonetheless, the use of the LCLIP had ontological ramifications, represented by some references in the meetings with stakeholder organisations to the need for wider inclusion in the risk assessment process, implying a systemic account of the organization. There were also direct indications of the need to enable communication and trust to form capacity to assess and develop decisions. However, this did not extend into a formalized account, and as such these moments remained supplementary through their vague, informal articulation. This minor level of inclusion did not extend to a need for a transformational account of adaptation except in the few occasions were UKCIP staff remarked that this was in fact what their problematization stopped short of, that is, that they avoided any overt or deliberate intervention into the organizational structure and did not push for organizational change either to enable certain decisions or as a central principle of adaptation itself.

The most significant of these supplementary moments appeared in the concepts of "flexible decisions" and "keeping options open" and "avoiding knock-on effects." These not only implied a social, qualitative epistemology, but the assumption of irreducible uncertainty, which undermined the assumption of prescient and objective knowledge and its access to essentially linear time. This disrupted in turn the pre-emptive, planned political rationale that assumes decisions that were temporally discrete.

As such, although they increased in appearance from the report in 2003 until the observations in 2009, the supplementary moments were nonetheless still resolved by being rearticulated linguistically into a conservative problematization that is, at its core, techno-scientific. Although it incorporates some socio-contextual elements, its political rationale is fundamentally resilient

in sense of maintaining existing objectives. Thus it is only incidentally transitional, as some staff members put it 'tinkering at the edges' while ensuring functional persistence. In sum, the core rationale of the problematization is 'altering decisions' pre-emptively (on the basis of scientific-based risk information) to ensure functional persistence.

By contrast, the alternative problematization suggested by these supplementary moments has a political rationale that is transformational and based on an ontology of irreducible uncertainty. Here the subject is understood as able to change and the solution to the threat of uncertainty lies in this capacity, such that capacity to change becomes the core referent of the problematization of adaptation. The table below demonstrates this range of actual and potential problematization within UKCIP's discourse, in relation to the frames identified in Chapter 1. UKCIP's core problematization is marked out in bold, and its supplementary moments are included in bold but appear in grey to demonstrate their limited articulation. Most significant here for determining the core problematization is the political rationale, which helps identify with which general frames of adaptation UKCIP sits most closely.

Table 7.1: The relation of UKCIP's problematization to three theoretical framings of adaptation

Characteristic /element	Techno-scientific Problematization [Hazards/Resilience]		Socio-contextual Problematization [Vulnerability/Transition]		Socio-emergent Problematization [Capacity/Transformation]	
	Epistemology	Ontology	Epistemology	Ontology	Epistemology	Ontology
Time	Linear, prediction-sciences; global circulation models	Knowledge of the future is accurate, objective (prescient), linear	Understanding rather than accuracy; generated from social context	Largely predictable future, but with a sensitivity to the social future as well	Communication of real time and emerging information	Emergent, evental time to account for threat but also for emergent solution
Space [subjects and objects]	Climate science, extended through risk calculus	Focus on biophysical, extending to physical products/processes; Exclusion of the social as object; Limited account of social as subject	Study of social and political contexts; Communicative and social learning practices	Social networks and contexts should be known	Knowing through flexible, flat relations; Increased awareness reflexive knowledge processes collectively and individually	highly connective and contingent networks; focus on the internal social as well as socio-ecological relations, in current and potential forms
Action/ Agency	Seek increasingly accurate science of prediction and impacts, perform risk assessments, 'black-box' decisions	Kinetic relations: power assumed to be immediate and a property of named, discrete actors.	Collaborative knowledge sharing to account for threat, and make decisions	Network society, including social capital considerations	Knowledge is collectively produced, and always changing	Ensuring communication and trust; Willingness to change and cooperate
Political rationale	Adaptation is ensured through finding better knowledge...	...and deploying that knowledge: Planned, linear, kinetic; agency is assumed; strategy based on current knowledge	Adaptation is based on better communication amongst connected stakeholders for better account of threat and solution...	...and this enables engagement with the real problems and enables buy in to the solutions	Context of irreducible uncertainty means that sensory awareness and clear, real-time communication produce the necessary knowledge of threat...	...as well as the means to (re)establish flexible, flat, network, building trust to facilitate collective decisions, enable substantial risk taking/change, carry out action.

In the period that was actively researched, 2002-2009, the supplements indicated above clearly served a subsidiary function to the core, usefully extending it when it couldn't 'cover over' the epistemic and ontological 'gaps' in order to account for or enact adaptation. In doing so, they appeared to demonstrate par excellence the complimentary use of hazards and vulnerability approaches that Fussel referred to. However, as indicated above, the articulation of these alternative elements as supplements limited their substantive meaning and their effect on the problematization as a whole, particularly in terms of its political rationale. This makes the assumption of complementarity open to question, which will be discussed further in Section 3.0.

2.2 On the supplement and practices, and limitations of the research

One particular realm in which the supplement seemed to emerge and play-out most easily was in UKCIP's practices. Within a Foucaultian account of discourse practices are as important a facet of discourse as the linguistic. The example given above and in Chapter 6 of the request to involve as many staff as possible also made clear that without these supplementary moments, the objectives of the core problematization would be harder to reach. There is a clear resonance here with the tension in rationale demonstrated between 'shadow systems' and formal policy where the former nonetheless are essential to enabling the success of the latter, in this instance by providing informal adaptive capacity through their social networks (Pelling et al. 2008).

It is precisely because meetings, in their more intimate and immediate performance, lack overt codification that they become useful entry points for the supplement, as this makes them much more 'open' discourse events. These are of course still shaped by disciplinarily power/knowledge that is produced through

UCKIP products, such as the tables which stakeholders fill out for their risk assessments, which direct them towards answering a specific set of questions. However, to be supplements, discourse events must be 'sedimented' to some extent, as Laclau and Mouffe might term it (Laclau and Mouffe 2001, Torfing 1999). This could be established through disciplinary practices, such as staff training. In the context of UKCIP's use of its technical literature to frame its work, and the wider dispersal of this material beyond UKCIP's own practices, such codification seems most significant where it is established in written form in UKCIP's reports and other literature. Of course, this does not preclude that UKCIP's supplementary moments might not sediment with their stakeholders who see their meetings as a representation of their problematization (Star and Griesemer 1989p. 393), although this direct audience is far more limited than that of UKCIP's published material and therefore its wider discursive effects are also more limited.

Nonetheless, this returns us to a more general theoretical question broached in Chapter 2 as to the validity of linguistic and particularly written discourse events in assessing UKCIP's problematization. It is noted here that the engagement with these practices, such as UKCIP's work with stakeholders, was limited in the research, both over time and in its range of organisations. As a result, a thorough representation of UKCIP's problematization of adaptation is impossible here. As discussed in the methodology chapter, the objective of this research was to account for UKCIP's own problematization in linguistic terms: first because of its central place in the discourse network as discussed in Chapter 1, and second because at the stage the research was being carried out this was really the only form it took, and the limited material practices such as the format

of interactions and presentations was taken into account, and furthermore the material impact of the risk-assessment is that it is in itself a structure that guides behaviour.

As such, UKCIP's central place made its own problematization the focus of research, with the result that further practices at local sites fell outside of the research project as the imbrication of power/knowledge relations at particular stakeholder sites would inevitably shift the problematization of adaptation to some extent. Clearly however, a full account of the problematization adaptation would require engagement with these 'local sites' (Foucault 1998) including the governance effects of UKCIP's tools, particularly now that those projects have reached a much more developed stage. As they were only in their initial phases at the time of research, this demonstrates a clear direction for further research which could take advantage of these newly completed case studies.

3.0 Complementarity and the function of the supplement

The discussions of the constituent elements of UKCIP's problematization as both core and supplementary moments recalls Fussel's comment that many climate change adaptation programmes, including UKCIP's, combine a "complimentary" hazards- and vulnerability-based approach (Fussel 2007, p. 270). Reading the function of the supplement together with the categories and rationales of techno-scientific resilience and socio-emergent transition provides us with a much more precise set of tools through which to unpick the specific elements and how they are articulated together. This is because supplementary moments are (re)produced as such by the manner of their articulation to the core

problematization. Therefore the nature of this articulation determines the nature of the 'complementarity' of the general problematizations of adaptation that they might reference, such as vulnerability, transition or transformation. This enables us to investigate precisely how this complimentary use is achieved at the conceptual level, and whether 'complementary' use equates to the 'comprehensive' or 'coherent' use of both frames. The answer will not only identify which problematization type is most influential, but will also indicate what effect this complementary use, enabled through the articulation of the supplement, has on the stability of UKCIP's problematization of adaptation and its potential for change.

We have learned in Chapters 4, 5 and 6 that the articulation of elements from a techno-scientific frame and a socio-contextual frame into a single problematization was contingent upon historical power/knowledge relations. In Chapter 2 is was established that, in order to articulate the supplement to the core to give it 'fullness,' the manner of that articulation meant that certain aspects of the supplementary moment were shut down, such that they also functioned as 'limit-points' (Derrida 1976) for the problematization as a whole. In this respect, the different frames certainly cannot be regarded as complimentary if this is assumed to mean both are included equally and fully, as through being articulated together the epistemology of one trumps the epistemology of the other. This was seen in Chapters 4 and 5 with the rendering of social knowledges from qualitative into quantitative terms, as well as through the tension and ultimate failure of the socio-economic scenarios to function as a heuristic device in the context of the desire for qualitatively calculable outcomes.

At an ontological level, we saw that the epistemology of the 2003 report entailed an imaginary of the subject as a discrete decision maker, whose actions and agency were defined by the moment of decision. This restricted the room available for the exploration of both agency and decisions as emergent in formation and implementation, and limited the concept of adaptive management to a cyclical imaginary rather than an emergent one. However, the advent of the LCLIP-vulnerability approach indicated that a more socio-contextual imaginary was forming. While this was primarily directed at an epistemic level of better accounting for the impacts of an external threat, it entailed an awareness of the systemic function of the stakeholder systems and also implied changes to this system to make it 'flatter' for the purposes of sharing information more effectively. As such, this adopts elements of a socio-contextual and even socio-emergent account of adaptation, but crucially articulates them to the service of the core techno-scientific problematization based on a hazards/impacts approach that sees the origin of the threat as external, rather than internal. As this indicates, it is the articulation of the political rationale that is the crucial determinant of whether these different frames are fully complimentary. As Pelling (2001) points out, there is a crucial difference between an account of adaptation that seeks functional persistence and one that is prepared to change, identifying its own nature as part of the problem.
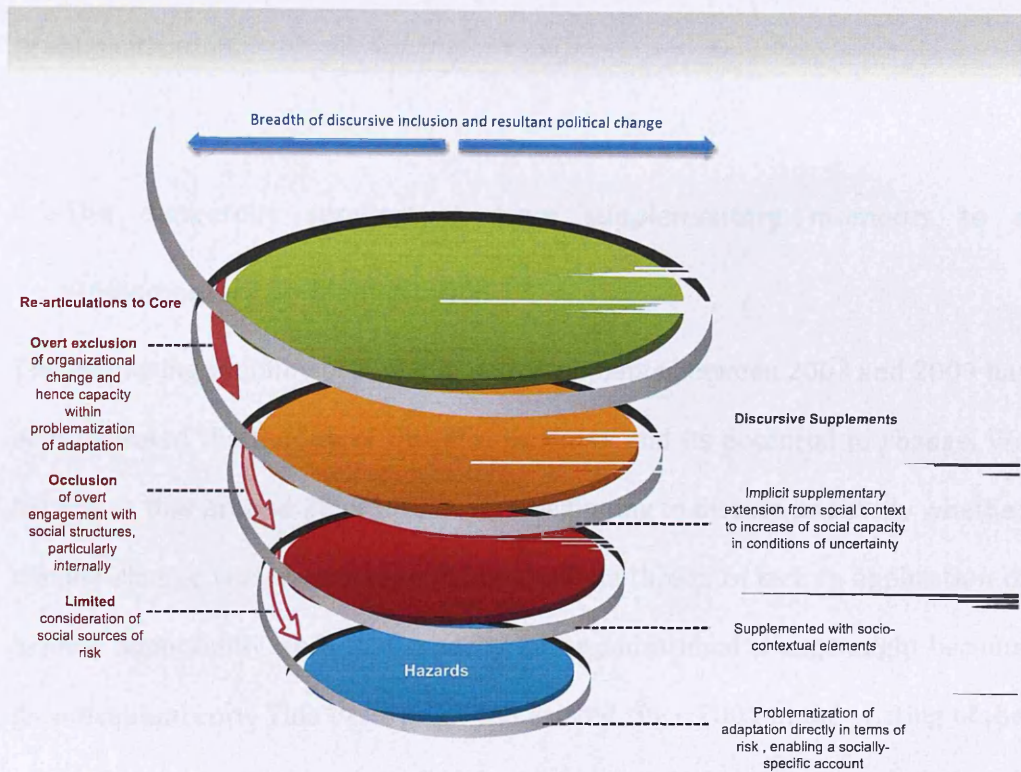
Nonetheless, the introduction of aspects of a vulnerability approach entailed awareness of the social body, use of social forms of knowledge, and the need for particular capacities to gather and communicate this knowledge. Although this was not UKCIP's intention, this entailed a re-thinking of the political rationale whereby the subject of adaptation also became the object of

adaptation: as vulnerability as the account of the problem implied a political rationale of creating capacity of the social system, which in turn rendering transition and possibly even transformation, as logical objectives. Although this was not formally adopted by UKCIP, this implication emerged most clearly in their internal discussion over whether it was right to intervene in organizational practices. The limited intervention that arose through the process-based National Indicator 188 also created an alternative political rationale based on building capacity without having to retain entrenched objectives.

However, the tension over whether such interventions should occur demonstrates that organisational change and deliberately building systemic capacity was clearly at odds with the 'functional persistence' rationale demonstrated by UKCIP's entrenched regard for 'existing objectives.' This tension resulted in practice in differences between what staff felt able to write formally and what they felt able to say informally and between explicit instructions to stakeholders and implicit ones. This in turn recalls Foucault's rule of the 'tactical polyvalence of discourses,' but what we have seen is that this tactical polyvalence as a representation of 'complementarity' that is far from comfortable or easy, that only works through articulations that limit even as they connect, which in turn must constantly be re-harnessed in order to function together. In UKCIP's specific case, we have seen this process means that this complementarity is established through the articulation of the techno-scientific account of adaptation at the core of the problematization such that socio-contextual elements are articulated in a subsidiary form as supplements, which limits the values they can introduce as well as their validity and reach.

This function of the supplement as extending core yet being limited from achieving 'fullness' itself, is demonstrated in the diagram below, in figure 7.1. It shows the specific supplements that extended UKCIP's original, hazards-based problematization to the wider, techno-scientific problematization via risk (indicated by the upward grey spiral), and the subsequent function of other supplementary moments including vulnerability elements (indicated by the upward grey spiral). It also shows how the latter element was rearticulated (the red arrows, deeper in colour for stronger re-articulations) as a supplementary moment to the techno-scientific 'resilient' core through limitations of the socio-contextual elements that could be included, particularly regarding internal capacity. This last aspect is even more strongly rearticulated when an attempt is made to move beyond a socio-contextual approach to socio-emergence, in a series of dramatic rearticulations which occurred outside of the research period, but which will be briefly discussed in section 5.

Breadth of discursive inclusion and resultant political change

Re-articulations to Core

Overt exclusion
of organizational
change and
hence capacity
within
problematization
of adaptation

Occlusion
of overt
engagement with
social structures,
particularly
internally

Limited
consideration of
social sources of
risk

Hazards

Discursive Supplements

Implicit supplementary
extension from social context
to increase of social capacity
in conditions of uncertainty

Supplemented with socio-
contextual elements

Problematization of
adaptation directly in terms of
risk , enabling a socially-
specific account

This constant pulling in and away of the supplement is precisely what renders it not only useful but also 'dangerous,' as Derrida put it (Derrida 1976, p. 163), as every action to render it subsidiary must recognize its potential to supplant the core moments of the problematization, and therefore the problematization as a whole. Thus 'complementarity' is marked by constant tension, and the constant potential of being undone. The next section will discuss this latter aspect, and the potential of these supplementary moments in UKCIP's discourse to become dangerous and posit a supplementary problematization of adaptation. This is followed in Section 5 through the account of how this actually happened through the development of guidance that supports a supplementary problematization that is at least socio-contextual with a political rationale of transition but which verges on being socio-emergent with a political rationale of

transformation. It then tracks the subsequent limitation, and re-articulation through occlusion of this supplementary problematization to the core problematization.

4.0 The dangerous supplement: from supplementary moments to a supplementary problematization

The increasing visibility of supplementary moments between 2003 and 2009 has demonstrated the fluidity of UKCIP's discourse and its potential to change. We have seen that around 2009 UKCIP were beginning to discuss internally whether climate change was, rather than being a unique threat, in fact an application of general adaptability, such that capacity for organizational change might become its conceptual core. This basic point had existed since 2001 in the writing of the initial technical report but was deliberately suppressed and as a result made an extremely constrained appearance in the final version in 2003. This clearly demonstrates Derrida's principle that it is because of this potential to disrupt the core's validity that supplement is considered as 'dangerous' to the original (Derrida 1976, p. 163), as it threatens to turn the original term into the new supplement. At the level of a full problematization, this happens when supplementary moments are articulated more strongly with each other, without being integrated through the framework of the original or 'core' elements. As a result they are not limited by these terms and can work to displace these. The most crucial marker of their success occurs at the level of a political rationale, which sets the framework for the problematization and orients the subject's behaviour within it.

4.1 Irreducible uncertainty, new ways of knowing and resultant rationales

Let us explore then the potential of UKCIP's supplementary terms to form an alternative problematization of adaptation. As we have seen above, UKCIP's epistemic supplementary moments entail an assumption of irreducible uncertainty which rejects the implicit principle that hazards or risk accounts are sufficient to know climate change. As Dessai *et al.* note: "By avoiding an approach that places climate prediction (and consequent risk assessment) at its heart, successful adaptation strategies can be developed in the face of this deep uncertainty" (2009, p. 75). This re-problematizes adaptation away from the premise of objective linear knowledge based on Global Circulation Models and climate projections, and towards emergent knowledge based on the current system status and real time observation.

It is not the objective of this research to explore the pros and cons of a particular take on adaptation but rather to identify the contingency and 'partial' nature of any problematization has come into being. However, in pointing out this necessarily partial nature, it should be signalled that there are substantial concerns about rallying a problematization of adaptation around climate predictions, even if these are 'upgraded' and rendered as probabilistic projections as was done with the UK Climate Projections of 2009. Most notably, Mike Hulme and Suraje Dessai (Dessai and Hulme 2004, Dessai and Hulme 2008, Dessai et al. 2009) see such projections as inherently reinstating the rationale of 'predict and provide' or an 'optimization approach' however dressed up this is in statistical representations of uncertainty. This effect is particularly apparent in public use in the UK, where the norm of utilizing science as an indisputably objective basis for policy (Jasanoff 1987, Jasanoff 1996, Jasanoff 2012b).

Admittedly this account skims the surface of a very complex argument about the use of projections in a risk-framework, but at a fundamental onto-political level it comes back to the principle of being able to plan pre-emptively on the basis of pre-determined outcomes (however moderated by likelihoods and magnitudes) as discussed in Chapter 5. As such there is substantial critical pressure for the adoption of a critical vulnerability based approach and a rationale generated out of this to deal with irreducible uncertainty, which we have explored as a supplementary problematization of socio-emergence which has transformability as its political rationale. As Hulme and Dessai put it: "We believe... that society will benefit much more from a greater understanding of the vulnerability of climate-influenced decisions to large irreducible uncertainties than in seeking to increase the accuracy and precision of the next generation of climate models" (Dessai et al. 2009, p. 76)

Without the assumption of predictability an alternative rationale of response is derived that extends UKCIP's supplements from 'robust decisions' and 'keeping options open' to not merely acting pre-emptively, but seeing decisions themselves as emergent. This would require the substantial development of UKCIP's account of 'monitoring' as engaging with emergent knowledge from being something of an 'add-on' to becoming a central part of the political rationale for ensuring adaptation. This applies to both external and internal systems, as well as their interactions, and indicates the requirement for faster and clearer communication in the analysis and performance of change (Dillon 2002, Welsh 2013).

In this respect, although NI-188's lifespan expired in March 2011 (Defra 2010), its principle of a process-based approach to adaptation which

transcended the limited sitting periods of local government offered an initial basis to re-account for the time of adaptation by building adaptive capacity. The nascent problematization of the emergent time indicated by such an approach is far more developed in other parts of the UK governance. A good exploration of this occurs in Adey and Anderson's discussion of UK Civil Contingencies (Adey and Anderson 2011). They identify a socio-emergent problematization of adaptation as moving "beyond the idea that the decision is a singular moment abstracted from the context within which it takes place and undertaken by a discrete actor or set of actors. Instead the decision is understood as differentiated, affectively registered, transformative, and on-going actualization of potential against a horizon of undecidability in which past, present and future fold together in complex ways" (McCormack and Schwanen 2011, p. 2801).

4.2 A supplementary ontology and rationale based on capacity for emergence

At an ontological level we have seen that UKCIP's supplementary moments indicate the need to re-problematize from a discrete, linear, materialist account of the climate threat towards an emergent and complex, social-capacity based account of threat. This shifts the primary object of concern and action from specific external products to general social constitution and capacity.

One minimal extension of UKCIP's problematization in this direction can be seen in the work of Sellke and Renn on another risk-framework which requires the inclusion of "the structure and interplay of the different actors dealing with risks, how these actors may differently perceive the risks and what concerns they have regarding their likely consequences" (Sellke and Renn 2010, P. 296). Of course, UKCIP does this in their risk framework too – but only externally of the stakeholder, whereas this particular report makes the step to

including in its problematization the internal characteristics of a stakeholder organisation: "the socio-political impacts prevalent within the entities and institutions having a role in the risk process, their organizational imperatives and the capacity needed for effective risk governance" (Sellke and Renn 2010, P. 296). This demonstrates operation of this particularly supplement within the political rationale in a very similar framework to UKCIP's.

However, the ontological supplement does not become part of the core problematization without an epistemological technology to make it operational. In order to boost the supplementary socio-emergent ontology, supporting methods for making visible socio-contextual elements through participative decision-making and across wider systems would need to be continued and extended, particularly in the direction of overtly and deliberately building the capacity of these networks to act as more open structures within organisations. This would require the additional presence of expertise in representing an alternative social imaginary, resources for futures and scenario work, and expertise in organizational change.

However, the interconnection between ontology and epistemology is even more fundamental than this. The crucial strength of a political rationale of 'capacity to change' is its ability to be articulated more coherently with irreducible uncertainty (Dillon 2002, Inderberg and Eikeland 2009, McCormack and Schwanen 2011). This is because the 'irreducible ignorance' presented by climate change is recognized as a condition rather than the threat to be 'covered over' (Glynos and Howarth 2007, Adey and Anderson 2011, Anderson 2010, Luhmann 1998). Placing capacity at the core of the rationale governing an

adaptation problematization takes the onus off predictive knowledge and actions as referenced above (Dessai and Hulme 2004, Dessai et al. 2008), and posits the need for these to be responsive instead, through maximum capacity to sense, respond and change in order to absorb the effect of the event.

In the context of enabling fundamental change, flat decision structures, that is to say ones whose lines of communication and power do not centralize control, are considered to be better able to transform, and to do it more quickly (Adey and Anderson 2011, McCormack and Schwanen 2011, Dillon 2002). In this, the UK precedent again seems to be best identifiable in the UK Civil Contingencies approach (Adey and Anderson 2011), although this limits itself to single extreme events rather than frequent systemic changes, it offers a model at a Governmental level for an emergent political response in the space-time of the event in a clearly allied field.

For Pelling, such emergence is ensured then through "beliefs and capacity" which for leads to the conclusion that "culture and governance" are the roots of adaptation (2011, p. 167). The supplementary problematization of adaptation returns us then to the need to consider critically what is meant by governance and how it operates through means of power that, although not necessarily immediately visible, and disguised in the form of 'positive freedom' is nonetheless pervasively in operation (Foucault). The point here is that, the use of governance as a mode of extending the problematization of climate change adaptation would be better read with tools to engage with it critically, particularly to ensure that its sometimes immanent, quiet forms of disciplinary power/knowledge and biopolitical power are also considered within the question of ensuring a flat power structure.

However, questions of capacity can also be extended in more practical, material ways. This direction was demonstrated by a former coordinator for the Southeast Climate Change Partnership who commented that, rather than being a "talking shop," a Partnership "should be, really, about the direct exchange of resources" to supplement each other's capacity (UKCIP Interviewee 2009, p. 16). Crucially this comment arises precisely from a problematization of climate change as a threat of irreducible uncertainty: "climate change is a gift for that kind of [...] thinking. Because it's an issue which no one organization can deal with, and no one organization could ever develop the resources to deal with it. Therefore [...] Find someone else who's got that [item you need], who's prepared to trust you and exchange that and build it up together ... and I think the mode is there [...] but I don't see much evidence of it" (UKCIP Interviewee 2009, p. 16). Although this is a personal opinion about the direction that the Climate Partnerships should take, it is particularly interesting coming from an experienced member of a Partnership, which also helped UKCIP spread the Partnership mode of operation to other regions and to sectoral partnerships. This demonstrates a much 'fuller' supplementary moment than that of 'avoiding adaptation constraining decisions.' Instead, this is a positive account of building capacity: working together to ensure greater resources, noting the necessity of building a culture of cooperation that relies on trust.

4.3 Wider political implications

The supplement here might appear as nothing more than the representation of the on-going struggle between laissez-faire government and networked governance, typical of neo-liberalism's operation through advanced liberal governmentality, which attempts to deploy "pluricentric governance...to 'govern

at a distance' by means of mobilizing a plurality of self-regulating actors and networks within an institutional framework that ensures conformity" (Torfing 2010, p. 408). This would seem a fairly accurate account of UKCIP's mode of adaptation, yet Torfing warns against making the assumption that this renders those wider networks as without political power in creating the overall rationale. Instead, he asserts that, in contrast to supposedly depoliticized managerialism (Swyngedouw 2010), this discourse hides its own, new terrain of power struggles which have the potential to become political (Torfing 2010) by redefining the problematization under which they operate.

This account, drawing on Foucault, challenges the somewhat abstract account of the political we explored through Rancière – not in terms of its substantive meaning, but in terms of the types and number of incidences that are labelled as political events. Rather than confining the political to a single, radical change, it is seen as distributed throughout an order's constituent relations not only in space but also in time as they are constantly being (re)instituted. To reverse Rancière's brushing off of Foucault, the fact that power is everywhere means that freedom expressed through the political event is a *potentiality* that is also distributed 'everywhere,' yet which is contingent upon specific instances of power play.

Just as Torfing (2010) notes that the supplement of local governance undermines the logic of centralized, state government, we have found with UKCIP that the supplement of decentralized systems undermines the techno-scientific mode in its account of both space and time. Indeed both cases seems to be representative of a European and wider trend, where there is a common narrative of struggle between:

"government [...] based on *sovereignty, hierarchy* and *control,* [and] governance [that is] based on *plurality, interdependency* and *coordination.* Whereas representative democracy is based on *universal citizenship, competition* and *representation,* democratic forms of governance are based on *affectedness, deliberation* and *participation.* To put it graphically: whereas the parliamentary chain of government is basically a linear model, the local forms of governance introduces a complex non-linear model [...] not unlike what Deleuze and Guattari (1987) describe as a rhizome" (Torfing 2010, p. 413).

While these parallels are unmistakeable, the policing function of the supplement becomes very clear here: its role is to maintain the supplement of complexity within the existing order of interests (expressed here as 'parliament'), rather than effecting allowing the full democratic affective and emergent mode that would effect a political moment by interrupting the current order.

The specific difficulty with making the supplement of capacity and emergence overt is also related to this. In making the networks of disciplinary power/knowledge and biopolitical power relations clear it would undermine that unique and useful duality of liberalism's 'non-interventionist'-interventions. In other words, the socio-contextual and socio-emergent supplementary moments that were useful in extending the reach of biopolitical governance when harnessed to a conservative political rationale become dangerous when overtly recognized and articulated into a political rationale of emergence. This brings us full circle to the analysis of 'discourse' and governmental regimes – clearly some practices of governance need to be *not* rendered overt linguistically

if they are to function in particular ways, and in fact most biopolitical governance rests precisely on this implicit nature: governance is rendered as self-interest (just as consumption is rendered as desire), such that by being 'self'-interested we serve the purpose of the existing order (Foucault 2008, Foucault 2009, Oels 2005). As such, whilst stakeholders tolerate UKCIP, UKCIP is also governed to be tolerant of these existing forms of life and the rationales they operate by.

The multiple locations of (re)institution means that the suppression of the supplement is by no means a simple process, but emerges on a myriad of frontiers, as this research has demonstrated: in policy through the experience of authors, word choice and content, and in verbal practices through specific limitations and conciliations of the accounts of capacity, time, interactions and agendas. The significance of the semiotic lens therefore is to make evident these operations of the police and contestations of power in the relatively mundane operations of technical advice for stakeholder-based adaptation governance. Similarly it also appears to be caught between the 'modern' and 'post-normal' accounts of science (Ferreyra 2006, Eden et al. 2006, O'Brien et al. 2007).

Discourse analysis, specifically through identifying the articulation of elements of ontology and epistemology into a political rationale, provides a precise inventory and explanation as to how it is that 'post-political' managerialism is a production of a police order in Rancière's sense, which works through ensuring a logic that keeps itself 'post-political' through the idealisation of science. In this, it is not just technocratic *management* that has "sutured the spaces of democratic politics" (Swyngedouw 2010, p. 214) but the trope of climate scenarios and risk-frameworks in acting as a code for that management

and the regulation of the technocratic order. The significance of this, as Swyngedouw crucially points out, is that this shores up general de-politicisation.

However such de-politicization requires discursive policing that operates at this interface of consensus-managerialism and broader participation precisely because of its door to broad participation (Torfing, 2010). If we bring this back to the discussion in Chapters 1 and 2 of the political and encounter with excess as necessary for ontological transformation (as the transformation of fundamental ethics and values), then the order of the police inherently disables the core political capacity essential to a transformative mode of adaptation (Park et al. 2012, Pelling 2011), particularly in light of the ever increasing predictions of the extremity of climate change and impacts.

This reflects Latour's argument that the division of nature and society "paralyzes" democracy, particularly where it corresponds to the separation of objective 'facts' as the accounting of nature, and subjective 'values' as a property of society (Latour 2004). Here facts are removed from their own origin in the social contingency of knowledge and their inherent political origins are elided, even as they overtly exclude supposedly more 'subjective' values from the calculation of the ordering of existence. We see precisely this operation in UKCIP's earlier discourse at an overt level with the rejection of social knowledges, and its implicit operation in its later discourse in the tension over ensuring adherence to the risk framework approach and the degree to which it could provide a robust basis for policy or strategy. Crucially, the later emergence of a supplementary discourse does tend towards what Latour designates a "matters of concern" approach that recognises contingency and avoids the desire

for absolute claims (Latour, 2004). However, as we have seen, this was then curtailed by a series of policing discursive interventions.

In addition to preventing onto-political transformation, avoiding the critique of the extant order avoids genuinely engaging with the order of life that was responsible for producing (anthropogenic) climate change in the first place. In this regard the most basic transformative adaptation is one that seeks to end consumption based 'carboniferous capitalism' (Dalby 2002, Patterson and Dalby 2006). This is itself an onto-political transformation far beyond mitigation (particularly given the general failure of the latter). To do this, such a critique must engage with the central order of the contemporary world – "the perceived inevitability of capitalism and a market economy" that is so entrenched that "[it] is easier to imagine the end of the world than to imagine the end of capitalism (Jameson, 2003, p, 73)" (Swyngedouw 2010, pp. 215-216).

Swyngedouw also points out the use of the apocalyptic to help secure the extant post-political order, the irony being that this prevents engagement with the cause of that fear (anthropogenic climate change) (Swyngedouw 2010). We have also witnessed this in the vivid imagery of threat occurring in climate scenario graphs and tables, extractable down to 25 and 5 square miles, and to daily and even hourly weather projections after 2009 (Defra 2012a). This produces fantasmatic idenfitication with UKCIP's discourse as the means of providing security, thereby reinstating the original order, or indeed changing 'us' to maintain 'it.' In this sense, techno-scientific resilience-based adaptation works to prevent transformation – both in the sense of adaptation as socio-emergence and in the related radical sense Rancière.

The significance of this research then is to have charted not only the moments of irruption and suppression of the supplement, but the suggestion of an alternative logic of socio-emergence based on adaptive capacity as a transformative rationale which is not only fundamentally political in Rancière's sense, but adopts this constant (re)politicization as a mode of adaptation. This poses an extreme challenge to the extant climate adaptation logic and in doing so moves beyond the lament that "poverty of political imagination pervades the precautionary principle" (Marieke de Goede and Samuel Randalls 2009, p. 874).

Here the attraction of the Human Security approach is most visible as an alternative problematization of adaptation that resonates with the supplement of socio-emergence. However, an interesting tension arises here if human security as a discourse is taken as a proxy for the transformative adaptation of socio-emergence: human security often presumes inalienable human rights to quality of life of some sort, and is also often associated with liberal governance (O'Brien and Leichenko 2007) which as we have seen, is already problematic if we take into account its pervasive forms of power. Furthermore, socio-emergence, taken to its fullest, if not most ethical, extent can also disaggregate the human and the social from any normative values – including those of human security, even building emergent life through a basic re-conception of the 'human' at the molecular level (Dillon 2003). The critiques of such security problematizations offered already (See for example Dillon 1996, amonst others, Dillon 2002, Dillon 2003, Campbell 1998, Marieke de Goede and Samuel Randalls 2009) offer some excellent examples of the modes for analysing 'human security' and socio-emergence in ways more alert to their own unique problematizations, that is,

inclusions and exclusions in the account of the world, subject or of 'life', and the associated political rationales.

However, despite these issues, any change to the existing account of adaptation would require fundamental discursive change in the wider UK political and business culture, as without such change current systems posit a clear limit to the possibility of engaging with a socio-emergent problematization of adaptation. Therefore the fundamental ontological and epistemic basis of these problematizations of capacity and emergence call for a deconstructive engagement with the assumed 'objectives' of adaptation strategies of individual organisations and wider discourses, including that of UKCIP and the UK Government.

4.4 UKCIP and the possibility of a supplementary problematization in 2009

The identification of these supplementary moments with an alternative account of adaptation, connected most significantly to socio-emergent capacity and transition, demonstrates clearly the profound implications of the supplement and its ability to supplant the core. This is particularly the case where there is a theme that links many of the supplementary moments together, or where their increase over time means that in effect there are so many supplements that the original discourse becomes incoherent and unsustainable.

At the time field research was being carried out in 2009, it seemed that UKCIP was experiencing such an increase, and as such, had three options in terms of the development of their problematization of adaptation: first, to try and maintain the position of the supplementary moments as they were; second, to explore the supplementary moments, their internal resonance and their links to a socio-emergent problematization of adaptation more directly; three, to explicitly

detach themselves from such a supplementary account by overtly 'othering' it, thereby maintaining the integrity of their own problematization.

In 2009 there were only minor indications that there would be any movement in the direction of the supplementary problematization: the supplements already discussed, and one staff member being asked to look into producing a report on their value, particularly regarding organizational change. However, this was a very recent decision at the time (UKCIP Interviewee B 2009) and as such the significance of such a report could not be established.

However, it is fair to say that adopting the organizational approach would have constituted a major shift in UKCIP's and wider UK policy on adaptation, and a substantial rupture between the extant problematization and its close link to climate projection sciences and environmental management. All of this demonstrates that if the supplementary problematization is to be developed at a UK government level, it needs to draw on a different power structure, either in terms of which agencies are tasked with enabling adaptation, or in terms of internal expertise.

5.0 Lessons Lost? A postscript on the demise of UKCIP and wider implications for UK discourse

While the years after 2009 fall beyond the research period, there have been some striking developments between then and the time of writing, which make clear that not only have the identified supplementary moments emerged further, but that a supplementary problematization that links them has become an overt part of UKCIP's discourse.

The broad supplementary problematization identified above as socio-emergent was dramatically recognized, and much more thoroughly explored, by a UKCIP report for the Adaptation Sub-Committee published in April 2010 entitled 'Attributes of Well-Adapting Organisations' (Lonsdale et al. 2010). The report explores a broad range of academic and practical contributions that could all be described as fitting within a socio-emergent problematization of adaptation as they all focus on improving adaptive capacity. Crucially the report also recognizes within this the difference between transition and transformation as the political rationales.

It is interesting in the context of the three possible directions for UKCIP's discourse highlighted above, that the 2010 report does not seek to place UKCIP's tools at the centre of their new discourse, but instead recommends that these alternative approaches, particularly PACT (Performance Acceleration through Capacity Building) be incorporated into the newly proposed national basis of adaptation at the time, the Climate Change Risk Assessment (CCRA) (Lonsdale et al. 2010). It should be said however that the CCRA in itself was based on the UKCIP 2003 risk framework. As such, although UKCIP does not itself knit these approaches together, it clearly introduces a broad supplementary problematization that is socio-emergent into the national discourse of adaptation. As such, this report clearly points to the need for further investigation of how this alternative problematization might be articulated into the CCRA, although as it does not do this work itself, it is difficult to know if and how this would be achieved for the problematization of adaptation.

This clear emergence of the supplement reflects both its emergence within UKCIP, its coincidental recruitment of new staff with this form of

expertise, and the changing discourse of adaptation across the UK and internationally which this report samples. However, the announcement in March 2011 that from September the Environment Agency would take over from UKCIP in providing the Government's official adaptation programme may have undermined the power/knowledge basis of this trajectory, and reminds us dramatically that policy is never a "closed system... but is formulated within a social and political space" (Hansen 2006, p. 29).

It is interesting that, whilst UKCIP's loss of the Defra contract may have been to do with the Conservative party's dislike of 'qangos' or a simple reorganization of policy provision, the adaptation portfolio was then returned to its institutional origins in Defra and the Environment Agency. As such, there are clear questions to be pursued as to what impact these discursive and institutional events have had not only on UKCIP's discourse itself, but on the wider UK Government discourse on adaptation.

In 2011, UKCIP published its last official report for the UK on its approach to adaptation (Brown et al. 2011). This marks out a distinction between 'top down' impacts and 'bottom up' vulnerability approach, and crucially re-evaluates the central place of the impacts approach, moving it from a more linear predictive tool to instead functioning as an explorative tool, explicitly taking on the Dessai et al critique (2008) discussed above. This move clearly begins to reproblematize access to knowledge in favour of irreducible uncertainty, undermining the epistemic basis of the core problematization, and shifting UKCIP's problematization towards a more emergent account. It effected a codification of the wider use of the Local Climate Impacts Profile (LCLIP) approach that UKCIP had rolled out with all its stakeholders, boosting the

presence of vulnerability in the problematization (see, for details UK Climate Impacts Programme 2009).

However, although the report moves to vulnerability as a better response to uncertainty, it sticks to a somewhat linear account of vulnerability itself as socio-contextual and historically based, and represents it as being of limited use for long-term decisions, thus reinstating the ideal of prescient knowledge. It resolves this by connecting vulnerability back to the value of impacts or techno-scientific information for covering this gap, thus tying it back to the core problematization within a somewhat linear predict and provide mode. As a result, although greater screen time is given to vulnerability, it crucially uses its socio-contextual basis as a limit point, linking it back to the techno-scientific framing in a constant cycle. This move obscures the gap of irreducible uncertainty, rather than accepting it and dealing with it through socio-emergence.

An alternative solution does appear in the discussion of decision-making in the brief mention given to resilience (Brown et al. 2011, p. 40), although without any clear connection to the epistemic problem that arises with the stronger presence of the vulnerability supplement. Importantly, this occurs after demonstrating the insufficiencies of the more familiar optimization approach with the result that resilience appears as the more appropriate approach. It is related explicitly to Holling and the IPCC definition, as: "'[the] ability of a social or ecological system to absorb disturbances while retaining the same basic structure and ways of functioning, the capacity for self-organisation, and the capacity to adapt to stress and change.' (IPCC, 2007a)" (Brown et al. 2011, p. 42)

Whilst there is only a little detail on this, they do note that one form of resilience recognizes irreducible uncertainty and requires learning – including learning from mistakes, the capacity to absorb shocks, to be flexible, and reorganize. The second form of resilience is resilience to specific risks. They then focus in on the latter and use a building example that links to the concept of robustness (Brown et al. 2011, p. 42), which returns the problematization to a pre-emptive planning mode. Whilst a greater space for these supplements has appeared, including for the first time clear links to the entire alternative discourses of vulnerability and resilience, the single paragraph of detail on resilience as an emergent capacity and the longer page on vulnerability shows that UKCIP itself still places the onus on a linear model of identifying the threat first and response after, reinstating the core problematization, although in a weakened, more nuanced form.

The report ends with the discussion of resilience and fails to tie all of these changes into a cohesive problematization or a approach, rather, they are left as if they are simply 'options' rather than contrary problematizations, with the final articulation constructed through a 'key messages' box. In it, it states that: "Resilience approaches aim to provide increased resilience either in general or in response to specific risks. They generally involve learning from experience. The options favoured in this approach tend to be ones considered to be robust against a range of uncertainties." (Brown et al. 2011, p. 43) This linguistically ties resilience back into the core problematization and terminology of the 2003 report, undermining the supplement whilst giving it more space. So even through this appropriately named 'supplementary guidance' indeed extends the elements

included as supplementary moments, it is also re-establishes these as a limit point, reinstating the core problematization.

In doing so, as an official supplement to UKCIP guidance, it closes down the capacity and transformation options that were opened up in the 2010 report to the Adaptation Sub-Committee by UKCIP. However, despite being a massive reduction from the detail from their report in 2010, this is still an increase from the 2003 report. This suggests that had UKCIP continued in their official role, they may have produced a more substantial shift beyond a socio-contextual problematization towards socio-emergence.

UKCIP's failure to substantially codify these socio-systemic supplements into their problematization has meant that they were not established in its technical documentation and only informally established with stakeholders when UKCIP lost its position as the national provider of a framework for adaptation. As a result, it is unclear whether there was much transference to the Environment Agency (EA) and the Climate Change Risk Assessment of its practice- based tacit knowledge of the need to include social, and particularly organizational elements in the problematization of adaptation.

There is clearly an opportunity in this transitional period to nonetheless explore the opening in the core problematization that the supplementary moments, and later the 2010 document in particular, reveal. Given the discussion in Chapter 4 of the Environment Agency's disciplinary biases a decade earlier, it will be interesting to see whether there has also been a further inclusion of vulnerability or organisational change expertise in the intervening years.

By contrast, what clearly did remain was UKCIP's core problematization based on risk, and a techno-scientific response. As a superficial indication of

where an exploration of these issues might lie, it should first be noted that UKCIP has not ceased to exist, and will continue adaptation research and information sharing (Defra Adapting to Climate Change Programme team 2012). However, its role as provider of adaptation support on behalf of the Government passed to the EA in April 2012, who are providing a renamed 'Climate Ready Support Service' (Defra 2012b), under the Adapting to Climate Change national programme run by the Department for Environment, Food and Rural Affairs (Defra). Defra still refers to adaptation in terms very similar to those of the original 2003 report, stating that: adaptation "needs to be built into our normal planning and risk management procedures... That way we can make sustainable adaptation decisions at the right time to maximise the benefits and minimise costs" (Defra 2012b). As such there do not appear to be any major changes at the time of writing in mid- 2012.

This is perhaps because the institutional form of the transition from UKCIP has been a phased one enabling the EA to "build on the work of UKCIP" and thereby maintain its problematization. In fact, the EA refers to adaptation directly terms of resilience (Environment Agency 2012). Interestingly however, the Climate Change Partnerships seem to have a renewed presence in this programme through a new coordinating company called Climate UK which is working together closely with the EA (Environment Agency 2012). The network oriented coordination body seems to present an institutional infrastructure for enabling a socio-contextual response and potentiality could facilitate a socio-emergent one.

However, it will be interesting to see how these different aspects of the national programme are articulated together with the much higher profile

nation-wide Climate Change Risk Assessment (CCRA). Crucially, the CCRA is based methodologically on the 2003 Risk Uncertainty and Decision-making framework (Brown et al. 2011). This clearly reinstates the centrality of risk as a discourse, with all the exclusions of encouraging a techno-scientific rather than socio-emergent approach discussed above. This problematization is made clear by the claim that the CCRA "fully accounts for uncertainties, provides a transparent comparison of risks, and cross-checks its results with current climate vulnerability" and that in turn the National Adaptation Programme "sets adaptation outcomes and puts in place policies to enable the timely uptake of actions and robust long-term decision-making" (Adaptation Sub-Committee 2011, p. 87). However, it should also be noted that the CCRA does link up impacts by sector, and links the significance of these to a response at the local level, supported through the regional Climate Change Partnerships (Defra 2012c). As such, there is clearly room here for an exploration of a socio-contextual response. The question is whether this will again be tied back to resilience, as seems likely with a risk and resilience based problematization, or whether these networks in practice will generate a more socio-emergent problematization. As Torfing (2010) suggests, the potential for the emergence of the supplement is inherent in this structure, but the specifics of its articulation as a discursive order will play a large part in enabling or policing this potential.

In sum, it seems that UKCIP provided a thorough exploration of a supplementary problematization founded on a socio-emergent frame in 2010, but was not able to integrate this thoroughly before its government role ceased in 2011-2012. With UKCIPs removal from this central role, it is unclear whether the supplementary elements that it did introduce have an institutional home in

the network centred on Defra and the EA, although they would seem much more likely to fit with the Climate UK organization, and the Climate Change Partnerships. Together, these bodies make up the institutional network of the new 'official' discourse on adaptation to climate change in the UK. As such it is unclear whether the emergence of these more socio-contextual elements of vulnerability and transition, but particularly their conceptual extension to socio-emergent aspects of capacity and transformation will re-problematize adaptation in UK discourse on climate change. Given that they seem to be building on the risk-framework approach, it seems certain that their problematization needs investigation to determine whether the socio-emergent supplementary problematization has made any impact whatsoever, and if so, what particular form of 'complementarity' might be being articulated in their problematization of adaptation in the UK.

6.0 Summary

This chapter has sought to marry the analysis of UKCIP's problematization of adaptation with the techno-scientific, socio-contextual and socio-emergent framings of adaptation discussed in Chapter 1. More specifically, it has noted the significance of their ontological and epistemic accounts of the subject and object of adaptation and how these know and act in space and time. How these moments are articulated into a political rationale and thus formed into a problematization as a whole has been discussed. We have found that UKCIP's core problematization is techno-scientific, based on subjects who are discrete in time and space, while external objects are adapted. A pre-emptive planning

account of agency is articulated into a rationale based on altering existing objectives.

This core problematization is supplemented by several elements associated with a socio-contextual and even socio-emergent account of adaptation. Rather than being 'complimentary' in the sense of being equal, the way in which these are articulated ensure that they remain bounded by a fundamentally conservative 'resilience'-based political rationality. Section 4 finds that the difficulty in articulating these supplementary elements in full is precisely because they threaten to 'supplant' the original terms of the core problematization. Their socio-emergent account of both threat and the political rationale that enables a solution also means that they demonstrate an alternative problematization, even if this is not articulated in full. As such, in UKCIP's case they function as a 'dangerous supplement' that extends the techno-scientific-resilience problematization but also demonstrates its inherent insufficiency, and as such conjure the image of an alternative, socio-emergent or transformative problematization of adaptation. The wider political implications of the supplementary problematization are far reaching. However, in 2009 it was unclear whether this discursive emergence would be consolidated. Section 5 discusses events between 2009 and 2012 when the supplementary problematization was recognized overtly and indeed was implicitly recognized as threatening to supplant UCKIP's problematization. It shows how this was responded to discursively by effectively closing down the supplement, first by othering it through naming it as outside of their remit, and later by recognising it, but rearticulating it to the core and limiting its content.

For both UKCIP and its observers, it seems clear that the overt recognition of the socio-emergent supplement, either through discourse analysis, or through its emergence in practice, raises ethical questions about the contingency of their original problematization and how it accounted for adaptation, particularly in terms of the political rationale that it enabled, and the rationale that it disabled through articulating supplementary problematizations as supplementary moments and policing them as limit points. In terms of the relevance for the UK as a whole, those questions now fall to Defra and the EA and their wider network, as the tensions, inclusions and occlusions identified here will have an important bearing on how their problematization is critically understood.

Chapter 8: Conclusion

1.0 Situation of the research and theoretical approach

UKCIP's discourse of adaptation emerged in the context of a wider scramble in UK government and internationally to understand and deal with adaptation to climate change from the late-1990s. As discussed in Chapter 5, the IPCC discussion of adaptation produced in 2001 was much broader than that adopted in UKCIP's 2003 framework, as it included the additional elements of state-coordinated and legislated approaches as well as a vulnerability based framing of adaptation (Intergovernmental Panel on Climate Change 2001). These alternative conceptions were reflected differently by various branches of UK government depending on their traditional areas of concern and modes of governance. Three such bodies of government are mentioned now to situate and reflect on the unique contingency of UKCIP's problematization, which this thesis has identified.

    With their core expertise in environmental management, the Department for Food and Rural Affairs (Defra), took from the IPCC the elements of its assessment-based approach that appeared most appropriate – namely climate scenario information – and translated them, through UKCIP, into a planned risk management approach. In doing so, UKCIP's early years of adaptation discourse conformed to the IPCC 'linear model of expertise' (Beck 2011) even as it sought to make this useful to stakeholders. By contrast, the UK Department for International Development (DFID) had as its concern the capacity and

vulnerability of populations. Indeed the development of the adaptive capacity concept in the IPCC 2001 report (Burton 2003, Beck 2011) had its origins in the development field. This meant DFID was more likely and more able to adopt a capacity-building and vulnerability-reduction based approach more quickly than UKCIP did. With its greater affinity for a political economy approach and socio-economic processes as well as identifying the community and individual as its ontological 'exposure unit' (as opposed to the business practices of, for example, farmers) DFID was far more alert to these more social characteristics of adaptation (Nelson, Lamboll and Arendse 2008, Pelling and High 2005).

As we have seen in Chapters 5 and 6, UKCIP tended to occlude these aspects both epistemologically and ontologically. It seems unsurprising then that it found that its approach tended to occlude charities with an overtly 'social' focus who represented vulnerable sectors of the UK population (Tompkins et al. 2010, West and Gawith 2005). The only apparent connection between Defra and UKCIP's domestic approach and DFID's international one appears to ride on the explicit distinction made at the IPCC, and picked up by the UKCIP 2003 report authors, that the approaches should be different because the level of adaptive capacity itself differed so markedly between developed and under-developed countries (Intergovernmental Panel on Climate Change 2001). However, both Defra and DFID implicitly adopted the long-term and gradual temporal framing of climate change implied in the initial scientific accounts of the IPCC. It may have been that the lack of futures representation in the IPCC reports (Nordlund 2008) also limited Defra and UKCIP's engagement with an emergent account of climate change.

The significant alternative discourse in this regard arose through the emergency-response resilience discourse in the UK, exemplified by the Civil Contingencies Secretariat which was established by the Cabinet Office. In contrast to the pre-emptive risk-management of UKCIP, or the adaptive capacity building and vulnerability reduction of DFID, this operated on a resilience basis within the time-frame of the event itself (Adey and Anderson 2011, Welsh 2013, Anderson 2010). Significantly, resilience as it is used here bears many of the hallmarks of socio-emergence for the duration of the event, although crucially this is limited to the duration of the 'emergency' and therefore assumed not to cause lasting change.

The lack of crossover in the early years of climate change adaptation between these three governmental centres and approaches demonstrates the power of the discursive framing of the threat. Although each dealt with the same basic threat of climate change, their different accounts of that threat in time and space, as either the risk-manageable future, as immanent in social orderings, or as an exceptional irruption of excess, meant that they each saw themselves as responding to very different threats with a very different set of solutions. There was accordingly almost no cooperation or overlap in their approaches to what might nonetheless be broadly labelled 'adaptation to climate change.'

This variety and the limited critical analysis of UKCIP's discourse meant that it was necessary to explore how UKCIP's specific account occurred and what it included. The aim of this research was therefore to critically analyse UKCIP's problematization of adaptation to climate change. This was pursued through a Foucaultian-based account of discourse, operationalized through discourse analysis and discourse theory techniques. In particular it utilized Laclau and

Mouffes' taxonomy of discourse as constituted by the articulation of elements as moments (Laclau and Mouffe 2001), and Foucault's account of a problematization as the political rationale that connects an ontology and epistemology of threat to a particular solution (Foucault 1998). Crucially Derrida's account of the 'supplement' (Derrida 1976), which was drawn into this analytical structure as the 'supplementary moment' allowed for the identification and investigation of elements that although articulated to the problematization in some way exceeded it. As such, they were articulated as supplements: subsidiary to the problematization, but by their presence also undermining its claim to wholeness, and thus threatening to supplant it. Together with Foucault's account of genealogy as the contingent emergence of discourse through particular imbrications of power and knowledge (Foucault 1998, Hall 2001), these concepts allowed for the analysis of how UKCIP's problematization was created between 2003-2009 and its potential for discursive emergence after this date.

The first Chapter discussed the established tensions in the wider discourse of adaptation between hazards-, vulnerability- and nascent capacity-based accounts of adaptation demonstrated by Burton et al. (2002), Fussel (Fussel 2007, Fussel and Klein 2006) O'Brien et al. (2007). It then explored Pelling's three typologies of adaptation as resilience, transition and transformation, which demonstrate further tensions at the level of the 'intention and action' of an account of adaptation.

These different approaches provided the constitutive elements and political rationales of that were linked and summarized as three archetypes of adaptation problematization: techno-scientific, socio-contextual, and socio-

emergent. These general problematizations were used in the analysis of UKCIP's own discourse through highlighting both what elements it includes and excludes in its problematization and the political rationale that structures it.

This discussion of the content of a problematization recalls Fussel's comment that many climate change adaptation programmes, including UKCIP's, combine a hazards- and vulnerability-based approach. This research has sought not only to account for UKCIP's problematization of adaptation, but to problematize the assumption of complementarity through looking more deeply at how this development occurs at UKCIP, both genealogically with considerations of power/knowledge, and also at the level of the discourse itself, through its conceptual content and linguistic articulation.

This thesis has made clear that the use of elements from both frames does occur, but that they are not complementary in the sense of each retaining their comprehensive meaning, and moreover, that the tension over these contradictory meanings is resolved through articulating some elements as subsidiary and therefore limited, and excluding other aspects altogether, in order to achieve their relative coherence within a single problematization. These operations must constantly be (re)articulated, and as such always harbour 'dangerous' potential for change even as it is the breadth that they offer which also gives the problematization a greater appearance of sufficiency. These findings will be related in relation to the specific aims and objectives of the thesis below.

2.0 Research aims and objectives: summary of findings

2.1 The power/knowledge contingency of UKCIP's problematization of adaptation

This research has critically analysed UKCIP's problematization of adaptation. In its discussion of how adaptation is accounted for, several key findings have come to the fore which are discussed here in conjunction with the core objectives. The first objective was to situate problematization in terms of the contingency of its emergence, in order to enable more critical engagement with the conceptual content and form of this problematization. This was explored through the exploring the history of how UKCIP's core document was created and how it was used over time. Chapter 4 in particular demonstrated the power/knowledge effects on the production of this discourse, specifically its institutional ties to the Environment Agency and Defra, and the background of UKCIP's own staff in environmental management, all of which resulted in in the strong influence of the disciplines of environmental risk assessment and risk management on UKCIP's problematization of adaptation.

The failure of the Socio-Economic Scenarios and the success of the climate scenarios also shaped the imaginary of what might be included in UKCIP's 2003 account of adaptation itself, particularly in terms of the inclusion of a product-oriented scientific account and the exclusion of a process-based social account of climate change as a problem. This combined with a neoliberal political system and overt liberal values to produce a discourse that focused on the discrete decision-maker as the subject that adapts, pre-emptive planning as the preferred account of 'action,' and the exposure unit's interface with biophysical climate as the object of adaptation. However the central place of risk and the tools of neoliberal environmental management globally and in New Labour's use of

partnerships also introduced contextual social aspects to both the ontological and epistemic bases of UKCIP's problematization of adaptation. These resulted in the limited presence of socio-contextual elements as supplementary moments within the core rationale. This conceptual contingency alerts us to the specificity of inclusion and exclusion of the conceptual content in UKCIP's problematization of adaptation, to the fact that it is not 'objective,' and that it plays into particular established discourses of 'orders'. These results are discussed in more detail under the remaining to objectives, in sections 2.2 and 2.3. The observation of this conceptual contingency also has wider ramifications. First, as discussed in Chapter 7, it alerts us to the need to analyse the contingency of the content of the emerging 'post-UKCIP' problematization. Second, if adaptation takes on a socio-emergent or transformative approach, part of this will require deliberately opening up the discourse of adaptation itself and that of the wider order.

Also considered in terms of power/knowledge were the origins of the supplement as part of this discursive emergence and the potential for future change. Four principles of power/knowledge established by Foucault were used here to enable the critical analysis of discourse. However, it should also be noted that they also act as techniques for enabling 'emergent' or 'transformational' adaptation itself through critique and awareness. These principles are: the rule of immanence, whereby power and knowledge imply one another and neither are prior; continual variations that result from this imbrication, such that discourse is constantly being re-articulated, modulating perhaps only slightly but always with potential to change; double conditioning, the use of the same problematization for different objectives, which can also reverse in the sense that the same subjects and strategies of power can appeal to very different discourses

for the same ends: signifying the 'tactical polyvalence of discourses' (Foucault 1998).

A further power/knowledge effect arises in the fantasmatic function of appeal to extant identity of the subject or the search for certainty to cover over the lack (Glynos and Howarth 2007, Laclau and Mouffe 2001). If anything, UKCIP's conservative problematization and covering over of the uncertainty of climate change through increasingly techno-scientific means demonstrates how large a part this comforting technologisation of adaptation has played in the problematization to date, and perhaps why it has been quite happily left alone in a post-political box (Swyngedouw 2010).

This awareness of these power/knowledge functions helps us to unpick what a problematization really is and does but also demonstrates its fragmented nature which allows for change: multiple uses but also multiple moments of control and limitation. These effects are not visible merely by a content analysis, or through the emic self-representation of adaptation actors, which is why power/knowledge considerations have added substantially to the depth of the semiotic approach adopted here.

2.2 UKCIP's problematization of adaptation: core and supplementary moments

The second aim of this thesis was to provide an account of UKCIP's problematization of adaptation in terms of its ontology and epistemology and how these are drawn together discursively as a political rationale. Addressing this aim through a semiotic lens in the first instance was an attempt to offer a detailed critical account of UKCIP's discourse in order to move beyond merely

accepting and reporting on its content, or critiquing it only on its own, existing terms.

This research found that the 2003 document was premised on the objective of making scientific knowledge useable by stakeholders and does this primarily through the use of risk-based technologies. Its account of the 'threat' to which it proffers a solution is that of biophysical climate change and knowledge of that change. Its core account of the solution is as a planned, pre-emptive decision which is assumed to be based on scientific information and existing objectives. The political rationale that binds these together is made up of the act of decision which is pre-emptive and couched in the technology of risk, as 'risk-based decision-making' that 'alters' existing decisions. This problematization is conservative in the sense of ensuring functional persistence of the present by excluding consideration of the social contingency of these objectives and excluding a wider process of making and delivering decisions themselves. This limits the account of adaptation to an essentially discrete moment both in space and time through its focus on outcomes and products. In sum, it is founded squarely in a modernist, techno-scientific approach to adaptation which resonates with the hazards and more limited resilience approach (Burton et al. 2002, Pelling 2011).

However, there are a substantial number of elements of a socio-contextual and even socio-emergent account that are articulated as supplementary moments to the core problematization. These increase in number and depth between 2003 and 2009. These supplements nuance and extend the core problematization in terms of its content but are articulated as subsidiary, limiting

the depth of their content and thus the effect they have on the 'core,' specifically at the level of its political rationale.

Particular supplementary moments of UKCIP's discourse occur in the concepts of 'robust' and 'no-regret decisions,' 'flexible decisions' and 'keeping options open,' and 'avoiding knock-on effects.' Taken together, these create a political logic that responds to the assumption of irreducible uncertainty, which cannot be resolved through risk. This opens up the possibility of an emergent account of time and a similarly emergent political rationale based on flexible capacity rather than prescient pre-emption. However, as supplements, these moments are articulated as subsidiary to the core, and therefore their full meaning is limited. Instead, they act as 'limit points' of the problematization by extending it slightly but through their articulation to the core actively shutting down alternative accounts of the problematization.

Specifically, while collective knowledge-making and other social forms of knowledge have come to be utilized in the opening stages of UKCIP's approach to adaptation, they are limited and non-explicit in the later stages of making a decision and performing it. As such, it is not surprising that 'implementation', 'monitoring' and 'review' are included in a limited fashion and situated as supplements through UKCIP's reluctance to develop these conceptually within its problematization. This is particularly notable with regard to an overt engagement with the character and process of decision-making within stakeholder organisations. Such occlusions serve to reinforce the pre-emptive, non-flexible relation between the times of decision and the process of adaptation.

However, the articulation of these supplementary moments to the core must constantly be (re)made and is far from stable. This was made clear when

the supplementary elements included also threatened to rupture the cohesion of the problematization by prompting alternative ways of knowing, specifically through responding to the irreducible uncertainty through shifting the object of knowledge from climate and technological risk outcomes to socio-contextual emergence and capacity.

The interviews make clear that after the 2003 report there is a gradual emergence of an account of adaptation as a process, signalling a shift from adaptation problematized as 'the' moment of decision to adaptation as practice and as process; in other words, *how* adaptation is done at a social and organizational level, rather than *what* decision is made, starts to become the focus. This is particularly the case in the Local Authority field under the remit of National Indicator-188, and in the broader socio-contextual practice of risk assessment that is introduced through the Local Climate Impacts Profile (LCLIP) vulnerability-based approach. Both intimated an alternative problematization, where vulnerability accounted for the problem or threat as an internal characteristic and the capacity for organizational change became the account for the solution. Crucially, the result is that the 'subject' of adaptation is brought into the core problematization as the problem or 'object' of adaptation themselves, demonstrating the potential for an alternative problematization based on socio-emergence, with a rationale of transformation through ensuring social capacity to change.

These findings about UKCIP's problematization are significant for UK discourse because of what this reveals about what is visible and what is invisible and the practices and policies it enabled or disabled as a result. This is true of as the Climate Change Risk Assessment and partnership approaches being

undertaken by Defra and the EA from 2011, as these build on UKCIP's the risk framework and practices. Furthermore, as a fairly 'standard' approach within the depoliticized environmental management mode of adaptation that was adopted by many developed countries, this discourse analysis hopes to demonstrate the contingency of onto-politics operational in this type of problematization, signalling the wider need for ethical critique (Glynos and Howarth 2007, Howarth 2000).

Theoretically, this research has avoided the pitfall of many Foucaultian discourse analyses that fail to methodically engage with the linguistic bases of the discourses that they claim to analyse. At that level it hopes to stand as an example of how productive the tools provided by critical discourse analysis, discourse analysis and discourse theory can be. However, the level of detail this required has created some trade-offs in the breadth and practice-orientation of the analysis, which are discussed further in section 3.0 below.

2.3 The reality of complementarity

The third objective was to explore how the problematization relates to other discourses of adaptation established in the literature, and determine if, how, and with what implications these function in a complimentary manner within UKCIP's problematization. To do this effectively, a semiotic lens was required to assess the conceptual linkages and their weight within the discourse. The connections to the wider discourses of hazards, impacts, vulnerability, resilience, transition and transformation have already been noted through techno-scientific, socio-contextual and socio-emergent problematizations and supplements in the core problematization. Chapter 7 also demonstrated how socio-emergent

supplementary moments could be developed into a full supplementary problematization founded on the principles of adaptive capacity and transformation.

Crucially, the semiotic lens is also able to demonstrate how it is that the supplement polices the extant problematization and its social order even as its presence appears to extend or even explode it. This brings us the discussion of the 'complementary' use of hazards and vulnerability which was unpicked particularly in Chapter 7. This question is significant because, although it was only a passing comment by Fussel, it does recognize UKCIP's use of both accounts and the wider assumption that these different approaches to adaptation can be used in a complimentary manner (O'Brien et al. 2007, O'Brien and Leichenko 2007, Burton et al. 2002, Fussel 2007, Fussel and Klein 2006).

This thesis does not reject that hazards and vulnerability or techno-science and socio-contextual accounts can be used together. However, it questions whether they are truly complimentary by demonstrating that the specific ways in which they are combined is not only highly contingent, but that the manner of their articulation has crucial effects for how their content is used, the problematization that results, the real areas of (in)visibility that are produced, and the effects it has (or loses) as a result.

The key discursive term afforded by the semiotic lens that has helped in this analysis has been Derrida and Rancière's account of the supplement, and the manner of its articulation as such, which demonstrates the dual and tense manner in which socio-contextual and particularly socio-emergent elements are articulated to UKCIP's problematization as subsidiary. This is particularly the case when they articulated to the epistemology of objective techno-science as a

platform for policy and the basic rationale of functional persistence. In this way the supplement is limited in its meaning and prevented from exceeding or undermining the core problematization. In the former case, it is seen as adding subsidiary social knowledge to the primary scientific knowledge, while in the latter case, it is prevented from creating a full socio-contextual problematization through the occlusion of a systemic account of the internal social nature of the stakeholder organizations. There is also a limit placed on extending from the critique of the contingency of social relations to actively using them to enable adaptation through a socio-emergent account of adaptation as transformation through the capacity to change or emerge. As such, 'complimentary,' if read through the function of the supplement, demonstrates that this comes with a price that prevents the equal or full representation of either account, and the huge areas of potential that this articulation of the supplement to the core problematization actually excludes.

Nonetheless, these supplements are inherently 'dangerous' as they can act as moments of discursive emergence that threaten the fundamentally conservative 'resilience' and 'transition' based political rationale in the techno-scientific problematization. This thesis has observed the emergence of such supplements at UKCIP and their subsequent re-articulation to the original problematization, albeit with an extended account of the supplement included. In this regard, it was the objective of this thesis to follow an ethical mode of critique: demonstrating the content and contingency of the extant discourse, and where its limits lie as a result, without positing a particular account as being somehow 'better.' For this reason, the identification of supplementary moments and their potentiality was limited to those that appeared within UKCIP's extant

discourse. Nonetheless the nature of this (re)articulation of UKCIP's problematization of adaptation to climate change, could be understood as very nearly becoming 'political' in Rancière's sense, but appears to have been 'policed' in terms of UKCIP's own problematization. It remains to be seen whether there were any political implications for the problematization of adaptation for the UK as those questions now fall to the Defra and EA-based provision of adaptation policy and support. As such, the inclusions and occlusions and the supplementary moments identified here will have important bearing on the contingent constitution of their 'new' problematization.

2.4 The wider political significance of the supplement and transformation: the poetics of adaptation

Chapter 2 established the theoretical foundation of this analysis on the post-foundationalist irreducibility of meaning (Marchart 2007, Rancière 2007b, Derrida 1976). This 'anti'-ontology means that no single order can account for the incalculable and incommensurable number of parts (Hewlett 2007, Marchart 2007, Rancière 2007b), and therefore the claim to inclusion becomes itself the definition of the political as no universal law or order exists to describe social order and its emergence (Rancière 1991, Rancière 2007a). This lack of fundament undermines the validity of any order even as that lack is what enables an order to take place. Furthermore, this fundamental contingency dislodges the validity of all knowledges and 'experts' as not only particular to a given order but as by definition ill-equipped to deal with the 'event' as the irruption of excess from beyond the order which designates them as expert. Crucially, these experts and their discourses – indicated by Rancière's critique of philosophers and

teachers - also serve the role of policing and limiting 'originary equality' – that is, the equal claim of an 'other' to a different order, based on the equal contingency of the other with the self, or the supplement with the order. In doing so, expertise in facts limits learning, and the capacity for learning (Rancière 2004, Rancière 1991) which for our purposes here can be extended to change, emergence or 'transformation.'

Thus at an ontological level the tension between science and society, expert and lay, techno-scientific and socio-emergent is bound up in a more fundamental contradiction of the social order. This fundamental impossibility of 'a' social order (Marchart 2007, Rancière 2007b) comes to the fore when that society actively and overtly seeks to adapt. Here adaptation takes its fullest, most political sense as socio-emergence or transformation. However, in this context, the problem seems to be how to ensure that adaptation comes in the form of genuinely political interventions, particularly as, once enacted they become instituted as the police, and in doing so inevitably undermine the transformability they originally sought.

Rancière's account of the political demonstrates for us the fundamental significance of the supplement as the location of the political and the critique of an extant order as well as its gateway to change. UKCIP's policing of the supplement, in an attempt to render it subsidiary, replicates the frequent response of liberal societies to the aporia of environmental 'problems,' by absorbing these at a semiotic level into the extant discursive order and thereby depriving them of their politically irruptive promise. This is particularly apparent in the UK (Swyngedouw 2010) where, as Chambers puts it "the prominence of 'third way' solutions, the emergence of consensus democracy and the rise of neo-

liberalism all [seem to] diminish politics to mere bureaucratic engineering"
(2010, p. 198).

In practical terms the disciplinary power/knowledge effects of the techno-
scientific and liberal discourse of the police is reflected in UKCIP's practices of
engagement with stakeholders and the desire to institute a particular discourse
of responsibilization. This obscures the irruptive force of climate change itself as
encounter with excess. UKCIP does this implicitly through stakeholder
engagement and supporting regional and sectoral networks, and helping them
secure 'their own' interests, so that the Government does not have to, and so that
mitigation efforts also do not have to.

However, this practice generates a second supplement of socio-emergent
supplementary moments, which are otherwise implicit governance techniques of
knowledge and order-ability. The desire to control all and know all that is
inherent to the modern order necessitates that governance drive outwards in all
directions and depths until the event horizon. However, on the basis of the post-
foundational ontology posited here, such an agenda is seen as requiring
continuous expansion as the more it encompasses the further the horizon
recedes. This is where the supplement of emergent time and space appears.
However, the core techno-scientific and consensus liberal framing has to work
hard to deny or obscure the presence of an outside or an excess, believing (or
desiring) all ecological threats to be knowable in principle and all social interests
to be present and established (Simons and Masschelein 2010). As such, any
ontological excess that appears must be sutured as a discursive (subsidiary)
supplement.

This suture of the void through an established account of climate change and adaptation thus creates a foundation that justifies and enables action, but in doing so necessarily limits the onto-political options that are available. This order of knowledge arises both in the epistemology of climate science and as a result of the 'existing objectives' or extant organisations as that which should be protected through the rationale of adaptation. It is significant then that any policy or ordering based on science, insofar as it uses science as a foundational knowledge that claims to know a universal objective truth, is likely to adopt this totalising approach that seeks to absorb all knowledges into a single logic.

Similarly 'existing objectives' speak a liberal language, but are absorbed into advanced liberalisms negotiated agreements within regional or sectoral interest groups. As Simons and Masschelein note, the "consensus police order assumes that there is no outside, and in its eagerness to see everywhere, and particularly behind every conflict, specific interests and identity, it denies all manifestations of (political) surplus or lack (Simons and Masschelein 2010, p. 598)." This clearly limits critical engagement with norms and values that cannot be absorbed within the wider extant order and therefore limits the possibilities for adaptation as transformation.

The limiting effect that this 'consensus' approach has was observed in the contingent content of the 2003 technical report through the exclusions of alternative political rationales such as more pervasive engagement in organisational structure or mandatory mitigation or collectivised state-based prophylactic approaches. Consensus policing was also seen later in the practices of UKCIP staff on stakeholders and themselves as they tried to adhere to the 2003 risk framework despite the increasing presence of a socio-emergent

supplement, in order to maintain a consistent approach, or problematization. Whilst consistency for adaptation is almost an oxymoron in terms, but it becomes necessary in the context of the wider consensus oriented, techno-scientifically based, policy.

This recalls Swyngedouw's (2010) argument, discussed earlier, that climate apocalypse obscures and ensures the continuity of capitalist production. It resonates with Dillon (2008) and Welsh (2013) who note the modus operandi of capitalist discipline as resilience is to require us to transform ourselves in order to maintain the social order of neo-liberal capitalism. This constant violence against the self is transformative of the subject but not of the overarching problematization of capitalist society. In Pellings taxonomy 'transformation' operates on precisely this principle, and becomes particularly invasive and apparently transformational as it extends its reach into the account of the subject. The crucial lesson then for any account of adaptation is: *what* adapts, or perhaps more importantly: what, in all this adaptation, *remains*?

The approach of identifying the problematization's core political rationale, rather than cataloguing changes can highlight the significance of this difference; that even if the adaptations appear to be radical, as long as the political rationale or referent object does not change, this is merely resilience or transition. This can also help to demonstrate the degree of sacrifice made at the event horizon to secure an implicit rationale. Swyngedouw demonstrates this well, and we see this also in UKCIP's governance work, albeit without the level of intrusion that Dillon identifies in other neoliberal arenas (Dillon 2003). This adds to the supplement a concern for its actual political significance as opposed to its potential; where the supplement merely expands the extant order, but maintains

its core rationale, then it is not political in Ranceire's sense. Thus, whilst the supplement is articulated to the core, its political effects are also held in check, as is its value for transformation.

However, the looseness of the supplement's articulation or relationship to the core discourse or order means that there is greater potential for it to become re-activated as a political node for change (Laclau and Mouffe 2001, Marchart 2007). Rancière's account of the political also limits the imaginary of transformation thus: all orders are hierarchical orders, as such, the less hierarchical and the less policed the order, the greater the allowance for the originary equality the greater the possibility that true politics and equality will occur. Laclau's focus on the capacity to revise power relations echoes this, and both resonate with complex adaptive systems thinking in that allowing flat, less hierarchical structures offers greater promise of transformation.

The value of discourse-based approach here has been to identify the strength of these articulations both semantically and in terms of power-knowledge relations. This has been explored as being open at certain moments and then policed at critical moments through UKCIP's history, usually in conjunction with institutional and 'political' (in the usual sense) objectives of Defra and the UK Government as well as the institutional expertise of those involved in (re)creating UKCIP's discourse. However, the implications of this theoretical account for adaptation itself are even greater: the looser the structures of discursive ordering, the greater capacity there is for adaptation, moving on the sliding scale from resilience to transformation as fundamental onto-political change.

Going back to the discussion of accounts of adaptation in Chapter 1, while resilience and transition maintain an order, transformation was refigured as transformability, that is, as the willingness to engage with change and critique. Thus, in addition to occluding specifically socio-emergent supplements, modernity's liberal consensus and techno-scientific occlusion of the void or excess of being per se profoundly undermines the possibility of adaptation being problematized in a genuinely transformative manner. For post-foundational theorists such as Foucault and Rancière, together with Bataille, it is in the recognition of the excess, the void or the divine, that transformation takes place, at transgression of the 'limit.' This requires a more engaged account of the experience of the limit and the space and time of the 'limit' or the 'event horizon.' This is indicated in the supplementary problematization's emergence of space and time but barely explored. To engage with the limit productively requires poetic, aesthetic, deliberately experimental and experiential engagement with excess (Simons and Masschelein 2010, Dillon 2008, Kate 2000, Foucault 1992), and critically, avoiding the temptation to 'suture.'

In our discussion of the aporia of climate change impacts Rancière offers a mode of engagement that assumes the excess, or the irreducibility of ignorance at its most profound level: the impossibility not only of knowing the future, but of knowing a 'solution' as all solutions are partial and impossible. This is accounted for in his (fittingly named) work: *The Ignorant Schoolmaster* (Rancière 1991), which is an exploration of the pedagogical response to the irreducibility of meaning to a given order, and hence the impossibility of teaching what cannot be known. As such, the response is to let the student, in their equality of contingency, teach themselves: "… one can teach what one doesn't know if the

student is emancipated... In short, the circle of emancipation must be *begun*" (Dillon 2005, quoting Rancière 1991, pp. 15-16). This crucially refuses to reify or order knowledge and refuses the accompanying institutionalisation of such knowledge (Dillon 2005). For adaptation as transformation this enables the decentralization of the production of knowledge and the refusal to codify an order of practice or hierarchy of rule. Although this is an idealisation of sorts – it offers a mode that attempts to ensure the openness of relations that allow complex adaptive systems to emerge, and transgression or transformation.

Crucially, however, Dillon notes that, for all its emancipatory value, Rancière's account of equality "too quickly closes down the complex political and ethical issues raised by the messianic and in particular the violence implied by it" (Dillon 2005, p. 435). The constant irruption of the political in any order and the foundationlessness of any order mean that change is not only inevitable but also infinite. Furthermore, if the political act is understood as the expression of freedom, emancipation becomes a driving code, that, although it posits no order, nonetheless "poses its own art, its own dispositions, and compositions," (Dillon 2005, p. 444). Furthermore "the play of this moment...its continuous inexhaustible advent, as well as the madness of decision that characterizes it...recalls, at least in part, Derrida's messianism without a messiah" (Dillon 2005, p. 446). The 'mad' arbitrariness of any decision, an order amidst irreducible excess, or in climate change parlance, irreducible uncertainty of the most profound kind to be encountered by an infinitely malleable social body, is at once emancipatory and in its destructive eruption, also necessarily violent. This is a 'sacrificial' violence that trades one equality for another because only the act of trading is important, not the goods themselves. Thus for Dillon, the question then

shifts from a concern with emancipation to the necessary question of "what violence attends [emancipation]? And how is that violence to be addressed?" (Dillon 2005, p. 447)

After all, in the context of ecological systems and climate change, the ecological orders established over millennia may have been achieved violently, through events and change, and have been policed (also violently, as Foucault is at pains to point out), yet whereas for Rancière the sum of parts exceeds a given ordering, in ecology the converse has also proven productive, rather than merely destructive: the sum is greater than the parts – the order does more than any of the parts could do on their own. Parallel to this, climate change is itself a political irruption of the extant order, and whilst it ushers in a new order, it does so with a colossal amount of violence. Is that excess which is destructive as valuable as that which is destroyed? 'Valuable' is also a deliberate term rather than 'equal' – while both are equal in their contingency per se, does it follow that the emancipatory assertion of the excluded and the excess is a better or wider selection of 'parts'?

This brings us back to the critique levelled against Norgaard that all coevolutions are equal. In fact, in reserving judgement on validity, as Rancière does, they are very similar approaches. However, in celebrating originary equality, the concern of other post structuralist theorists for the mode of being that opens up to emergence (rather than emerging regardless of the crushing of other equalities) is lost. Hanging in the balance is not the concern for care of the self (Foucault 1990, Foucault 1992) but concern for care of the other, as explored by Derrida, for example (Stamp 2009). In care of the other, the appreciation of the equality of contingency can become a celebration of what is produced as well as the desire for production and also builds openness as a positive trait and

practice rather than as a mere interruption or eruption without temporal substance (Dillon 2005, Dillon 2008).

There is no solution, order or code for the undecidable decision at the limit point of an order, but it adds a layer to the messianic interval that the political operates within, and marks it with a capacity for thought, for turning about, for exploration without destruction that expands the ethical and practical boundaries of response as well as the time of formulating that response. It is this that broadens the basis of transformation away from mere an-archy to trans-*form*-ation, where form and order are possible, even desirable, so long as they are relatively flat and therefore open to change.

However, that excess needs to be presented: it needs to be given a form in order to 'count' and in order to achieve transformation. As such, the crucial nature of the supplement identified in UKCIP's discourse not only marks the space of excess, but a particular element of excess, which in being articulated to the core begins to be designated, and to have a 'proper name' such that it is called into the 'account' (Rancière 2001, Rancière and Panagia 2000). This happens in terms of the phrase 'stakeholders' but crucially, through the emerging inclusion of a new named subject (such as naming a 'representative selection' or 'crucial nodes' or indeed 'all' of the workforce, consumers, or range of individuals responding to impacts) and the limited inclusion of techniques such as various modes of communication and deliberation and social scenario or futures visioning. Critically, without naming and describing an alternative future, we are presented with no alternative to the current order and therefore have no basis for transformation. The central importance of encounter and agonism, and jumps into unknown experimentation therefore cannot be underestimated. Nor can the

colossal distance between this mode of engagement with the excess and that of techno-scientific rationality in radically limiting the breadth and depth of adaptation.

In sum, if transformation as the most extensive account of adaptation is to be engaged with both in terms of harnessing the productivity of originary equality and celebrating the productions of order, the mode of engaging with the supplement at this sacral boundary must be developed itself, in addition to engagement with the particular supplement presented here, which just so happens to speak to this ontology of contingency and originary equality as well. Just as the ignorant schoolmaster allowed his students to teach themselves, the supplement presented here of open-dialogue and decision-making across time and space opens up the moment of transformation to all points of (re)institution, but it also does so with an awareness of the productive nature of their relations as both contingency and capacity.

3.0 Limitations and Future directions

There are several limitations to this research that have been recognized throughout the thesis and which will be repeated here with a view to introducing avenues for improvement and future research. Most significant of these were, first, that there was a limitation in data selection in the sense of not carrying out a thorough review of the Local Climate Impacts Profile and how this was itself introduced to UKCIP's discourse and how it functioned within the framework of the risk-analysis more precisely. This would be an important area for the extension of this research.

More fundamentally however, while the linguistic approach to the analysis of discourse is incredibly productive, it is also an incredibly labour-intensive and slow process, resulting in a high resolution but a limited purview of UKCIP's full discourse. A fuller account would include a much wider range of discourse events, but particularly important are those established through practices of governance such as UKCIP's 'tools'. The risk-framework discussed here is one such tool, but it takes a much more effective and disciplinary power/knowledge form through the technologies and 'rituals' or procedure of UKCIPs meetings, spread-sheets and computer-program interfaces such as the Adaptation Wizard and the Weather Generator. Each of these could be analysed at the level provided by critical discourse analysis, and all of them combine into an account of UKCIP's discourse, which properly construed as a problematization includes practices of governance. This demonstrates a clear direction for further research, as well as a broadened research strategy, as well as being able to draw on UKCIP's now quite expansive range of case studies.

The discussion in the previous section and in Chapter 7 also makes clear that the legacy of UKCIP's problematization still continues in the UK, and as such the real implications of this research are to be found not only in the stakeholder engagements already undertaken, but in those currently emerging through the national Climate Change Risk Assessment and related Defra and Environment Agency adaptation practices. Therefore tracking the emergence of the discourse through these new institutional nodes would be crucial to any account of the wider problematization of adaptation in the UK after 2012.

Appendix 1: List of Observations of UKCIP stakeholder meetings and supporting documentation

Observation title and description	Data Collected (analysis method)
"Stakeholder A," second meeting with UKCIP, basic risk assessment, 2009	- Minutes from first meeting in written form provided by UKCIP (background information) - Vulnerability assessment spread sheet provided by UKCIP (background information) - Observation and audio recording. (Observation notes combined with transcript subjected to discourse analysis and coding) - Follow-up interview with UKCIP Interviewee E (transcript subjected to discourse analysis and coding) - Follow-up interview with UKCIP Interviewee G (transcript subjected to discourse analysis and coding)
"Stakeholder B," first meeting with UKCIP, background to climate adaptation and basic risk assessment, 2009	- Audio recording provided by UKCIP of first and second meeting. (Transcribed, with discourse analysis and coding) - Agenda and notes from UKCIP about the meeting plan (background information) - Copy of UKCIP notes from post-event assessment for both meetings (background information)

UKCIP presentation to Emergency Planning Society (EPS), 2009 Value of event: Interesting because this was the first official engagement between UKCIP and the EPS. Also selected because it appeared the most likely to directly confront the issue of different conceptualisations of adaptation as resilience, and different temporal understandings.	- Observation, audio recording and transcript, analysed using discourse analysis and coding - Copy of power-point presentation given my UKCIP representative - Follow-up interview with UKCIP representative
UKCP'09 Oxford Launch, 2009	- Observed to see if this connected to any changes to the risk framework, LCLIP and general presentation of adaptation. Audio recorded. (No major changes, so used as background only)

Appendix 2: Interview Schedule

Interviewee and Position	Explanation of relation to other discourse events
[Interview name removed in final copy for anonymity purposes]	Lead author of the Climate Adaptation: risk, uncertainty and decision-making report
[Interview name removed in final copy for anonymity purposes]	Co-author at UKCIP of the Climate Adaptation: risk, uncertainty and decision-making report
[Interview name removed in final copy for anonymity purposes]	Long-term head of the Science Team at UKCIP
[Interview name removed in final copy for anonymity purposes]	Long-term staff at UKCIP, and involved in Stakeholder B case-study
[Interview name removed in final copy for anonymity purposes]	This was a 'snowball' interview, recommended someone who presented an 'alternative' take on UKCIP's current and potential discourse, also involved in stakeholder work
[Interview name removed in final copy for anonymity purposes]	Stakeholder work with Stakeholder A case-study
[Interview name removed in final copy for anonymity purposes]	Also worked with Stakeholder A.
[Interview name removed in final copy for anonymity purposes]	Stakeholder work, mostly with Local Authorities, also presented to the professional organisation the Emergency Planning Society

Bibliography

Adaptation Sub-Committee. 2011. Adapting to climate change in the UK: measuring progress. London: Adaptation Sub-Committee.

Adey, P. & B. Anderson (2011) Event and anticipation: UK Civil Contingencies and the space-times of decision. *Environment and Planning A,* 43, 2878-2899.

Adger, N., I. Lorenzoni & K. O'Brien. 2009. Adapting to Climate Change: thresholds, values, governance. Cambridge: Cambridge University Press.

Agamben, G. 1998. *Homo Sacer: Sovereign power and bare life.* Stanford: Stanford University Press.

Anderson, B. 2006. *Imagined Communities.* London: Verso.

Anderson, B. (2010) Preemption, precaution, preparedness: anticipatory action and future geographies. *Progress in Human Geography,* 34.

--- (2011) Affect and biopower: towards a politics of life. *Transactions of the Institute of British Geographers,* 37, 28-43.

Barnett, J. & W. N. Adger (2007) Climate change, human security and violent conflict. *Political Geography,* 26, 639-655.

Beck, S. (2011) Moving Beyond the Linear Model of Expertise? IPCC and the test of adaptation. *Regional Environmental Change,* 11, 297-306.

Billig, M. 2001. Discursive, rhetorical and ideological messages. In *Discourse Theory and Practice: a reader,* eds. M. Wetherell, S. Taylor & S. J. Yates. London: Sage.

Brockhaus, M. & H. Kambire. 2009. Decentralization: a window of opportunity for successful adaptation to climate change? In *Adapting to Climate Change: thresholds, values, governance,* eds. N. Adger, I. Lorenzoni & K. O'Brien. Cambridge: Cambridge University Press.

Brown, A., M. Gawith, K. Lonsdale & P. Pringle. 2011. Managing adaptation: linking theory and practice. Oxford: UK Climate Impacts Programme.

Bulkeley, H. & A. P. Mol (2003) participation and environmental governance: consensus, ambivalence and debate. *Environmental Values,* 12, 143-54.

Burton, I. (2003) Book Review of Climate Change 2001: Impacts, Adaptation and Vulnerability Rperot fo IPCC Working Group II. *Agricultural and Forest Meteorology,* 117, 123-124.

Burton, I., S. Huq, B. Lim, O. Pillfosova & E. L. Schipper (2002) From impacts assessment to adaptation priorities: the shaping of adaptation policy. *Climate Policy,* 2, 145-149.

Cabinet Office Strategy Unit. 2002. Risk: improving governments capability to handle risk and uncertainty. In *Strategy Unit Report.* London: Cabinet Office Strategy Unit.

Campbell, D. 1998. *Writing Security: United States Foreign Policy and the Politics of Identity.* Minneapolis: University of Minnesota Press.

Castree, N. & B. Braun. 2001. *Social nature: theory, practice and politics.* Oxford: Blackwell.

Chacko, E. (2004) Positionality and Praxis: fieldwork experiences in rural India. *Singapore Journal of Tropical Geography,* 25, 51-63.

Chambers, S. A. 2010. Jacques Rancière (1940-). In *From Agamben to Zizek: Contemporary Critical Theorists,* ed. J. Simons. Edinburgh: Edinburgh University Press.

Chow, R. (1999) When Whiteness Feminizes: some consequences of a supplementary logic. *Differences: a Journal of Feminist Cultural Studies,* 11.

Clark, N. (2010) Volatile Worlds, Vulnerable Bodies: Confronting Abrupt Climate Change. *Theory Culture Society,* 27, 31-53.

Cohen, S. J. 1997. Mackenzie Basin impact study: final report. ed. S. J. Cohen. Vancouver: Environment Canada.

Colls, A., M. Erhard, U. Fritsch, J. v. Minnen & T. Voigt. 2005. Vulnerability and adaptation to climate change in Europe. In *EEA Technical report.* Copenhagen: European Environment Agency.

Dalby, S. 2002. *Environmental Security.* Minneapolis: University of Minnesota Press.

Defra. 2010. Archive: National indicator 188: Adapting to climate change. Defra.

--- (2012a) About the Weather Generator. 26 July 2011).

--- (2012b) Adapting to climate change. 2012. 25 May 2012).

--- (2012c) UK Climate Change Risk Assessment (CCRA). 2012. http://www.defra.gov.uk/environment/climate/government/risk-assessment/ (last accessed 28 May 2012).

Defra Adapting to Climate Change Programme team. 2012. Environment Agency to provide practical advice to help England adapt to climate change. In *Defra,* ed. Defra. Defra.

Demeritt, D. (2001) The Construction of Global Warming and the Politics of Science. *Annals of the Association of American Geographers,* 91, 307-337.

--- (2006) Science studies, climate change and the prospects for constructivist critique. *Economy and Society,* 35, 453-479.

Demeritt, D. & D. Langdon (2004) The UK Climate Change Programme and communication with local authorities. *Global Environmental Change,* 14, 325-336.

Derrida, J. 1976. *Of Grammatology.* Baltimore and London: Johns Hopkins University Press.

Dessai, S. & M. Hulme (2004) Does climate adaptation policy need probabilities? *Climate Policy,* 4, 107–128.

--- (2008) Negotiating future climates for public policy: a critical assessment of the development of climate scenarios for the UK. *Environmental science & policy,* 11, 54–70.

Dessai, S., M. Hulme, R. Lempert & R. Pielke. 2008. Climate Prediction: a limit to adaptation? In *Living with climate change: are there limits to adaptation?,* eds. N Adger, I Lorenzoni & K. O'Brien. Cambridge: Cambridge University Press.

Dessai, S., M. Hulme, R. Lempert & J. Roger Pielke. 2009. Climate prediction: a limit to adaptation? In *Adapting to climate change: thresholds, values, governance,* eds. W. N. Adger, I. Lorenzoni & K. L. O'Brien, 64-78. Cambridge: Cambridge University Press.

Dijk, T. V. 2001. Principles of Critical Discourse Analysis. In *Discourse Theory and Practice: a reader,* eds. M. Wetherell, S. Taylor & S. J. Yates, 300 – 317. London: Sage.

Dillon, M. 1996. *Politics of Security.* London: Routledge.

Dillon, M. (2002) Network society, network centric warfare and the state of emergency. *Theory Culture Society,* 19.

--- (2003) Virtual Security: A Life Science of (Dis)order. *Millennium: Journal of International Studies,* 32, 531-558.

Dillon, M. (2005) A Passion for the (Im)possible: Jacques Rancière, Equality, Pedagogy and the Messianic. *European Journal of Political Theory,* 4, 429-452.

--- (2008) Lethal Freedom: Divine Violence and the Machiavellian Moment. *Theory and Event,* 11, 1-33.

Doyle, S. (2012) Reflexivity and the Capacity to Think. *Qualitative Health Research,* 23, 248-255.

Eden, S., A. Donaldson & G. Walker (2006) Green groups and grey areas: scientific boundary-work, nongovernmental organisations, and environmental knowledge. *Environment and Planning A,* 38, 1061-1076.

Environment Agency. 2012. Adapting to Climate Change Programme. http://www.environment-agency.gov.uk/research/132323.aspx: Environment Agency.

Eriksen, S. & K. O'Brien (2007) Vulnerability, poverty and the need for sustainable adaptation measures. *Climate Policy,* 7, 73-88.

ESYS Consulting. 2004. Review of UKCIP: final report.

Fairclough, N. 2000. *New Labour, new language?* London: Routledge.

---. 2001. The discourse of New Labour: Critical Discourse Analysis. In *Discourse as data: a guide for analysis,* eds. Simeon Yates, Margaret Wetherell & S. Taylor, 227-266. London and Milton Keynes: Sage and The Open University.

---. 2010. *Critical Discourse Analysis: the critical study of language.* Harlow.

Feindt, P. & A. Oels (2005) Does discourse matter? Discourse analysis in environmental policy making. *Journal of Environmental Policy & Planning,* 7, 1-13.

Ferreyra, C. (2006) Practicality, Positionality, and Emancipation: reflections on Participatory Action Research wtih a Watershed Partnership. *Syst Pract Act Res,* 2006, 577-598.

Flynn, T. R. 2005. *Satre, Foucault, and historical reason: a poststructuralist mapping of history.* Chicago: University of Chicago Press.

Folke, C., S. Carpenter, T. Elmqvist, L. Gunderson, C. Holling & B. Walker (2002) Resilience and Sustainable Development: Building Adaptive Capacity in a World of Transformations. *Ambio,* 31, 437-440.

Forsyth, T. (2010) Panacea of paradox? Cross-sector partnerships, climate change, and development. *Wiley Interdisciplinary Reviews: Climate Change,* 1, 683–696.

Foucault, M. 1977. *Discipline and Punish: the birth of the prison*. New York: Pantheon.

---. 1990. *The Care of the Self: The History of Sexuality Volume Three*. London: Penguin.

---. 1992. *The Use of Pleasure: The History of Sexuality Volume Two*. London: Penguin.

---. 1994. *The essential works of Foucault 1954-1984: power*. London: Penguin.

---. 1998. *The Will to Knowledge: The History of Sexuality Volume One*. London: Penguin Books.

---. 2001. *Fearless Speech*. New York: Semiotext(e).

---. 2008. *The Birth of Biopolitics: lectures at the College de France 1978 - 1979*. Basingstoke: Palgrave Macmillan.

---. 2009. *Security, territory, population: lectures at the College de France 1977 - 1978*. Basingstoke: Palgrave Macmillan.

Fussel, H. M. (2007) Adaptation planning for climate change: concepts, assessment approaches, and key lessons. *Integrated Research System for Sustainability Science*, 265-275.

Fussel, H. M. & R. J. T. Klein (2006) Climate change vulnerability assessments: an evolution of conceptual thinking. *Climatic Change*, 75, 301-329.

Gawith, M., R. Street, R. Westaway & A. Steynor (2008) Application of the UKCIP02 climate change scenarios: reflections and lessons learnt. *Global Environmental Change*, 19, 113-121.

Gergen, K. 2001. Self-narration in social life. In *Discourse theory and practice: a reader*, eds. M. Wetherell, S. Taylor & S. J. Yates, 247-260. London: Sage.

Glynos, J. & D. Howarth. 2007. *Logics of critical explanation in social and political theory*. Abingdon: Routledge.

Guston, D. H. (1999) Stabilizing the Boundary between US Politics and Science: The Role of the Office of Technology Transfer as a Boundary Organization. *Social Studies of Science*, 29, 87-111.

Hacking, I. 1990. *The taming of chance*. Cambridge: Cambridge University Press.

---. 2006. *The emergence of probability: a philosophical study of early ideas about probability, induction, and statistical inference*. Cambridge: Cambridge University Press.

Hall, S. 2001. Foucault: power, knowledge and discourse. In *Discourse theory and practice: a reader,* eds. M. Wetherell, S. Taylor & S. J. Yates, 72-81. London: Sage.

Hansen, L. 2006. *Security as practice: discourse analysis and the bosnian war.* Abingdon: Routledge.

Harman, J., M. Gawith & M. Colley (2005) Progress on assessing climate impacts through the UK Climate Impacts Programme. *Weather,* 60, 258-262.

Harper, D. 2012a. Police. In *Online Etymology Dictionary.* http://www.etymonline.com/index.php?allowed_in_frame=0&search=police&searchmode=none: Online.

---. 2012b. Policy. In *Online Etymology Dictionary.* http://www.etymonline.com/index.php?allowed_in_frame=0&search=policy&searchmode=none: Online.

Harvey, D. 1990. *The condition of postmodernity: an enquiry into the origins of cultural change.* Oxford: Blackwell.

Head, L. (2010) Cultural Ecology: adaptation - retrofitting a concept? *Progress in Human Geography,* 34, 234-212.

Hewlett, N. 2007. *Badiou, Balibar, Rancière: Re-thinking Emancipation.* London: Continuum.

Holstein, J. A. & J. F. Gubrium. 1995. *The Active Interview.* Thousand Oaks: Sage.

Hoogendoorn, G. & G. Visser (2012) Stumbling over researcher positionality and polical-temporal contingency in South African second-home tourism research. *Critical Arts,* 26.

Howarth, D. 2000. *Discourse.* Maidenhead: Open University Press.

Hughes, N., J. Tomei & P. Ekins. 2009. Critical review of the application of the UKCIP socioeconomic scenarios: lessons learnt and future directions. London: Kings College London Department of Geography.

Hulme, M. 2009. *Why we disagree about climate change: understanding controversy, inaction and opportunity.* Cambridge: Cambridge University Press.

Hulme, M. & S. Dessai (2008) Predicting, deciding, learning: can one evaluate the 'success' of national climate scenarios. *Environmental Research Letters,* 1-7.

Hulme, M. & J. Turnpenny (2004) Understanding and managing climate change: the UK experience. *Geographical Journal,* 170, 105-115.

Inderberg, T. H. & P. O. Eikeland. 2009. Limits to adaptation: analysing institutional constraints. In *Adapting to Climate Change: thresholds, values, governance,* eds. N. Adger, I. Lorenzoni & K. O'Brien. Cambridge: Cambridge University Press.

Intergovernmental Panel on Climate Change. 2001. *Contribution of Working Group II to the Third Assessment Report of the Intergovernmental Panel on Climate Change.* Cambridge University Press.

Interviewee C. 2009. Interview with Interviewee C, UK, February 2nd 2009.

Interviewee H. 2009. Interview with Interviewee H, UK, 30th January 2009.

Jäger, S. 2001. Discourse and knowledge: Theoretical and methodological aspects of a critical discourse and dispositive analysis. In *Methods of Critical Discourse Analysis,* eds. R. Wodak & M. Meyer, 32-62. London: Sage.

Jameson, F. (2003) Future City. *New Left Review,* 21, 65-79.

Jasanoff, S. (1987) Contested Boundaries in Policy-Relavant Science. *Social Studies of Science,* 17, 195-230.

--- (1996) Beyond Epistemology: relativism and engagement in the politics of *Social Studies of Science,* 26.

--- (2010) A New Climate for Society. *Theory Culture Society,* 27, 233-253.

---. 2012a. *Science and Public Reason.* Hoboken: Routledge.

---. 2012b. The Songlines of Risk. In *Science and Public Reason.* Hoboken: Routledge.

Jenkins, G. J., J. M. Murphy, D. M. H. Sexton, J. A. Lowe, P. Jones & C. G. Kilsby. 2009. UK Climate Projections: Briefing report. Exeter, UK: Met Office Hadley Centre.

Johnstone, B. 2008. *Discourse Analysis.* Oxford: Blackwell.

Kate, L. t. 2000. The Gift of Loss" A Study of the Fugitive God in Batialle's Atheology, with References to Jean Luc-Nancy. In *Flight of the Gods: Philosophical Reflections on Negative Theology,* eds. I. Bulhof & L. t. Kate. New York: Fordham University Press.

Laclau, E. & C. Mouffe. 2001. *Hegemony and socialist strategy: towards a radical democratic politics.* London: Verso.

Larsen, J. 2003. Record Heat Wave in Europe Takes 35,000 Lives: Far Greater Losses May Lie Ahead. Earth Policy Institute.

Latour, B. 2004. *Politics of Nature: How to Bring the Sciences into Democracy.* Cambridge, MA: Harvard University Press.

Levina, E. & D. Tirpak. 2006. Adaptation to climate change: key terms. Organisation for Economic Co-operation and Development: Organisation for Economic Co-operation and Development, International Energy Agency.

Lonsdale, K., M. Gawith, K. Johnstone, R. Street, C. West & A. Brown. 2010. Attributes of Well-Adapting Organisations: a report prepared by UK Climate Impacts Programme for the Adaptation Sub-Committee. Oxford: UKCIP.

Lorenzoni, I., M. Jones & J. Turnpenny (2007) Climate change, human genetics and post-normality in the UK. *Futures,* 39, 65-82.

Lovbrand, E., J. Stripple & B. Wiman (2008) Earth System governmentality: reflections on science in the anthropocene. *Global Environmental Change,* 19, 7-13.

Luhmann, N. 1998. *Observations on modernity.* Stanford: Stanford University Press.

Marchart, O. 2007. *Post-foundational Political Thought: Political Difference in Nancy, Lefort, Badiou and Laclau.* Edinburgh: Edinburgh University Press.

Marieke de Goede & Samuel Randalls (2009) Precaution, preemption: arts and technologies of the actionable future. *Environment and Planning D: Society and Space,* 27, 859-878.

Maybin, J. 2001. Language, Struggle and Voice: The Bakhtin/Volosinov writngs. In *Discourse theory and practice: a reader,* eds. M. Wetherell, S. Taylor & S. J. Yates, 64-71. London: Sage.

McCormack, D. P. & T. Schwanen (2011) Guest editorial: The space - times of decision making. *Environment and Planning A,* 43, 2801-2818.

McKenzie-Hedger, M., R. Connell & P. Bramwell (2006) Bridging the gap: empowering decision-making for adaptation through the UK Climate Impacts Programme. *Climate Policy,* 6, 201-215.

Metcalfe, G., K. Jenkinson & K. Johnstone. 2009. A changing climate for business: business planing for the impacts of climate change, revised edition January 2009. Oxford: UKCIP.

Nelson, V., R. Lamboll & A. Arendse. 2008. Climate Change Adaptation, Adaptive Capacity and Development Discussion Paper. In *DFID/DSA Policy Forum.* University of Greenwich, London, UK.

Nordlund, G. (2008) Futures Research and the IPCC Assessment Study of the Effects of Climate Change. *Futures,* 40, 873-876.

Norgaard, R. B. 1994. *Development Betrayed: The End of Progress and a Co-Evolutionary Revisioning of the Future.* Routledge.

O'Brien, K., S. Eriksen, L. Nygaard & A. Schjolden (2007) Why different interpretations of vulnerability matter in climate change discourses. *Climate Policy,* 7, 73-88.

O'Brien, K. & R. Leichenko. 2007. Human Security, vulnerability, and sustainable adaptation. In *Human Development Report 2007/2008 Occasional Paper: Fighting climate change: Human solidarity in a divided world,* ed. H. D. R. O. O. PAPER.

Oels, A. (2005) Rendering Climate Change Governable: From Biopower to Advanced Liberal Government? *Journal of Environmental Policy & Planning,* 7, 185-207.

Okereke, C., H. Bulkeley & H. Schroeder (2009) Conceptualizing climate governance beyond the international regime. *Global Environmental Politics,* 9, 58-78.

Olausson, U. (2009) Global warming--global responsibility? Media frames of collective action and scientific certainty. *Public Understanding of Science,* 18, 421-436.

Park, S., N. Marshall, E. Jakku, A. Dowd, S. Howden, E. Mendham & A. Flemming (2012) Informing adaptation responses to climate change through theories of transformation. *Global Environmental Change,* 22, 115-126.

Patterson, M. & S. Dalby (2006) Empire's Ecological Tyreprints. *Environmental Politics,* 15.

Pelling, M. 2011. *Adaptation to Climate Change: from resilience to transformation (Kindle Edition).* T & F Books UK.

Pelling, M. & C. High. 2005. Social Learning and Adaptation to Climate Change. In *Benfield Hazard Research Centre Disaster Studies Working Paper 11.*

Pelling, M., C. High, J. Dearing & D. Smith (2008) Shadow spaces for social learning: a relational understanding of adaptive capacity to climate change within organisations. *Environment and Planning A,* 40, 867-884.

Pelling, M. A., D. Smith & J. Dearing. 2004. Rapid Climate Change UK: Towards An Institutional Theory of Adaptation. In *End of award report.* Swindon: Economic and Social Research Council.

Potter, J. 2001. Wittgenstein and Austin. In *Discourse Theory and Practice: a reader,* eds. M. Wetherell, S. Taylor & S. J. Yates. London: Sage.

Rancière, J. 1991. *The Ignorant Schoolmaster: Five Lessons in Intellectual Emancipation.* Stanford: Stanford University Press.

---. 1998. *Disagreement: Politics and Philosophy.* Minneapolis: University of Minnesota Press.

--- (2001) Ten Theses on Politics. *Theory and Event,* 5.

---. 2004. *The Philosopher and his Poor.* Durham: Duke University Press.

---. 2007a. Does democracy mean something? In *Adieu Derrida,* ed. C. Douzinas, 84-100. Basingstoke: Palgrave Macmillan.

---. 2007b. *On the Shores of Politics.* London: Verso.

Rancière, J. & D. Panagia (2000) Dissenting Words: A Conversation with Jacques Rancière. *Diacritics,* 30, 113-126.

Renkema, J. 2004. *Introduction to discourse studies.* Amsterdam: John Benjamins.

Rettberg, S. (2010) Contested narraives of pastoral vulnerability and risk in Ethiopia's Afar region. *Pastoralism,* 1, 248-273.

Reusswig, F. 2010. The new climate change discourse: a challenge for environmental sociology. In *Environmental sociology: European perspectives and interdisciplinary challenges,* eds. M. Gross & H. Heinrichs, 39-58. Dordrecht Springer.

Roe, E. 1994. *Narrative policy analysis: theory and practice.* Durham: Duke University Press.

Sabia, D. (2010) Defending Immanent Critique. *Political Theory,* 38, 684-711.

Schipper, L. (2006) A conceptual history of adaptation in the UNFCCC process. *Review of European Community and International Environmental Law,* 15, 82-92.

Select Bipartisan Committee to Investigate the Preparation for and Response to Hurricane Katrina. 2006. A Failure of Initiative: Final Report of the Select Bipartisan Committee to Investigate the Preparation for and Response to Hurricane Katrina. Washington: Committee of the Whole House on the State of the Union.

Sellke, P. & O. Renn. 2010. Risk society and environmental policy: risk governance in a complex world. In *Environmental Sociology,* eds. M. Gross & H. Heinrichs, 295--322. Springer Netherlands.

Shackley, S. & B. Wynne (1995a) Global climate change: the mutual construction of an emergent science-policy domain. *Science and Public Policy,* 22, 218-230.

Shackley, S. & B. Wynne (1995b) Integrating knowledge for climate change: pyramids, nets and uncertainties. *Global Environmental Change,* 5, 113-126.

--- (1996) Representing uncertainty in global climate change science and policy: boundary-ordering devices and authority. *Science, technology and human values,* 21, 275-302.

Simons, M. & J. Masschelein (2010) Governmental, Political and Pedagogic Subjectivation: Foucault *with* Rancière. *Educational Philosophy and Theory,* 42.

Stakeholder A Observation. 2009. Observation Notes and Transcript of Second UKCIP meeting with Stakeholder A: Monday 23rd February 2008, Day 2: Risk Assessment.

Stakeholder B Observation. 2009a. Transcript of first UKCIP meeting with Stakeholder B.

--- (2009b) Transcript of second meeting with Stakeholder B.

Stamp, R. (2009) The Torsion of Politics and Friendship in Derrida, Foucualt and Rancière. *Borderlands,* 8.

Star, S. L. & J. R. Griesemer (1989) 'Translations' and Boundary Objects: Amateurs and Professionals in Berkeley's Museum of Vertebrate Soology, 1907-39. *Social Studies of Science,* 19, 387-420.

Stevenson, R. (2009) Discourse, power, and energy conflicts: understanding Welsh renewable energy planning policy. *Environment and Planning C: Government and Policy,* 27, 512-526.

Swyngedouw, E. (2010) Apocalypse Forever?: Post-political Populism and the Spectre of Climate Change. *Theory Culture Society,* 27, 213-232.

Szerszynski, B. (2010) Reading and Writing the Weather: Climate Technics and the Moment of Responsibility. *Theory Culture Society,* 27, 9-30.

Szerszynski, B. & J. Urry (2010) Changing Climates: Introduction. *Theory Culture Society,* 27, 1-8.

Tadjbaksh, S. & A. Chenoy. 2007. *Human security: concepts and implications.* Abingdon: Routledge.

The World Bank & Potsdam Institute for Climate Impact Research and Climate Analytics. 2012. Turn Down the Heat: Why a 4 Degrees Centigrade Warmer World Must be Avoided. Washington: International Bandk for Reconstruction and Development/The World Bank.

Titscher, S., M. Meyer, R. Wodak & E. Vetter. 2000. *Methods of text and discourse analysis.* London: Sage.

Tompkins, E. L., W. N. Adger, E. Boyd, S. Nicholson-Cole, K. Weatherhead & N. Arnell (2010) Observed adaptation to climate change: UK evidence of transition to a well-adapting society. *Global Environmental Change,* 20 627-635.

Torfing, J. 1999. *New theories of discourse: Laclau, Mouffe, and Zizek.* Oxford: Blackwell.

--- (2010) Local forms of governance in Denmark: the revenge of the supplement. *Journal of Power,* 3, 405-425.

Turnpenny, J., A. Haxeltine, I. Lorenzoni, T. O'Riordan & M. Jones. 2005. Mapping actors invovled in climate change policy networks in the UK. In *Tyndall Centre for Climate Change Research.* Tyndall Centre for Climate Change Research: Tyndall Centre for Climate Change Research.

UK Climate Impacts Programme. 2000. Socio-economic scenarios for climate change impact assessment: a guide to their use in the UK Climate Impacts Programme. Oxford: UKCIP.

---. 2004. UK Climate Impacts Programme – Work Programme 2005 – 2010. ed. U. K. C. I. Programme. Oxford: UKCIP.

---. 2009. A local climate impacts profile: how to do an LCLIP. Oxford: UKCIP.

---. 2010. The UKCIP Adaptation Wizard v 3.0.

UKCIP Interviewee A. 2009. Interview with UKCIP Interviewee A, Oxford, 2nd July 2009. Oxford.

UKCIP Interviewee B. 2009. Interview with UKCIP Interviewee B, Oxford, 2nd July 2009.

UKCIP Interviewee D. 2009. Interview with UKCIP Interviewee D, 7th August 2009.

UKCIP Interviewee E. 2009. Telephone Interview with UKCIP Interviewee E, 23rd March 2009.

UKCIP Interviewee F. 2009. Interview with UKCIP Interviewee F, Oxford, 2nd July 2009. ed. E. Oppermann. Oxford.

UKCIP Interviewee G. 2009. Interview with UKCIP Interviewee G, Oxford, 2nd July 2009.

Welsh, M. (2013) Resilience and responsibility: governing uncertainty in a complex world. *The Geographical Journal.*

Wertsch, J. 2001. The Multivoicedness of Meaning. In *Discourse Theory and Practice: a reader,* eds. M. Wetherell, S. Taylor & S. J. Yates. London: Sage.

West, C. & M. Gawith. 2005. Measuring Progress: Preparing for climate change through the UK Climate Impacts Programme. In *UKCIP Technical Report.* Oxford: UK Climate Impacts Programme.

Wetherell, M. 2001a. Debates in Discourse Research. In *Discourse Theory and Practice: a reader,* eds. Margaret Wetherell, Stephanie Taylor & S. J. Yates, 380-399. London: Sage.

---. 2001b. Themes of Discourse Research: the case of Diana. In *Discourse Theory and Practice: a reader,* eds. M. Wetherell, S. Taylor & S. J. Yates, 14-28. London: Sage.

Wetherell, M., S. Taylor & S. J. Yates. 2001. Discourse Theory and Practice: a reader. London: Sage.

Whitehead, M., R. Jones & J. Pykett (2011) Governing irrationality, or a more than rational government? Reflections on the rescientisation of decision making British public policy. *Environment and Planning A,* 43, 2819-2837.

Willows, R. & R. Connell. 2003. Climate Adaptation: risk, uncertainty and decision-making. In *UKCIP Technical Report.* Oxford: UKCIP.

Willows, R., N. Reynard, R. Connell & I. Medowcroft. 2003b. Climate adaptation: risk, uncertainty and decision-making. In *UKCIP Technical Report – Review Draft.*

Wodak, R. & M. Meyer. 2001. Methods of Critical Discoruse Analysis. In *Introducing Qualitative Methods,* ed. D. Silverman. London: Sage.

Wynne, B. (2010) Strange Weather, Again: Climate Science as Political Art. *Theory Culture Society,* 27, 289-305.